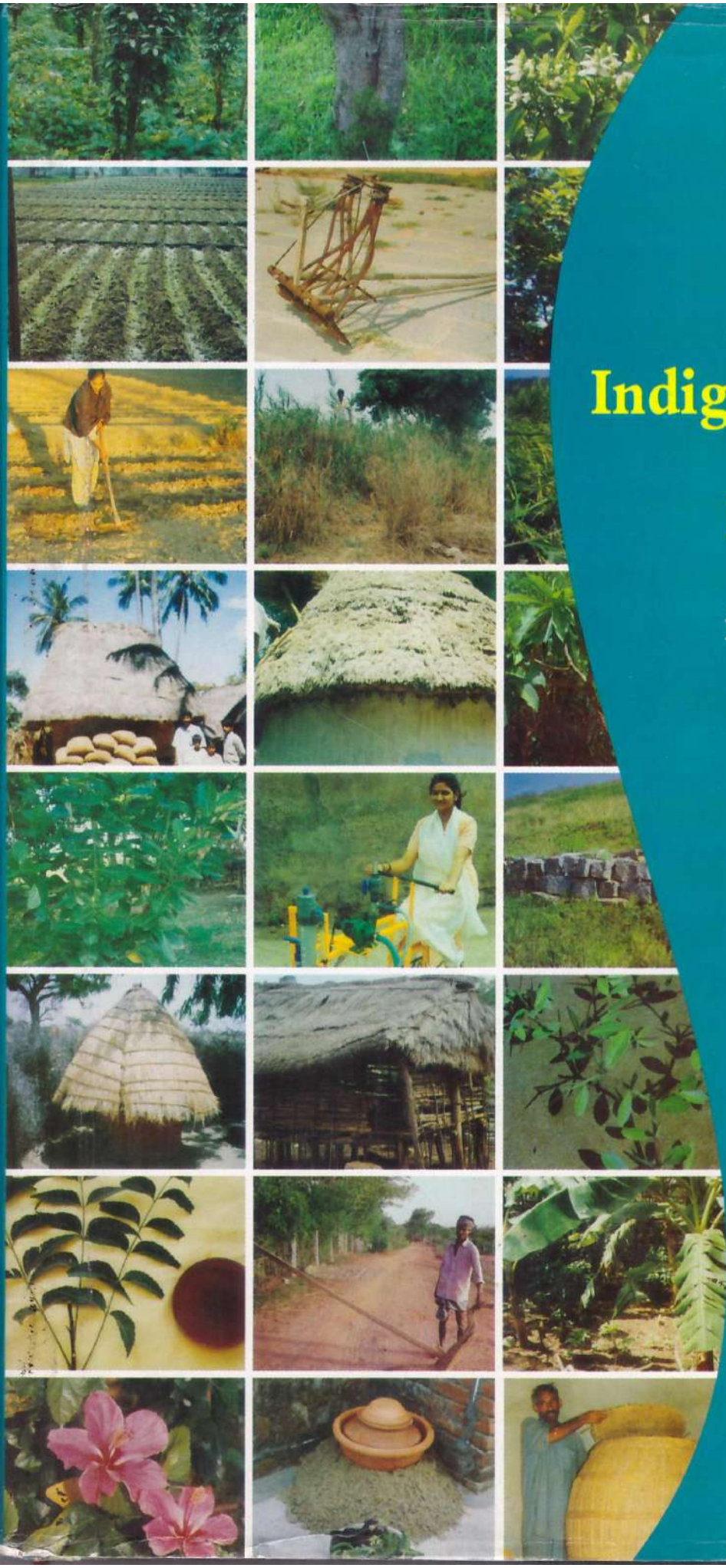


Inventory of

Indigenous Technical Knowledge

in Agriculture

Document 2

Mission Unit
Divison of Agricultural Extension
Indian Council of Agricultural Research
New Delhi 110012

Inventory of Indigenous Technical Knowledge in Agriculture

Mission mode Project on

Collection, Documentation and Validation of

Indigenous Technical Knowledge

Document 2

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Foreward

The indigenous Technical Knowledge (ITK) system has been developed by the people based on their experiences and continuous improvement through informal experimentation over centuries. These ITKs are interwoven and assimilated in the cultural life of the people. India has one of the largest collections of ancient manuscript in the world, which includes 14 sastras, 4 vedas, 4 upvedas and 6 branches of vedangas. The advent of the concept of sustainability in Indian agricultural scenario has invoked interest on indigenous technical knowledge that has the element use of natural products to solve problems pertaining to agriculture and allied activities. One of the major issues identified is to prepare an inventory of such indigenous wisdom, abundantly available with the Indian farmers.

The Indian Council of Agricultural Research (ICAR) launched a Mission Mode Project on 'Collection, Documentation and Validation of Indigenous Technical Knowledge' during 2000 under National Agricultural Technology Project (NATP). Initially, an effort was made to collect and compile such practices from the available literature, books, journals, thesis, etc. so as to make them accessible at one place. The information have been compiled and published in the form of a book entitled Inventory o f Indigenous Technical Knowledge in Agriculture Document 1 during June 2002.

Information on ITK have also been collected from primary sources through voluntary disclosures which have been compiled. I am delighted to see the publication entitled, Inventory of Indigenous Technical Knowledge in Agriculture—Document 2, intended to provide easy accessibility of 1,998 indigenous technical practices/knowledge in agriculture and allied areas covering 23 thematic areas, viz. rain water management, soil and water conservation, wind erosion, tillage practices, crops and cropping systems, soil fertility management, pest and disease management, weather forecasting, horticultural crops, veterinary and animal husbandry, fishery, farm implements, post-harvest technologies, ethno-botany and agro-biodiversity, grain/seed storage, fuel management, thermal efficiency, waste water management, garbage disposal and management, food product development, natural yarns, dyes and weaves, low-cost housing materials and ethnic foods, besides the ITKs, which cut across the themes.

I am sure that this document would be useful for the planners, policy makers and all those engaged in espousing the cause of sustainable development of agriculture, including the issues related to food and environment security and protection of

intellectual property rights. I congratulate Dr P Das, Deputy Director-General (Agricultural Extension) and his team for their pathidocument.



(**M**ANGALA **R**AI)

Secretary

Department of Agricultural Research and Education

and

Director-General

Indian Council of Agricultural Research, New Delhi

28 February 2003

New Delhi

Preface

Since inception of the project entitled Collection, Documentation and Validation of Indigenous Technical Knowledge in June 2000 under National Agricultural Technology Project of the Indian Council of Agricultural Research, effort has been made in collecting and documenting the indigenous practices relating to agriculture and other allied activities. The information related to indigenous technical knowledge available from secondary sources were compiled in the form of a book, Inventory of Indigenous Technical Knowledge in Agriculture—Document 1 in June 2002.

The information pertaining to indigenous technical knowledge collected from primary sources through voluntary disclosers during 2001 have been compiled in this volume, Inventory of Indigenous Technical Knowledge in Agriculture—Document 2. As in Document 1, the chapters in this book have been presented theme-wise and each ITK has been provided with a code number to facilitate designing of information system of the ITKs. Adequate care has been taken to provide information on the details of technologies, including the performance, location and extent of their use to facilitate its blending with scientific information for making it user-friendly.

The compilation and writing of this publication has been possible with the support of NATP and by continuous effort of the project personnel including the Principal Investigator, Zonal Leaders, Computer Programmer, Research Associates and Senior Research Fellows engaged in the project. Dr S S Ghosh, Zonal Coordinator, Zone II, Kolkata and presently Vice-Chancellor, West Bengal University of Animal and Fishery Sciences, Kolkata deserves a mention for his technical input in shaping the ITKs, particularly those related to veterinary science and animal husbandry for Bihar, Jharkhand, Orissa and West Bengal.

27 February 2003
New Delhi

P DAS
Mission Leader

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1

Introduction

The Indian Council of Agricultural Research (ICAR) under National Agricultural Technology Project (NATP) sanctioned a Mission Mode project on Collection, Documentation and Validation of Indigenous Technical Knowledge in June 2000 for 3 years with a financial outlay of Rs 367.7061 lakhs. The objectives of the project are:

1. To identify, collect, classify and document indigenous technical knowledge (ITK) in different agro-climatic regions in respect of production and farming systems;
2. To catalogue and characterize the information for developing database;
3. To ascertain the propensity of the extent and level of use of various ITKs by the farmers in the management of their farming systems;
4. To validate the selected ITKs; and
5. To evolve a mechanism to protect peoples' property rights and facilitate the process of sharing for the benefit of the farming community.

FUNCTIONING OF THE PROJECT

The Mission Unit of the project is located at the Division of Agricultural Extension, Indian Council of Agricultural Research, Krishi Anusandhan Bhawan, New Delhi. The Lead Centre is located at the Zonal Coordinating Unit for TOT Projects, Zone VII, Jabalpur. There are 10 Zonal Leaders, placed at different ICAR Institutes/State Agricultural Universities (SAU)/other organizations to facilitate the coverage of the project across the country. Validation of ITKs is being done by the Zonal Leaders with the support of the Cooperating Centres' Principal Investigators (CCPIs) drawn from different ICAR institutes/SAUs/other organizations located at the respective nearby areas of the site of disclosures of ITKs. At the field level, CCPIs are assisted by the Facilitators (where it is necessary) belonging to different Krishi Vigyan Kendras for conducting validation. The diagrammatic presentation of functional mechanism of the project is indicated in Fig. 1.

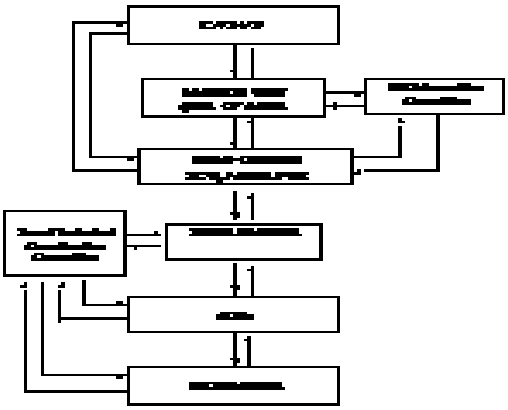


Fig. 1. Functional mechanism of the project

The ITK Information Committee (ITKIC), an apex body, provides guidance in operationalization of the project. Zonal Technical Coordination Committees, headed by reputed scientists, decide on the methodology of validation and review its progress.

Funds for the project are received at the Lead Centre from the ICAR (NATP), which are further released to the Zonal Leaders, based on the requirement within the sanctioned budget. The CCPIs receive the funds for validation of ITKs from the Zonal Leaders.

COLLECTION OF INFORMATION ON ITK

The ITK Information Committee (ITKIC), chaired by Dr A. Alam, Deputy Director General (Agri. Engg.) with all the Deputy Director Generals of the ICAR and other scientists and Principal Investigator as Members, and one of the Zonal Leaders as Member-Secretary, provided guidelines in collection of the information of ITKs through voluntary disclosure. A hand-out entitled

Guidelines and format for obtaining information on indigenous technical knowledge was prepared.

PROCESSING OF INFORMATION ON ITK

Advertisements in prominent national and local dailies were made, seeking voluntary disclosure on ITKs. The information received were screened and classified by the Zonal Leaders based on a comprehensive index with weightage given on the criteria including severity of problem, extent of prevention of maximum losses, innovativeness, ease of handling, availability of input, extent of use, extent of indigenous knowledge used, rationality, eco-friendliness and cost-effectiveness. The names of ITKs found suitable for documentation have been compiled for inclusion in this publication. The information on ITK have been presented in various thematic areas, viz., Rain Water Management (RWM), Soil and Water Conservation (SWC), Wind Erosion (WE), Tillage Practices (TIP), Crops and Cropping Systems (CCS), Soil Fertility Management (SFM), Pest and Disease Management (PDM), Weather Forecasting (WEF), Horticultural Crops (HOR), Veterinary and Animal Husbandry (VET), Fishery (FIS), Farm Implements (FIM), Ethno-Botany and Agro-Biodiversity (BOT), Grain/Seed Storage (GSS), Fuel Management (FM), Thermal Efficiency (TEF), Waste Water Management (WWM), Garbage Disposal and Management (GDM), Food Product Development (FPD), Natural yarns, dyes and weaves (YAW), Low Cost Housing materials (LCH) and Ethnic Food (EF). In addition, some of the disclosers have provided information cutting across theme, which have been classified as Unclassified. Out of 1998 ITKs, highest number is in the theme of veterinary and animal husbandry (556), followed by pest and disease management in crops (232), grain/seed storage (177), horticultural crops (164), crops and cropping systems (149), the lowest in post-harvest technologies (4) are indicated below:

Theme	No. of ITKs
Veterinary and animal husbandry	556
Pest and disease management	232
Grain/seed storage	177
Horticultural crops	164
Crops and cropping systems	148
Ethno-botany and bio-diversity	102
Ethnic food	92
Farm implements	89
Food product development	61
Weather forecasting	55
Soil and water conservation	48
Rain water management	43
Soil fertility management	35
Tillage practices	33
Fishery	31
Housing material	29
Natural yarns, dyes and weaves	24
Thermal efficiency	12
Fuel management	09
Garbage disposal and management	09
Wind erosion	05
Waste water management	05
Post-harvest technology	04
Unclassified	35
Total	1998

2

Rain Water Management

Code No.	Title of ITK	Details of ITK and rationale	Name and address of discloser/facilitator
596	Moisture conservation through mulching	In Kinnaur district, surface of soil is covered with pinus, chilgoza needles and grasses from the kandas (hill top). Mulching conserves soil moisture in the field and also helps in maintaining the soil temperature. The continuous use of chilgoza tree needles also increases the fertility of the soil. Farmers use pinus or chilgoza needles to cover the soil surface. A very thin layer of needles is spread over the soil. Mulching with FYM is also in use. This has been practised in most of the villages in hilly area in Kinnaur district of Himachal Pradesh since time immemorial. This helps in subsistence farming in cold desert area.Keywords: soil surface, pinus and chilgoza needles, grasses, mulching, soil moisture, soil fertility	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
2023	Sand mulching for improving soil properties	Addition of 15–20 cartload of sand/acre during off season once in 3 years helps in moisture conservation, peg penetration in groundnut and prevents surface soil crust formation. It is an age-old practice, followed in 20–30% area in Anantapur region of Andhra Pradesh where the groundnut is the major dryland crop.Keywords: sand mulching, moisture conservation, peg penetration, soil crust	Dr M. Madhavi and Dr P. K. Mishra, CRIDA, Hyderabad (Andhra Pradesh) 500059
1	Indigenous water-storage structures	Rain water is harvested in structures like beriyan, khadins and ponds. Generally the rain water harvested in beriyan, where walls are made up of stones.Keywords: beriyan, khadins	Shri Tan Singh Rajput, S/o Shri Swarup Singh, Ludwa, Jaisalmer (Rajasthan) 345 001
2	Rain water harvesting in the fields by making khadins	Khadins are prepared in the field for harvesting of rain water. This practice facilitates cultivation of at least one crop even in the condition of only one rain. This is also practised on community level. **Keywords:** khadins, rain water management	Shri Luna Ram, S/o Shri Chaukha Ram, Rupsi, Jaisalmer (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
104.	Storage of water in pond	Rain water is harvested and stored in ponds and lake, which is later used for irrigation throughout the year. Livestock also drink water. About 35 farmers are using this practice for the last 5 years. Storage of water in ponds is in practice in Karikuttanoor village of Dharmapuri district in Tamil Nadu. **Keywords**: pond, rain water, livestock, agriculture	Shri Ponnukan Erimalai, Karikuttanoor, Dharmapuri (Tamil Nadu)
103.	Man made tunnel for water harvesting1  Suranga- man made tunnel for water harvesting	Ground water is available at different Ground water is available at different depths in different locations such as plain lands, slopy undulating terrains etc. Water available in hilly areas runs almost parallel to the undulations. Intercepting the water-table by digging below the slopes and oozing water is possible by digging tunnels. The water is used for drinking and irrigation purposes. This is an age-old practice in hilly and slopy lands of Kasaragod district of Kerala. A large number of tunnels are existing in Bayar village. About 30-35% of the total cultivable area is irrigated with tunnel water. About 40% of total families are dependent on tunnel water for drinking purpose. Tunnels are dug in medium to hard lateritic soils, which are slopy in nature, needing no cement or extra input to plaster the walls. The tunnels are 5-6 feet in height, 2-3 feet in width and 10-150 m length. Its construction is done only by skilled workers. The person who digs the tunnel uses candles and kerosene lamps as a source of light. If the tunnel length is beyond limitation, air-ventillation of 1 meter size are made. Lateral tunnels are also made if the main tunnel does not yield water. **Keywords**: water harvesting, main tunnel, lateral tunnel	Shri Shree Padre, Padgre Village, Kasaragod (Kerala) 671552
	Technique of water harvesting	This practice is followed by the farmers of Sihphir village under Tlangnuam block in Aizawl district of Mizoram. A pit of 15×12×6 feet is dug at selected spots in the farm for storing rain water. This stored water is used for irrigation during cropping season. The bottom of the dug out is sealed with agro-films or cement and taps are provided at the lower end for water discharge, which is applied to crops by means of small HDP pipes. Watering is also done manually with can. Gutters provided at the edge of the roofs of farm-houses collect rain water to the dam. This system has been found to increase the production level of vegetables by 50%. The practice has been in	Shri H. Lalthanpuia, Training Associate,Krishi Vigyan Kendra, Kolasib (Mizoram) 796081

Code No.	Title of ITK	Description of The ITK	Name and address of discloser/facilitator
		use of 15 years with modification by using agro-film lining instead of earthen pit. Out of 130 farm families only, 12 families follow the practice. **Keywords:** rain-water harvesting, earthen pit, agro-film lining	
452	Technique of rain water harvesting	The villagers of Kikr&#65533;ma village in Phek district of Nagaland has adopted a method of harvesting rain-water mainly for irrigation of paddy fields and also for use as a source of drinking water. The system is to harvest water in water harvesting ponds constructed locally and tapping run-off rain water through contour trenches. The method is simple but it is very effective. The technique involves construction of a channel parallel to the slope. Stones are also carefully laid at the bed of the channel to prevent gully erosion. Several parallel gradual sloping contour trenches are made in series on both sides of the channel. These trenches collect run-off water from the catchment areas and drain it into the channel that leads the water to the target field. During planting season of rice, the water collected in the pond is gradually released by cutting open a small section of the bund. It has been recorded that a pond of 3&#65533;2&#65533;2 m size can irrigate terrace to yield 600 kg rice. This practice has received wide publicity since many areas covered under the system are by the side of highways. The system has been followed by all the villagers for the past 150 years. **Keywords:** rain water harvesting, ponds, contour trenches, irrigation	Shri Thenocho, Ex-Speaker, NLA, Kohima (Nagaland)
583	Storage of rain water in tanks, locally known as talabs	Large tanks locally known as talabs are made for storage of rain water, which is used for drinking purpose as well as irrigating fields and orchard, mainly mango. This method is practised by a number of villages in Jammu and Kashmir. Farmers fill water in pitchers from talab and irrigate mango trees in the early hours of the morning. This was in use a number of years ago before 1947, but its use declined as its renovation was neglected. **Keywords:** rain water storage, talabs, drinking purpose, irrigationDried and surplus wooden logs of deodar, kail and oak are used for water storage in hilly areas of Himachal Pradesh, where cement, iron and stone are	Chief Scientist, KVK, R.S. Pura, Jammu (Jammu and Kashmir) 181 102

INDIGENOUS TECHNICAL KNOWLEDGE IN AGRICULTURE

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
584.	Indigenous technology for water storage using wooden logs	Dried and surplus wooden logs of deodar, kail and oak are used for water storage in hilly areas of Himachal Pradesh, where cement, iron and stone are difficult to carry. This is the practice in every village where surplus wooden logs are available. Wooden logs are used for water storage for washing utensils and clothes. It is in practice from last several years and involves little cost. **Keywords**: water conservation, wooden logs  Indigenous water storage technology	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
592.	Harvesting of spring water in small ponds for irrigation and domestic use	Spring water is collected in small reservoirs, scattered at intervals on the high uplands. Water is drawn from these ponds or reservoir when required. It is a common practice in cold deserts and temperate wet Himalayas. Water from these ponds is used for irrigation and domestic purposes. Small ponds are prepared for water storage. These ponds are made of concrete stones. The walls of ponds are cemented with sandy loamy soil, so that water does not pass through these walls. The muddy contents settle down and collected. The water becomes clear, transparent and consumable. The stored water is collected and distributed to the desired place through diversion channels. This has been practised in most of the villages in hilly areas of Himachal Pradesh where water accumulates easily in low-lying ponds. **Keywords**: spring water, harvesting, small pond, irrigation, domestic use, diversion channel	Ms Krishna Hetta, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
595.	Farm pond for water harvesting	Farm ponds are useful during the period of water scarcity. Rain water during spring season, and snow melted water of glacier during winter are harvested in farm ponds and used for multiple purposes, i.e. irrigation and other domestic uses. Farm ponds are constructed near the house and field. These types of ponds are also constructed near the road side and forest area to provide sufficient water to the livestock	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		during grazing and migration. These ponds are constructed by digging the soil 4–5 feet near the natural slope of land and the walls of these ponds are piled with stone and other concrete like materials so that water does not percolate through these walls. Different rain-water channels are diverted into these ponds for storage of water. This has been practised in most of the villages of hilly areas of Himachal Pradesh since time immemorial. **Keywords**: farm pond, water scarcity, glacier, rain water, irrigation, domestic use	
1079	Technique of rain water harvesting and conservation	The practice of deep ploughing and bunding of fields is done for conservation of rain water. A village pond is also made where run-off water is collected and used for ground-water recharging as well as for drinking purpose for animals. The ground water is blackish and unfit for irrigation in the rainfed areas like Rewari district in Haryana. So this method of water harvesting is used to solve the problem. The recently developed watershed technology is based on this water storage tank and conservation of soil moisture. This is followed by about 60% of the farmers in the area for many years. Tube well is also used as an alternative. **Keywords**: deep ploughing, bunding of fields, rain water conservation, pond, irrigation, drinking purposes	Shri Promod Kumar, Training Associate (Soil Science), Krishi Vigyan Kendra,B.B. Ashram,Rampura-Rewari(Haryana) 123 401
1749	Water harvesting with hand pump	In the entire Kutch and Saurashtra region of Gujarat, where water scarcity is an acute problem, people harvest rain water from the roof and store in a big storage tank of capacity 30,000 to 40,000 litres.These are concrete structures free from leakage. This water later on is used for domestic purpose as well as for animals. A hand pump is used for pumping water from this storage structure. The hand pump is fitted above the storage tank. Suction pipe of the hand-pump is made in such a way that it can suck water from remote end of the tank. Rain water collected at roof is channellized through rubber or iron pipe and passed through a passage hole provided in hand pump to the water tank. Water available is not of very good quality and can be used for washing clothes, bathing etc. Therefore in some places, it is chlorinated to maintain its hygienic status. In some of the extreme situations	Shri O P Agrawal,6/3, Shalimar Enclave,E-3, Arera Colony,Bhopal (Madhya Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		it is also used for drinking purpose. The practice is in use since last 20 years, with most of average to big farmers using it. Rich farmers who can afford heavy cost of deep boring do not practise this. **Keywords**: hand pump, rain-water harvesting, scarcity period	
3	Rain water management through construction of tank and auger	Rain water is harvested in tanks constructed through digging the land and making the auger (*murar*). Roof water is also harvested by the persons having *pucca* houses by making the auger and construction of tanks. **Keywords**: tank, auger, rain water  Rainwater management through construction of auger	Shri Rana Ram Kumar, C/o Shri Dungar Singh Bhati, Thakur Virendra Nagar, Near First RAC, Mandor, Jodhpur (Rajasthan)
105	Rain water management for teak, mango and neem in arid and semi-arid regions	This practice is to retain rain water in the soil and to grow trees, particularly mango, neem and teak, which are best suited for arid and semi-arid regions. The practice is appropriate for garden or estate where teak, mango or neem trees are grown. A circle in the soil is made around 1-year old teak trees within a distance of 2 feet. Along the line of the circle, a hole of 3 inches depth is made. During the first year, at the time of rainy season, rain water gets collected in these holes. This technique may be adopted in areas where there is less water available. When the tree is 2 years old a circle can be made at a distance of 4 feet, as well as 6'' deep holes on the circle. Similar circle can be made when the tree is 3 years old with the distance of 6 feet as well as 9" deep holes on the circle to retain water in the successive year. This has been in practice for the last 2 years. There is no	Shri S Murugean, Periakovilankulam, Sankarankovil, Tirunelveli (Tamil Nadu) 627953

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		practical risk and it is easy to handle, less labour intensive and best suited for such trees. This is in practice in Periakovilankullam village of Tirunelveli district in Tamil Nadu. **Keywords**: rain water storage, arid, semi-arid, teak, neem, mango	
586	Rain water conservation in *pakhar*	Rain water is collected and stored in *pakhar* (water reservoir), which is used and harvested at the time of need during the year. These *pakhars* are made by erecting check-dam, where rain water can be collected easily and in more quantity. It is kept away from roads and other common facilities, but from where most of the farmers could use water. *Pakhar* is prepared in different sizes as per the quantity of stored water. **Keywords**: *Pakhar*, check-dam, rain-water harvesting	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
589	Rain-water harvesting from roof	Water harvesting during summer is necessary to tide over water shortage. The roof-water harvesting becomes available for household uses as well as for irrigation purposes under rainfed farming. In the lower areas of Himachal Pradesh during the rainy season, roof water is collected in dug-out structure that are known as *diggi* in kangra and *Khatis* in Hamirpur and Bilaspur districts. Dug-out structures are cemented internally to avoid water infiltrations. The structure is dug in hard rocks. This stored water is then made available for irrigation purposes through small water channels. These dug out structures are underground and have definite outlets at the top of these structures. This has been practised in most of the villages in Himachal Pradesh and is useful for household uses as well as for irrigation purpose and is in use from ancient times. **Keywords**: rain-water harvesting, roof, dug-out storage structure, irrigation and household use	Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
590	Harvesting of water from melting snow	Snow-melted water is harvested for irrigation and other multiple purposes. Heavy snow in winter provides good source of water. Heavy snow is melted with the help of ash. It is spread over the snow. Ash contains certain substances that help in converting snow into water. This water is collected in large ponds. Ponds are dug at a suitable place where run-off water is collected and then water is distributed to	Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		the agricultural land for irrigation through the diversion channels. This has been practised in most of the hilly areas of Himachal Pradesh since time immemorial. **Keywords**: melting snow, harvesting, ash, pond, irrigation of crops	
591	Harvesting of dew and fog water for farming	In plains and valleys, occurrence of dew and fog is very common after the receding of monsoon. After monsoon the humidity remains quite high (approx. 85%) in atmosphere. During night time, temperature falls down sharply, resulting in the condensation of vapour into water, which falls on soil surface and makes the top soil wet. In hills there is traditional practice to plough the fields early in the morning before dew or fog is evaporated. By doing so, moisture is mixed with soil particles in the plough layer (8–10 inches). This moisture is retained by soil for a long time. Natural fog or dew is harvested to add moisture to the agricultural field. High atmospheric humidity is used for retaining moisture in the soil. This has been practised in most of the villages in hilly areas of Himachal Pradesh since ancient times **Keywords**: dew and fog, high humidity, condensation of vapour, wet top soil, ploughing in morning.	Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
593	Flooding of agricultural fields with glacial water for higher crop productivity	Flooding of agricultural field with glacial water helps in removing toxic salts and also controls pests and diseases of agricultural crops. The deposition of fresh silt with unweathered minerals (especially lime) from glacier source of fresh water enhances the soil fertility by removing toxic salts with temperature ranging from 0 to 5°C, which protects the crop from different kinds of diseases. Heavy snowfall in hilly areas is good source of water. The ash is spread over the snow that helps in the conversion of snow into water very effectively. This water is collected by digging small ponds near the natural slope of land and then used for irrigation purposes. Water is brought in channels from glacial by gravity methods. Glacial water is diverted to the agriculture fields in many ways. This has been practised in most of the villages of hilly area of Himachal Pradesh since very early times. **Keywords**: glacial water, irrigation, agricultural fields, higher productivity, ash, toxic salts, pest	Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
599	Utilization of uphill water in Himalayan region	In several parts of the Himalayas, villages are located at the foot-hills or valleys. Villagers often harvest rain water by building small water storage ponds (ponds are locally called *chal*). The number of such ponds varies from 30 to 40 depending upon the valleys and villages. Each water pond is 30 feet long, 30 feet wide and three feet deep. During rainy season water gets stored in these water ponds, which not only acts as water reservoir for the villagers but also controls the flood in the low hill areas during rainy season. These water ponds are not used for human drinking purpose but provides drinking water for cattle and for irrigation purposes. This is in practice for past several years. **Keywords**: recharging the uphill water streams, small water ponds, storage, water reservoir, floods, drinking water for cattle, irrigation	Shri Prem Singh Verma, Gawahi, Sandhu, Shimla (Himachal Pradesh)
1751	Rain water management	Farmers limit the use of rain water which is stored in reservoirs. The Bais, competitiveness among farmers for using reserved water for irrigation should be avoided and the water may be provided to all the farmers in a regulated and limited way. Crops, which require less water like pigeonpea, greengram, blackgram, cotton, etc. may be encouraged. **Keywords**: competition in water use, crops requiring less water	Shri Thakur Randhir Singh, Shahpur, East Nimar (Madhya Pradesh)
2024	Rain water measurement using role (Indigenous rain gauge)	Role (7.4" depth × 9" diameter hole on a 3"×3"×1.5" granite stone block) is useful in knowing the quantity of rainfall required for sowing. Sowing of seeds in the field is done when the role is filled with rain water. This technique helps the farmers in estimating the rainfall that is sufficient to go for seeding. This method is adopted for sowing dryland crops like sorghum, castor etc. in Alfisols. **Keywords**: rainfall, sowing	Shri Narasimha Reddy, Nallevelli, Rangareddy, (Andhra Pradesah)
2022	Use of white soil (*sudda mannu*) as tank sealant/lining material	The sides and lower surface of tanks of size 10 m×5 m ×1 m are compacted with white soil (clay). It helps in sealing the parts in the bed and sides to save water for off season protective irrigation. Farmers having bore-well facility pump water at night when electricity is available. This reduces the soil loss through seepage. **Keywords**: white soil, tank sealant, irrigation	Dr P.K.Mishra and Shri Somasekhara, CRIDA, Hyderabad (Andhra Pradesh) 500 059

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
453	Bamboo drip irrigation system in hills	The people of Jaintia Hills district of Meghalya follow a system to irrigate plantation crops like betel vine, arecanut and other crops byusing bamboo, where the water requirement is relatively low. Agriculture in the hill states of NEH region is mostly rain dependent with no proper irrigation system. Due to lack of proper irrigation, it is difficult to divert water from natural perennial sources to the place of use. However, considering the need to divert water to the crop fields, the tribal farmers of Meghalaya have developed a unique system of irrigation using cut bamboos. Bamboo drip irrigation system is based on the principle of gravitational flow, which is considered as a system of skillful and efficient management of available water sources. In this system water is carried with the help of bamboo, which is joined and rejoined in different sub-channels for taking water to the target site. The flow of water is efficiently controlled as per requirement taking advantage of the elevations of the hills. The water in the system is allowed to trickle drop by drop at the selected sites through small holes at appropriate point. The water flow has been observed to vary from 800 to 1,200 litres per hour. This system has a very good impact and is spreading to other regions also. The system is in practice for about 150 years by almost all the farmers. **Keywords**: bamboo, irrigation, gravitational flow	Shri H.S. Nongkyndil, Technical Assistant, ICAR Complex, Barapani (Meghalaya) 793 103
585	Rainfed indigenous crops	Indigenous crops like *bharesa* (*saresa*), *bathua*, *kathu*, *koda* etc. are grown safely by the farmers under water-scarce situation. There crops do not need irrigation and are grown with very little care. They withstand even high rains and have no problem of insects and pests. The produced grains can be stored as many as 40–50 years. They provide high nutritious food to the dwellers. **Keywords**: rainfed crops, *bharesa*, *saresa*, *bathua*, *koda*, nutritious	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
587	Water-diversion channels to check waterlogging	Farmers have been managing soil and water by making arrangements for safe disposal of excess water. They make diversion channels at the toe of the rivers. Water collected at the toe, falls on the lower terrace. Generally, diversion ditches were constructed along	Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		with the contour lines and across slopes in order to interrupt surface run-off and divert it to suitable outlets. However, for a wide terrace, they are made perpendicular to the toe at appropriate locations and this is done according to the rational decision of the farmers who have years of practical experience. The diversion channels are made by digging the channel in the water-logged areas. These channels are variable in size (length, breadth, height etc.). These channels are cemented with the clay loamy soil. This practice is useful in maintaining the terraces free of waterlogged conditions. It also helps in controlling the soil erosion and maintaining optimum moisture conditions in the terraces. This is in practice in most of the villages in hilly areas of Himachal Pradesh since ancient times. **Keywords**: excess water management, waterlogging, diversion channels, erosion check, moisture maintenance	171005
588	Use of drip-irrigation method for irrigation	Water drops from earthen pitcher act as a counterpart of modern drip irrigation. It is a cheap, easy and water-saving method of Mountain Research irrigation. The water is collected in the pitcher. The pitcher is placed in soil and the new plant is planted close to it. The pitcher is filled with water during summer months (April–June) and stone slate lid is placed on it. The roots draw water from pitcher, which in turn reduces the mortality. The pitcher once filled supplies sufficient water for at least two weeks and then again it is filled, and so on. This has been practised in most of the villages of Shimla district of Himachal Pradesh since time immemorial. **Keywords**: drip irrigation, earthen pitcher, irrigation	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
594	Construction of kuhls or water channels for irrigation	It is a time-tested fact that communities made water channels for glacial and spring water in order to ensure the irrigation of agricultural lands. Irrigation is necessary for all the crops sown in cold desert of hilly areas for increased and sustainable production. If the river has steep gradient, water is diverted into canal some distance upstream and led along a contour so that it can flow to the fields by gravity. *Kuhl* or water channels are made near or around the natural slope of land by digging channels with spade and these channels 4–5" breadth and height are cemented with sandy loamy soil. This has been practised in most of the villages of hilly areas of Himachal Pradesh since time immemorial. **Keywords**: water channels, glacial, spring water, irrigation of crop, increased production Rain-water is harvested in *kuhls* (canals) and utilized	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

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		for irrigating agricultural fields. The advantage of this practice is that excess salt can be removed and thus soil fertility is increased. This is an age-old practice by the farmers of Himachal Pradesh. **Keywords**: *kuhls* (canal), rain-water harvesting, irrigation of agricultural fields	
598	Management by the practice of kuhls (canals)	Rain water is harvested in the field by making prominent bunding around the boundaries of the field. In other words the water is stopped being run off from the field. Water is conserved in the field itself, which also helps to increase the ground water. This is practised in Ganivan village in Chitrakoot district of Uttar Pradesh. **Keywords**: field bunding, rain water	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 andMs Krishna Hetta, SRF Mountain Research, Development Associates, Shimla (Himachal Pradesh) 171 005
1080	Rain water management by flooding the field with rain water	Farmers of Khaspokharia village expedite field preparation and seeding when monsoon starts, due to lack of labour and farm resources. To manage in hurry, direct sowing without waiting for rain is adopted, because rice seeds are not damaged for a long period even if it does not get favourable condition for germination. It is found to be beneficial and it is in continuous practice for last several years by maximum number of farmers. **Keywords**: paddy, seed, monsoon, rain, germination	Er. Mithilesh Kumar Jha, Training Associate (Agric. Engg), KVK, Ganivan, Chitrakoot 271 125 (Uttar Pradesh)
1321	Dry sowing of paddy	*Matka* method for irrigation is effective in saving water and precise application of water to effective root zone of plant. Angle iron is fixed 2–3 ft above the root for keeping matka. *Matka* is filled with water and 2 holes are made. The water drops fall on the root zone. Each day 5–6 hours is necessary. The cost involved is 50% of the cost in drip irrigation system. The farmers of Sangli (Maharashtra) use this method for irrigation in fruit crops. **Keywords**: *matka*, root zone, drip irrigation, fruit crop.	Shri Sanat Kumar Savaiya, Dumbisai, Haibasa,West Singhbhum (Jharkhand)
1750	Matka method for irrigation in dryland area for fruit crops	*Matka* method for irrigation is effective in saving water and precise application of water to effective root zone of plant. Angle iron is fixed 2–3 ft above the root for keeping matka. *Matka* is filled with water and 2 holes are made. The water drops fall on the root zone. Each day 5–6 hours is necessary. The cost involved is 50% of the cost in drip irrigation system. The farmers of Sangli (Maharashtra) use this method	Sri Saptami K.Jha. Trg. Asso.KVK, Sangli (Maharashtra) 416 416

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		for irrigation in fruit crops. **Keywords**: *matka*, root zone, drip irrigation, fruit crop.	
325	Technique to recharge ground water	The surface water is diverted to a 10'×10' pit constructed around a bore well. The pit is filled with sand, charcoal and stone in different layers. The filtered ater is diverted to aquifer through a 2" hole of the casing pipe. It costs Rs 8,000 for this construction. The system works better in 5–10 years old functional bore wells. **Keywords**: surface water, filtration, aquifer recharge	Shri A M Masagi, 169/70 Parvati Nilaya, Kallappa Layout, Amruthahalli, Atarayanpur, Bangalore (Karnataka) 560 092
1051	Water storage for domestic and irrigation purposes	I n most villages of district Hamirpur the farmers experience an acute shortage of water in summer. During this period, most of the natural sources of water like the wells and bores dry up and farmers have to bring water from far-flung areas. For this purpose, the farmers of these regions of the district make water storage structures commonly known as *khatis*. These *khatis* provide stored water, which is the main source of water for various purposes during summer season. *Khatis* are made on the concrete hard rocks where the water is collected from sub-surface runoff. The stored water is the main source of the water during the summer season and is used for drinking and other domestic purposes. The strata is rich in silica that eliminates the impurities in the stored water. Evaporation and seepage/ infiltration losses of the water are also minimized in the concrete hard pan of the rocks, where these *khatis* are constructed. These *khatis* are prevalent because there is no other source of water for drinking and other purposes (like irrigation) in the region in the summer season. This has been practised in most of the villages in district Hamirpur as well as other parts of the state since time immemorial. **Keywords**: water scarcity, water storage, *khatis*, drinking purpose, irrigation	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
1317	Indigenous natural resource management in *Shiwaliks*	The farmers are practising indigenous natural resource management practices to arrest soil erosion and also to get stable production of crops. The details of practices adopted by the farming community are as follows: 1. Every cultivated field is surrounded by earthen bund of variable size to conserve rain water or to impound irrigation water, check soil erosion, establish boundaries of ownership and to allocate land to different crops. Bunds are supported with sod-farming grasses and prevalent weeds. Grass stubbles and boulders are dumped on the bunds. Stone walls are erected in places where	Dr Dr S.S Grewal, Dr.S.P.S.Brar, Dr J.S.Kolar, Directorate of Extention Education, Punjab Agric.University, Ludhiana (Punjab) 141 004

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bund is likely to breach. Field bunds are also supported with thorny fence (*kikar*, berom, *karonda*, lantana etc.). Live hedges of *kana*, *nara*, agave and *bana* are made along the drainage line of bunds to protect the fields.

2. The land levelling in slopy lands is done by locally made wooden karaha (blade) pulled by a pair of bullocks. The gradual levelling of slopy land into series of bunded and levelled partial is an age-old practice of this region.

3. The rainfed farming community maintains soil fertility by addition of FYM to maize in maize-wheat rotation just before onset of mansoon. Sheep and goat flocks camp at night in open fields. The weeds in maize fields are ploughed back into the field around knee height stage of crop (haloding). In addition, pond soil is added once a while in double cropped areas.

4. Kuhl system of irrigation (channels from both banks of perennial system) and barawandi system (time and turn of irrigation to bonafide beneficiaries) and community (village) parts to store rain water are traditional rain water-management practices adopted by the farmers. Natural springs found in the hills are given proper shape with dressed stone to form a pool of clean water for drinking.

5. Diversion ditches along the boundary between the farm and the forest land are taken along the foot hill to intercept the rain water from hill. Stone /gravel outlets or grassed outlets or kana/nara supported outlets are provided for safe disposal of run-off water. Bamboo, dhaman (Grevia optiva) and banana are planted at curvatures and along the moist torrent banks of upper parts of Shiwaliks. Arundo donax, Ipomoea carnea, Vitex negundo and Saccharum munja, Saccharum spontaneum are planted to protect drainage ways.

6. Indigenous bio-fencing: Bakarwal, ber and thorny branches of Acacia nilotica, cactus and agave are used as bio-fencing materials.

Keywords: natural resources management, *kuhl* system, *barawandi* system, bio-fencing

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2030	Water management for farming	Tanks are constructed with mud bunds with outlets to allow the excess water in the rainy season. Water level for outlet is available up to first week of November. Thereafter the water is lifted through motor pumps or other methods. This helps to overcome the crop failure due to terminal water shortages. **Keywords**: tanks, outlet, terminal water shortage	Shri C. Bhaskar Rao 38–13–11/1 Lakshmi Nagar, Marripalem, Vishakhapatnam (AndhraPradesh)
1082	Indigenous method of rain-water harvesting	*Pucca* wells called *kunds* are coustructed in the field when rain water is collected for use in the irrigation as well as for and drinking purposes. The *kund* is connected by slopy water channel (*nali*) from different corners of the field. This *kund* is constructed individually or by community in the village and fields which has rainfed type of agriculture. Some *kunds* have depth of up to 40 feet with a slopy side. This is an age-old practice which is followed by 60–80% farmers in a villages Saral, Dadous and other villages of Bhiwani district in Hayana. The other farmers who do not follow this system use canal water and tube well (2" size outlet) for the same purpose. **Keywords**: *pucca* well, rain-water harvesting, irrigation, drinking purposes	Shri Ram Sarup, Ex-Sarpanch, Saral, Bhiwani, Shri Partap Singh, Shadipura, Hind (Haryana)
517	*Chari*- a small ponds for rain-water storage	*Chari* (10'×15'×5') is prepared near the small streams in hills. When the water streams dry up, water is stored in *chari* which is used as drinking water for animals and also provides irrigation water to nearby fields. The water is stored for longer period which can be conveniently used. **Keywords**: rain water, dug out, irrigation, drinking by animals	
333	*Bada bandh yojana* for rain water harvesting	*Bada bandh yojana* is a big pond situated in slopy land on the upper-end reaches of a village. A large band of soil is arranged in such a way that once it is filled completely, excess water can be used to raise crops. Two pipelines at the border and a good drainage system are made to manage water for different crops. This stored water is used as protective irrigation for cultivation of rice, wheat, sugarcane and groundnut. This is being practised in Ghuntulipasi village of Agustak in Orissa. **Keywords**: *bada bandh yojana*, rain-water management	Shri Binod Bihari Sahu, S/o Suresh Chandra Sahu, Ghuntulipasi-machhakuta, Angul (Orissa) 759 124

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
331	*Pukur* (pond) *khanan* for rain-water harvesting	Some area of land is excavated and made in the form of tank to store the rain-water with a common outlet. This stored water is used during drought period for irrigation and domestic use.Almost all the farmers are following this practice in Shibiloon village of Burdwan district in West Bengal. **Keywords**: *pukur*, water storage, supplemental irrigation	Ms Madhumita Ghosh, Shibiloon, Burdwan (West Bengal) 713130
2258	Construction of *naada* for silt harvesting	The step-wise procedure being followed for construction of *naada* in Rajasthan are: *Step 1:* Along the gully or *nalla* a site is chosen for constructing loose stone check-dam, considering the slope and expected area resulting *naada* field. *Step 2:* A loose stone check-dam is constructed 2–3 feet high using big stones at foundation. The width of the dam depends upon the expected height of the dam. *Step3:* Every year, the height of *naada* is raised by 2 feet, which helps in establishing the structure and collection of additional silts. *Step 4:* Now the *naada* is ready for cultivation. The overflow of water is diverted on a big rock to avoid damage to the structure. The silt is rich in organic matter.	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

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Soil and Water Conservation

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
456	Traditional system of controlling soil erosion in *jhum* field	In this practice, the *Jhumia* of Khonoma and Pfutsero villages under Kohima and Phek districts of Nagaland respectively follow indigenous technique to check soil erosion by use of mechanical and vegetative barrier. As there is no viable alternative to *jhum* cultivation, in the steep hill areas of Nagaland, the farmers continue practicing *jhum* cultivation, particularly in the high hill areas. However, the farmers are aware of the fact that the hill slopes when cultivated are prone to soil erosion through rain and wind. They have, therefore, developed a technique to check soil erosion through mechanical and vegetative barriers to sustain cultivation in the hill slopes. I. *Mechanical barrier:* The farmers construct boulder and stone barriers to check soil erosion. They also use logs, poles, bamboos and trash, besides creating earthen bunds. The use of these materials is as per availability and rate. II. *Vegetative barrier:* Many farmers use the method of planting crops and vegetables in rows across the slope in the *jhum* field to check soil erosion. For example, crops like maize, millets, jobs-tears are used as vegetative barriers in some place across the slope, where crops like soybean and velvet bean are grown in rows along the contour to check soil erosion. These methods are cost effective and have a very good impact. Almost all the farmers are practicing this for the past 50 years. **Keywords**: *jhum*, soil erosion, mechanical barrier, vegetative barrier, steep hills	Shri Sanchothung Odyuo C/o Dr Kapenlo Thong, NRC on Mithun, Jharnapani (Nagaland) 797 106
603	Basin preparation	Basin preparation with shovel is a time-consuming technique but it works better in small fields. For big fields, basin preparation with modified traditional plough is a time-saving practice. By this practice, water is economically used. Hence, every farmer can	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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	 Basin preparation with shovel	get the water according to his requirements. It helps in retaining the water in the field for long time for better absorption. This technique also preserves soil fertility, checks soil erosion and irrigation is done economically. Basin preparation is done with the help of shovel or traditional modified plough. Shovel has a long rod-like wooden handle and a rectangular piece of wood is attached to the handle. In some cases, rectangular piece may be made of iron. Traditional modified ploughs have wooden beam, wooden handle and two iron blades. Basins are prepared in December or January for *rabi* crops, in October for winter vegetables and in June for summer vegetables. Number of basins varies with the size of the field. For wheat, basins are prepared according to the irrigation facilities available. One or two basins are primary basins and other are secondary. Small area between the basin is irrigated by opening and closing the primary basins. In vegetables, narrow basins are prepared. This ITK is practised throughout the Himachal Pradesh since time immemorial. **Keywords**: basin, shovel, plough, irrigation, soil erosion, soil fertility	
604	A furrow at the top of the field To check land-slide	To check land slide, the upper tip part of the field is thoroughly ploughed. Also the upper part of the field is to be levelled somewhat down to the levels of the field, so that water does not accumulate there and cause land slide. This is practised in all parts of Himachal Pradesh and is in practice for the last several years. **Keywords**: ploughing, check land slide	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh)171 005
605	Control measures to prevent soil and water erosion	In hilly areas where contour farming is in practice, a stanch/sewer, width of 1.5 ft is dug on the upper side of the field to the excess run-off water. **Keywords**: contour farming, stranch/sewer, drain out	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)
606	Check-dam and *pakhar* to check soil erosion	The sides of the fields are kept levelled and not slopy. One should be vigilant of the portion of the field where water erodes soil. It is checked manually by soil by making check dams in gullies (*pakhar*). Grass and long root trees are planted on bunds and dams. These grasses and plants are *sohal*, *talaba*, leafy plants, strong and deep-root shrubs and trees, etc. **Keywords**: check-dam, *pakhar*, *sohal*, *talaba*, deep-rooted shrubs	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
608	Use of forest black soil for enhancing crop productivity	Use of forest soil/black soil increases fertility. This practice also does the function of mulching. Thes purpose of this practice is to enhance soil fertility. Farmers incorporate forest topsoil either directly in the field or as bedding material for the animals in the cattle sheds. This improves the fertility status and soil texture. As a bedding material it is quite common in orchard and vegetable farming, This practice is used in most of the villages of hilly area of Himachal Pradesh since time immemorial. **Keywords**: forest soil, black soil, fertility	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1083	Stirring and planking of fields, fallow in Kharif with effective shower/rain	Helps in conservation of rainwater. Water is harvested by stirring and planking the field after ploughing. Field is kept fallow during *kharif*. Effective shower and rainwater is absorbed in the ploughed field. Conserve the water. **Keywords**: stirring and planking, fallow in *kharif*	Dr L.S. Suhag, Director of Extension Education, CCS Haryana Agricultural University, Hissar (Haryana) 125 004
1324	Rain water management by tillage operation before starting of rainy season	Villager of Jhunai Pahari village of Dhanbad district in Jharkhand use this practice to increase the water-holding capacity of the field soil and rain-water management to save the crop in scarcity period. Farmers managed the rain-water by ploughing across the slope, bunding, terracing and water-harvesting bunds. It is age-old practice followed by maximum number of farmers in the village. **Keywords**: rain-water management, ploughing, bunding, terracing, harvesting, scarcity period	Shri Ladhan Marandi, Jhunai Pahari, Bagsuma, Nirsa, Dhanbad (Jharkhand)
1325	Check the soil erosion by using stone/rock	Land of Singhbhum district of Jharkhand is undulating, therefore rain water flows with high velocity and soil erosion is high. To check soil erosion, stones/rocks are arranged in the inlet and outlet of the field or pond and water is allowed to flow over the stone/rock. This is being in practice for the last several years and till date no modification has been made. **Keywords**: undulating, rain-water, high velocity, erosion, stone/rock, arranged, inlet, outlet, field, pond	Shri Sanat Kumar Sawaiyan, Department of Extension Education, Ranchi Agricultural College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006



Control of soil erosion by stone bunding

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1326	To prevent soil erosion through plantation of desi babool and *siris* on the ridges of rice fields	By planting babool and *siris* on the ridges of rice field, soil erosion is checked. To prevent soil erosion *desi babool* (*Acasia nilotica*) and *siris* (*Albiggia lebbeck*) are planted on the ridges of rice field. The practice is followed in the villages of Tamar Block of Ranchi district and has potentials for its further spread in undulating tracts of Chotanagpur and similar other areas. It has been found effective to check soil erosion. About 86% farmers follow this practice. Cost: benefit is 1 : 12 approximately. **Keywords**: soil erosion, *desi babool* (*Acacia nilotica*), *siris* (*Albizzia lebbeck*), rice field	Shri Ramesh Shanker Prasad, Deparment of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834006
1327	To check soil and water erosion	Terrace cultivation, bunding and rain water harvesting are done to prevent soil and water erosion and conservation of rain water *in situ.* Apart from conservation of soil water and rain water harvesting, these peactices helps in reducing fertilizer movement from one plot to another plot. About 70% farmers of the Khijuria village of Dumka district in Jharkhand use this age-old practice. **Keywords**: soil erosion, water erosion, rain-water harvesting, fertilizer movement	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834006
1328	To control different types of soil erosion such as splash, sheet, rill and gullies	Farmers of Bahadurpur village of Dhanbad district in Jharkhand practise some simple excersices to check soil erosion, as follows: 1. Deep ploughing in summer 2. Ploughing across the slope 3. Composting the land before rainy season 4. Filling the cracked land by ash (wood) 5. Cultivation of deep-rooted crops 6. Cover crops 7. Mulching, and 8. Plugging of gullies by stone, bricks and mats. The impact of these practices are very effective to control soil and water erosion and to protect fertility of the soil. Total cost of these practiðe is around Rs 3000 per ha. This is in practice for last several years by 50% farmers in the village. **Keywords**: soil and water erosion, ploughing in summer, soil fertility The practice of cross-ploughing with frequent harrowing during off-season is being used for sowing	Shri Siromani Singh Choudhary, Bahadurpur, Bagsuma, Govindpur, Dhanbad (Jharkhand) 828109

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1761	Cross ploughing with frequent harrowing to check soil and water erosion	The practice of cross-ploughing with frequent harrowing during off-season is being used for sowing sorghum in the shallow clay loam soils. It controls the run-off, prevents soil and water erosion and conserves soil moisture, maintains soil structure, absorbs the soil moisture, and ultimately provides optimum moisture for crop growth. This practice is being used by 75% of farmers of Golpoli village in Solapur district of Maharashtra. **Keywords:** cross ploughing,	Shri Bansode Tanaji Jyotiram, Gulpoli, Barshi, Solapur (Maharsatra)
2033	Mixed pulses as vegetative barrier	Pulses like greengram, cowpea and blackgram are grown with groundnut at a planting ratio of 20 : 1 to 40 : 1 to reduce soil and water erosion. The spreading and close growing nature of groundnut reduces the splashing effect of rain drops. These mixed pulses act as vegetative barrier and reduce the run off and the velocity of water, thereby checking soil and water erosion. **Keywords:** pulse crops, vegetative barrier	Dr M. Madhavi, Associate Professor, AICRPDA, Kamalanagar, ARS, Ananthapur (Andhra Pradesh) and Dr P K Mishra, CRIDA, Hyderabad (Andhra Pradesh)
330	Checking of soil and water erosion using bamboo structure	Indigenous structures made of bamboo are placed in the paddy field at an interval of 10–12 feet to check the speed of flow of rai water in the foot- hill areas, thereby reducing damage to the paddy field in the low- lying areas, and checking crop loss upto 50%. The practice is being followed by 90% of the farmers with Rs 10 per structure in the Makarbili village of Nawapada district in Orissa. **Keywords:** bamboo, soil and water conservation, run-off velocity	Ms Namita Rani Mahapatra, L-294, Baramunda, Housing Board Colony, Bhubaneshwar (Orissa) 751 003



Bamboo made structure for checking soil and water erosion

Code No.	Title of the ITK	Description of the ITK	Name and address of discloser/facilitator
332	*Aal bandha* or *bandh deoya* (field bunding)	This practice is being followed for demarcation of a particular field and to check soil and water erosion as the *bandha* reduces the velocity of run-off, increases the time for infiltration of rain water and helps storage of water. Almost all farmers are following this practice. **Keywords:** aal bandha, soil and water conservation, field bund	Ms Madhumita Ghosh, Shibiloon, Burdwan (West Bengal) 713 130
454	Bench terracing on steep hill slopes	yield of crops, the farmers of Mizoram district construct terraces 1 to 3 m wide along the contour on the hill slopes (40 to 100%), equipped with water storage tanks in which water is collected during rainy season, or nearby perennial water source such as streams are used for terrace construction. Earth is cut to get bench terrace of convenient width, one upon the other. It requires 2 mandays work for cutting a normal width of terrace (1 m to 10 m). This method checks soil erosion to a great extent and 150 farmers out of 165 farm families have been following it. Farmers who cannot afford construction do not practice it and they follow shifting cultivation in the hill-side slopes. **Keywords:** soil and water erosion, bench terraces	Shri H Lalthanpuria, Training Associate, KVK Kolasib (Mizoram) 796 081
455	Use of logs, bamboo and stones for control of soil and water erosion in the hilly *jhum* cultivation	In this practice, the *Jhumia* of Nsünyu village under Tseminyu block in Kohima district of Nagaland use logs, bamboo and stones for controlling soil erosion in the hilly *jhum* fields. *Jhum* system of farming is very popular in this region, which is one of the main factors of losing soil fertility. To check this, logs, bamboos and stones are laid across the slopes of *jhum* fields in rows at a distance of 10–20 feet (row to row), depending on the degree of the slope. Proper support of the laid log/bamboo is ensured to last for	Shri Sanenpfu Magh, SDAO,Tseminyu, P.O. Tseminyu, (Nagaland)



Aal bandh–a field bunding method

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		fields in rows at a distance of 10–20 feet (row to row), depending on the degree of the slope. Proper support of the laid log/bamboo is ensured to last for at least three years, as the farmers go up to third year. Thus, the soil erosion and speed of the run-off water are checked and moisture is conserved in the soil. This practice results in increased crop yield. The entire farming community of this region has been following this practice since time immemorial with certain modifications like planting colocasia, ginger, chilies etc. on the bund to strengthen the bund and serve as additional barrier as also to get additional harvest. **Keywords:** log, bamboo, stone, soil erosion, bund, jhum, run-off water	
458	Construction of pits (Mizo method) on the hill-side slopes to check soil and water erosion	The farmers of Tlangnuam village in Aizawl district of Mizoram have adopted a method suited to local conditions for controlling soil erosion and better yield of paddy. In this practice, pits of 1 foot width, 3 feet or more (according to convenience) length and 8 inches depth are arranged on the hill-side slopes of 45 or 100% or less in a triangular manner. Spacing between the pits is maintained at 1 foot along the contour as well as across the contour. This is practised for cultivation of paddy, which is more sustainable compared to jhum method. This method is 50% less labour intensive and gives 10–15% higher productivity. It is highly cost effective as one man can cover 10 ha to prepare such a structure. Weeds of rainy season along with the paddy straw are collected in the pit, which can be used as manure for the next season. This arrangement also checks the speed of rain-water run-off and helps accumulate topsoil in the pits. This is in practice for the last 5 years and 20 farmers out of 25 in the village follow the practice. **Keywords:** soil erosion, pits, *jhum*	Shri P.H. Lalthanpuia, Krishi Vigyan Kendra Kolasib (Mizoram) 796081
607	Terrace-riser slicing to check land slide	Terrace-riser slicing is a common practice for adding new soil and to check land slides. Farmers believe that this practice add new fertile soil, which checks land slides and enhances the soil fertility. The terrace riser slicing also controls the rodents, rats and insect pest. As a part of overall soil fertility and terrace-management system, farmers slice terrace risers that deposit the sliced material on the field below. The risers for level bench terrace are scraped once in two years. Farmers do this to control weeds on terraces that would otherwise damage the crop. Terrace in lowland irrigated water are sliced while transplanting	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		years. Farmers do this to control weeds on terraces that would otherwise damage the crop. Terrace in lowland irrigated water are sliced while transplanting rice and upland terraces are sliced during winter, generally before maize plantation. This is practised in most of the villages in hilly area of Lahaul and Spiti of Himachal Pradesh, since time immemorial. **Keywords:** terrace-riser slicing landslide, improved soil fertility, rodent control, insect pests and weed control	
609	Use of natural gradients for irrigation  Use of natural gradients for irrigation and water mills	In cold deserts of Himachal Pradesh, kuhls (water channels) are built along the hill gradient for maintaining proper gravity for irrigation. Kuhls are commonly found in West Himalaya cold deserts. If the river has a steep gradient, water is diverted into a canal some distance upstream and led along a contour so that it can flow to fields by gravity. Kuhls are built along the hill gradient for maintaining proper gravity for irrigation and running water mills. Wooden water channels are also used for running water mills. These wooden channels are generally made by making notches at the natural water sources and the water is diverted using the natural gravitational flow of water. Since the topography of the area consists of very high slopes and rocky terraces, wooden water channel are also used at many places. Long wooden channels placed at steep gradient is used for maintaining the speed of water flow. This method is in practice in cold deserts of Himachal Pradesh since time immemorial. **Keywords:** natural gradient, irrigation, water mill	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
610	Terracing: an ethno-engineering technique for soil and water conservation	Terracing is the most common type of practice to check soils and water erosion on slopy land. Terracing helps in levelling and stabilizing the slopy land, and enhances soil fertility and moisture retention. There are a number of terrace types, each reflecting the physical and socio-economic attributes of the villages where they occur. Irrigated rice terraces are flat and dyked (bunded), rainfed terraces tend to be gently outward or sideways sloping, so as to join to terraces at different levels. Terraces range from perfectly groomed flat filled with substantial vertical rock lined rises to a simple row of banana trees and a small pile of stones cast off the field along the contour line.	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No	Title of ITK	Description of the ITK	Name and address ofdiscloser/facilitator
		Regardless of their surface foam, they generally reflect the local soil conditions, regional climatic conditions and cropping references. Local productivity and profitability of farming systems develop on them. Risers connect terraces. Terrace risers are stony soil, which will have stone line, vegetated or purposely cut to bare soil. Extremely stony soil will have stone lined risers. Most terrace risers are vegetated either naturally or planted with improved grasses to provide significant quantities of fodder. The slope and height of risers are different for outward sloping and level bench terraces. Risers of outward-sloping terraces are higher and are more inclined to aid stabilization. Although risers with a slope means reduction of cultivable land, farmers maintain a riser with a slope to protect fertile topsoil. This method is practised in most of the villages of hilly area of Himachal Pradesh, since time immemorial. **Keywords:** terracing, ethno engineering, conservation	
611.	Terracing with materials such as stones, soils etc. to check soil erosion	To check soil erosion by water, terraces are constructed across the slope and supported by suitable risers of particular height and width. The risers are made up of boulders, supported by grasses. The roots of the grasses hold the boulders intact and drain excess water. This is practised in Sunchar village of Nagrota Bagwan block in Kangra district of Himachal Pradesh by majority of the farmers for ages. The practice is to check soil erosion, and also bunds are used for growing grasses for animals or livestock. **Keywords:** bund, stones, soil, check soil erosion, grasses for livestock	Shri Rajeev Kumar, Room No 32, NBN II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
614.	Traditional stone wall to check soil erosion	T o check soil erosion in the hilly region in upper part of Himachal Pradesh, the farmers construct stone wall across the slope. This checks soil erosion very effective in hill where cultivations is done up to 25100 degree slope, and where there are many chances of landslides, sheet and gully erosion. this has been practised to the past several years by majority of the farmers. **Keywords:** stone wall, check soil erosion	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
615	Conservation technique in cultivation of apple in Himalayan region	Traditional apple-orchard farming involve use of contour ditches, water-control canal, soil traps, bench terraces and hedge rows of fast-growing leguminous plants, which have been adopted by the farmers of Himlayan region. Soil and water erosion is a serious problem in hilly regions. Since earlier times farmers used to practise this technology in an integrated way to improve soil and water conservation and manage nutrients in apple orchard. This technology helps in stabilizing the fragile eco-system dominated by apple-farming system. Use of such technologies lays focus on soil and water conservation as well as fertility management, resulting in a paradigm shift towards maximization of productivity, profitability and sustainability of hill eco-system. This is in practice for several years. **Keywords:** contour ditches, water-control canal, soil traps, apple orchard, bench terraces, hedge rows	Shri Prem Singh Verma, Gawahi, Sandhu Theog, Shimla (Himachal Pradesh)
1329	Stone wall for controlling soil erosion  Stone wall for Controlling soil erosion	Construction of stone wall is useful to control the speed of run off water. The soil comes through rain water from upper portion to lower part of the bund. The soil is accumulated near the wall, so that soil erosion is checked. A stone wall, 3–4 ft high is made in lower part of the field bund. The wall is constructed with width of 30 cm and height from 90–120 cm. The practice is common in the villages of Namkum Block of Ranchi district (Jharkhand). About 80% soil erosion is checked and life of bund also increase compared to that without wall bund. About 80% cost is saved, which is usually invested every year for maintenance of bund. **Keywords:** soil erosion, stone wall, size of bund	Shri Ranjay Kumar Singh, Department of Extention Education, BAU, Kanke, Ranchi (Jharkhand) 834 006
1756	Soil and water conservation	Water is collected and conserved by making small dams/bunds. Soil and silt is taken out of rivers to make them deeper and the soil and silt is used to check water from speedy flow. Small bunds made up of soil, stones and line connect check water. Iron mesh is also used to check water flow eroding soil. **Keywords:** small dams made up of soil and stones, iron mesh to check soil erosion	Shri Randhir Singh Bais, Shahpur, East Nimar (Madhya Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1757	Control of soil and water erosion	Digging of two types of ponds, viz., *khet talab* and *khod talab,* is making *kolhapuri* bunds on rivers and riverlets, cement bunds, earthen bunds/dam and planting grass and bushes on the bunds are some of the techniques to control soil and water erosion. It not only checks soils from erosion by flowing water but also conserves water in reservoirs (ponds). *Khet talab* are constructed on every 5 hectare land with the size of 20×20 sq. meter and 3 meter depth. *Khod talab* are constructed at the place of flowing water with the size of 20×60 sq. meter and 3 meter depth. **Keywords**: *khet talab, khod talab,* planting grass on bunds	Shri Subhash Mahadevrao Vankhede, Borala, Arala, Amaravati (Maharastra)
1758	Checking soil and water erosion by crop residues	Crop residues of banana, sugarcane, cotton and wheat are used as mulching material to check soil and water erosion. Use of these crop residues also helps in increasing soil fertility and reduces the cost of compost and fertilizer application in the crop. **Keywords**: crop residue, checking soil and water erosion, fertilizer cost reduction	Shri Thakur Randhir Singh Bais Shahpur, East Nimar (Khandura) (Madhya Pradesh)
1759	Preparation of bunds in rice field	Chhattisgarh region receive heavy rainfall during July and August. For that time, rice is the only crop suitable for that area. But at later stages terminal drought condition affected crop severely at reproductive stage. For water management practices, farmers constructed huge rice dykes (bunds) and impounded water for 30–40 cm in rice field after vegetative phase. To tolerate this condition, traditionally tall rice varieties are being cultivated. **Keywords**: heavy rainfall, drought conditions, reproductive stage, dykes, tall rice variety	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492012
1760	Method to check soil and water erosion	Tribal farmers in Konka and Ghanghat villages of Dindori district in Madhya Pradesh harness rain water of hills for agricultural use by constructing levelled terraces on slopes and diverting the excess water down to crop fields. In doing so, the natural source of water, which is often a stream of perennial nature, is first located and the stream flow track is earmarked. Levelled terraces, by use of stones found around, are made with stone boulders, bigger sized ones at the bottom and the smaller ones on the top. A soil layer of 60–90 cm is spread on the top of the stone terraces for raising crops. Depending on the slope of terrain,	Shri Ranjay K. Singh, C/o Dr C. B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Coloney, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		the structure of terraces to be constructed is determined. Water drained from the topmost terrace flows to the terrace down which irrigates the crop there. Channels on all sides of the soil beds are constructed to drain the run off. Water from the lowest terrace finds its way to the natural drainage outlet. For conserving the soil, the farmers plant shrub (*Euphorbia* sp.) and perennial grasses such as *moa* along the borders. Other practices are making small bunds in the fields by use of earth, rocks, wood and branches; pitching; retaining tree stumps and roots; planting around the bunds; making entire field into small plots; fallowing of lands and ploughing and sowing across the slope. **Keywords**: levelled teracing, cultivation in terraces, in *situ* rain water conservation	
1762	Use of Indigenous material	The tribal of Amravati (Maharastra) conserve soil and water by forming sloppy diversion trenches at upper ridge of lands or forming loose bunds in the field along the slope. The water flow is directed outside the field. Grasses and vegetation grow on the bunds and twigs of trees are tied to wooden poles at drainage points. The picture helps in soil and water conservation, levelling of field and increase productivity. **Keywords**: diversion trench, vegetation, soil and water conservation	Dr O.P. Ingle, Head, Deptt. of Extn. Edn. Dr. PDKV, Akola (Maharashtra) 444104
2027	Checking erosion	Erosion by water is controlled or reduced by formation of mud bunds wherever there is a damage to tanks or streams to save the cultivated lands due to flood. **Keywords**: water-erosion control, mud bunding, cultivated land, flood	Shri C. Bhaskar Rao, 38–13–11/1 Lakshmi Nagar, Marripalem, Vishakhapatnam (Andhra Pradesh)
646	Contour system of cultivation	In Shimla district of Himachal Pradesh, as most of the lands are slopy having slope more than 60%, run-off water causes soil erosion. To cope with these problems, the farmers of the area do planting of temperate fruits and agro-forestry tree species, making bench terraces 1 m wide with inward slope to minimize the velocity of run-off water, thereby checking the soil erosion. This practice is very helpful in conservation of rain water, which is efficiently	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		utilized by plants under drought conditions to overcome the water stress. **Keywords**: run-off water, soil erosion, plantation of trees, bench terraces, conserve soil and water	
612	*Cedrus deodara* leaves to check soil erosion	Soil erosion is checked through leaves of *Cedrus deodara* tree in many parts of Lahaul and Spiti districts of Himachal Pradesh. Uniformly distributed leaves of *Cedrus deodara* are compactly pressed with stones, so that soil erosion be controlled at its maximum during rainy season. This is in practice for last several years by the number of farmers in Lahul and Spiti districts. **Keywords**: *Cedrus deodara,* soil erosion, stone and rain	Shri Chaman Rao, Research Scholar Department of Bio Science Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
613	To check soil and water erosion by planting trees along the fields	Planting of trees like *buel, kachnar* and oak along the fields results into soil and moisture conservation, and reduce, soil and water erosion, wind velocity, intensity of sunlight. This practice improves soil fertility by shedding leaves and increasing soil moisture, which help in loosening the soil. This is in practice all over Himachal Pradesh for last several years without modification. **Keywords**: soil and water erosion, plantation, conservation, fertility, wind velocity	Shri Rajeev Kumar, Room No. 32 D, NBH- II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 171 005
1330	Checking soil and water erosion through sisam *(Dalbergia sisso)* and *semal (Salmalia ceiba)* plantation	Planting of seedlings of *sisam (Dalbergia sisoo)* and *semal (Salmalia ceiba)* on field boundaries 3.0 m apart helps to control the soil erosion. The root zone of these plants help to increase the moisture holding capacity of soil by 70–80% compared to no plantation. Cost: benefit ratio of this practice about 1 : 8. **Keywords**: *sisam, semal,* plantation, soil erosion, moisture holding capacity	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiya, Sheohar (Bihar)
2029	Cover cropping for soil and water conservation	Cover crops like cucumber, ridgegourd and greengram are cultivated during *kharif* and these are incorporated after picking the fruit/ pods. Cover crops reduce the impact of rain drops on the soil because of spreading nature and close canopy. Due to incorporation they add lot of biomass, ensuring a better rainy season crop like wheat and chickpea. **Keywords**: cover crop soil and water conservation	Dr V. Surakod, Agronomist, Bijapur (Karnataka), and Dr P.K. Mishra, CRIDA, Hyderabad (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2031 2319	Use of *kaki veduru* and *dharba* for checking soil erosion	By planting kaki veduru *(Andropogan species)* and *dharba (Imperata arundinacea)* in the field bunds that are located by the side of canal help in checking erosion of top soil and reducing the velocity of overflow and entrap the silt load behind them. It increases the infiltration time as it is having thick profuse vegetative growth and extensive fibrous root system. It is advantageous over the use of stone constructions. **Keywords**: vegetative barrier, silt trap, soil erosion	Shri Rajashekar Naidu, Gudimallam, Yerpedu, Chittoor (Andhra Pradesh)
2028	Soil-conservation practices	The soil and water erosion are controlled by laying stones and mud with thorny sticks across the gully to a height of 3 feet about width. This involves less cost and all the materials are locally available. All the villagers in the Mahabubnagar district of Andhra Pradesh are following the practice. **Keywords**: soil, water conservation, stone, mud, thorny stick	Shri Reeds, 1–386 / S/22 S.N. Reddy Nagar, V.S. Road, Champapet, Hyderabad (Andhra Pradesh)



Use of kaki veduru and dharba for checking soil erosion



Soil conservation method

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2307	Methods of soil and water conservation	Some of the recommended soil and water conservation practices for various situation are as follows. *Low rainfall black cotton soil:* stone checks at regular intervals, earthen hooks on contour bunds and establishment of percolation tanks. Low rainfall hilly areas: Stone checks to stabilize the gullies, earthen hooks on contour bunds, farm ponds. *Red soils:* Contour farming with stone checks, field bunds and earthen hooks. High rainfall black cotton soils: Graded bunding, broad bed and furrow with central water ways. **Keywords:** soil and water, conservation	Dr G.Subba Reddy and Dr H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Pradesh) 500 059
621	Use of grasses on field bunds	In many parts of Shimla district of Himachal Pradesh, many farmers make terraces on the slopy land with the help of stones to check soil erosion caused by run-off water. During ploughing these field, bunds of 1.5–2 feet width are left on which grasses grow naturally, which further helps to check the soil erosion by rain water. The soil is ploughed 1–2 times and after sowing the crops moisture-retention channels are made on the upper side and middle of the field perpendicular to the slope. This practice is in use from centuries. **Keywords:** growing of grass on bund, check soil erosion, retain moisture	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207
629	Soil mulching for conservation of moisture in soil	Plant residues and other materials used as a covering for the soil to conserve moisture, reduce run-off and erosion check the weed growth, protect from cool climate or improve the soil. Mulching materials are usually cut grass, foliage or straw, but may include compost, saw-dust, sand, stones etc. Proper conservation of moisture is of great importance in dry and arid regions, which depends mostly on the scanty rainfall they receive. The soils must be kept in an ideal condition of cultivation at the time of rainfall so that all the water is absorbed into the soil and there is no loss through drainage or surface run-off. When the water has been absorbed into the soil, it must be retained there until it is required by the crops. The soil moisture is conserved against losses through evaporation by creating soil mulch. Certain organic materials (manure) may also be applied with advantage on the surface of the soil to create a dry	Shri Rajeev Kumar, Room No. 32 DNHB - II (CD) Hostel, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		layer in which the circulation of the air remains free. This is done in fields where a crop has been already been sown. The dry layer acts as a buffer between the soil moisture and the sun or the wind. A shallow cultivation with a plough or a harrow will bring about a top layer of soil, which will be loose and more open than the soil below. The water rising through capillary movement will be retained in the lower layer of the soil, as the layer above refuses to attract water due to the open and loose nature of the soil. In the hill regions this practice of conserving moisture has not received proper attention and crop failures have been reported due to the prevalence of drought conditions at one or the other stage of crop growth. This ITK is practised in many areas of north India since time immemorial for conservation of soil moisture. **Keywords:** soil mulching conservation of soil moisture, plant residues, run off, erosion, check weed growth, protect cool climate	
1086	Mulching of sugarcane crop with its trash	Sugarcane trash collected after harvesting is kept during the season to be used afterwards after fresh planting of the crop, which conserves moisture under limited irrigation conditions. A 5 cm thick layer of sugarcane trash is spread on loosened soil in sugarcane field. It checks evaporation losses from soil and suppresses the growth of weeds by cutting of light for their growth. This is practised in Bullewal village of Nawanshahr in Punjab. **Keywords:** sugarcane trash, mulching, moisture conservation, weed control	Shri S. Bachitar Singh, Bullewal, Balachour, Nawanshahr (Punjab)
1340	Reservoir prepared by soil, branches, leaves and straw	Villagers of the Thaitanagar block in Simdega district (Jharkhand) use soil, branches of trees, their leaves and straw for making reservoir. After break of monsoon water in reservoir is used to irrigate crops, drinking water for animals and for domestic use etc. A 7 feet high and 3 feet wide bund is prepared. Then wooden pillar is put on the front of bund, and branches of trees, leaves and straw are hanged on it. It checks or breaks the pressure of water to bund and the bund remains safe. Water is harvested from the nearby field and stored in this structure. **Keywords:** soil, branches of trees, leaves. straw, reservoir, water pressure	Shri Villiam Samad, Asanbeda, Lathakhaman, Simdega (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2308	Methods of water harvesting	Various methods employed for harvesting water by farmer in various states are as follows: *Rajasthan:* Large peripherl bunds, in *situ* and interplot water harvesting, *khadin* system, *rela* and *tal* farming. *Gujarat:* Diversion drains, stone bunding, contour farming. *Andhra Pradesh:* Water ways along field boundaries, *khus (Vetivar)* grass boundaries. North Western India: Soil mulching, filter strips. **Keywords:** water harvesting, methods	Dr G.Subba Reddy and Dr H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Predesh) 500 059
106	Stone terracing for soil and water conservation	Stone terracing for soil and water conservationS	Shri K. Raman, S/o Shri Kali, Pottiam, Kallakuruchi, Villipuram (Tamil Nadu) 606 207
107	Vertical mulching to control soil and water erosion	Vertical mulching at 10 meter intervals is done to conserve soil and water in Pottiam village of Villupuram district of Tamil Nadu. More than 25% of the farmers in this village are practicing this technology where they have 2% slope in the field. Paddy straw, cotton stalk and straw of other plant materials are used for mulching. It costs Rs. 375 to cover one hectare. **Keyword:** straw mulching	Shri K. Raman, S/o Shri Kali, Pottiam, Kallakuruchi, Villipuram (Tamil Nadu) 606 207

4

Wind Erosion

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1765	Vegetative hedges/field boundary hedges to check wind erosion	The farmers of Phulcineholi village of Pandharpur in Solapur district of Maharastra are growing shevari on field bunds/boundary of sugarcane as a vegetative barrier. These barriers reduce the wind velocity and protect crop from wind, avoiding lodging. It is being practiced since last 10 years. **Keywords**: vegetative hedge, *shevari*	Shri Narayan Jadhav, Pliulchincholi, Pandharpur, Solapur (Maharastra)
4	Control of wind erosion through vegetative barrier and covering the soil surface	Sandy soil during hot season is prone to wind erosion due to high wind velocity. Fertile part of the soil is blown away from the field. To check wind erosion, farmers put sticks and branches of locally available bushes across the wind direction, which work as wind  Method to check wind erosion break. Besides this, farmers spread the residues of bushes and grass stock in the fields. Such practices are adopted in summer months. **Keywords**: wind erosion, wind break,soil-surface cover, bush	Shri Ganga Ram Vishnoi, Sukhmandal, Gilankor, Shergarh, Jodhpur (Rajasthan)
616	To prevent wind storm	To brake the wind velocity, *kunish*, *poplar* and *safeda* trees are planted across the wind direction. It acts as vegetative wall. These plants have broad leaves and are used to save the apple plants. Their wood is used as fuel and timber. It is also used in animal sheds and	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		for making compost. **Keywords**: wind velocity, *kunish*, *poplar*, *safeda*, vegetative wall	
617	Planting trees to check wind erosion	Long and strong rooted trees like *moru vraksha*, *van vraksha*, *kharshu vraksha* etc. are densely planted on the bunds of the fields to check wind erosion. When stones were available in plenty, people used to construct 4 inch,5 inch stone wall around the field to check soil erosion. This practice is not being followed now, since the stones are not available. **Keywords**: long-rooted trees, stone wall	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
1764	Method to check wind erosion by planting wind breakers on bunds	Farmers plant wind breaking shrubs and trees on the bunds around the fields. These wind breakers are castor, *sitaphal*, *ber*, mango, *jamun*, etc. Other crop plants like pigeonpea, sorghum, cotton, etc are also used as wind breakers. **Keywords**: wind breaking shrubs and trees	Shri Thakur Randhir Singh, Bais Shahpur, East Nimar (Khandura) (Madhya Pradesh)

5

Tillage Practices

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
109	Shallow planting after summer rains	Rain water conservation is done by ploughing in summer after the receipt of every rain in rainfed red laterite soils. Country plough is used for this purpose wherein tillage is done upto 5 cm. This practice is in use for last 10 years, being followed by about 10 farmers. **Keywords:** tillage, country plough, summer rains	Shri M. Manickam, S/o Shri Muthu, Thoradipattu, Kallakuruchi, Villipuram (Tamil Nadu) 606207
112	Indigenous ploughing method	Ploughing with wooden plough three times before sowing helps to increase soil mulching properly. Deep plough increases the yield and enriches the soil. About 30 farmers are practicing this method for the last 45 years. This is widely in use and easy to adopt. **Keyword:** wooden plough	Shri Mathappan, Galigattum, Bagulampatti, Denkanikottai, Dharmapuri (Tamil Nadu)
113	Indigenous sowing method	Seed sowing at a depth of 30 cm or 1 feet, will give a good result in yield. This practice is common in slopy land as well as plains. This is best suited for groundnut and millets. About 32 farmers are practicing this method for the last 40 years. Food security can be ensured if this method is followed carefully in order to get good yield. This is in practice in Galigattum village of Dharmapuri district in Tamil Nadu. **Keywords:** groundnut, millets, seed sowing	Shri M. Chinnappyan, Galigattum, Bagulampatti, Denkanikottai, Dharmapuri (Tamil Nadu)
335	Zero tillage for potato cultivation	Potato is grown in rice fallows after harvesting of aman rice (winter rice). The tubers are planted in the moist soil without any tillage operation at a spacing of 50×20 cm. After 7 days, when potato sprouts, it is covered with paddy straw without any tillage operation and addition of any inorganic fertilizer. It comes to harvest by January to February. Thus potato can be grown as a short-duration crop between two crops by zero tillage. This practice is being followed by 50% farmers in Lihivipur village of South 24 Parganas in West Bengal. **Keywords:** zero tillage, potato, mulching	Shri Ananda Kumar Mandal, Agricultural Development Officer, 48/4 Sultan Alam Road, Lake Garden, Government Housing Estate, Kolkatta (West Benagal) 700 033

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
336	Langal deoya for land preparation	Langal deoya is a primitive wooden bullock- drawn device used for primary tillage and for land preparation. **Keywords:** langal, tillage, land preparation	Ms Madhumita Ghosh, Shibiloon, Burdwan(West Bengal) 713 130
624	Minimum tillage	In Lahaul and Spiti district of Himachal Pradesh, farmers follow the practice of sowing wheat and barley after a single ploughing. Sometimes, in areas where upland paddy is sown and if dry season is prevalent at the time of harvest, wheat is sown immediately after the harvest. No preparatory tillage is undertaken and fields are left fallow in rotation. This practice causes least soil losses through surface run-off and this maintains soil fertility. A majority of the farmers in this are practising it for several years. **Keywords:** minimum tillage, single plough, wheat, barley, paddy, soil fertility	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 and Ms Krishna Hetta, SRF Mountain Reseearch Development Associates, Shimla (Himachal Pradesh) 171 005
627	Indigenous land-preparation practice	Sword-like curbed ploughing is successful in checking sudden run-off. Levelling of the ploughed field helps in moisture conservation, and irrigation of fallow land during autumn protects the surface layer of soil against heavy wind and also facilitates easy tillage operation during the next spring. Means of irrigation in the region are kuhls (small water channels) drawn from streams/khads/nallahas. Fields are ploughed in sword like curved pattern to ensure proper land tillage at all the corners of the field. Sloping lands are ploughed, following a bottom to top approach to avoid soil loss. Indigenous plough with two extra flat pieces of wood is attached to both sides of its iron blade and is used for tillage operation. The tillage operation is followed by the levelling of the field by using a maddin behind an animal. A maddin is a plain wooden plank. A heavy stone is put in the maddin to create good levelling force. This practice is used throughout the hilly region of Himachal Pradesh to protect the surface layer of soil against heavy wind and also checking sudden run-off. **Keywords:** land preparation, sword plough, tillage, soil erosion, moisture conservation	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1339	Method of land preparation and weeding in paddy	It is a low-cost technology of farmers in the Govindpur village of Dhanbad district in Jharkhand. The practice is used for keeping the soil aerable and free from weeds. It is also used for having a good crop yield through own resource and less cost of cultivation. It is in practice for last several years by maximum number of farmers. **Keywords:** land preparation, weed, soil, aerable, cultivation	Shri Nab Kishor Mandal, Mohubani, Govindpur, Dhanbad (Jharkhand)
1343	Primary tillage	This practice is followed by all farmers to minimize the loss in yield by 25% to 50%. Weed, disease and pest infestation decrease and the yield of crops increases up to 50% due to this practice. In this practice, primary tillage in the form of 3–4 ploughings is done from January to May at long intervals. This practice facilitates accretion into the soil, which activates microbial activities there. This is age-old practice, adopted by all the farmers in the village. **Keywords:** primary tillage, weeds diseases, pest, ploughing, microbial activity	Shri R.S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1345	Land preparation for wheat and potato cultivation	Farmers use this practice to minimize the loss in yield by 50%. Weeds, diseases and pest infestation decrease and the yield of wheat and potato increases up to 50% if this practice is followed. In this practice, a wooden cylindrical shaped implement, locally known as mungri, having 5–6 feet long handle, is used for breaking the clods during land preparation for wheat and potato. This is age-old practice and there is no modification made over years. It is adopted by almost all households. **Keywords:** wheat, potato, mungri, clods	Ms L. Kispota, Ms Seemavati Singh and Shri R. S. Prasad, Department of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1349	Summer ploughing	Weed, disease and pest infestation decrease productivity of the crops up to 50%. These problems are managed by two to three deep summer ploughings in April–May without planking, through indigenous plough. This practice is used by all the villagers of Khijuria village of Dumka district in Jharkhand. It minimizes the loss in productivity by 25% to 30%. This is in practice for last 100 years. **Keywords:** summer ploughing, productivity, planking, plough	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1767	Summer ploughing in rice field	Summer ploughing of rice fields is adopted by farmers after receiving rains during summer. This is practiced to reduce insect and weed population in the field. Farmers of Raipur district of Chhattisgarh are practicing this method. **Keywords:** summer ploughing, reduced insect and weed population	Director of Extension, Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492012
2034	Ploughing in pre-sowing season	Ploughing after every shower during the pre-sowing season (summer) is practised to conserve enough moisture for the crop, remove weeds and ensure good crop. **Keywords:** ploughing, pre-sowing season, conservation of moisture	Shri K.Lakshmana, Ph.D. Scholar, PG Hostel College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2035	Preparatory cultivation in podu lands	Weeds are the major problem in the tribal areas where shifting cultivation is being practised and also due to high rainfall. The tribal farmers are growing crops in the podu lands in three year sequence of shifting cultivation. In the first year they grow red gram to reduce weed density and enhance soil fertility. From second year onwards they grow mixed crops like sorghum, pearlmillet, kora etc. The biennial and perennial weeds are cut down and burning is done at the beginning so that perennial weeds may not perpetuate later. This adds potash to soil, sterilise soil and controls the pupal and larval stages and fungal inoculum. **Keywords:** shifting cultivation, soil burning, weed problem	Training Organiser Rustakuntabai, Kuruparam, Vizianagaram (Andhra Pradesh) 532523
2036	Talari technique (ploughing)	Talari technique (ploughing with four bullocks and a wooden plough) for land preparation results in  Talari technique of ploughing	Shri B.Narasimha Rao, Meerkhan pet, Kandukur, Rangareddy (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2037	Circular ploughing from periphery to centre	deeper ploughing as deep as 2 ft which is more than the depth recorded by tractor ploughing. It is used for growing coriander, pulses and sorghum. The cost of operation per ha is Rs 240. This also results in control of perennial deep rooted weeds. **Keywords:** deep ploughing, weed control Circular ploughing is advantageous over line ploughing for farmers having land holdings of size less than 0.5 acre. In this case land is utilized efficiently, thereby time and energy are saved in case of groundnut sowing. **Keywords:** circular ploughing, groundnut, efficient utilization of land	Shri Venkata Ramana Vadada, Gara, Srikakulam (Andhra Pradesh)
2038	Use of blade hoe for intercultural operations	Local blade hoe (dawara) is used by tying a rope around the tynes for intercultural operations. A small furrow is opened. This helps in in situ moisture conservation. This bullock drawn blade hoe is used in rainfed castor and sorghum. It removes the weeds and breaks the capillary continuity, as the disturbed soil act as soil mulch. This practice improves the productivity of groundnut by 10 to 15%. **Keywords:** interculture, blade hoe, moisture conservation.	Dr P.K. Mishra, CRIDA, Santhoshnagar, Hyderabad (Andhra Pradesh) 500 059
618	Hoeing  Indigenous tools for hoeing	Hoeing places the soil around the base of the stem and roots, which enhances the plant growth, soil becomes porous and insects are killed. Farmers hoe their fields on labour-haring basis. Two types of crops (rabi and kharif) are grown. During rabi, vegetables are grown. Rabi crops such as wheat does not need hoeing. Farmers hoe the vegetables and kharif maize crop. They dig the soil with the help of khurpa (hand hoe) also called rambha (crowbar). Also the weeds are removed from the vegetable or maize crops. Soil is then placed around the stem. They also remove the weeds form the maize crop with the help of zadi, also called khutti. Farmers with small family and more land hire the daily wages laboures for hoeing their fields in time. However, farmers having large families hoe their fields themselves. **Keywords:** hoeing, weed, healthy crop	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
619	Selection process for quality cereal seed	Clean and healthy seeds produce healthy crops. Healthy seeds ensure more yield. Farmers select healthy cobs of maize after harvesting. From these healthy cobs, lower part (which is full grown) is separated for seeds. In wheat, farmers select spot-free and large-sized seeds from the heap of grains. They also purchase the healthy and disease-free seeds of potato and vegetables from the market. Selection of seeds is done on the basis of size, shape, and compactness, and freedom from disease and insect pest attack. The selected seeds of rabi crops are sown in November or December and of kharif crops in June. This ITK is very prevalent throughout Himachal Pradesh. **Keywords:** quality seed, healthy cobs, disease-free seeds, seed germination, crop production	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
620	Pruning and thinning for better crop stand	Thinning is done during hoeing of kharif crop and pruning is done for fruit crops at a time when plants are three feet in height. Farmers cut infected branches of the trees with the help of sickle and remove extra  Indigenous tools for pruning plants of maize by crowbar. Pruning helps in the development of branches and thinning ensure proper spacing of the plants in the field and reduce the competition for water and nutrients. **Keywords:** pruning, thinning, crop, crowbar, sickle	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
622	Technologies for raising forest nurseries	Nursery raising is quite helpful for farming community. Roots of plants have a symbiotic association with fungi and it is essential for their survival. The soil from natural zone contains elements those are essential for the establishment and growth of the particular plants. In forest nurseries, nurserymen usually bring soil from the natural zone of the plant if a plant is to be introduced into a new area or at a site where no vegetation exists. Soil from natural zone of the plants also contains natural microbial association, which provides nutrients from the soil. The seedling are raised in nursery bags. Soil pathogens enhance the survival rate, which varies from 25 to 75%. Nursery is an area where plants are raised for eventual planting out, and has ordinarily both seedling and transplant beds. Nurseries are either permanent or temporary. It is maintained either with irrigation or other artificial watering source. This ITK is used throughout the Himachal Pradesh since time immemorial for nursery raising. **Keywords:** forest nurseries, natural zone, soil	Dr O.S. Shad, C/o Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
625	Earthing up of crops for stable footing	The crops that grow up very tall and do not have extensive root system, require earthing up twice or more in a season, particularly during the rainy season when the soil around the roots is washed away with heavy rains. Tuber crops like potato depend for their good growth on nature and quality of soil, which is available around it. Maize has a shallow root system, which gets exposed after a heavy shower of rain and gets uprooted by winds of high velocity. The soil is ridged up around the main stem of the plant to cover the root zone. A dose of organic manure may also be applied at the time of earthing up to provide the necessary nutrients for proper growth and good yield of the crop. Earthing up results in the formation of small pockets or hollows between two adjoining plants. These pockets catch rain water, which is absorbed by the soil. The pockets also hold the soil when it is washed out by heavy rain. Care is taken to ensure that there is no stagnation of water immediately near the root zone of the plants. The soil is gathered around the plants during the intercultural operations by manual labour. A ridging plough is used to level areas for the earthing up of crops, which have	Shri Rajeev Kumar, Room No 32 D, NBN II (CD) Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh)171005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
623	Use of shangma stone for weed control	been sown in rows with sufficient space between the rows. Earthling up is more commonly practised on vegetable crops, potato and ginger i n the hill areas. This is very effective and has been practised throughout Himachal Pradesh. **Keywords:** earthing up, maize, potato, ginger, strong winds, uprooted Shangma stone is light bluish in colour. It is broken down into small pieces. Its pieces are spread over a small heap of soil, piled up in the middle of field in December. This water-soluble stone is spread as a thin soil layer in the field for weed control. Sowing is then done after 10–15 days. This has been practised in most of the villages of tribal (Kinnaur, and Lahaul and Spiti) hilly areas of Himachal Pradesh since time immemorial. **Keywords:** shangma stone, spreading, field, weed control	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
628	Intercultivation for proper sprouting of seed	In this practice, a light cultivation or soil is done after the seeds have sprouted. The intercultural operations are done with small hand hoes and sharp pointed hook-like iron implements, fixed to wooden handles. Sometimes, blind hoeing is done even before the seeds have sprouted, to break the crust formed so as to ensure good germination. The practice is done for sprouting of seeds and also to thin out the crop for proper growth to increase production and conservation of soil moisture. This is practised in Kangra district of Himachal pradesh by a majority of the farmers for centuries. In earlier days, only pointed hook-like structure made of wood was practised but today iron hooks are used. **Keywords:** intercultural operation, hand hoe, seed sprouting, moisture conservation.	Shri Rajeev Kumar, Room No 32 D, NBH -II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh)175 001
1341	Bushening in rice	Farmers of Khaspokharia village of West Singhbhum district in Jharkhand perform bushening on direct-seeded rice field by ploughing with worn-out desi plough, followed by planking. Bushening controls weeds by burying the weeds in mud. Buried weeds, after decomposition, supply nutrients to the plants and boost up growth with increased number of tillers. By this practice 60% to 70% weed infestation is	Shri Sanat Kumar Sawaiyan, Department of Extention Education, Birsa Agricultural University, Kanke, Ranchi, (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1344	Pre-sowing manuring in rice	controlled and yield increases up to 10–20%. This is an age-old practice, adopted by maximum number of farmers. **Keywords:** bushening, rice, plough, nutrients, weed, tillering This practice is followed by all the farmers to minimize the loss in yield by 25% to 50%. In this practice, pre-sowing manuring for transplanted rice is done by keeping dried cow-dung mixed with ashes in the field at different places in basketful of heaps. At the time of final ploughing the heaps are properly spread in the field. This practice also facilitates aeration into the soil, which activates microbial activities there. This age-old practice is adopted by maximum number of farmers in the village and in the areas surrounding Ranchi. **Keywords:** preserving, manure, weeds diseases, pest/insect	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1346	Ploughing in the standing rice crop	Farmers of Noorhi village of Ranchi district in Jharkhand do ploughing in the standing rice crop. In this practice, weeds are uprooted and distorted. After this practice, uprooted rice plants are retransplanted where plant population becomes very thin. It is found effective for better growth of the crop. This is in practice for last several years by maximum number of farmers. **Keywords:** plough, standing rice crop, weed, uproot	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1347	Interculture with three-bladed hand hoe	This is practised in the Sindri village of Ranchi district in Jharkhand. This is in practice to maintain plant population and removal of weeds. In this practice, interculturing and thinning are done by three bladed hand hoe on direct-seeded standing rice crop because weeds compete with crop for moisture and nutrients.This practice is very effective for better growth of the main crop. It is age-old practice, followed by majority of farmers in Sindri village. **Keywords:** interculture, thinning, three-bladed hand hoe, weed, moisture, nutrients	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1563	Gachiao an intercultural operation	Gaps in rice fields generally appear due to low percentage of germination or due to bushening operation. For filling up these gaps and maintaining proper distance between plants, this operation is	Shri Sanat Kumar Sawaiyan, Dumbisai, Chaibasa, West Singhbhum (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
623	Tillage practice	practised. Direct-seeded rice crops are uprooted and replanted in the gaps with the help of three-bladed hand hoe, locally known as gachiao. Gachiao is generally practised a week after bushening in direct-seeded medium land in 5–6 inches deep water. It is helpful in increasing the number of tillers per plant and boosts up the health of plants. All the farmers of Khaspokharia village of West Singhbhum district in Jharkhand follow this practice for last several years and 5–10% increase in yield of rice is obtained due to it. **Keywords:** gachiao, intercultural operation, direct-seeded rice crops, three-bladed hand hoe, bushening For ploughing in hilly areas, black bullocks of same size are used. Smaller bullocks are better, since the plot size in hills is small. Black bullocks can tolerate cold weather. First ploughing is done eight inches deep so that harmful insects come out and are killed. The fields are made free from stones. Deep-rooted weeds are uprooted fully and either burnt dried. Compost manure is applied each year. **Keywords:** black bullocks, small size, cold weather, deep ploughing, insect control	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
354	Weed control in drilled rice	Weed is a major problem in direct-seeded upland rice. By ploughing the land within two days of sowing, the emerging weed seeds germinate earlier than the paddy seeds. Hence, the mortality of weeds is ascertained.By this practice more than 70% of weeds are controlled. It is an age- old practice, being followed by all farmers of village having upland in Guhalachatua of Keonjhar district in Orissa. **Keywords:** weed control, drilled rice, ploughing	Shri Amaresh Khunita, Training Assistant (Agronomy), Krishi Vigyan Kendra, Keonjhar (Orissa) 758 002
647	Sign to indicate that field is sown	After sowing a field, a line is drawn with plough to indicate that the field has been sown. By doing so, other farmer of the village come to know that the field has already been sown and they do not walk over it. This is practised by a majority of the 171 005 farmers in upper parts of Himachal Pradesh. **Keywords:** drawing of line, ploughed field, prevent walking over it	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1128	Ploughing of the field with kasala (hand hoe) after harvesting	To remove weeds, provide aeration to crops and to conserve moisture in the soil, ploughing is done with kasala (hand hoe). This practice increases crop yields and the problem of weed is greatly reduced. This is an age old practice especially for the farmers of Uchama and Julana blocks of Haryana where all the farmers in the village still practice this method. Weedicides are also used by the farmers as an alternative method. **Keywords:** kasala, ploughing, reduced weed, increased production	Dr A.K. Mehta, Zonal Coordinator, ZCUI, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141004

6
Crops and Cropping Systems

Code No	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
7	Rabbing method of land preparation for raising nursery for paddy and fingermillet	Farmers of the Dangs district of Gujarat prepare their lands by burning of branches and leaves of trees, dung of animal etc., and covering the area selected for nursery during late summer. The nursery is raised in the burnt land. This practice is locally called rabbing. It helps in easy uprooting of seedlings, burns weed seeds, and adds organic matter and ash to the soil, resulting in vigorus growth of the seedlings. Since long time this technology is being used by all the farmers of Dang district of Gujarat. **Keywords:** rabbing, burning of residues, nursery raising, soil fertility, good seedling growth	Shri V.D. Joshi ,Training Organiser, KVK, Gujarat Agril. University, Waghai, Dangs (Gujarat) 390 470
120	Traditional paddy variety cultivar (sarkar nellu) in rainfed sloppy lands	More than 40 farmers of Gundianatham village in Tamil Nadu grow paddy (Oryza sativa) locally called sarkar nellu. Direct seeding is generally done but  Sarkar nellu– a traditional rice variety sometimes transplanting of the seedlings is done without puddling. This variety is in use for the last 30 years in this village. **Keywords:** sarkar nellu, traditional paddy, laterite soil	Shri R. Annadurai, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207

INDIGENOUS TECHNICAL KNOWLEDGE IN AGRICULTURE

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
459	Ashra-ahu mixed cropping	The practice of mixed cropping of ashra-ahu rice is followed by the farmers of Barak valley and lower Assam districts. This is done to get both ahu and ashra rice together.There are low-lying shallow-water rice growing situations where water starts accumulating due to pre-monsoon showers (March-April) and the field water level reaches 50 cm to 75 cm during the peak monsoon period (June–August), but subsides with the decline in rainfall to almost dry in November to December. In such situations a specific group of rice varieties known locally as ashra is traditionally grown either as monoculture or mixed with ahu rice. In mixed cropping situation, equal quantity of seeds of the traditional ahu and ashra varieties is wet broadcast with sprouted seeds during April. The ahu component matures early by July-August, whereas the ashra component is still in vegetative stage. The ahu component is harvested in the usual time. The leaf pruning of ashra component during the harvesting of ahu is believed to reduce excessive vegetative growth, increase the tillering and decrease the chance of early lodging of ashra, rice plants. Harvesting of ashra is done after the crop reaches its maturity at the end of November. The advantage of this mixed cropping is that it provides insurance against risk of flood damage as compared to existing farming system. It has a great influence in getting both ahu and ashra crops in a year where normal sali crop is not possible. About 70% of farmers have adopted this practice since 20 years with some modifications made from time to time on variety and seed rate. **Keywords:** mixed cropping, ashra-ahu, pre-monsoon showers, peak monsoon, harvesting	Shri J. K. Choudhary, Krishi Vigyan Kendra Napam, P.Box No 51, Tezpur (Assam)
651	Methods of nursery preparation	First location for nursery bed is selected, then wastes are burnt on that place, which kills insect pests. Then a plot 1 ft width and 3 ft length and 9 inches height is prepared by digging. One foot depth soil is removed from the plot and it is again burnt with waste materials. Then half of the removed soil is spread on the plot. Mixture of sand (2 parts) and rotten cowdung or its ash (1 part) are then spread on the plot. After that, seed sowing is done. **Keywords:** nursery, burnt waste materials, rotten cowdung or its ash	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
662	Control of wild rice by growing purple rice	This practice is adopted to control the wild rice weed in rice field by growing the purple-coloured rice variety like R-575. The practice is followed by farmers in Dangu, Kummi, Khudla and Karni villages of Balh and Gobalpur development blocks in Mandi district of Himachal Pradesh. The wild rice locally called nirsan is a major problem in upland rice- growing areas. Being identical to rice plants in foliage, it is difficult to distinguish between wild and cultivated rice, The wild rice matures much earlier than the cultivated rice and shatters its grains in the field. Due to this, it becomes practically impossible to eradicate this weed from rice field. Since,this weed is of same species as that of cultivated rice, no herbicide can be used for controlling this weed. Farmers of the mentioned areas where this problem exists adopted a practice of growing purple-coloured rice variety (R-575) in the infested fields. This variety of rice has purple-coloured foliage, which is distinctly different from wild rice. During weeding operation, farmers remove green-coloured wild rice from their fields, thus eradicating this weed from the field. The farmers are practising this for the last 45 years. **Keywords:** wild rice, growing of purple rice, easy weeding of wild rice	Dr S. K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwa Vidyalaya, Mandi (Himachal Pradesh) 175 001
1088	Indigenous paddy variety (bhandai) grown by resource-poor farmers.	The resource-poor farmers grow bhandai, an indigenous paddy variety, to reduce risk from biophysical and socio-economic factors. This variety is drought resistant and has long spreading root. It is early and short duration variety. It is resistant to insects and pests. Farmers feel that this is location-specific variety which could best be grown in their conditions. As it is early and of short duration, farmers can grow subsequently pulses and oilseeds crops successfully. The variety is grown in Azamgarh district of Uttar Pradesh. **Keywords:** bhandai, indigenous paddy variety, drought resistant, insect and pest resistant, location specific	Shri Ranjay K. Singh, Ph.D.Scholar, C/o Dr. C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1089	Traditional paddy variety (Nagina- 22) for highly risk-prone unirrigated conditions	The resource-poor farmers having light soil with slopy land under unirrigated conditions grow Nagina- 22 variety. It is one of the best varieties grown for early maturity under the upper stream, highly slopy land, where soil is very light with moisture stress. It	Shri Ranjay K. Singh, Ph.D. Scholar, C/o Dr. C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony,

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1090	Indigenous paddy variety (karahni) grown on blackish soils under rainfed conditions	i s generally grown under monocropping system in Azamgarh district of Uttar Pradesh. Nagina-22 variety is not an indigenous variety but was developed at research station long back and is now quite popular. Farmers are still continuing it under stress situations. **Keywords:** Nagina-22, paddy variety, unirrigated slopy land, light soils, traditional variety Karahni is an indigenous paddy variety grown in areas of Azamgarh district of Uttar Pradesh, which are moderately risk-prone with blackish soil and which are partially irrigated. It gives good yield of 15–20 quintals per hectare in a short time and clears the field for growing rabi pulses and oilseeds. The variety is location-specific and resistant to insects, pests and waterlogged conditions. **Keywords:** karahni variety of paddy, blackish soil, pest and disease resistant, waterlogged condition	Adhartal, Jabalpur (Madhya Pradesh) 482 004Shri Ranjay K. Singh, Ph.D. Scholar, C/o Dr. C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1091	Indigenous paddy variety (karanga) grown in partially irrigated soil	Karanga is an indigenous paddy variety grown on brown soils of Azamgarh district. It can successfully grow on moderate risk conditions by the resource poor farmers. It is one of the best varieties suitable for water-logged and heavy soil like karail mitti at the lower stream. It produces 20–25 quintals of grain per hectare. It is short duration and leaves the field free for growing pulses and oilseed crops during rabi. It is resistant to pests and diseases also. **Keywords:** karanga variety of paddy, waterlogged condition, brown and heavy soils, karail mitti, short duration, resistant to pests and diseases	Shri Ranjay K. Singh, Ph.D. Scholar, C/o Dr. C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1359	Utilization of low lands by wet seeding of rice	Farmers of Khijuria village of Dumka district in Jharkhand use deep lowlands through suitable variety. In this practice, wet seeding is done after water recession, because farmers do not wait for complete drying of fields. Due to this practice 100% waterlogged lands are utilized. This is in practice for last several years by the farmers having this type of land. **Keywords:** deep lowlands, wet seeding, waterlogging	Ms Seemavati Singh, Department of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1360	Direct seeding of rice	In upland, direct seeding of rice is done through broadcasting method. Usually this practice is done after onset of Education, pre-monsoon/monsoon (15 June). This practice influences the cropping system of the land; if there is irrigation facilities available farmer utilizes this land as a yearly rabi crops, after harvesting the rice (gora). This is age-old practice followed by 70% farmers in the Khijuria village of Dumka district of Jharkhand **Keywords:** direct seeding, upland broadcasting, pre-monsoon, irrigation	Shri Veeresh Kumar, Departmnet of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834006
1362	To prevent lodging in rice crop at maturity in water logging condition	Farmers of Khalisha and Udwaninagar village of Bhojpur district in Bihar use this practice. The practice is used for preventing lodging in rice crop during maturity period in waterlogged condition. In this condition, after 2 months of transplanting, the  Lodging in rice upper portion of the rice plants is cut with the help of sickle. Excess growth of the rice plants is checked due to pruning of upper portion of the plant. Lower part of plant becomes strong. This is in practice for last several years by all farmers in the village. **Keywords:** lodging, rice crop, water-logging, sickle, pruning	Shri Vishwesh Kumar, C/o Shri Satyendar Prasad Singh, Kataiyan Village, Dostiyan, Sheohar, Sitamarhi (Bihar)
1363	Rice cultivation in marshy land without any field preparation	In marshy land it is not possible to plough the land. Hence this practice is helpful for rice cultivation. For sowing in over-saturated or marshy land situation, rice seeds are water soaked till sprouting of the seeds. Then the sprouted seeds are broadcast in marshy lands. This practice is followed in Khalisha Bakri and Krwan villages of Udwantnagar in Bhojpur	Shri Ranjay Kumar Singh, Research Associate, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1365	Use of traditional rice varieties to minimize risk	district (Bihar). It is followed in about 90% marshy land and waterlogging lands and yield of rice is comparatively 20% to 30% more than that in transplanted rice. Cost: benefit is 1 : 6 approximately. **Keywords:** marshy land, sprouted seeds, rice, waterlogged Traditional varieties are disease and pest resistant and also suitable to existing micro-farming situations. These varieties give at least some yield even in stress situations and no risk is involved. The practice is followed in many villages namely Kulaburu, Balubaru,Khaspokharia and Ukugutu villages of Tantnagar Block of Singhbhum district of Jharkhand. Success has been reported in more than 80% of the cases. Cost: benefit is 1 : 5 approximately. **Keywords:** traditional varieties, pest resistant, risk, stress	Shri R.K. Singh, Research Associate, Department of Extension Education, BAU, Ranchi (Jharkhand) 834 006
1366	Agricultural practices in East Singhbhum district of Jharkhand	**Farm Implements** Implements used for land preperation are bullock-drawn plough (small and big), moi, spade, gaita, kadokurol, hausa and gachian **Cultivation Practices for Direct-Seeded Paddy** 1. *Tillage and intercultural management* Land preparation After harvesting of paddy during 15–20 December, when the soil is moist, the first ploughing is done by old (small) plough. This is called ugal. This ploughing is done from December to February. After getting rains during February-March, the first ploughed soil is settled. Then the second ploughing (called shamul) is done by new (big size) plough during April to 15 May. By this ploughing the lower soil comes upward and all plant residues are covered with soil, which increases soil fertility. Cowdung is dried from first week of May and applied (broadcast) in the field at the rate of two to three bullock-cartload per bigha (40 to 60 baskets). This cowdung is mixed by ploughing during 15–20 May. Cowdung is broadcast by baskets manually. Sometimes	Paryavaran Chetan Kendra, Bada Sigdi, Potaka, East Singhbhum (Jharkhand)

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		cowdung mixing and sowing of paddy are done simultaneously. Sowing Paddy is sown after broadcast of cowdung. Paddy need @ 16–20 kg per bigha is broadcast and covered with soil by ploughing. *Intercultural operations* When paddy plants reach the height of 7–8 inches and sufficient standing water (5–6 inches) is there in the field, the first intercultural ploughing (called kadau) is done. This ploughing is done during rainfall. The second intercultural ploughing (second kadau) is done after 7–9 days of first intercultural ploughing when 6–7 inches water is stranding. It is done only in sandy loam soils, while in dry soils only one intercultural ploughing is done. After intercultural ploughing, planking with moi (bamboo plank) is done over the paddy plants. The plants are laid down in the mud. This kills the insects, that stay over the plants. The field is also levelled by this operation. This operation is called moi dona. After moi operation, paddy plants stand straight. Weeds are decomposed in soil. After 1 week, the yellow, damaged and decomposed leaves of paddy plants are pruned and covered in soil (mud) along with decomposed weeds. The weeds which remain undecomposed are taken out. This operation is called nikoni. After 2–5 days of nikoni operation, some of the tillers of paddy plants are taken out and transplanted where there is no plant (empty space). This operation of equalizing the plant population is called gachhiyan. This operation makes the plants more vigorous and even in the field. When the paddy plants take the height of 1–1.5 feet, branches of kendu, bhelwa, sinduar, mahua, sal or padoi are placed in the field in standing position at different places. This helps in getting away insects. The birds also sit on these branches and eat away the insects. At the time of panicle formation, 4–5 days	

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		before flowering, the second weeding nikoni and bachhai are done. When paddy grain is matured, the paddy plants are arranged in standing position at some level with the help of long bamboo, so that harvesting can be done conveniently and ears are not disposed off here and there. In the mean time, preparations for threshing-yard are done during 10–30 September. *Harvesting* Tand and ash paddy is harvested 4–6 inches above the base level. The small plants of 4–5 handful and big plants of 2 handful are kept separately in lines while harvesting. The long plants are harvested upto 1 foot above the base level. The bundles are tied after drying in the field itself. *Post-harvesting* Paddy after transplanting is collected and transported to threshing yard (khawari) either by bullock cart or by man on the head. Threshing yard is prepared by pasting cowdung and kodan ash or mud paste. Paddy is set on the yard and bhelwa branch is placed over it in standing position. Paddy plants are sometimes set over the kodo straw. Threshing of small paddy plants is done by bullocks or by man with the help of their feet. Threshing is done also with the help of bamboo. Paddy plants are beaten by chanchad made of bamboo or plank (pata) made of wood or on stone rock. After threshing paddy grain is separated with the help of bamboo sup. This practice is called dhukai. After dhukai (separation of grain), the paddy grain is stored for consumption and seed purposes by separate methods. Paddy grains are stored in bamboo dedmi, oldi, kotha, wooden box or muva handi, etc. Paddy straw is also stored by special method to be used as fodder for animals.	

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Cultivation Practices for Transplanted Paddy

1. *Tillage and intercultural practices:*

Land preparation

First ploughing is done in dry field when soil is moist or when 2–3 inches water is standing in the field. Second ploughing is done after 3–4 days of first ploughing, so that all weeds and crop residue are buried in the soil. After ploughing, levelling is done with the help of moi. Third ploughing (preparation of kado) is done when weeds and crop residues are decomposed. It takes 3–4 days, when *kado* (third ploughing) is done. After ploughing moi is used for levelling. If field is uneven and there are heaps of soil at some places, the soil is scraped with the help of kado kural and leveling is done.

Transplanting

Paddy seedlings of handful bundles are thrown/distributed in the field and then transplanted. At the time of transplanting either the field is kept dry or filled with 1-inch water. When the roots of paddy seedlings are set in the soil, the field is given 3 inches water.

Weeding

Nikoni (weeding) is done after 1 month of transplanting.

All other operations in transplanting the paddy are done in the same manner as in the case of dried seeded paddy.

Keywords: ugal, shamal, old and new plough, kadan, moi, bamboo-plank, nikoni, gachhiyan, sunduar, kenda, bhelwa, mahua, sal, padsi, bachhai, tand and ash paddy, khamari, kodo straw, kodo ash, chanchad made of bamboo, pata, sup, dhukai, dedmi, deli, kotha, kado, kado kural

Pest and Disease Management

Branches of sinduar plant are buried in the field when the paddy is attacked by diseases.

Paddy crop is protected from insects by spreading tender leaves of podsi plant @ 3–4 buckets per bigha. Branches of podsi plant are also buried in the soil, as well as of rata plant.

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		Flowers of gujari, neem and karanj are spread in the field to protect paddy from diseases. About 2–3 buckets of flowers per bigha are applied in the field. Moi made of bahera tree wood is used for operation at the time of kadan (ploughing in the standing paddy). This protects the crop from insects. Insects are getting away by fire. Insects are getting away by drum sounds. Fresh cowdung is mixed with soil and sprayed to control diseases in paddy. Pests and diseases are controlled by changing the water in the paddy fields. Disease and insect preventive trees like neem, karanj, ashan, arjun, jamun, palash, sinduar etc are planted on the bunds to protect the paddy crop from pests. Fur of *konda* is picked and applied in the land. This controls insects and pests in paddy crop. About 1 to 1.5 basketfuls of *kanchi bans* pieces per bigha are broadcasted in standing water with cowdung. Water is kept standing for 3–4 days. This controls white (*safed rog*) disease in paddy. *Chulha* ash is dusted on brinjal, ladies finger and bean crops to control insects. **Calendar of Agricultural Operations** For ploughing and application of cow dung manure, 15 January and first day of Magh month are considered good. Second ploughing is considered better in February-March Paddy sown on 25–26 May and 13–14 of *Jyestha* month avoids insects and pests attack. Transplanting of paddy, *kadan and gachhiyan* in paddy before *Bhadra* 12 is considered better for paddy crop. **Keywords:** sinduar, podsi, rata, gujari, karanj, bahera, kadan, ploughing in the standing paddy, ashan, arjun, jamun, palash, kendu, kanchi bans, safed rog in paddy, chulha ash, gachhiyan	
1773	Rabbing for raising rice nursery	Rabbing (burning of nursery area) is done to minimize weed population in nursery bed, get healthy seedlings for transplanting and to increase resistance in rice plants against various diseases and insect pests. For this, dry cow dung is collected for about 4–5 months at one place where nursery of paddy is to be raised and spread in the field. The cowdung is stored	Shri Ananad Babaji Gaonkar Shirvande (Ratambewadi) Malvan, Sindhudurg (Maharashtra) 416 616

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		b y the farmers from his own herd of cattle and if possible it is also collected from outside area. Before rabbing, plant toppings (branches) of ain kinjal, kumbh, uukshi, jamun, kuda and penkul are collected from reserved/own varkas land and kept for 15 days for drying. These plant loppings are called as kavale in vernacular language. The kavale are brought nearer to nursery and stacked at one place. Through out the season (about 4–5 months), dry plant leaves are collected from nearby area of house and farms and are kept at one place. Before rabbing, dry cow dung is spread in the desired area, followed by kavale above which dry plant leaves and waste dry grass are spread and kept as it is for sun drying for 6–8 hours. Generally the practice of spreading the above material is done in morning hours. The material is burnt during late evening hours. Weed seeds are destroyed and soil borne fungi are inactivated due to rabbing. As a result, weed intensity is reduced by 80%, soil-borne disease 95%, stem borer incidence is reduced by 92% and there is an increase of 2 q/ha in yield of grain. This practice is being used since 50 years by the farmers of Shirvande of Malvan tehsil in Sindhidurg district of Maharastra. **Keywords:** rabbing, raising rice nursery, cowdung, plant toppings, weed control, soil borne diseases, increased yield	
1779	Direct seeding of rice	Bushening operation followed by gap filling and weeding in rice is practised by small holding farmers of Chhattisgarh region. The direct seeding of rice with bushening operation give sustainable yield when compared to transplanting rice under rainfed conditions. Normal transplanting is required stable rainfall for its cultivation. The rainfall analysis shows most of the areas does not have stable rainfall during July in Chhattisgarh. Farmers of Chhattisgarh region have adopted this practice to over come the drought problem, since many years. **Keywords:** gap filling, weeding, transplanting, rainfed, nursery	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492 012

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1788	Location specific indigenous paddy varieties for sustainable production	Tribal of Bastar district adopt farming practices in 3 major farming situations for which they have specified biophysical indicators like soil colour, texture, depth etc. They are cultivating about 38 paddy varieties of different maturity duration and yield potential. With specific characteristics, these 38 varieties are classified based on farming situations under which they are being cultivated. **Keywords:** farming situation, indigenous paddy variety, biophysical indicator	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril.Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
2046	Intercropping rainfed rice and redgram	Sowing of rice (BPT 5204) and redgram (LRG-30) in 11 : 1 ratio during rainy season, acts as an insurance against failure of rains. Even if redgram fail and during heavy rains rice gives good yield and economic returns from both crops during normal years in rainfed black and red soils. **Keywords:** insurance, redgram, economic returns, black and red soils	Shri P. Srikantha Reddy, Deepaguntla, Gospadu, Nandyal, Kurnool (Andhra Pradesh)
2056	Burning of trash on nursery beds	Farm waste and trash are burnt on the nursery beds. The heat that is generated by burning, sterilizes the soil and some nutrients like potash is added. It is practised in near by villages of Jamaikunta in Karimnagar of Andhra Pradesh. **Keywords:** burning trash, nursery beds	Shri M.Venkatram Narsimha Reddy, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 505 122
2057	Paddy broadcasting in prepared fields (direct sowing)	Paddy seed is soaked in water for 24 hrs and then kept in a gunny bag; thereby seeds are germinated. The germinated seed is directly sown (broadcasted) in the field. By this practice the cost of cultivation is reduced in respect of transplanting etc. Weeding is a major problem under this condition. By this practice crop period is reduced by 10–15 days and cost of cultivation is reduced. **Keywords:** paddy, germinated seed, broadcasting	Shri A. Ramaswami, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 505 122
640	Intercropping of maize and tomato	In Hamirpur district, maximum farmers have small land holdings where major crop of the rainy season is maize. For increasing income per unit area, farmers take long duration tall varieties of tomato in the interspaces of maize, using maize plants as staking material and tying with polythene ropes. Maize crop is sown by keeping at row-to-row distance of 75 cm	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		in June, whereas tomato seedlings are transplanted between the two lines of maize on ridge with onset of monsoon. A few farmers are now adopting this practice because of stalk-rot problem in maize, improper drainage, insect pests problem in tomato, high temperature and humidity in the field along with tender and lanky growth of tomato plants. **Keywords:** intercroping, maize, tomato, staking material	
643	Traditional method of maize sowing	Due to small size of fields in hilly areas, the majority of farmers are using bullocks for ploughing and sowing. This practice maintains a row to row distance of 6 cm with plough and seeds are dropped at a step distance (approx. 60 cm). Maize is the major crop of the region during kharif. Farmer sow maize behind plough by kera method with row-to-row distance 20 cm, and drop of seeds through the tin in the furrow at step to step distance.This ITK is practiced throughout the Himachal Pradesh since time imemorial. **Keywords:** maize, kera method, crop productivity	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
648	Traditional intercropping of maize, beans, cucumber and bhang	Traditionally people of the Seraj valley of Kullu district has been doing for centuries mixed cropping of maize (Zea mays), beans (Phaseolus spp.), cucumber and bhang (Cannabis sativa). These crops are grown in kharif and they support each other. This is one of the best methods of bio-diversity which the farmers are using for a long time. The purpose of this practice is to maintain biodiversity and also to make maximum use of the land. Maize crop is grown as the main crop in theses fields, which provides support to tender bean plants and cucumbers. The beans provide nitrogen to maize and cucumber by fixing free nitrogen from atmosphere. The bhang plants are grown around the corner of the fields. It protects the maize from birds and animals. Thus the farmers gets four crops from one field, which are mutually beneficial to each other. About 20,000 farm families practise this method. **Keywords:** mixed cropping, maize, bean, cucumber, bhang, maximum land use, maintain biodiversity	Dr O.S. Shad and T.N. Lalchaupal, Deptt. of Bio Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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655	Mixed cropping	Mixed cropping helps in crop diversification and for increasing the production of maize, millets, beans/pulses. This practice is applied on sandy and clay loam soil by a majority of farmers in all parts of western Himalayan desert. This practice ensures diversity of food crops and also improvement in the nutritional status of families. **Keywords:** mixed cropping, diversification, sand/clay and maize/millets/beans/pulses	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
668	Mixed cropping of maize with colocasia	Maize and colocasia are sown in the same field. Earthing up is done at the time of shoot formation of the colocasia tubers. Natural and artificial fertilizers are added at the time of earthing up. This practice reduces the insect and pest attacks, maintains soil fertility and enhances crop production. Farmers of Balot village of Kangra district of Himachal Pradesh are practising this mixed cropping method for several years. **Keywords:** earthing up, pest and insect attack, soil fertility, crop production	Shri Rajeev Kumar, Room No 32 D, NBH-II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 171 005
672	Mixed cropping of maize and rajmash	Farmers of upper part of Shimla practice mixed cropping system for maize and rajmash production. This technique is being followed for the last 60–70 years by maximum number of farmers in the village. In May or June, farmers use equal amount of seeds of maize and rajmash for sowing. After 30 to 35 days the length of maize and rajmash is 4 to 5 inches. This crop is ready at mid-September. **Keywords:** mixed cropping system, maize, rajmash	Shri Laiq Ram, Deorighat, Theog, Shimla (Himachal Pradesh) 171 201
673	Mixed cropping of maize and soybean	Farmers of Mashal village of Kangra district in Himachal Pradesh practice mixed cropping of maize and soybean. Maize is sown in April and May. After this soybean is broadcast. This practice is done to minimize insect pest attack, increase crop production and maintain soil fertility. This is practised for centuries by a majority of farmers. **Keywords:** mixed cropping, maize, soybean	Shri Rajeev Kumar, Room No 32 D, NBH II Hostel. HPU, Summer Hill, Shimla (Himachal Pradesh) 175001
674	Mixed cropping of maize with turmeric	In Reedi village of Kangra district in Himachal Pradesh, farmers practice mixed cropping of maize and turmeric to increase production, to prevent attack of insect pests and to maintain soil fertility. When tuber germinates into shoot form, the root of every	Shri Rajeev Kumar, Room No 32 D, NBH II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 175001

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		turmeric is earthed up. Sometimes natural or chemical fertilizers are also used during earthing up. This is a newly developed technique, which has been in use for the last 2 years by a majority of farmers. **Keywords:** mixed cropping, maize, turmeric, earthing up	
1097	Mixed cropping of onion with winter maize	Mixed cropping of onion with winter maize produces two crops at a time which increases income and reduces risk failure of one crop. Sowing of winter maize is done on southern side and transplanting of onion is done on northern side of east west ridges. This is practised in Piarcana village of Ferozpur district in Punjab. **Keywords:** onion and maize cropping, southern and northern sides of ridges, east-west ridge	Shri S. Sukhjit Singh, S/o S. Sarjit Singh, Piarcana, Ghal Khurd, Ferozpur (Punjab)
2044	Growing maize in rows around the commercial crops/ vegetables	Maize/castor grown in rows around the main field of vegetables serve as a guard and trap crop for animals and pests respectively. **Keywords:** maize, guard crop, vegetables	Shri B.R. Naik, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2053	Maize + redgram intercropping system	Redgram is sown as an intercrop with maize during rabi season Maize being a short duration crop, it is harvested by 100 days and redgram being a long duration crop can efficiently utilize the resources, maize is irrigated and redgram is grown without irrigation after harvest of maize. **Keyword:** maize-redgram intercrop	Shri A.Rajeswar Rao, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 506 122
2055	Maize intercrop with turmeric	Maize is sown along with turmeric in alternate rows during kharif. The maize is harvested within 90–100 days. Turmeric is a long duration crop. It reduces the risk resulting in higher and early income. **Keywords:** maize intercrop, turmeric	Shri E. Papi Reddy,C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 505 122
1775	Cultivation of pearlmillet in summer season	Cultivation of cotton is increasing day by day in Morane village of Dhule district of Maharashtra, and thereby reducing the area for food crops. The farmers experience the shortage of food grains for their family as well as for animals. To overcome the problem, farmers have started cultivation of summer pearlmillet under irrigated conditions, which has been in practice since last 4–5 years. Sowing is done in	Shri P S Patil, Training Organiser, Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004

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		January where the practices are same as that of kharif season. Five to six irrigations are required. The farmers are getting good quality grains and fodder as compared to kharif crop and so far no pest and disease are noticed. Farmers are getting additional yield of pearl millet after cotton. Generally, no crop was taken after cotton except in some areas where summer groundnut is cultivated. About 20–25 farm families are following this practice and others who do not use it is due to non-availability of irrigation facilities. **Keywords:** pearlmillet, irrigation, cotton, increased production	
2045	Sowing jowar along with cuccurbits	Jowar and cucurbit seeds are sown together by mixing each other. The exudate released by cucurbits perhaps prevent the emergence of Striga spp. which is a partial stem parasite on jowar. **Keywords:** jowar, cucumber, root exudate, striga	Shri E. Venkat Reddy, Krishi Vigyan Kendra, Malyal Warangal (Andhra Pradesh) 506 101
2047	Relay cropping of sorghum in groundnut	Rainfed groundnut is sown in kharif in June/July with TMV2 variety at 45 cm rows; later jowar is sown in September or October with M35–1, to provide insurance of crop against failure of monsoon. If there is monsoon failure in kharif, sorghum may give the yields or vice versa. **Keywords:** groundnut, jowar, sowing ratio	Shri P. Ravi Sankar, Pathikonda, Kurnool (Andhra Pradesh)
8	Throwing method of fingermillet transplanting	Dangs district of Gujarat is hilly, and the farmers have small and undulated fields. In this region they grow nagli (fingermillet) crop traditionally. They raise seedlings before the rainy season. Just after receipt of first rainfall, they instead of transplanting of the crop adopt throwing of seedlings in the puddled fields. Their main belief behind the practice is that by throwing seedlings, more roots come up and plants get easy standing position, which gives more tillering and subsequently more yield. **Keywords:** fingermillet, puddling, higher root, higher tiller	Shri V.D. Joshi, Training Organiser, Krishi Vigyan Kendra Waghai, Waghai-Dangs (Gujarat) 390 470
117	Traditional minor millet (*Nalla thinai*)	Minormillet (*Setaria italica*) locally called nalla *thinai* is grown by the tribal farmers in rainfed sloppy red laterite soils of Gundianatham village of Tamil Nadu. This crop performs well under harsh environmental conditions. Different varieties of	Shri R. Sadiyan, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207

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		 Nalla thenai– a traditional minor millet minor millets are under cultivation for the last 10 years by more than 25 farmers. **Keywords:** minor millets, thinai, Setaria italica	
118	Traditional minor millet (koran thinai) in rainfed sloppy lands	In drought prone rainfed sloppy red laterite soils, more than 25 farmers of Gundianatham village in Tamil Nadu prefer koran thinai. It is a medium  Koran thenai– a traditional minor millet yielder, nutritious food crop that grows well under stress conditions. For the last 10 years this is being cultivated. **Keywords:** koran thinai, drought, laterite, sloppy	Shri R. Sadaiyan, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
119	Traditional minor millet (samai) in rainfed sloppy lands	In drought prone rainfed sloppy red laterite soil, more than 25 farmers of Gundianatham village of Tamil Nadu are growing minormillet (Panicum milliare),  Samai thenai– a traditional minor millet locally called samai, for the last 10 years. It has medicinal value and yields good, under stress. **Keywords:** minormillet, panicum miliare, samai	Shri R. Sadaiyan, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207
122	Traditional fingermillet cultivar (kelvaragu) in rainfed sloppy lands	Fingermillet (Eleusine coracana) is an important crop in rainfed sloppy red laterite soil in Gundianatham village of Tamil Nadu. More than 20 farmers are  Kelvaragu– a traditional minor millet growing this for the last 5 years. It can be cultivated under drought condition. It is resistant to pest and disease. **Keywords:** fingermillet, kelvaragu, pest and disease resistant	Shri R. Andiyan, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
641	Intercropping of wheat and cucurbits	Cucurbit and bitter gourd are planted as early crop after cutting a patch of 45–60 cm of standing wheat crop at a distance of 1.2–2 meter on both sides of the fields in the month of March to take early crops of cucurbit. The harvested green wheat is used as fodder to animals. This practice provides early crop of summer cucurbits. The main advantages of this practice are that it advances the sowing date of cucurbits which results in early harvest of cucurbits and ensure remunerative prices of the produce in the market. Otherwise the farmers sow the crop in the month of May-June after harvesting the wheat crop. The crop which is sown in the month of May-June gives low yield due to attack of insect pests as flowering and fruiting of the crops coincide with the onset of monsoon rains. This ITK is practised in Himachal Pradesh, since time immemorial. **Keywords:** intercropping, wheat, cucurbit	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
642	Intercropping of wheat and colocasia	Under rainfed conditions, colocasia cultivation is mainly affected due to improper germination. To ensure proper germination of colocasia, farmers utilize conserved soil moisture recieved with winter rains. The onset of monsoon further flourishes the crop and also advances crop maturity by two weeks. Otherwise in rainfed areas it becomes difficult to take the main crop if monsoon rains get delayed. In addition to this, crop duration and cost involved in field preparation is also reduced, as per sowing of colocasia is done along with wheat. In some parts of Hamirpur district, farmers sow wheat crop by kera method in November/December along with colocasia. They also sow colocasia in June with maize crop. While adopting this practice, farmers keep in mind that to ensure proper germination in colocasia, conserved soil moisture due to winter rain is being utilized. After harvesting of wheat, colocasia start germinating. Due to adoption of this practice (intercropping of wheat and colocasia), farmers achieved early germination of colocasia along with early maturity of the crop. This ITK is practised especially in Hamirpur, Mandi, Bilaspur and Kangra districts for a long time. **Keywords:** intercropping, wheat, colocasia, germination	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
663	Top-dressing of farmyard manure (FYM) in late- sown wheat	In rainfed area of high altitude, where sowing of wheat is delayed due to non-availability of rain, up to end of December or beginning of January, well- rotten FYM is spread on the top soil after sowing a wheat crop. The covering of soil with FYM absorbs more heat from sun and also it acts as a barrier between atmosphere and soil. This increased in soil temperature facilitates germination of wheat seed in colder areas. The practice is followed at Churag, Chindi, Thandapani, Choki, Kanda and Bhakhrot villages of Karsog and Janjahli blocks in Mandi district of Himachal Pradesh for the last 10 years with 60% effectiveness. **Keywords:** top-dressing with FYM, late-sown wheat, increased temperature, increased germination rate	Dr S.K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
669	Mixed cropping of wheat with Brassica campestris	Wheat sowing is completed during October and November. After the seeds are sown, the seeds of the Brassica campestris are broadcast. This is in practice for getting more than one crop and to overcome the problem of insect/pest attack, by maximum number of farmers. **Keywords:** mixed cropping system, wheat, Brassica campestris and insect or pests	Shri Rajeev Kumar, Room No. 32 D, NBH II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 171 005
670	Mixed cropping of wheat with chickpea	Sowing of wheat crop is completed during October and November, after that the seeds of gram are broadcast through hands in the same field. This is in practice for getting more than one crop and overcome the problem of insect-pest attack. This practice is adopted for the last several years by maximum number of farmers for both rabi and kharif crops. **Keywords:** mixed cropping system, wheat, gram, and insect/pest	Shri Rajeev Kumar, Room No. 32 D, NBH II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 171 005
671	Mixed cropping of wheat, mustard, chickpea and lentil	Mixed cropping system is in practice in different parts of Himachal Pradesh. In one cropping period farmers harvest 3–4 types of crops. Wheat seeds mixed with chickpea and lentil are sown in the fields. The field is levelled with the help of leveller. After that the mustard seeds are sown in the field and again leveler is applied to the field. If there are chances of rainfall, then the leveler is applied to the field after 5–6 days of rainfall. This practice is being followed by maximum number of farmers in the village for last	Shri Vidya Datta Sharma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		several years. It is easy to practice and involves little cost. **Keywords:** mixed cropping system, wheat, mustard, chickpea, lentil	
1784	Use of *khapali* variety of wheat	Farmers in the villages of Solapur district are growing a local variety of wheat *(khapali)* at 30 cm spacing in the deep black soils from November to December. This variety is resistant to pests and diseases and is fetching higher price in the market. It is being used for last 30 years **Keywords:** wheat, *khapali* variety, pest and disease resistant, higher price	Dr B.D. Koli, Agronomist, NARP, ZARS, 97 Raviwar Path P. Box No. 207 Solapur (Maharashtra)
1786	Sowing time of wheat crop	Most of farmers of Dhule found that when coconut oil starts freezing, it is the best time for sowing of wheat. It helps in obtaining profuse tillering and producing good yield. The minimum temperature is between 12–14°C when wheat is sown, coconut oil freezes at that temperature. **Keywords:** Coconut oil, freezing, sowing of wheat, profuse tillering	Prof. P.S. Patil, Training Organiser, KVK, Dhule 424 004 (Maharashtra)
123	Traditional blackgram cultivar *(nattu ulundu)* in rainfed sloppy lands	In sloppy red laterite soils, blackgram *(Vigna mungo)* is taken under rainfed conditions. A local cultivar namely *nattu ulundu* is preferred by more than 20%  *Nautu ulundu*– a traditional variety of blackgram farmers as it performs well under drought conditions for the last 5 years. **Keywords:** rainfed, blackgram, *nattu ulundu*	Shri R. Andiyan, S/o Shri Raman, Gundianatham, Kallakuruchi, Villupuram (Tamil Nadu) 606 207

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1777	Off- season cultivation of pigeonpea	The purpose of off-season cultivation of pigeonpea is that there is a great demand for its green pods in the city of Surat during June to September. Considering the material demand, farmers of Chinchkheda village of Dhule district in Maharashtra have started off-season cultivation of pigeonpea. Pigeonpea is sown in March to April so that harvest can be made from June onwards. Farmers get good price (Rs 20 per kg) of pods, thereby obtain better monetary returns from off-season cultivation than its kharif cultivation for grains. The practice has been in use since 10–13 years with 10–15 farmers. **Keywords:** off-season pigeonpea, green pod, higher monetary return	Dr M. S. Mahajan, Training Associate (Agronomy), Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004
1092	Control of pod-borer in gram by mixed cropping with coriander	To reduce the attack of pod-borer in gram, mixed cropping with coriander is followed by farmers of Senduria Village in Ballia district of Uttar Pradesh. This practice has been in use for the past 15 years by only 5–10 farmers due to lack of awareness among the farming community. **Keywords:** mixed cropping of gram and coriander, pod- borer	Shri Lallan Ojha, Senduria, Surahi, Ballia (Uttar Pradesh) 277 004
1356	Cultivation of bean under rainfed condition on undulated slopy lateritic and acidic soils	This is practised in the Kurchi village of Dhanbad district of Jharkhand to get more income under rainfed farming condition with less cost involvement. Cultivation of drought-resistant variety of bean under rainfed condition enables it to act as cover management crop and to control weeds. It is traditional practice for long period of time and followed by 27 farmers families out of 32 farmers families in the village. **Keywords:** bean, rainfed, drought, irrigation	Shri Mahadeo Mahato, Kurhi, Gobindpur, Dhanbad (Jharkhand)
1780	Rice based cropping system in rainfed condition	Traditional tall and long duration varieties are being cultivated under bushening system by the farmers of Chhattisgarh region. If the plant population under bushening system became low after bushening, *lathyrus* seeds or linseed are broadcasted as a relay crop in the paddy field. About 60 kg/ha *lathyrus* seeds are sown in standing water in the rice field 15 to 20 days prior to rice maturity and harvested 5 q/ha *lathyrus* without using any other inputs and tillage operations. Farmers taking bonus crop and the *lathyrus* husk is used for animal feed.	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492 012

Code No	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		Keywords: tall and long duration rice variety, bushening system. lathyrus, linseed, bonus crop, animal feed	
2043	Sunflower seeds soaked in challa	The hard impermeable seed coat of sunflower is softened by soaking the seed in the sour butter milk (challa). This acts as growth activator and accelerates germination. This ensures uniform germination/crop stand of sunflower. It is practised in Kambalapally village of Warangal in Andhra Pradesh. **Keywords:** sunflower, seed-soaking challa, seed coat	Shri A. Narsiah, Krishi Vigyan Kendra, Malyal Warangal (Andhra Pradesh) 506 101
5	Sowing of mustard seed mixed with DAP	Rajasthan is the major mustard growing zone in India. Sowing of mustard mixed with di- ammonium phospate (DAP) has been practicing in the Sawai Madhopur district of Rajasthan. It helps in equal distribution of seed, saves time for seeding and fertilization, and cope up with the problem of unavailability of implements for application of fertilizer and seed separately. By this practice farmers are getting 15–20 quintals of mustard per hectare and it is being followed by 90% of the farmers. **Keywords:** mustard, sowing seed mixed with DAP	Shri Abdul Gaffar, S/o Shri Mazid Khan, Karmoda, Sawai Madhopur (Rajasthan) 522 001
636	Intercropping of brassica and til	In the wheat fields, 6 to10 rows of brassica (Brassica campestris) are sown and til (Sesamum indicum) are sown in maize fields as intercrops. Intercropping reduces attack of insects/pests and can be best performed by hand sowing. Intercropping is in practice for last several years by maximum number of farmers to help in maintaining the fertility of the soil. **Keywords:** intercropping, Brassica campestris, Sesamum indicum, maize and wheat	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
129	Cultivation of local variety of groundnu	Groundnut is a major crop, grown in red soil under rainfed conditions in village Malamanoor, Potaneri, Salem district of Tamil Nadu. A variety with drought tolerance capacity is suited to the situation. For this purpose, farmers use a local variety kodikadalai which gives high yielding and in use for the last 30 years by 40–50 farmers. **Keywords:** red soil, rainfed, drought tolerant	Shri K. Ayyamuthu, 4 -18 Malamanoor, Potaneri, Mettur, Salem (Tamil Nadu) 636 453

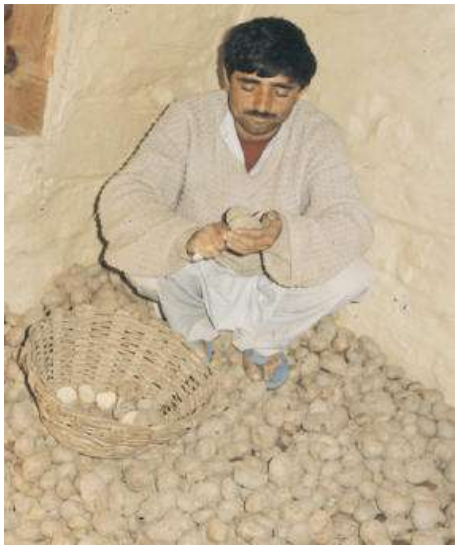
Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1776	Intercropping of chilli with summer groundnut	The farmers of Pimpalner village of Dhule district in Maharashtra practice intercropping of chilli with summer groundnut in the ratio of 1 : 4 or 1 : 5 to get higher monetary return. This cropping is done in January. Thinning is done in chilli crop 30 days after sowing. After harvesting of groundnut in the month of May, hoeing and weeding are done to promote growth of chilli and as such the crop is continued upto July/August. The practice has been in use since 10 years with 75 families. **Keywords:** chilli, summer groundnut, intercropping, higher monetary return	Shri P S Patil, Training Organiser, Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004
667	Mixed cropping of sesame with maize	To overcome the insect and pest attack, the farmers of Baldhar village of Kangra district of Himachal Pradesh adopt mixed cropping method. Sesame seeds are sown in maize field. By this mixed cropping pattern more than one crop is grown in the same field at a particular period. Fertility of the soil is maintained, and the attack of insect and pest is reduced. **Keywords:** soil fertility, insect and pest attack, higher land use	Shri Rajeev Kumar, Room No 32 D, NBH II Hostel, HPU, Summer Hill, Shimla (Himachal Pradesh) 171 005
121	Indigenous practices for sugarcane cultivation	Sugarcane farmers of Soolankurichi, Pagandai, Ladkinaiyanpatti, Ariyaperumaloor, Eliyathoov and Manjaputtur villages in Villupuram district of Tamil Nadu adopt different indigenous techniques as described below. ***Preparatory cultivation*** Country plough is used to make ridges and furrows and other cultivation operations, which is economical. Ridges and furrows formed in east-west direction give better sprouting. The optimum length of ridges is 15 m in clay soil and 20 m in red soil. Ridges and furrow, formed in the direction of wind help avoid lodging of cane. Cane planted after paddy harvest just by placing in furrows formed with spade give good sprouting. A closer planting of 60 cm between rows gives higher yield. Under saline condition, sugarcane grows better than any other crop. Continuous growing of sugarcane in the same soil depletes soil fertility quickly (hence crop rotation is needed).	Dr R. Thiyagarajan, Senior Scientist and Head, Extension Section, Sugarcane Breeding Institute, Coimbatore (Tamil Nadu) 641 007

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		Season Early planting gives good yield and protection from pests. Planting of cane during November–December gives low germination in clay soil area. Cane planting after paddy in February gives higher yield due to green manure application to paddy crop. **Manures and fertilizers** River silt increases the yield and also gives good quality jaggery. Red soil application helps in better soil reclamation. Application of farm yard manure increases yield and improves soil fertility. Cattle penning increases yield and improves soil fertility. Pig manure is the best form of organic manure to sugarcane. Poultry litter releases more heat and helps avoid insects. Incorporation of sunnhemp and sesbania gives good yield and prevents weeds. Urea applied by diluting in irrigation water boosts cane yield. Broadcasting of fertilizer increases weed growth besides leading to wastage of fertilizer. Fertilizer applied along the lines of the crop and covered with soil avoids wastage of fertilizer. **Setts and planting** Healthy canes (without any pest and disease affection) are sorted out and selected for planting for higher cane yield. Seven month cane planted in well drained soil is good. 1/3 tops used as setts from matured cane which is 10–12 months give good yield. Full cane harvested without removing the leaves can be kept up to 7 days before planting. Tops harvested and kept in horizontal position and covered with trash can be kept up to 1 month and used for seed. Setts with longer internodes kept closer to each other provide an ideal population and sprouting. Cane with shorter internodes ensures a better population density. Three budded setts are easy for planting thus saving time and money. Two budded setts avoid bud wastage and give uniform population. Setts placed with partial exposure of buds give better sprouting. Setts are cut in a slanting way to avoid bud injury. Setts placed and trampled after irrigation help to tide over labour problem besides being economical.	

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		Intercultural operations	
		Trash left in the field controls weed population and helps in better soil moisture conservation. Herbicide application affects intercropping. Weeding done with bullock-drawn country plough is economical. Pulse as intercrop increases soil fertility and avoids weed population. During detrashing, water shoots are removed, which gives good yield. Proping done along the bund and water channels facilitates easy irrigation and avoids lodging.	
		Pest and disease management	
		Trash burning in the field kills pests. Castor crop used as border crop attracts pests. Dead hearts caused by early shoot borer attack are removed and sand is applied for obtaining better tillering. Earthing up reduces early shoot borer. Neem seeds powder applied with urea, helps avoid pests. Detrashing avoids building up of pests like internode borer and scale insects. Rats are destroyed by smoking with cowdung in the burrows. Rats are caught by using pots with cowdung slurry and bait buried at ground level, and are killed. They are destroyed by digging the bunds. Snakes are left free to prey on rats. Avoiding more than two ratoons avoids diseases. For smut, the black whips are removed and burnt. Wetland sugarcane is more affected with red rot. For red rot, the clumps are removed and burnt.Kerosene is applied in the irrigation water to control red rot.	
		Harvesting and ratoon management	
		Irrigation before 2 days of harvest gives more yield. Harvesting at correct age gives better sprouting and healthy ratoons. Harvested canes are covered with trash to avoid deterioration and yield loss. Trash mulching enables better availability of soil moisture to the crop. Trash burnt in the field affects sprouting in ratoon crop. After harvest, the ridges are broken with spade before allowing for ratoon growth. A small patch left unharvested is used for gap filling in ratoon crop.	

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		Jaggery preparation Low application of chemical fertilizer gives good-quality jaggery. Groundnut cake application gives superior-quality jaggery and colour. Urea applied at 6th and 7th month through irrigation water gives good quality jaggery. Ammonium chloride applied at 7th month through irrigation water also gives good-quality jaggery. More matured cane gives lower quality jaggery. Indigenous crusher drawn by bullocks gives pure and good-quality jaggery. Lime used as clarificant is most economical. Remains of cotton plant are used as clarificant. Washing soda is used to remove the impurities. Coconut oil used in the process gives better outturn. Indigenously made iron vessel, vella copre, if used for boiling juice gives better outturn. Indigenously developed free furnace called *jannal aduppu,* is more efficient for jaggery preparation. Indigenously developed *vella poti* made of iron and used for pouring the semi-solid jaggery solution is economical. **Storage** Indigenously developed chambers, called *machu veedu* consist of a large room with a single wooden door. Top of this room is covered with bamboo poles and red soil is used for storing jaggery up to 2 years without deterioration in quality. Paddy husk, if used at the bottom of the storage chamber, helps in avoiding quick deterioration. **Keywords:** indigenous practices, sugarcane cultivation	
337	Paired row planting for avoiding lodging in sugarcane	Paired row method of planting in sugarcane is practiced to avoid the crop damage due to lodging during cyclonic winds by tying both the rows with each other by their leaves. Thus the plants stand erect. This practice helps in developing a better plant stand and obtain higher sugar recovery. This is being practiced by 80% of farmers for the last 25 years in Mudulipalli village of Ganjam in Orissa. **Keywords:** sugarcane, paired row planting,tying, lodging, sugar content	Shri Hadibandhu Swain, Mudulipalli, Ganjam (Orissa)761126  Paired row planting to avoid lodging

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
341	Method of dew water conservation for sugarcane cultivation under rainfed conditions	Farmers conserve moisture in the sugarcane-growing uplands by daily ploughing and laddering the lands in the early morning during October–December and in evening during January–March. By this, top soil is pulverized into powder and dew water is protected from evaporating during the day time. This process retains sufficient water for germination of sugarcane. This is being followed by 95% farmers for the last 100 years in Sirakabad and surrounding villages of Purulia district in West Bengal. **Keywords:** dew-water conservation, ploughing and laddering, morning, evening	Dr A.K. Mukherjee, Department of Agronomy, Mohanpur, Nadia (West Bengal) 741 252
1355	*Ronda* cultivation of sugarcane	*Ronda* practice is used by the villagers of Bara Baghmara village of Dhanbad district in Jharkhand. Conservation of soil moisture for proper cropping is necessary. For conservation of soil moisture, farmers increase the number of ploughings in the field. It is adopted in rainfed area. About 8–10% farmers use this age-old practice for conserving rain water in soil. **Keywords:** *ronda,* soil moisture, conservation, cropping	Shri Subal Mahto, Bara Baghmara, Govindpur, Dhanbad (Jharkhand) 828 109
124	Organic farming practices in plantation crops	Organic farming practices developed by Shri. Jeyaraj are indicated here. Pouring 100 ml kerosene in the primordial (crown) region of banana plant controls bunchy top disease. Three kg neem cake and one kg tobacco are soaked in 50 litre of water for 3 days. The mixture is filtered and applied to control pests in cabbage, cauliflower, peas, beans, tomato and carrot. Six kg *kattumarikolunthu,* 3 kg neem cake and 1 kg tobacco are soaked in 50 litre water for 3 days. The content is filtered and the extract is poured on coffee plantation to control coffee berry borer, with the time interval of 15 days. About 500g fresh cow dung is dissolved in 15 litres of water and the liquid is sprinkled over the seedlings and apply weekly once to boost growth in the nursery. Cowhorn manure is prepared by burying cow horns along with cow dung. The compost manure is obtained after 3 months. The manure is sprinkled at the rate of 25g per acre, to ensures green plantation. **Keywords:** organic farming, bunchy top, coffee berry borer, cow horn manure	Shri Jeyaraj, Kodaikannal, Cholai school, Pethuparai, Perumalparai, Dindigul (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
126 126(b)	Paddy germination	For early sprouting of paddy seeds, the seeds are soaked for 24 hours and filled in a bigger copper vessel called *andaa* whose mouth is covered with paddy straw and bamboo sticks kept in criss-cross manner. Then the vessel is kept upside down in a room corner for 24 hours. In the next day, all the seeds are sprouted. **Keywords:** paddy seeds, early sprouting	Shri K. Perumal, Thethupatty, Dindigul (Tamil Nadu)
340	Growing of potato after winter rice	Potato seed is sown by dibbling method in the muddy rice field (after harvest of rice) on residual moisture at a spacing of 15×25 cm by covering it with dry hyacinth plant and straw for conserving moisture and supply of nutrients. By this practice farmers get additional return of Rs 30,000 per hectare and efficiently utilize the residual moisture. **Keywords:** potato, winter, rice, dibbling	Dr Debabrata Basu, RRS NAZ, Bidhan Chandra Krishi Vidyalaya, Gayshpur, Nadia (West Bengal) 741 234
657	Chopping of potato seeds for sowing	Farmers of Kinnaur and higher region of Shimla district of Himachal Pradesh are sowing chopped pieces of potato instead of sowing whole potato  Chopping of potato seed tubers for sowing tubers. Potato is chopped into two to three pieces depending upon the size, and each chopped piece must have an eye to ensuring seedling after germination. It is sown in April and harvested during September/October. This is in practice at the cold	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1778	Ratooning of *kharif* cotton	desert and wet temperate zone farming area and is being adopted for last several years by a majority of the farmers. **Keywords:** potato, chopping, germination, cold desert and wet temperate Some farmers in Pimpri village of Dhule district in Maharashtra have started taking ratoon crop of kharif cotton. The farmers having irrigation facilities take the ratoon. It is taken after 3–4 pickings are done. The crop is provided with chemical fertilizers and 2–3 irrigations are given till February–March. This practice is followed to obtain additional returns from the same crop. An additional 10–15 q/ha is obtained from the same crop if it is properly managed. The practice has been in use for 8–10 years. About 10–15 farmers are practising this technology. **Keywords:** ratooning, *kharif* cotton, fertilization, irrigation	Prof P. S. Patil, Training Organiser, Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004
1785	Use of cowdung and mud slurry for seed treatment of *desi* cotton	The cowdung is mixed with mud in equal proportion to prepare a slurry. The slurry is spread over the seed and rubbed for uniform application, then dried under shed. The treatment is given day before sowing. The method helps in sowing operation and improves germination and yield. **Keywords:** cowdung and mud slurry	Prof. P.S. Patil, Training Organiser, KVK, Dhule (Maharashtra) 424 004
6	Prevailed crop rotations for higher production in Thar desert	Following crop rotations are being practiced by the farmers in deserts districts, viz. Jodhpur, Nagour Pali and Bikaner of Rajasthan 1. Jodhpur : Fallow-Guar (cluster-beans)-bajra (millet)+moth 2. Bikaner-Sevan grass *(lausurus sindicus)-Guar*-Bajra-*moth* 3. Nagour-Fallow-*Till* (Sesame)-*Guar*-Bajra 4. Pali and Nagour-Bajra-*Mung*-Till 5. Pali-*Mung-Till-Guar Gawar-till*. In these cropping systems there is a provision of keeping land fallow and growing pulse crops, which fixes the nitrogen and further adds nutrients. These crop rotations gets higher production while restoring the soil fertility. It is being practiced for many decades from generations to generations. **Keywords:** Crop rotation, production desert districts	Dr. Z. D Kavia, PS CAZRI, Jodhpur and Dr J K Bhati, PS CAZRI, Jodhpur (Rajasthan) 342 003

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115	Organic farming cultivation	There are many organic cultivation for different crops prescribed by the discloser. These are indicated here: *Coconut*: Cowurine is mixed with tank silt and cow dung manure and applied to coconut. It improves the yield of the coconut and maintains good fertility in the soil. *Horsegram*: Horsegram is cultivated in coconut field to increase the fertility in the soil and it also fed to the animals to improve the quality and quantity of milk in cattle. *Paddy*: To increase the yield, 25 cart loads compost manure are applied to the field before planting and cow urine is sprayed (1 litre cow urine mixed in 20 litres of water) on the foliage at the time of 20th, 40th, 60th days after planting. *Greengram*: Greengram, 40 kg subabul, 2 kg rice bran and 500g coconut cake is fed to the animal in a day to improve milk yield in the cattle. *Animal*: Banana flower and turmeric controls diarrhoea in cow. Mastistis is prevented by mixing 1 kg calcium in 200 litre drinking water to animal. **Keywords**: organic farming, cow dung, cow urine, greengram, subabul, rice bran, coconut cake, calcium, banana flower, turmeric	Shri Gomathi Nayagam, Farmer, Vivasaya Seva Sangam, Puliangudi, Tirunelveli (Tamil Nadu)
116	Integrated farming system with paddy and fish culture	Integrated farming system of paddy and fish is practised in the waterlogged region of Kuttanad in Kerala. Kuttanad region is lying below sea level and remains waterlogged throughout the year. Raised bunds are constructed on the sides of the paddy field. Coconut and pineapple are grown on the bunds. Under such geographic condition, paddy is raised as the main crop in rabi season. Sowing is done by direct seeding and harvesting is done by cutting the panicle.After cutting, the remaining parts of the plants are left in the field. Later on, water is flooded in the field to a moderate level and fingerlings of different species of fish are released in the field. These fishes feed on the vegetative contents of the left-over paddy plants and the weeds. Poultry and pig rearing are done on raised platforms on the sides of the paddy field so that castings fall directly into the water. After harvest of fish, water is drained from the field. Due to exhaustive feeding by the fish, the entire paddy field becomes free of weeds with a thick layer of mud that is rich in organic matter and plant nutrients.	Shri Krishnan Kutty, Kandathil House, Veliyanad Alappuzha (Kerala)

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		Broadcasting of paddy seeds in the next rabi is done without any pre-sowing or land preparation, thereby saving a huge amount of money spent on land preparation and weeding. Apart from this, remunerative returns are obtained from both paddy and fish culture. This integrated farming system has been adopted by 20% of the farmers in Veliyanad village in Alappuzha district of Kerala. **Keywords:** waterlogging, paddy and fish culture	
127	Organic farming practices for sugarcane and turmeric	The practices developed by Shri. R. Sundararaman, farmer of Sathyamangalam village, Erode district of Tamil Nadu for organic farming practices in sugarcane and turmeric are indicated here. *Green manuring for sugarcane:* Four types pulses, four type millets, two type oil seeds and two type aromatic crops are sown at the time of ploughing. The germinated crops are ploughed in situ by rotractor and inter ploughing is done in 2 feet on 60th day. This practice enhances growth of the sugarcane crops. *Mulching*: The left over trashes after the sugar-cane crop harvest and detrashing wastes are spread on the soil surface as a mulching material in the alternate rows with a breadth of 2–3 feet. This practice reduces 50% of the total water requirement. The trash acts as soil conditioner, increase earth worm population and controls weeds. *Organic manure for sugarcane:* Starter solution, panchagavya, fermented curd, leaf powder of usilai (Albizia amora) and mixture of fermented curd and coconut milk are applied through irrigation water separately. A fort night interval is given for each application. *Preparation methods of organic fertilizer:* Starter solution: 15 kg cow dung, 15 litre cow urine and 100 g palm sugar are mixed and immersed in water for 2 days and applied through irrigation water. *Panchagavya*: Five kg cow dung, 5 litre cow urine, 2 litre curd (fermented for 15 days), 2 litre milk, ½ litre ghee, 500 g jaggery and 2 tender coconut water are mixed well and allowed to fermentation for 15 days. Two lime panchagavya is mixed with 100 litre of water and applied through irrigation channel. *Albizia amara spray*: 3 kg leaf powder is sufficient for one acre. 5 litre fermented curd and 5 tender	Shri R. Sundararaman, Kumbu Pullam Thottam, Kenjanur, Sathyamangalam, Erode (Tamil Nadu)

Code No.	Title of ITK	Details of ITK and rationale	Name and address of discloser/facilator
		coconut water is mixed and fermented for week. This mixture is sprayed for 1 acre. *Preparation of turmeric seed material*: Turmeric seeds are soaked in 2% panchagavya solution for 15 minutes before storage to protect from scale insects. Germination is enhanced by soaking the seeds in panchagavya solution before sowing. **Keywords**: green manure, mulching, pulses, millets, oil seeds, aromatic crop, detrashing, starter solution, panchagavya, fermented curd, Albizia amora, coconut water, cowdung, cowurine, palm sugar, jaggery, turmeric	
128	Traditional knowledge on crops	There are various types of ITKs regarding crops and cropping systems suited to different climates being followed by the villagers of Midnapore (West Bengal) and Bhagalpur (Bihar) dictricts. 1. Machan is prepared by bamboo for watching the agricultural field. 2. Fence made of agave, the spiny leafy plant, helps to protect agricultural field. 3. Winnowing tray made of bamboo is used to separate chaff from grain. 4. Straw ash (pansh) is added to the clay soil before sowing paddy to make soil porous, so that air can pass easily. 5. Intermittent chiselling is done by ploughing (langal) instead of tractor to prevent the growth of hard pan under soil surface. 6. Cultivation of leguminous crop is done to enrich kharif paddy. 7. Granary (gole) made of bamboo, soil and straw is used to store the grain. 8. Cloth hanger (shike) is used to cover banana and pumpkin. 9. Paddy is threashed by samath ukhar and kothi is used for storing grains. **Keywords:** fence, intermittent chiselling, leguminous crop. agave fence, granary	Dr R.K. Manna, CICFRI (ICAR), 22 (1031), 80 ft. Raod, Rajajinagar, Bangalore (Karnataka) 560010
130	Stress management in paddy and onion	Under water stress condition spraying of one teepol of potash mixed with 10 litres water at panicle-initiation stage increases productivity of paddy. Similarly for onion 500 litres water for 1 hectare is in use. About 70% farmers of Uremel Alazian village	Shri K. Tirunavukarasu, Uremel Alazian, Thenkasi, Tirunelveli (Tamil Nadu) 627852

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		follow this practice for the last 12 years with good results. **Keywords:** water scarcity, spray of potash and water, paddy, onion	
338	*Bijbona or kata or jharona*	Cutting the crops manually and early harvesting. **Keywords:** harvesting, manual	Ms Madhumita Ghosh, Shibiloon, Burdwan (West Bengal) 713 130
339	Relay cropping of jute after summer rice	Farmers sow jute in rice field 20 to 25 days before harvesting of rice through broadcasting. After harvest of rice, farmers make the soil loose by using a hoe and apply DAP (di-ammonium phosphate) @ of 75 to 100 kg per hectare, followed by irrigation. It helps in minimizing the production cost by zero tillage, fit into cropping sequence, minimize the risk of crop failure due to flood by early harvesting, and lesser weed problem. This practice saves Rs 3,000 per hectare for land preparation and initial irrigation. Sixty families, out of 90, in Charsahak in Nadia district of West Bengal follow this practice. **Keywords:** jute, rice, relay cropping, zero tillage	Dr. Debabrata Basu, RRS NAZ, Bidhan Chandra Krishi Vidyalaya, Gayshpur, Nadia (West Bengal) 741234
342	Intensive cropping with two relay and one intercrop in same piece of land	Red amaranthus is sown by broadcasting with early cauliflower, which is planted in rows and is harvested after 28 days as a leafy vegetable. Then bitter gourd is sown in small pits between rows of cauliflower and plants are kept aloof from the standing cauliflower, with the help of sticks. After harvesting of the cauliflower, scaffolds are made to support the growing bitter gourds. One month before the withdrawal of the bitter gourd from field, ridge gourd is sown in pits and, when it becomes taller enough to grow in scaffold, the bitter gourd plants are slashed. The dried bitter gourd remains in situ. After harvest of the ridge gourd, land is prepared for transplanting autumn rice. This practice is being followed because average land holdings are decreasing sharply with increasing population. As a result, in intensification of agriculture by relay and mixed cropping, it also minimizes the risk. This is being followed in Balarambati village of Hooghly district in West Bengal. **Keywords:** intensive cropping, vegetables, rice	Dr Debabrata Basu, B-2/225 Kalayani, Nadia (West Bengal) 741 235

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
461	Rice-based farming system of Apatani plateau	The Apatani tribe in Subansiri district of Arunachal Pradesh has evolved a farming system based on rice with an object to sustain crop, livestock and fish production. The valley is called the rice bowl of the Apatanis, who practice wet rice cultivation and have a good knowledge of land and water management. They cultivate rice integrated with fish culture in the terraces, and ginger and millets on the ridges. The system covers efficient land management where terraces are prepared with strong bunds. Terraces are made by trial-and-error method with main emphasis on perfect leveling and well-managed irrigation- cum-drainage system. Thick grasses are grown on both sides of the drain to check erosion. Water for irrigation is tapped from the surrounding hills and channelise it to the lower edges of the field. The farmers put emphasis on right water management in lowland rice field and also to drain off the water from the rice field during tillering and flowering stages. The farmers also manage nutrient and fertility of the terraces through recycling of agricultural wastes. For example, paddy straw is allowed to be decomposed in the wet terraces. Pig and poultry dropping, rice husk, ash and weeds removed during weeding are also recycled in the terraces for improving soil fertility. They also go for paddy-cum-fish culture practices. The farmers also preserve their environment by planting trees, bamboos etc. so that the surrounding of the valley, uplands and the village are reserved as forest. The system has been widely acclaimed and has been recognized as one of the important farming systems of the region. All the farmers of this region are following this practice for the past 70 years. **Keywords**: Apatani plateau, rice bowl, terracing, paddy-cum-fish culture	Shri A.K. Khan, Technical Officer (T6), ICAR Research Complex, Jharnapani (Nagaland) 797 106
463	Integrated cash-crop plantations	The farmers of Koio village under Chukitong block in Wokha district of Nagaland practice a suitable cultivation as an alternative to shifting cultivation for higher return by taking up a few cash crops on the same plot of land as an integrated cash crop plantation. Here the farmers have selected large cardamum as the main crop, and the boundary of the plantation is being done by planting tung (*Aleurite montana*) They grow oil seed crop on the boundary.	Shri E.H. Lotha, Dy Director of Agriculture, Directorate of Agriculture, Kohima (Nagaland) 797 001

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		The passion fruit is grown as the fencing crop around the main crop plantation area. The plantation pattern is as indicated below: 1. Crop : Large cardamum Planting season : May to July Spacing : 6'×6' or 5'×5' Gestation : 4 years Time of harvest : August to October Yield : 5 to 12 q/ha 2. Crop : Tung (Aleurite montana) Planting season : March to April Spacing : 20' to 20' Gestation : 4 years Time of harvest : December Yield : 70 to 100 kg/tree 3. Crop : Passion fruit (Passiflora edulis) Planting season : April to June Spacing : 15' to 20' Gestation : 2 years Time of harvest : July to September Yield : 200–300 fruits/tree The main purpose of this practice is to maximize income and also to reduce the practice of shifting cultivation, which is affecting the soil fertility in Nagaland. Now almost all the farmers have adopted this practice and is in use since the last 20 years. **Keywords**: integrated cropping, shifting cultivation, cardamom, tung, passion fruit, increased source of income	
464	Multiple cropping in jhum field	The practice of multiple cropping in *jhum* field is followed by farmers of Wokha district in the state of Nagaland. *Jhuming* is still popular in this region and in order to get higher production and sustainable farming, multiple cropping system has been adopted, where 20 to 40 or more items of crops are grown on the same plot of land as intercropping with paddy as the main crop. To demarcate the boundary from the next farmer job's tears millet is sown around his own plot. Then, maize, sesamum and vegetable and other	Shri E. H. Lotha Dy Director of Agriculture, Directorate of Agriculture, Kohima (Nagaland) 797001

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		crops are sown in line as the filter strips whereas colocassia and ginger are also sown in line as contour vegetative hedges in order to conserve soil and water and also help form bunds at certain spacing in rows. The leguminous crops, specially the beans, are grown on every standing staking that are kept purposely at the time of jungle clearing. Harvesting of such crops start right from May and June. And for seed or marketing purposes it will be harvested in December. Some of the cucurbits and the tuber crops are grown as the cover crops wherever necessary and chilli is grown only on certain locations. These systems are practiced for higher production and economic return, and as soil-and-water conservation measures. With this practice, the economic return of a given area is increased by at least three times. Most of the farmers have adopted this practice and it is in use for about last 20 years. **Keywords**: multiple cropping, *jhuming,* higher production, sustainable farming, paddy, job's tears millet, sesame, maize, ginger, leguminous crops	
465	Alder tree-based farming system in Nagaland	The *Jhumia* of Khonoma village under Kohima district of Nagaland plant alder trees in the *jhum* cycle area and traditional agricultural crops basically with the idea that their root nodules improve soil fertility by fixing atmospheric nitrogen. It also increases crop yield and reduces soil erosion, besides providing sheds to plantation crops like coffee at lower altitude and cardamom at higher altitude. Normally, a Jhumia cultivates the field for 2 years within a 9 years span, but the alder-based system allows two harvests in every 4 to 5 years.The system involves pollarding of alder trees in two phase i.e. (i) Initial pollarding and (ii) cyclical/subsequent pollarding. This practice has been in use since about 100 years by the whole community. **Keywords:** alder, *jhum*, soil fertility, nitrogen fixation	Ms Nurhienu Zetsui, ICAR Research Complex, Jharnapani, Medziphema (Nagaland) 797 106
518	Three-tier croping system	Farmers with small land holdings make best use of resources by adopting 3- tier cropping system to increase crop intensity. In this system three crops are sown in the field at one point of time, keeping in view the rooting systems of the crops. For example, turmeric/colocasia are planted at 1.5 feet depth, potato/onion at 0.5 feet depth, and coriander/spinach	Ms Janaki Nayal, Bhagtola, Almora (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		a t 4–5 cm depth. Coriander/spinach is harvested first, followed by potato/onion. Turmeric/colocasia is harvested lastly. This system gives three crops from a single field. **Keywords**: colocasia, turmeric, onion, planting at different depths.	
637	Indigenous crop rotation	Barley is sown in the first year and in the next year wheat is sown. It is done to increase the fertility of the soil, crop productivity and decreasing the attack of insest/pests. This practice is adopted in many villages of Kangra of Himachal Pradesh for the last several generations. This practice balances the soil fertility and avoids the spreading of disease from one crop to another. **Keywords**: barley, wheat, fertility, productivity and spreading	Shri Rajeev Rana, Department of Bio-Science, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
638	Prioritisation of crop sowing	Farmers have limited growing period, to tide over they synchronize harvesting, threshing and storage before the onset of winter. This practice is used to overcome the problem of short crop cultivation, and maximum number of crops are harvested within limited growing seasons. This is in practice in various villages of the Kangra district of Himachal Pradesh for past several years. **Keywords**: crop sowing, harvesting, threshing and storage	Shri Rajeev Rana, Dep. of BioScience, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
639	Mixed cropping (wheat/barley + beans)	Mixed cropping helps in crop diversification and maintains soil productivity beside conserving the soil. This practice is applied on sandy or clay loamy soil for increasing the production of wheat, barley and beans. This is in practice for last several generation by a majority of farmers in different districts of Himachal Pradesh. **Keywords**: mixed cropping system, diversification, productivity and crop	hri Rajeev Rana, Dep. of BioScience, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
644	Mixed cropping (bajra + til/moth/moong/ mash/lobia)	Bajra is sown with *til, moth, moong, mash and lobia* in Nud, Badayala Chak, Fatwal, Nayakhoo, Soul Bhalwa and Kanjal villages of Jammu district. This practice provides the farmers grains as well as fodder at different intervals. The practice is adopted where the area is 100% rainfed. It is in practice for the last several years by all the farmers in the village.	Chief Scientist,KVK, R.S. Pura, Jammu (Jammu & Kashmir) 181 102

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		Keywords: mixed cropping system, bajra, grain, fodder, rainfed	
645	Traditional crop cultivation in the Dodra-kwar area of Shimla district	Dodra-kwar village of Chirgaon block in Shimla district of Himachal Pradesh remains under snow for almost 5–6 months, and there is only one growing season in summer. The land is slopy and highly prone to erosion and drought. Therefore, the people of this area grow traditional crops like bathua (*Chenopodium spp*.), cholai (*Amaranthus spp.*), ogla (*Fagopyrum esculentum*), phafra (*Fagopyrum titaricum), koda (Eleusine coracana*) etc, to conserve soil fertility, check soil erosion and at the same time produce foodgrains. The crops are highly tolerant to drought and the leaf of these crops helps check soil erosion by rain. Some of the leaves of these crops are used as vegetable. These cereals are the staple food of this area, since the place does not have road facilities and one has to travel on foot (about 50 km) to reach the place. All the farmers of this area practice this method which is in vogue for generations. **Keywords**: one growing season, check soil erosion, staple food	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207
649	Traditional mixed cropping of kodra, kangni, china and mash	Traditionally, in the lower areas of Anni Block in Kullu district of Himachal Pradesh mixed cropping of *kodra (Eleusine coracana), kangni (Pennisetum chalecium), china (Panicum inliacum) and mash (Phaseolos spp*.) is done. These are kharif crops and the practice is adopted for maximum land use. In this mixed-cropping, mash crop traps atmospheric nitrogen from other crops, and china and kangni-grown in the four corners of the field give protection to the inside crops and also convert heaps of organic material into soil. About 20,000 families have adopted this practice. **Keywords**: mixed cropping, koda, kangni, china, mash, maximum land use	Dr O.S. Shad and T.N. Lalchaupal, Dep. of Bio Sciences, Himachal Pradesh University, Shimla, (Himachal Pradesh) 171 005
650	To examine the germination capacity of seeds	T o examine the germination capacity of seeds like apple, *kainth, parsimmon, kiwi etc. sour lassi or shilgarm* water are poured in the field, with addition of small amount of salt. Seeds that are floating, are considered false seed and those settling down at the bottom are considered true or healthy seeds. For storing these healthy seeds, these are washed in soap	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

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		water, sun-dried and then stored in polybags. **Keywords:** germination capacity, *shilgarm* water	
652	Sowing and planting crops	Crops should be sown or planted in lines, at proper distance and at proper time. Sowing and planting of crops in hurry is harmful. Seed should be healthy. Soil should be made light and airy by ploughing. Weeds should be removed while sowing or planting the crop. **Keywords:** sowing, healthy seed, soil erosion	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
653	Rotating farming	Farmers of cold desert western Himalayas start rotation with barley in the first year buckwheat in the second year and in the third year wheat is sown. Pea is cultivated after barley crop to fix atmospheric nitrogen. This practice balances the soil fertility and avoids spreading of diseases from one crop to another. This practice is adopted by a majority of farmers to increase soil fertility and reduce the impact of pests and disease. **Keywords:** rotating farming, cold desert, western Himalayas, wheat, barley and pea	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
654	Crop rotation in cold desert of Himachal Pradesh	Due to climatic constraints in west Himalayan cold desert, particularly in Kinnoure district of Himachal Praddesh only mono-cropping is practiced by the farmers. For synchronizing the operations such as harvesting, threshing and storage of the produce before the onset of winter, a majority of the farmers of Kinnour district follow a crop rotation of wheat-barley-pea/ beans-buckwheat since generations. **Keywords:** cold desert, mono-cropping, wheat, barley, beans, buck-wheat	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
656	Uniform seed broadcasting by hand	Though small area is available for agriculture in hilly area of Himachal Pradesh a majority of the farmers are using bullocks for ploughing and sowing. Practically, it is tried to maintain a row-to-row distance of 60 cm and seeds are broadcast with hand, so that it roughly matches with scientifically recommended spacing of seeding. One handful of seeds is uniformly broadcast in three or four equal lots. The distance of furrows made during ploughing determines the quantity of seeds sown in each lot. For verification, a handful of soil is picked up at random from any part of the field and, if in each pick	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

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		here are seven seeds, it is indicative of proper broadcasting, ensuring appropriate spacing. This test roughly coincides with scientifically recommended seed spacing. This is practised in most of the villages in Spiti valley of Himachal Pradesh since time immemorial. **Keywords**: hand-broadcast of seed, maintenance of spacing, proper germination, increased production	
658	Crop rotation and double cropping	In this practice, rotation starts with barley in the first year, and buckwheat in the second year. The rotational sequence is governed by the quantity of the available manure. Usually, one-third of the total holding is thoroughly manured during the barley cultivation year and no additional manure is added for the following year. In the third year same field is sown with wheat and the remaining two-thirds of the holdings are similarly treated in succession. This practice is specific to remote locations of Lahaul (**miar nallah**) and some other regions of Himachal Pradesh. This practice is done, as barley requires heavy doses of organic manure for better crop harvest. The organic matter content of the soil after barley harvesting is sufficient to raise good product of millets followed by wheat. This helps in meeting the challenges of limited availability of organic manures for successful management of soil and fertility levels. A majority of the farmers are practising this for several years. **Keywords**: crop rotation, wheat, buckwheat, barley, manure	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
659	Land use for optimum resource management	The farmers of Lahaul valley in Himachal Pradesh sow wheat, barley, millets, potato and maize in such a way so that no exhaustive crop is repeated in the following year. Wheat and barley are sown in the post-monsoon season and millets, potato and maize in monsoon season. The practice is followed by a majority of the farmers for several years. **Keywords:** sowing, wheat, barley, millets, potato, maize, post-monsoon, during monsoon	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
660	Crop rotation: a practice of fallow lands to enhance crop production	Crop rotation is useful to keep lands fallow for rejuvenation of soil fertility. Residual effect of different crops varies due to differences in rooting and feeding zones, and the types of crops. Under irrigated conditions, wherever paddy cultivation is	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh)

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		possible, wheat is alternated with paddy. In unirrigated fields, with one crop in a year, wheat or barley rotates with maize or blackgram. However, in cold places (irrespective of irrigation) where paddy cannot be grown and two regular crops are not practicable, wheat or barley (or in some cases lentil) is followed by fallowing in winter and the lands are used for growing maize or buckwheat (*phulan*) in the following year. Mostly maize is followed by wheat and buckwheat, or blackgram will follow wheat that has followed maize. Where maize is not cultivated, wheat and barley crops are cultivated. This has been practised in most of the villages of Lahaul valley for time immemorial for enhancing soil fertility and crop productivity. **Keywords:** crop rotation, fallow land, soil fertility, increase in crop production, maize, wheat, paddy, millet, buckwheat	
661	Uniform seed broadcasting and appropriate seed rate	A handful of seed is uniformly broadcast in three to four equal lots. The distance of furrows made during ploughing determines the quantity of seeds thrown in each lot. For verification of properly spaced broadcasting, a handful of soil is picked up at random from any part of the field and if in each pick there are seven seeds, indicates proper broadcasting. The *seven seeds test* roughly coincides with scientifically recommended seed spacing. The advantage is that it is less laborious than that of time sowing. This is practised by many farmers for several years irrespective of the region of Himachal Pradesh. Wheat and barley are major crops grown in this area. Either a girl or an expert in the family does the work. **Keywords**: seed, broadcast, lots, *seven seeds test*	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
664	Mixed cropping	Mixed cropping helps in crop diversification and value addition. It provides shield against any chance of failure of a particular crop and also improves the nutritional status of the families. Cultivation of maize (*Zea mays*) with millets/beans (*Sorghum vulgare*) or pulses as constituent crops is done in mixed cropping. Also leguminous crops like blackgram (*Phaseolus mungo*) and greengram (*Phaseolus aureus*) are grown as mixed crops along the plot edge. The roots of leguminous crops fix atmospheric nitrogen. Mixed cropping is an excellent method of crop	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 and Chief Scientist, KVK, R. S. Pura, Jammu (Jammu and Kashmir) 181 102

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		diversification. A majority of the farmers in hilly areas of Himachal Pradesh grow different types of crops under this technique. **Keywords**: mixed cropping, maize, millets, beans, leguminous crop, crop diversification	
665	Foliage residue of the plant	This practice involves cutting of foliage (leaves) along with small branches of various trees like *Grewia optiva (buel), Albizzia chinensis (ohi), Morus alba (toot), Celtis australis (khirab)* etc. The foliage along with small branches or stems are piled up in the fodder for the animals. This is practised in Khera villages of Palampur block in Kangra district of Himachal Pradesh. This foliage residue provides fodder to the animals during scarcity. **Keywords:** cutting of foliage, fodder, scarcity period	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
666	Sowing of healthy seeds	The farmers of Serathana village of Kangra district in Himachal Pradesh select healthy seeds for sowing. In maize, small amount of healthy cobs are kept separated for seeds. In wheat, large seeds from the heap are selected and also the healthy disease-free seeds are also purchased from the market for potato and vegetables. Healthy seeds are less susceptible to insect/pest attack and maximum seed germination can be ensured. This practice increases the yield of crops. This practice has been adopted for last two years by maximum number of farmers in the village. **Keywords**: sowing, cob heap, seeds, insect and pest	Shri Rajeev Kumar, Room No 32 D, NBH II Hostel, Himachal Pradesh University,Summer Hill, Shimla (Himachal Pradesh) 175 001
675	Mixed cropping for controlling wilt in chillies	This practice is being used in Theog Tehsil of Shimla district in Himachal Pradesh. In this practice farmers are practising mixed cropping of chilli, coriander and garlic for controlling wilt in chilli and earning more money. Coriander is also grown on field bunds for seed purpose. This practice is followed by all the farmers of Bhejhog since 8 to 9 years. The smell of coriander and garlic work as repellant for the insects. Farmers also get additional money from time to time from coriander leaf. **Keywords:** garlic, coriander, chilli	Shri Ravi Kant, Bhejhog, Theog, Shimla (Himachal Pradesh)
676	Intercropping (wheat + brassica and maize + sesame)	Farmers of Kangra district in Himachal Pradesh take two crops from the same field at the same time. In intercropping, crops are less prone to insect attack, leading to higher production. It also helps in	Shri Rajeev Kumar, Room No. 32, NBH II Hostel, Shimla (Himachal Pradesh) 171005

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		maintaining fertility of the soil. Farmers use this practice both for *rabi* and kharif crops. In the wheat fields, 6 to 10 rows of mustard (*Brassica campesrtis*) are sown and sesame (*Sesamum indicum*) are sown in maize fields as intercrops. Intercropping is achieved by hand sowing. Farmers grow different types of crops by this technique, on the basis of their family requirements and needs. This enhances the income of the farmers. **Keywords**: intercropping, *Brassica*, sesame, pest control, crop production	
577	Method of snow melting	In Spiti valley of Himachal Pradesh farmers adopt a traditional method for snow melting. For sowing barley early, farmers spread ash over the field for melting snow. Ash is having such properties to melt snow fastly. This is in practice for several years. **Keywords:** snow melting, ash, barley	Shri Indira Thakur, C/o Shri K.L. Thakur, House No. 28, Type IV, Brock Host, Shimla (Himachal Pradesh)
1087	Bamboo drip irrigation system	Bamboo drip irrigation system is an indigenous technique of irrigation, evolved and used by tribal farmers of Jaintia Hill district in Meghalaya. The system is used on steep hill slopes for irrigating betel vine leaf and black pepper crops planted with arecanut. In hills, natural perennial streams are the main source of water for domestic and irrigation use. Water is diverted from upper reaches of hill top to the lower reaches though gravity flow. Water is diverted from the source with the help of bamboo channel. Such channel sections convey water efficiently at the rate of 18 to 20 litre per minute or even more, over a distance of several 100 m. Elevation difference between the water source and the point of water application may be as high as 100 m. For distribution of water, it is carried to the plot site and distributed into branches, which are made and laid out with the use of different forms of bamboo pipes/channels. The unique feature of the whole arrangement is to divert the water without leakage and control of water flow in any branch as per requirment. This is achieved with some manipulation in the intake pipe positions. Reduced channel sections and diversion units are used at the last stage of water application. The last channel section helps in dropping water drop by drip at the plant site. Once	Dr A. Singh, Water Technology Centre, Indian Agricultural Research Institute, New Delhi 110 012

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		laid out, the system works round the clock. The whole unit works without any leakage and distributes 18 to 20 litre water entering into the system per minute to 10 to 80 drops per minute at the plant site. **Keywords**: hill-top water, conveyance through bamboo channel, water diversion network, at plant site	
1093	Control of wilt in gram and lentil	Intercropping of linseed with gram and lentil reduces the attack of wilt disease in gram and lentil. This practice has been in use for the past 10–12 years by about 10–15 farmers of Amaon village in Ballia district of Uttar Pradesh. The reason for less number of users is due to lack of awareness and alternatively summer ploughing, followed by practising of crop rotation. **Keywords**: linseed, gram and lentil intercropping, wilt disease	Shri Ravi Kant Rai Amoan, Sohaon, Ballia (Uttar Pradesh) 277005
1094	Intercropping to reduce the attack of antelopes in pea crop	Few farmers (about 15) of Pipara Kalan village in Ballia district of Uttar Pradesh follow the practice of introducing mustard crop in pea crop field to reduce the attack of antelope. The smell produced by the mustard may be offensive to antelopes and thus prevents it from damaging the crop. This is in practice for the past 10 years but with a few users due to the lack of awareness and lack of faith of the practice. **Keywords**: mustard crop, pea crop, antelope attack	Shri Kamata Prasad Singh, Pipara kalan, Pipara kalan, Ballia (Uttar Pradesh)277054
1095	Mixed cropping under less irrigation facilities of Punjab	Different mixed cropping sequnces such as bajra and moong; bajra and urd, jowar and arhar, bajra and til; wheat and gram, wheat and sarson, gram and sarson etc. are practiced due to less irrigation facilities and also to get more yield. **Keywords**: mixed cropping, bajra and *moong*, bajra and *urd,* jowar and *arhar*, bajra and *til*, wheat and gram, wheat and *sarson, gram* and *sarson*	Dr A.K. Mehta,Zonal Coordinator, ZCUI, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141 004
1096	Intercropping of gobhi sarson in berseem	Crops like *gobhi sarson* and berseem are compatible with each other and do not affect the internal resource of the farmers and give additional produce. Rationale of the practice is to take the advantage of cultivable area in a diversified way. *Gobhi sarson* is grown on bunds, whereas berseem is grown in beds. Sowing on the bunds reduces the adverse effect of excess	Associate Director (Training), Krishi Vigyan Kendra, Kapurthala (Punjab) 144 601

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		water on gobhi sarson. This is practised in Amritsar, Gurdaspur, Kapurthala, Jalandhar and Ludhiana districts of Punjab **Keywords:** intercropping, gobhi sarson, berseem	
1357	Indigenous agricultural practices in East Singhbhum district of Jharkhand	**Month-wise rotation of agricultural produce** *Chait-Baisakh: piyal, kendu, phuti, khira, bael, papal, mango, mahua, jhinga, sal-seed, oal. Jyesth-Asadh: kusum, jamun, mango, mahua* *Srawan-Bhadon: maize, moong, bawala, tand paddy, chana, wild potato, semal root, wild kundri, urd, birahi* Agahan-Pausa: kanad, ber, amra, tomato, radish, brinjal, kachu, kodo, kundrum, seam, chura, gunja Magh-Fagun: kurthi, ber, munaga, khasari, gram, tisi, lentil, pigeonpea **Local Paddy Varieties** *Chingri, Koya, Kankri, Naragi, Majhi, Bhojna, Bali, Kashiful, Jhagari, Sitasal, Malto, Vivishal, Goyabali, Bera, Malto, Lakhanshal, Lata Shal, Deputy Shal, Bhutiya, Rajarani, Lakhimuni, Chingari, Chopa, Rupshal, Jamay Ladu, Siyar Negur* **Pulse crops** *Pigeonpea, khesari, kurthi, barbate, urd, moong* **Tools and Implements in use** *hal, kural, moi, arand, juat, kudal, gaita, jhaba, bahuk, gachhuigan, khurpi, jhanjari, iis, fal, aand, (rope of paddy straw), kado kural, jhori, dobka, latha dang* **Indigenous Methods of Insect and Pest Control** The following materials are used for pest and disease control of crops: Podasi leaf, sinduar leaf, ind branch, drum beating, operation of moi made of bahera, changing water, changing seed, broadcast of green bamboo pieces in the field, application of kandu fruit in the soil, application of karanj flower in the soil, putting feathers of sahi musa under ground, rotating branches of babri, suri leaf, neem leaf, wild kachu leaf, jamun fruit, arjun fruit, ashan fruit or leaf	Paryavaran Chetna Kendra, Bada Sigdi, Potaka,East Singhbhum (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator

Indigenous Method for Seed Storage

Mixing powder of sindwar and potom leaves

Pasting seeds on the wall

Bamboo khanchar

Bamboo morai

Wooden box

Earthen pot

Earthen kotha

Hanging over chulha

Drying tying in the cloth

Drying over the roof (chhajja)

Indigenous Crops Grown in Various Soils

Soil type	*Crops*
Tand soil	*kado, gudali, gunja, kudrum*
Stony soil	for pasture use
Sandy and kachnar	Gora Paddy, Chingari
soil	Paddy, *Lovanchi, Kankari* Upper layer of ash: *Rangi, Kashiphood, Aash Bhojna*
Aash land	Malta, Sita Shal, Chingari paddy
Bera land	Bera paddy, Banskocha, Siyal, Negur, Meghbadal, Kalikunji, kitchen garden, Bottle gourd, kundari, bhindi, brinjal, tomato, maize, chillies, bitterguard, cucumber, coriander, turmeric

Indigenous Manures used

Dung of cattle, buffalo and kada landi of goat and sheep landi (faeces) of duck, pigeon, poultry birds landi of bagula grass, leaves, cowdung, soil pank and pauli soil of water reservoir (talab), well, pokher pauli soil of hill springs

Indigenous Technology for Weather Forecasting:

1. If chickpea and tamarind become moist in house, there will be rain within a week
2. If black ants carry eggs in line and run, there will be rain in 3–4 days
3. If bagula drops its egg on the ground, there will be no rain for 1 month

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		4. If moon is surrounded by kundali from distance and few stars are inside, there will be rain with in 1–2 days. 5. If rainbow is visible in west, there will be heavy rain 6. If termite lifts soil at dry place, there will be rain within a week **Keywords:** indigenous crops of Jharkhand, indigenous paddy varieties, indigenous tools and implements, insect and pest control, methods of grain storage, indigenous soil types and crops grown, indigenous weather forecasting	
1358	Pigeonpea and kudrum (Hibiscus sabdariffa) protect the main crops	Pigeonpea (Cajanus cajan) and kudrum (Hibiscus sabdariffa) are planted on the surrounding bund of main crop. This protects the main crop from animals and also checks soil erosion. This practice is being followed for the last several years by the people of Singhbhum region of Jharkhand. **Keywords:** pigeonpea (Cajanus cajan), kudrum (Hibiscus sabdariffa), bund, protecttion of the main crop, checking soil erosion	Shri Sanat Kumar Sawaiyan, Dumbisa, Chaibasa, West Singhbhum (Jharkhand) 834 006
1361	Mixed cropping for production of main crop	Protection of main crop from cattle and animals is very difficult; hence farmers of Khaspokharia village in West Singhbhum district of Jharkhand follow this practice. The main crop is protected by plantation of pigeonpea and kudrum on the field bunds, which act as fence for cattle/animals. Roots of these plants hold the soil and check soil erosion. This is in practice for last 100 years by a majority of farmers in the village. **Keywords:** arhar, kudrum, cattle/animal, soil erosion, plantation	Shri Sanat Kumar Sawaiyan, Dumbisai, Chaibasa, West Singhbhum (Jharkhand) 834 006
1364	Paira cropping in rice	This is in practice in Sindri village of Ranchi district in Jharkhand. In this practice, seeds of chickpea are broadcast as paira crop in the standing crop of rice before 15–20 days of harvesting. Practice is used for minimizing the time of tillage operation and loss of moisture during field preparation for succeeding crop. This is age-old practice followed by 70% farmers in Sindri village. **Keywords:** moisture, succeeding crop, chickpea, rice, paira cropping	Md. Aslam, Department of Extension Education, Birsa Agricultural University, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1772	Indigenous system and practices	Farmers of Amaravati district grow crops following traditional system of farming. They prepare land in April to June with the help of a nagarti, bakhar, etc. They sow the crops after rain during June or July. Cotton seeds are sown with the help of chaufula. Some farmers sow moong between cotton lines and after harvest of moong take cotton crop. Some farmers sow moong, tur (pigeonpea) or jowar in lines. After moong, farmers take gram (chickpea) or wheat and some take karandi. Cotton is sown by chaufula, while some farmers sow cotton, moong, tur, jowar by tifala/tikori. Jowar and karadi are sown by duguni/dukakari. Karadi is sown in the month of September. The seed rate of cotton, moong, jowar and karadi followed by farmers is 7–8 kg per hectare. Seed rate used for gram is 10 kg per acre while that of wheat it is 25–30 kg per acre. Hoeing and weeding is done by dabara or dudon pher. **Keywords:** indigenous method of cultivation, indigenous implements, cropping pattern, traditional practices.	Shri Subhash Mahadevrao Vankhede,Borala, Arala, Amaravati (Maharastra)
1774	Use of barley a border crop to save pulse crop from frost	Barley is given around the pulse crop as border crop. This saves the pulse crop from frost and hailstroms. **Keywords:** barley, pulse crop, border crop, frost free	Shri Swami Triptanandji, C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
1781	Crop rotation practices	Colocassia and other vegetable crops are raised in the sweet potato harvested field. Due to this crop rotation, life cycle of sweet potato weevil got dis-rupted. Farmers of Raipur district in Chhattiagarh have adopting this method, since several years. **Keywords:** sweet potato weevil, colocassia, vegetable crops	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492012
1782	Micro-farming situation based crops and cropping systems	Farmers of Sahari and Ghanaghat villages of Dindori district of Madhya Pradesh, grow crops based on micro-farming situations. For determining micro-farming situations, soil properties such as topography, soil colour, soil depth, irrigation sources and overall problems in handling the soils are considered. Thus three micro-farming situations which do exist are utilized for growing different crops such as paddy, maize, minormillet and niger in different situations. Again, use of varieties of a given crop in a farming	Shri Ranjay K. Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		situation is also vetted based on the characteristics of the crops and varieties. **Keywords:** micro-farming situation, selection of crops, varieties	
1783	Cultivation of indigenous medicinal crops	Disclosure has given the specific characterization of various medicinal plants. The cultivation of these medicinal plants could ameliorate the economic condition of the farmers. The plants with their characterization are given in the shape of hindi poem, which are as follows: *Lendy pipar:* Medicine for ashthma, boat, cold and cough.Also called as pipar and pipali. *Bach:* Leaf of bach and Akanda is medicine for cough, atisar, urinal diseases, mirgi, fever and wormicide. *Satawar:* Roots have the medicinal value against leprosy and for male infertility. Increases spermatozoa. *Isabgol:* Husk of the seeds are used for constipaction, piles, urinary problems, dysentery and stomach problems. *Safed musali:* Roots are used as medicine for male genital organs, stimulant and increases semen production. *Musk dand:* Seeds are used for Bat-vikar, heart disease and for developing strength and stamina. *Tikhur:* Tikhur flower is good for anaemia, has the medicinal value against ulcer, asthma, jaundice (pilia), indigestion etc. *Black turmeric:* Black-turmeric is a blood purifier, used in tuberculosis, tumor, white leukoria, lung infections, etc. *Kaal megh:* The powder of the whole plant is used against malaria, liver disease, skin disease, etc. *Mulhati:* Roots are used against T.B., asthma, thrust, cold, cough, vomiting, stomach-ache, anaemia, etc. *Sarpgandha:* Roots are used in blood pressure, histeria, unmad and sleeplessness. *Chandrasoor:* Seeds induce growth of child, increase milk in mother after delivery, relieve eye pain and clear urine.	Shri Govind Prasad Mishra 17, Alok nagar, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator

Tulasi: Tulasi leaves and whole plant is used against cough, pitt and alergy. It increases memory and semen in males. It cures skin diseases.

Kronch (kimach): Roots, leaves, seeds and pods are used in respiratory problems, boat, cough and increases in males. It increases power and gives strength and stamina.

Ashwagandha: Root is used in arthritis, skin disease, ulcer and lung disease while leaves are used in joint pain, back-ache and pelvic pain. It clears blockage and used in bone T.B.

Ajwain: It is wormicide, increases digestion and apetite.

Sanay: It removes chronic constipation. Leaves of sanay are used to make karha by boiling in water.

Saunf: Saunf seeds are used in dysentery, stomach ache.

Khursani ajwain: It checks cough, ashthma, sleepleessness, mirgi, vomiting, nausia, shirarog, etc.

Kalonji: Used as spices for making various dishes.

Babachi: Oil extracted from seeds is used to prepare medicine for skin diseases. Its ointment is used in leprosy, root is used for protecting teeth and leaves to check diarrhoea.

Turmeric: Root is blood purifier, used in skin diseases and in making in beautician item as well as antiseptic medicines/ointments. It is used as spices for household use.

Sada suhagan: Leaves are used in blood cancer and haemorrhage, blood pressure and used as tonic.

Guggul: Guggul gum is used in piles, kidney stone, high cholestrol, blood clotting and in boat rog.

Sugandh grass: Flavored oil is prepared with sagandh grass mixed with jova, pamarosa, lime, rajnigandha, mentha, khas, aonla, neem, etc.

Keywords: medicinal plants, spices, roots and leaves are used to cure various diseases

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1787	Adoption of *Rishi-krishi* technique to harvest bumper yield.	Use of amritpani to increase beneficial microbial activities in the soil is a Rishi-krishi technique. A mixture of 330 g of ghee of desi cow, 10 kg cowdung, 500 g honey and 200 litres of water is called amritpani. The same is spread over the soil before sowing with help of small branch of neem tree. It is repeated at 15 days interval for 3–4 times. The solution is sufficient for one acre. Farmers of Jalagaon (Maharashtra) use this practice for getting better yield. **Keywords:** amritpani, neem branch, microbial activity.	Prof. P.S.Patil, Training Organiser, KVK, Dhule 424 004 (Maharashtra)
1789	Weed management in irrigated crops	Farmers of Sangli districts in Maharastra are adopting this weed management practices in irrigated field. Urea solution is sprayed in sugarcane crop to control weeds. Cynodon dactylon and Cyprus rotundus weeds are controlled by sowing rajgira (Amaranthus spp) in that field. 50–60% weed infestation by urea spray and 20–25% weed infestation by amaranthus is reduced in the field. 5 to 10% of the village farmers are adopting this practice since 10 years. **Keywords:** sugarcane, urea solution, amaranthus, weed reduction	Shri S.S. Patil, Bhilwadi Road, Tasgaon, Sangli (Maharastra)
2048	Mixed cropping	Mixed cropping of redgram with j*owar, bajra, sesame,* korra etc. reduces the pest and disease infestation, minimises weeds. It helps to get at least one or two crops under drought. In addition to this, mixed cropping helps in efficient use of land and light due to differential growth period. The farmers get both cereals and pulses, which result in balanced diet and avoid malnutrition. **Keywords:** mixed cropping, cereals, legumes, disease infestation	Shri Arika Prasada Rao, Jangara Padu, Kurupam, Vizianagaram (Andhra Pradesh)
2049	Crop rotation	In order to rationalize the monsoon fully in the Vizianagaram district, the farmers take up sowing of mesta or sesamum in May with the advancement of monsoon and take up paddy crop after harvesting by growing these crops. Farmers are getting additional returns with low risk and whatever returns they get, they put as input for succeeding paddy crop. **Keywords:** crop rotation, mesta, sesamum, paddy	Shri T. Krupa Rao, Goreda Kurupan, Vizianagaram (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2052	Keeping the land fallow in between crops	Some cultivated land is kept fallow during *kharif* in this tillage operation like ploughing and weeding is done every fortnight. This increase the water-holding capacity of the land and ultimately increases the yield of consecutive crop. By keeping land fallow, yield is doubled, e.g., bengalgram sown in fallow land yielded 600 kg/acre compared to yield 300 kg/acre. It reduces the cost of cultivation and gives more returns. **Keywords:** fallow land, between crops	Shri S.M. Reddy, S/o S.V. Reddy, Vikarabad, Rangareddy (Andhra Pradesh)
2054	Mixed cropping of field bean + castor + maize	Pulse (fieldbean)–oilseed (castor)–cereal maize are sown in line during rabi season. The maize and castor are sown before field bean. After the maize is harvested, the twines of field bean will take support of castor and climb over. This system reduces the risk, gets higher income and efficiently utilizes the resources. **Keywords:** mixed cropping, field bean, castor, maize	Shri A. Muttaiah, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 505 122
2058	Growing of trap crop to control pests	Farmers of Huzurabad division in Andhra Pradesh are practising this method to control pests in chilli and tobacco crops. *Tagetus patula* and Tagetus spp. are cultivated as trap crops along with the main crop (chilli and tobacco) during *kharif* season to control pest attack. Trap crop is grown between and also along the sides. Insect pests lay their eggs on the yellow flowers of the trap crop, which cause death due to the lack of food. **Keywords:** T*agetus patula, chilli,* tobacco	Shri CH. Raj Reddy, C/o Prakasham, Krishi Vigyan Kendra, Gramma Nava Nirman Samithi, Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
2059 and 2061	Sequential cropping of sugarcane, groundnut and paddy	Sequential cropping of sugarcane, groundnut and paddy is better over growing groundnut during kharif and paddy during rabi season. Sugarcane being a deep	Shri Rajashekar Naidu, Gudimallam, Yerpedu, Chittoor (Andhra Pradesh)



Sugarcane cultivation

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		rooted crop efficiently absorbs moisture during kharif from the deeper layers of soil. Later the summer sown groundnut obsorbs nutrients from the upper layers and enriches soil fertility. Paddy grown during next rabi season helps in controlling perennial weeds like Cynodon dactylon and Cyperus rotundus and reduces pest incidence. **Keywords:** sequential cropping, sugarcane, groundnut, paddy	
2060	Growing *velluli* (garlic) once in three years in nut-grass infected fields	Nut sedge (Cyanodon dactylon) has become a major problem in the upland areas, making its control very difficult. Growing velluli (garlic) in kharif once in three years in the field affected with nut sedge was found to reduce its count, probably as it smoother the incidence/germination by leaving certain chemicals in the field, thereby cost of weeding was reduced over the normal method of growing continuously same crop. **Keywords**: Nut sedge, garlic, control	Shri Venkata Narasaiah, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2309	Eco friendly cropping systems	The various traditional crop combinations to reduce the pest and disease incidence in different parts of the country are as follows. Maize-marygold: Reduce nematode populations *Tomato-crotolara:* tomato yield increased Rice-garlic-corn-tomato: reduce nematode population Groundnut-mustard: reduce nematode population Rice-tobacco-rice: control of root knot population Sunflower+cotton: reduce the leaf hopperdamage Sorghum+cowpea (1 : 1): control stem borer of sorghum Wheat+chickpea (1 : 1): reduces the pod borer attack Castor+cowpea (1 : 1): reduces the aphid damage **Keywords**: cropping system, pest management	Dr. G. Subba Reddy, Dr. H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Pradesh) 500059
111	Direct seeding of cotton	Cotton is sown through dibbling by hand without any ploughing after harvest of crops such as fingermillet, pearlmillet with one time irrigation. About 80–100 farmers of Medur village in Coimbatore district in Tamil Nadu are adopting this practice for the last 10–20 years. **Keywords:** cotton sowing, dibbling	Shri M.C. Murugesan, Kuranoor Thottan, Medur, Coimbatore (Tamil Nadu) 641 113

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
327	Determination of irrigation	For determination of irrigation requirement in paddy, a thin bamboo stick is placed vertically in the transplanted rice crop. If it does not fall, it indicates the crop is in stress condition and needs irrigation. This practice is recommended in all seasons, with 30 to 60% success and is being followed by 80 to 90% of farmers in the Makarbili village of Nawapada district of Orissa. **Keywords:** bamboo stick, irrigation requirement, rice	Ms S. Das, C/o Shri N M Das, Gandhi Marg, Amalapada, Angul (Orissa) 759 122
328	Banana as an indicator plant to irrigate sugarcane	In the sugarcane plot one or two plants of banana are planted. As the banana is sensitive to moisture stress, it shows symptom of water deficiency earlier than sugarcane. Farmers apply irrigation when the water-stress deficiency in banana is noticed. By this practice, farmers in Karadabadi village of Ganjam in Orissa save 15 to 20% of water and are able to irrigate sugarcane crop in time, resulting in 10 to 15% higher yield of sugarcane as compared to normal practice of irrigation indiscriminately. About 90% of the farmers in the village adopt this practice. **Keywords:** banana, irrigation, sugarcane	Shri Rama Chandra Dagua, Ballipadar, Ganjam (Orissa) 761127
358	Use of jackfruit leaf extract for control of cuscuta in niger	Jackfruit leaves 7 to 8 kg are ground to extract about 1 litre juice. This juice is diluted to 200 litres with water, which is drenched into the soil immediately  Jackfruit leaf extract is used for control of cuscuta in niger after sowing of niger in 1 acre. There was about 2% cuscuta infestation in the treated plots compared to untreated plots, which resulted in 35% higher yield in comparison to use of pesticides.It is being followed	Shri Bhagaban Naik, Dalaiguda Village, Semiliguguda Block, Koraput (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		b y 30–40% farmers in Dalaiguda village of Koraput district in Orissa. **Keywords**: jackfruit leaf extract, cuscuta, niger	
364	Weed control in rice using common salt	Common salt is dissolved in water and sprayed in rice fields for controlling major weeds. This practice is being used by 40 to 50% farmers of Makarbili village in Nawapada district of Orissa with 60% effectiveness in controlling weeds. **Keywords**: common salt, weed control, rice	Dr Sarbani Das, C/o Nilamadhab Das, Gandhi Pora, Amalapada, Angul (Orissa)
447(a)	Seed drying for better germination	Drying of seeds for half an hour in bright sun before sowing is practiced to improve germination and seedling vigour. **Keywords**: seed drying, germination, seedling vigour	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(b)	Burning of straw in nursery area	After preparation of nursery bed before sowing, burning of organic substances (straw, weeds) is done to sterilize the seedbed. After burning, warm water is added to percolate water up to root zone (15 cm) and sowing is done after cooling the soil. The ash, added by burning straw helps in checking surface soil crustation, resulting in smooth emergence of seedlings. **Keywords**: nursery bed, seedling emergence, soil sterilization	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(c)	Seed selection for sowing	Seeds in the middle of tray are used for sowing, because only the seed with maximum test weight are left in the middle of the tray, which give assured and good germination, and optimum plant stand. **Keywords**: seed, middle of the tray, germination	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(d)	Increasing the efficiency of fertilizer and pest control	Chopped green leaves (150–250 kg) of basaka, neem, custard apple, kurchi and nisinda, are mixed in puddled field before transplanting of rice to increase the use-efficiency of applied fertilizer nitrogen and reduce the infestation of insect pests, pathogens and weeds. **Keywords:** green leaves, basaka, neem, fertilizer, pest and disease control	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
460	Dry and wet broadcast of rice in flood-prone areas	These practices are followed in almost all the flood affected areas of Barak valley zone and some flood-affected areas of the Brahmaputra valley to produce rice crop by escaping flood. **Dry broadcast of ahu rice** In flood-prone rice tracts where early harvest is indispensable, the farmers traditionally take resort to dry broadcast of short-duration dumai class of local ahu varieties of around 80 days duration. Dry seeding is done in the later part of February to early March with high seed rate around 120%. For such practice, tillage operation for land preparation is done at the earliest opportunity with the help of initial pre-monsoon showers during February. Usually lighter soils are preferred and no fertilization is done. **Wet broadcast of late sali** After recession of floods water wet broadcast of dumai (70 to 80 days duration) and Murali (85 to 90 days) classes of indigenous rice varieties are practiced in puddled soil. In this practice sowing has to be completed by the middle of September, as the latter sowings will create sterility problem due to low temperature. With the introduction of HYVs the indigenous varieties are constantly being replaced, although the system is still prevalent. The advantage of the practice is that it provides insurance against risk of flood damage as compared to the existing farming systems. This practice is in use for years with modification made from time to time on the variety. About 70% farmers adopt these practices. Alternatively the farmers go for late transplanting of sali rice in the second fortnight of September. **Keywords**: dry broadcast of ahu, wet broadcast of late sali, flood-prone area	Shri J. K. Choudhary, Krishi Vigyan Kendra Napam, P. Box No 51 Tezpur (Assam)
597	Spade insertion as indicator for proper irrigation in agricultural fields	Insertion of spade or digging of soil is done to test moisture content in soil. It is a local practice to ascertain optimum utilization of water and its penetration up to root zone of the soil profile. Farmers test moisture content of soil with the help of spade digging. Farmers regulate irrigation to desired soil depth by inserting spade (belcha) to the soil. If the front portion is completely inserted, it is considered	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		to be properly irrigated. Similarly, in other cases soil is thrown up in the air. If it splits into small pieces (soil particles), this shows proper irrigation. This is practised in hilly areas of Himachal Pradesh since long time. This is a very good indicator for the farmers to estimate proper irrigation of agricultural land. **Keywords:** digging of soil, spade, moisture content, soil splitting	
765	Traditional ground-floor farming in apple orchards	In the hill-regions, availability of land is one of the most serious limiting factors with large area coming under apple cultivation. Farmers grow several crops in the apple orchard such as legumes, fodders, vegetables, flowers etc. to increase productivity, to maintain soil, water and nutrient status. As experienced by the farmers, it is highly productive, profitable and a sustainable farming system. The practice is adopted in all the apple-growing belts of Himalayas for several years. **Keywords**: intercropping of apple, legumes, fodder, vegetable, less cultivable land, increased productivity, higher profit	Shri Ramesh Kumar, Village Bashnog, P.O. Sarion Tehsil Theog, Shimla (Himachal Pradesh)
1085	Increasing yield of mustard by topping	Yield of mustard is increased by 15–20% by topping. practice done at 35–40 days after sowing.	Shri B L Yadav Krishi Vigyan Kendra Mathura (Uttar Pradesh) 281001
1342	Indigenous practice of paddy cultivation in Saraikela-Karsarwa district of Jharkhand	The farmers of Saraikela - Kharsawa district (Jharkhand) are practising indigenous paddy cultivation. The details are as follows. Direct sown paddy First ploughing for land preparation is done in Pausha-Magh. Crop residue of earlier crop is burnt in the field. The ash acts as manure. After soil getting heated, the second ploughing is done. Weeds are removed and dried, which act as manure. Land is levelled by karaha. Before sowing, cow-dung, or tank soil is broadcasted. Seed is sown in dry soil and then ploughed. If soil is moist, the seed germinates in 5–6 days. If there is no moisture, seed germinates after rains. After 25–30 days, kadan operation is done in standing water. After 1 week nikoni (weeding) is done and then gachhiyan is	Shri Dhani Ram Muramu, Solgariya, Jumal, Saraikela, Kharsawa (Jharkhand)

Code No	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		done. Light paddy mature in September while medium in October and heavy in November. After harvest, paddy is taken to grainyard where it is threshed by heating and is cleaned. **Transplanting** The seed is tolagari (nursery) by giving water and after kado seed is broadcasted. Water is then drained. After 15–20 days, plants are ready for transplanting. Where the transplanting is done, kado is done. Koya variety (indigenous) is resistant to insects and pests, and requires less manure. Its colour is black and is hard and spiky. It is used for puja. Goyabali and Kankari paddy are used for mudhi. Lakhan Sal and Jhanti Sal liked by the farmers, as they does not lodge in the field. Rice after dehusking of paddy could be arwa or usana. Arwa rice is used for making gundi by beating in chholar or dhenki. Gundi is used for cooking with meat to make leto or pitha by mixing salt, ginger, spices, etc. This is cooked in nadwa. Usana rice is used for making drinks. **Keywords:** land preparation for paddy, karaha, pank soil, *kadan, nikoni, gachhiyan, tolagari, kado, goyabati, kankari paddy, nsudhi, Lakhan Sal, Jhanti Sal, arwa, usana, gundi, chholar, dhenki, leto, pitha, nadwa*	
1348	Prevention of lodging in rice	This is in practice in the Sindri village of Ranchi district in Jharkhand. Sometimes tall rice plants fall down during high wind due to its panicle weight. In this practice, upper portion of rice plants is cut by sickle to check excessive vegetative growth and maintain plant height to prevent lodging. This practice is adopted for the last several years by maximum number of farmers in the village. **Keywords:** lodging, wind, panicle weight, sickle, excessive vegetative growth	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1350	Moisture and weed management in ginger (Zingiber officinale) crop	The whole field is covered with wheat husk or rice straw to reduce the evaporation losses of moisture from field and also to minimize the favourable environment for growth of weeds. In addition, straw mulch also helps to create favourable environment for germination of ginger tubers. After sowing ginger in the field, the whole field is covered by 2 inch thin	Shri Ranjay Kumar Singh, Department of Extention Education, BAU, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		layer of wheat husk or rice straw, and cover is replaced after two to two and half months after sowing. **Intercultural Practices** This practice is used by the vegetable growers of Karge Panchayat of Mandar Block of Ranchi district (Jharkhand). About 60% irrigation water is saved and about 80% weed problem is solved. This practice helped to get uniform germination (100%) in farmers fields where this practice is adopted. **Keywords**: wheat husk, rice straw, ginger	
2074	Keeping crushed poisonous nuts at irrigation inlets in groundnut fields	The poisonous nuts are crushed into powder and tied in a cloth and kept at the inlet of the irrigation channel. The poisonous content in the nuts gets dissolved into water and flows into main fields. This gets soaked into soil, thereby the white grubs and other pathogens are killed. **Keywords**: poisonous nuts, irrigation inlets, groundnut	Shri P.Rajeswar Rao, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506101
1769	Sowing rabi sorghum at the time of gokulasthami	The recommended time of sowing for rabi sorghum is 2nd fortnight of September to 1st fortnight of October. However, some farmers of Solapur district sow sorghum in deep black soils after completion of lokhandi charan at Barshi tehsil and gokul/ashtami up to 15 August, in Magalvedha tehsil in very deep soil. It results in good germination and higher yield of sorghum. The crop sown in September is affected due to high intensity of rainfall (5–7 mm/hour). It is being practised by all the farmers in heavy clay soils since 30 to 40 years **Keywords**: rabi sorghum, sowing time	Dr B. D Koli, Agronomist, NARP, 97 Raviwar Peth, P. Box No. 207, Solapur (Maharashtra) 413002
2041	Sowing groundnut in rows	Groundnut seeds are dropped in furrows by walking behind the country plough at spacing approximately. The furrow closes automatically when the subsequent furrow opens by plough. It facilitates in sowing of groundnut at required spacing in sandy loam soil under rainfed tank-based farming. It is an age old practice and is being practised by 95% of the farmers. **Keywords**: groundnut, sowing rows	Shri K. Lakshmana, Ph. D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500030

7

Pest and Disease Management

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
133.	Control of leaf folder in paddy	To control leaf folder in paddy, ducks are released in the field to feed on the pest. This is practiced by a few farmers for the last 5 years in Karruppathevan-patty village of Theni district in Tamil Nadu. **Keywords:** leaf folder, paddy, duck	Shri A. Kumaresan, Karruppathevanpatty, Kamachipuram, Theni (Tamil Nadu) 625 520
134.	Control of mealy bug in paddy	Burning of discarded cycle tyre controls mealy bugs in the paddy field.The smoke and smell of the burning tyre repels the pest. This practice is being followed by the farmers in Dindigul for the last 3 years. **Keywords:** mealy bug, cycle tyre	Shri Ponnusamy, Behampur, Dindigul (Tamil Nadu) 624 00
137.	Control of leaf folder and stem borer in paddy	To control leaf folder and stem borer in paddy, spraying of kerosene is in practice. Five litres of kerosene mixed with soap and water is sprayed for 1 hectare. For the last 7 years farmers of Periayur village in Madurai district, Tamil Nadu are practicing this method. **Keywords:** kerosene, soap, insect control	Shri M. Jagadesan, Thummanayakkanpatty, Peraiyur, Madurai (Tamil Nadu) 625 703
139.	Pest management in paddy	To control pests in paddy, farmers generally spray chilli and tobacco extract. For the last 5 years 20% of farmers are using this technique in Nachalur village, district Karur in Tamil Nadu. **Keywords:** chilli, tobacco, pest control	Shri R. Velusamy, Valluvar Nagar, Nachalur, Kulithalai, Karur(Tamil Nadu) 639 112
142.	Control of bacterial blight in paddy	Cowdung is mixed with water thoroughly and kept for 3–4 hours till the course materials settle down. The solution on top is filtered and sprayed on paddy leaf for control of bacterial blight. Bactericidal action of cowdung helps reduce the population of the bacteria (Xanthomonas sp.). This practice is adopted by most of the farmers of Koipuram, Ezhumatoor and Puramatton blocks in Pathanamthitta district of Kerala. In Koippurram village, 20% farmers are practicing this for several decades. **Keywords:** cowdung, bacterial blight, paddy	Shri George Thomas Chakkittayil, Koabhagom Thadiyoor, Pathanamthitta (Kerala

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
143.	Control of white crane attack in rice seedling	In paddy field, white crane is controlled by tying cotton threads across the field, at the seeding stage. By adopting this, birds entry is stopped. This is being in use by 30% of the farmers in Ezhumatoor, Kopipuram and Puramattom villages, Pathanamthitta district of Keral. **Keywords:** cotton thread, control of white crane, paddy field	Shri P. Jacob Mathew Pondicheriyil, Puthenpurayil, Kuttor Pathanamthitta (Kerala)
151.	Control of earhead bug in paddy by use of neem seed kernal powder	To control earhead bug in paddy, powder of neem (Azadirachta indica) seed kernal is applied to the crop 2–3 times after transplanting. This is practiced by 50 farm families for last 30 years in Malamanoor, Potaneri village of Salem district in Tamil Nadu. **Keywords:** earhead bug, neem seed kernal powder	Shri C. Balasubramanian, 4/12 - A, Malamabnoor, Potaneri, Mettur, Salem (Tamil Nadu) 636 453
155.	Control of sucking pests	Sucking pests such as brown plant hopper in rice is controlled by dusting of ash on the standing crop. Control of sucking pests such as aphids and thrips in vegetables is done by spraying water. These practices are followed by all the farmers in village Kottar in Kanyakumari district of Tamil Nadu for the last 4 years. **Keywords:** paddy, vegetable crops, sucking pests	Shri S. Bala, 114, Xavsier South Street, Kottar, Nagercoil, Kanyakumari (Tamil Nadu)
349.	Control of gandhi bug in rice by rotten crab	Rice gandhi bug is controlled by using bait rotten crab mixed with furadon granule and packed in a fresh cloth. This bait is placed in different corners of the rice field. The gandhi bugs are attracted by the odour of rotten crabs, suck its juice and get killed. Furadon (500 g) is used for control of gandhi bug in 1 hectare area. By this practice 80% of pest is controlled. It is being practiced since ages but incorporation of furadon in the bait is a new idea, followed by 45% of farmers in Gobindapur village of 24-Parganas in West Bengal. **Keywords:** gandhi bug, rice, furadon, rotten crab	Dr Debabrota Basu, RRS, NAZ, BCKV, Gayeshpur, Nadia (West Bengal) 741 234
350.	Control of paddy leaf folder by installing fishtail palm branches or twigs in the field	Branches or twigs (4–5) of fishtail palm are installed in the paddy field at the time of infestation. These fishtail palm branches harbour the predatory birds and control the paddy leaf- folder within 8 to 10 days.	Shri Rajendra kumar Dalai, Dalaiguda, Koraput (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 Fish tail palm branches used for control of rice leaf folds About 30 to 40% farmers are practicing this technique to control leaf-folder in paddy. **Keywords:** paddy, leaf- folder, fishtail palm	
351.	Control of paddy case-worm by kalothia plants	Leaf- folder on rice is controlled by application of 5 to 6 bundles, each containing 10 to12 kalothia (Tephrosia purpurea) plant by pressing into the mud. By this, the plants get decomposed and release some chemicals, which act as repellent or killing agent. About 25 to 30% the farmers are adopting this practice. **Keywords:** paddy case-worm, kalothia, soil application	Shri Madhu Sudan Dalai Daliguda, Semiliguda, Koraput (Orissa)
353.	Control of rice stem-borer and mosquito larvae	Cashewnut-shell oil is used for control of mosquito and stem-borer in rice. It is sprayed 2 to 3 times at the time of incidence, as it acts as larvicide and bio-pesticide. This practice is being followed for more than 500 years in the entire farming community of Nandapore village in Koraput district of Orissa. **Keywords:** cashewnut-shell oil, rice, stem-borer, mosquito larvae	Mysore Agro Chemical (Pvt) Ltd., 46 D, Rafi Ahmed Kidwai Road, Satyam Chambers, Kolkata (West Bengal) 700 016
356.	Control of gandhi bug in rice by snail fish	Gandhi bug problem in rice during pollination is controlled by hanging a snail fish in a cloth attached to a stick erected in the field at about 25 places per acre. Due to rotten smell of snail, gandhi bugs leave the field. Meanwhile rice plant completes pollination. It is being followed from time immemorial. **Keywords:** rice, gandhi bug, snail fish.	Shri M. Mohanty,Senior Research Fellow, Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
357	Control of insect-pest in lowland rice using Cleisanthus collinus	Approximately 0.4 to 0.5 kg fresh, tender branches of Cleisanthus collinus are planted erect/spread in the standing water after establishment of the crop in  Cleisanthus collinus for control of insect–pests in lowland rice summer rice with the anticipation of the pest outbreak. This practice is being followed by a good number of farmers belonging to Kaogari village under Jhargram subdivision in Midnapur of West Bengal. This practice has been in vogue over generations without any modification and is being followed in patches vulnerable to insect pest incidence. **Keywords:** rice, pest control, Cleisanthus collinus	Dr G. B. Manna,Ex-Principal Scientist,85 H, Hijli Co-operative, Prembazar, Kharagpur (West Bengal) 721 306
359	Control of paddy leaf - folder by using bamboo shoots/sprout	Young bamboo shoots or sprouts (250 g) are collected from the nearby forest and soaked in 1 litre water overnight. In the next morning, the water is decanted and sprayed with the help of a broom on the infected field of 1 acre. After 7 to 8 days, leaf-folder pest is controlled due to alkaline substance present in young shoots or sprouts, which acts as repelling or killing agent. It is being followed by 25% farmers in the Dalaiguda village of Koraput district in Orissa. **Keywords:** bamboo, rice, leaf-folder	Shri Bhagawan Naik, Daliaiguda Avihr, Semilliuda, Koraput (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
365	Planting of wild Saccharum spotaneum in paddy field for controlling leaf-folder	Wild Saccharum twigs of height 4 to 5 feet and 4 to 5 cm diameter are planted after 15 days of transplanting in rice field for control of leaf-folder. These erected branches harbour the predators at the time of occurrence of leaf-folder, thereby suppressing the incidence of pest. About 90% farmers in the Benakunda village of Ganjam district in Orissa adopt this practice. **Keywords:** wild Saccharum, leaf folder, rice field	Shri Birendra Nayak, Bhajanagar, Ganjam (Orissa) 761 126
367	Traditional practice of controlling insect pests in lowland rice	The twigs of Cleisanthus collinus are used to control insect and pests in lowland rice cultivation. Farmers of forest belt areas of West Bengal and Orissa are practicing this method to control insects and pests in lowland rice. Tender branches of 1–1.5 m length are planted erect all over the field at random after the crop has been well established after transplanting or beushening operation, for direct-seeded lowland rice, before the outbreak of any insect and pest incidents. The fresh leaves of this plant are applied on the standing water either in anticipation of the outbreak or at the initial stage of the incidence of insect-pest. This practice effectively controls insects and pests. The bark, leaves and fruits are also used as fish poison. The active principle has been identified as oduvin, an yellowish white crystalline glucoside. This is in vogue for several years without any modification. **Keywords:** Cleisanthus collinus twigs, tender branches, fresh leaves, reduced insect and pest attack	Dr. G.B. Manna, Ex-Principal Scientist, CRRI, ICAR, Cuttack (Orissa) 753 006
368	Management of gandhi (harmful green algae) in paddy field by karada (Cleisanthus collinus) leav	Gandhi (Gliocladium, Chlamydomone acetabularia) which occurs in kharif paddy fields in stagnant water can be controlled by broadcasting 50–100 kg freshly plucked karada leaves in August. The alga consumes oxygen from water of the rice field and produces carbon dioxide that results in yellowing and dwarfing of rice plants. The toxic cations present in the karada leaves damage chlorophyll of green alga. This practice has been in use since time immemorial in the Panipila village of Nayagarh district of Orissa. **Keywords:** gandhi algae, rice, karada leaf	Shri M Mohanty, Senior Research Fellow, Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
472	Clipping off of tip of rice seedlings before transplanting	Clipping off of tip of rice seedlings before transplanting is practiced all over the state of Assam to ease transplantation; to facilitate uniform growth and to remove insect egg masses and other major insect pests	Shri J. K. Chaudhary, Krishi Vigyan Kendra Napam, Tezpur (Assam)

Code No.	Title of ITK	Details of ITK	Name and address of discloser/facilitator
		present on the leaf-tips. This has been in practice since long time by all the farmers without any modification. Chemical pesticide is the other alternative to this practice. **Keywords:** paddy, clipping off, ease in transplanting, uniform growth, insect egg	
473	Fixing of tree branches in standing rice field to control insect pests	I n this practice, pieces of tree branches are randomly fixed in the rice field to control some major insect pests through biological means. Generally chaura (lata mahudi) plants are preferred. The practice is followed since long by almost all the paddy growers of Assam. The idea is to attract birds to perch on the branches fixed in the rice field and eat-up the insects. **Keywords:** fixing of branches, rice field, controlling pests	Shri J. K. Chaudhary, Krishi Vigyan Kendra Napam, Tezpur (Assam)
474	Use of different methods to control rice pests	Different methods used to control rice pests are: 1. Chopped pieces of colocasia and sometimes chopped peels of Citrus grandis are spread in the rice field. 2. In some places Calotrophis gigantea is grown on bunds of paddy fields 3. Fixing of dead crabs, frogs or even pieces of jackfruit (Artocarpus heterophyllus) to bamboo sticks in rice fields. 4. Rope dipped in kerosenise oil is drawn over the standing rice crop. 5. Branches of Eupatorium odoratum are fixed in rice fields. Use of colocasia and Citrus grandis may act as repellent against different insect pests like hispa and case worm, where thrips get attached and trapped on the leaves of Calo-trophis gigantea. Use of dead crabs, frogs and jackfruits may act as bait to some insect, viz. rice bug and hispa. Rope dipped in kerosene oil and branches of Eupatorium odoratum may act as a repellent against major insect pests of rice. All these methods are eco-friendly and, therefore, have a good impact. These practices have been in use since long time without any modi-fication by all the rice farmers all over Assam. **Keywords:** controlling rice pests, colocasia, Citrus grandis, Calotrophis gigantea, jackfruit, rope dipped in kerosene oil, Eupatorium odoratum stem	Shri J. K. Chaudhary, Krishi Vigyan Kendra Napam, Tezpur (Assam)

Code No.	Title of ITK	Details of ITK and rationale	Name and address of discloser/facilator
475.	Chopping off the paddy at nursery stage to control infestation thrips	To protect the paddy from the damage caused by leaf-tips thrips as well as to control lodging problem, the farmers of Medziphema, Soc[illegible]noma, Kukidolong, Jharnapani etc. have adopted the method of chopping off the paddy at nursery stage. Thrips infestation has been observed to be a common problem in almost all the paddy-growing areas of Nagaland. This insect generally attack the paddy from the tips, sucking its moisture/water content, which results in subsequent drying up of the paddy. The general practice developed is that the tip of the paddy is chopped off which discourages the insect to have its initial attack. Lodging problem is minimized, as initial tilting of the paddy stem is avoided by the practice. This technique has been developed by the farmers over the years which has been found to have a good effect up to the extent of 40%. Almost 100% of the farmers are practicing this for decades. **Keywords:** thrips, lodging, chopping, tilting	Ms Razouneinuo Zuyie, Research Associate, NATP, NRC on Mithun, Jharnapani (Nagaland) 797 106
476	Use of dhatura stems and leaves to control stem borer infestation in paddy.	The farmers of Raz[illegible]phema, Zubza etc. under Dimapur and Kohima districts respectively of Nagaland have devised their own means to control stemborer infestation by using dhatura stem and leaves in the paddy field. Stemborer infestation in paddy is very common in Nagaland. The indigenous tribal people of the state are normally not very keen to apply chemical insecticides/ pesticides, mainly due to its cost factor as well as attitude of the people to grow paddy mostly under organic farming system. The practice is to spread dhatura leaves and stems (cut pieces) in the paddy field particularly on observing the stemborer attack. The water in the field is then blocked through bunds so that the dhatura stems and leaves spread and get decomposed. These decomposed leaves and stems get circulated throughout the field, which acts as a repellent to the stem borer, thereby saving paddy from severe damages. The smell as well as the bitterness of dhatura leaves could be the reason to distract the stemborer pest from approaching the area. The practice has been in use since time immemorial, but about 40% of the total farmers only use it due to non-availability of dhatura plant. Alternatively, the farmers drain out water from the paddy field when the infestation occurs, and it is allowed to dry up	Ms Razouneinuo Zuyie, Research Associate, NATP, NRC on Mithun, Jharnapani (Nagaland) 797 106

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		after which fresh water is pumped in again **Keywords:** dhatura, stem borer, infestation, paddy, decompose, bitter smell	
477.	Management of rice caseworm (Nymphulla depunctalis)	The farmers of Disoi Khash village under Dhekargoya Development Block in Jorhat district of Assam have adopted different methods for the management of rice caseworm, Nymphulla depunctalis in paddy field. When infestation of caseworm occurs, one of the following practices is adopted: 1. Water is drained out of the rice field and it is kept dry for 3 or 4 days 2. If it is not possible to drain out the water, wild colocassia plants are chopped and applied to the field on standing water and 3. Raw cowdung is applied to the standing water in the rice field.The purpose of the practice is to kill the larvae of case worm, which float in the standing water in rice field and feed on the leaf epidermis of rice plants during morning and afternoon. The caseworm larva respires with the help of rectal gills and oxygen is taken from water, like fish. Therefore, if water is drained out of rice field, they cannot thrive. On the other hand, if the raw cow dung is applied to standing water, it becomes turbid and respiratory function is disturbed. Application of colocassia plants make the water toxic to caseworm larvae. Draining out water from rice field has excellent effect, killing about 100% caseworm larvae, whereas application of chopped colocassia plant and raw cowdung to standing water in the field controls 75–80% caseworm larvae. All 55 farmers of the village have been practising these methods since time immemorial. Alternatively, some farmers apply insecticides like chlorpyriphos, monocrotophos etc. for control of rice caseworm. **Keywords:** caseworm, draining out water, wild colocasia, raw cowdung	Dr Jitendranath Khound, Retd. Professor, Assam Agricultural University, Jorhat,Uday Nagar, Club Road, Jorhat (Assam) 785 001
478.	Use of dead frog/crab to control bug in paddy	The farmers of Khonoma village in Kohima district of Nagaland have adopted a method by use of dead frog or crab to control gandhi bug infestation in paddy. This insect infestation is very common in all the varieties of paddy, but has been found to be	Shri A.K. Khan, Technical Officer (T6), ICAR ResearchComplex,Jharnapani (Nagaland) 797 106

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		significantly higher in early, maturing varieties. The practice is to put dead frogs and crabs in a bamboo stick equivalent to the length of the paddy, since gandhi bug attack is more prominent during milking stage. Several dead frogs/crabs are put in the field depending on the size of the plot. The gandhi bugs are attracted towards the dead frog/crabs and feed on them thereby saving the paddy crop. Each dead frog/crab by and large can attract around 20 gandhi bugs. Attraction of bugs to the carcasses of frogs/crabs might be due to the smell of the carcass. This practice is in use for the past 20–25 years by about 100 out of 150 farm families. **Keywords:** gandhi bug, dead frog/crab, milking stage, paddy	
480.	Use of pumelo (Citrus grandis) and siam weed for hispa control in paddy	In this practice, the farmers of Boutepoa Bari village, under Jalah block in Barpeta district of Assam, use pulp of pumelo (Citrus grandis) locally called robal-tenga or siam weed (Eupatorium rugosum) locally called Germany ban, for control of hispa infestation in paddy. This practice has been in use since the last 5 years by 20% of the farmers with an efficiency rate of about 20%. The plant materials and fruits used are locally and cheaply available. Alternatively, bark of kedamba tree or cowdung or ash is used by the farmers for the same purpose. **Keywords:** Pumelo, siam weed, hispa, paddy	Shri Satish Kalita, Boutepoa Bari Village, Jalah block, Barpeta (Assam) 781 328
588.	Method of insect-pest management in rice	Most of the paddy growers of Rohru and Chirgaon villages in Shimla districts of Himachal Pradesh plant twigs of kainth (Pyrus pashia) in the periphery of the fields after paddy seedling are sown. These keep away insect pests from damaging the paddy. It is seen that insect pests are reduced by 50% the use of kainth twigs. **Keywords:** paddy, kainth twigs, damage prevention from insect pest	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207
702.	Herbal pesticides for control of insect pests in wheat and rice crop	Wheat and rice are infested by a number of pests. Use of herbal pesticide minimizes the attack of insect pest on paddy. This herbal pesticide is prepared by mixing cow urine, nirgandi (Vitex negundo) leaves and hing (asafoetida). This mixture in appropriate proportion is considered effective bio-pesticide for wheat/rice pests. It contains certain ingredients	Shri Rajinder Rajan, Rajan Tyre Service, Theog, Shimla (Himachal Pradesh) 171 201

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		having insecticidal as well as insect-repellant property, which makes it useful for control of insect pests of paddy crop. The leaves of nirgandi (Vitex negundo) are boiled in water (about 30–40 leaves in 10 litres water) till condensed to one liters. About 10 g asafoetida is then mixed in it. These ingredients are mixed in about 5 litres cow urine. This mixture is then filtered and used (sprayed) as bio-pesticide over affected crops. This spray is effective for all sowing seasons, i.e. early sowing, normal or late sowing seasons of the crops. This ITK has been practised in Theog area of Shimla district, Himachal Pradesh since time immemorial. Now-a-days only cash crops such as cabbage, cauliflower, tomato etc. are grown in this area,with declining acreage under paddy. **Keywords:** bio-pesticide, paddy crops, Vitex negundo leaves, cow urine, pest control, asafoetida.	
1108.	Method of herbicide application through glass bottle having holes in the cork	Generally herbicides are broadcast after mixing it with sand. In the disclosed practice instead of broadcasting, the herbicides are poured through glass bottle having holes in the cork. This practice is labour and time saving. 30% of the farmers in Badhani Jaimal Singh village of Punjab are following this practice for last 4–5 years. **Keywords:** herbicide, poring, glass bottle, holes, cork	Shr Gursewak Singh Badhani Jaimal Singh Ghal Khurd, Ferozepur (Punjab)
1115.	Control of khaira disease in paddy by application of lime and cowdung	Khaira disease has been reported in many villages of Bareilly and Badaun districts of Uttar Pradesh. The disease is caused by mineral deficiency. About 2–3 kg of lime and one bucket of cowdung are mixed in 200 litres of water. This solution is sprayed on the affected crop of paddy. One spray controls the disease by 50%. The farmers use this indigenous practice to control the disease. **Keywords:** mineral deficiency, khaira disease, lime + cowdung mixture	Dr. Shagufta Jamal Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1116.	Control of gandhi bug by spray of garlic and tobacco leaves extract with washing powder in water	Gandhi bug is a highly damaging insect of paddy crop. The insect sucks milk of the tender paddy grains at the initial stage. The grain formation is stopped and the paddy seeds remain hollow. The yield is affected very badly, up to 80%. The solution is made of extract of 1 kg garlic, g tobacco leaves and 200 g washing powder dissolved in 200 litres water. The	Dr Shagufta Jamal Department of Adult and Continuing Education and Extension Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		 Garlic, tobacco leaves and washing powder to control gandhi bug in paddy solution is sprayed on the affected crop of paddy. One spray controls the insect by 80%. This practice is used by the progressive and well-to-do farmers in Bareilly and Badaum districts of Uttar Pradesh. **Keywords:** gandhi bug, spray of garlic, tobacco and washing powder solution	
1381.	Control of rice hispa by parasi leaves	During vegetative phase, farmers of Bara Sigdi village of East Singhbhum district observe symptoms of whitening of paddy leaves. To control it, fresh leaves of parasi tree are broadcast in paddy fields with standing water. Parasi leaves are used to control the pests/insects of paddy, particularly rice hispa. Parasi leaf has strong bitter taste, which is toxic to the insects, thus it work as repelling agent. This is age-old practice, followed by all the farmers in the Bara Sigdi village. **Keywords:** rice hispa, parasi, paddy, toxic, pest/insect	Shri Vibhishan Paryavaran Chetna Kendra, Bara Sigdi, Potka,East Singhbhum (Jharkhand)
1387.	Control of insect/pests in paddy	Farmers of Buribara village of west Singhbhum district in Jharkhand used custard apple (Annona squamosa) for pest control in paddy crop. Leaves and seeds of custard apple contain chemical having insecticidal properties. Insect/pests of paddy crop are controlled by broadcasting leaves or seeds of custard apple because smell of leaves acts as repellent, whereas leaves are toxic in nature to plant parasites. Leaves are used raw whereas seeds are processed and used as a powder. This is age-old practice and fol-lowed by every farmer. **Keywords:** insect/pest, paddy,custard apple (Annona squamosa), leaf, seed, insecticide	Shri Vishwajit Doraibru Shri Haricharan Bodra, ASRA Building, Tambo, Chaibasa, West Singhbhum (Jharkhand)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1388.	Pest and disease management in paddy	Farmers of Buribara village of West Singhbhum district of Jharkhand use this practice to control pests infecting root and stem in paddy crop. When tissue borer, paddy gallfly, rice-root aphid and mealy bugs attack the paddy fields, the plants turn yellow, shoots becomes dry and plant growth is stunted. When visible symptoms are observed at the initial stage, leaves of sindwar (Vitex negundo) are to be broadcast in the paddy fields. Sindwar leaves acts as repellent. This is age-old practice and followed by every farmer. **Keywords:** pests/insects, disease, tissue borer, paddy gallfly, rice-root aphid, mealy bugs, sindwar	Shri Vishwajit Doraibru Shri Haricharan Bodra ASRA Building, West Singhbhum (Jharkhand)
1389.	Control of rice hispa by mahua byproduct in paddy	Rice hispa is common pest in paddy that infests the crop during the vegetative stage. Symptoms of white patches appears. Application of baska (i.e. mahua by product), is obtained in the process of making alcohol from mahua) helps in controlling rice hispa as well as increasing the fertility of soil. Baska, being toxic and having pungent smell, controls the spreading of the insect/pest in rice. This practice is used since ages without any modification and is followed by minimum number (about 10–15% of farmers) in the Angardia village of wWest Singhbhum. **Keywords:** rice hispa, insect/pest, baska, mahua, pesticide	Shri Lenga Purty, Angardia Khetiatangar, Chibasa, West Singhbhum (Jharkhand) 833 201
1391.	Insect pest management in nursery plots	Farmers of Hatma village of Ranchi district use this practice for controlling the insect/pest attack and damping off in vegetable nursery. In this practice paddy straw is burnt in nursery plots after the first ploughing. Due to burning of straw the soil becomes sterilized and free from insect/pest. Ash acts as potash. **Keywords:** insect/pest, nursery plot, paddy straw, soil, potash	Shri Veeresh Kumar Departmnet of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand)834 006
1394.	Use of neem leaves for control of banki disease in paddy	Neem has insecticidal property. Banki disease of paddy is common in these areas. Leaves of neem are spread in the field to control banki. The practice is done in Okhargarha village of Kanke Block of Ranchi district of Jharkhand. The success has been observed in more than 50% of the cases. Cost: benefit ratio of this practice is 1 : 6 approximately. **Keywords:** neem leaves, paddy, banki disease	Shri Rajev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1396	Control of gandhi bug (Leptocorisa acuta)	Farmers burn discarded rubber tyre in the field by holding it in their hands. Gandhi (Leptocorisa acuta) bug are attracted towards it. This method is effective in protecting rice crop from gundhi bug. This is age-old practice, adopted by farmers of Tamar block of Ranchi district in Jharkhand. **Keywords:** gandhi bug, Leptocorisa acuta, rubber tyre, burn	Ms L. Kispota Ms Seema Singh Shri R.S. Prasad Department of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1397.	Control of case-worm (Nymphula depunctalis)	In the practice, farmers use kerosene oil-soaked chord to control caseworm in rice. About 70–80% pest control is observed with this practice. It is practised for last several years by maximum number of farmers in Tamar block of Ranchi district in Jharkhand. **Keywords:** caseworm, Nymphula depunctalis, kerosene oil, rice crop, insect/pest	Ms L. Kispota Ms Seema Singh and Shri R. S. Prasad Department of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1398.	Protect rice crop from lahi and gandhi bugs by bhelwa branches	Majority of farmers of Ranchi district of Jharkhand use branches of bhelwa tree to protect rice crop from lahi and gandhi bugs. They collect branches from bhelwa tree and plant these in rice field. This practice keeps insects away from rice crop. **Keywords:** bhelwa, lahi,gandhi bug	Ms Rasmi Kandulna Hawai Nagar, Hatia, Ranchi (Jharkhand) 834 003
1404.	Control of paddy caseworm (Nymphula depunctalis) with sindwar leaves	Sindwar leaves are locally available, which act as intoxicant on the insects. In this practice, sindwar leaves are boiled in water and the solution is cooled. It is sprayed on the crops (1 kg leaves per 5 litres water for 0.06 acre) with the help of broom to control caseworm (Nymphula depunctalis). By this practice 60% caseworm is controlled. This is in practice for last 25 years by maximum number of farmers in the village. **Keywords:** sindwar, paddy, caseworm (Nymphula depunctalis), broom	Shri Veeresh Kumar Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1405.	Control of rice hispa by basi mar	Rice hispa damages rice crop severely during early stage of cropping. To control the rice hispa, people of Kurchi village of Dhanbad district (Jharkhand) use basi mar spraying in the plot. Alternatively farmers fill up their plots with water in early morning. They shake the crop with silver oak or maize stick. Later stick is fixed in the middle of plot. Then water is allowed to drain from this field. They continue this practice for 2 to 3 days. All farmers of the village are using this age-old practice.	Shri Ashu Mahto Kurchi, Ghortoppa, Dhanbad (Jharkhand)

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		Keywords: rice hispa, basi mar, silver stick, maize stick, rice field	
1406	Control of rice case- worm in paddy using bamboo shoot extract  Bamboo rhizome used in control of rice case worm	Farmers of Bharajo village of Hazaribag district of Jharkhand are adopting this method to control case-worm in paddy. Tender bamboo shoots, locally known as karil, are immersed in water for 2–3 days. One kg karil is soaked in 4 litres water. After 2–3 days, the extracted solution is sprayed in the paddy field affected with rice case-worm. About 50 litres of extracted solution is required for spraying 1 acre paddy field. The insects are controlled within 6–7 days of the application. After removal of the extracted solution the bamboo shoot is used for preparation of pickles, curries etc. About 295 farmers are practising this traditional method. **Keywords:** karil, insects, case-worm	Shri Seva Mahto Shri Basudev Lal Shri Ishwar Mahto Shri Baijnath Mahto Bharajo, Jharpo, Hazaribag (Jharkhand) 825 327
1407.	Control of gandhi bug in paddy by neem flowers	Farmers of Bara Sigdi village of East Singhbhum district face a problem of gandhi bug during milking stage in paddy crop. This problem is controlled by tying neem (Azadirachta indica) or kujri flowers in small bundles in 5–6 places; bugs are repelled by using this practices. About 98% farmers are practising it in the village. **Keywords**: gandhi bug, paddy, neem (Azadirachta indica), kujri	Ms Salge Marande Paryavaran Chetna Kendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand)
1408.	Control of rice hispa by fruits of keond/kendu/tendu tree0	Incidence of rice hispa is common problem at vegetative stage of the crop. It is controlled by applying crushed fruits of keond/ kendu/tendu tree in paddy fields. Farmers of Bara Sigdi village of east Singhbhum district in Jharkhand believe that bitter and acrid taste of the leaves and unripe fruits become toxic for insects. This practice is successful in controlling the pest up to 95–98%. **Keywords:** rice hispa, keond/kendu/tendu, insect	Shri Sideshwar Paryavaran Chetna Kendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand)
1410.	Use of bamboo in control of pests in rice	The pest in rice crop is controlled by using bamboo's suckers or stems, In this age-old practice, suchers or young stems of bamboo are cut int small pieces and kept in a pot with water for 3 days to decay and release bad smell. Then it is applied into rice fields @ 10 Kg/100 square meters for about 1 week interval. Few farmers of the Chiru village of West Singhbhum	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterianary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 016

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		district in Jharkhand follow the practice. **Keyword**: bamboo, pest, sucker/stem, rice field	
1412.	Control of rice hispa in rice	Rice hispa or white patches are very common in paddy crop. They can be controlled by dusting the sand and kerosene oil mixture (5 : 1). The success rate of this practice is almost 20–25%. It is practised for the last 40–50 years by maximum number of farmers in the Oraina village of Nawda district of Bihar. **Keywords:** rice hispa, white patches, sand, kerosene oil	Shri Arun Kumar Singh Oraina, Nawada (Bihar)
1414.	Control of gandhi bug by dead snake	People of Gumdapokher village of West Singhbhum district of Jharkhand use this practice for protecting rice crop from gandhi bug. In this practice, dead snake is hanged by the side of the rice field. Great risk is involved in trapping or killing the snake. **Keywords:** gandhi bug, snake, rice crop	Shri Sanat Kumar Sawaiyan, Dumbisai, Chaibasa, West Singhbhum (Jharkhand) 833 201
1418.	Control of caseworm (Nymphula depunctalis) by pasu and sali leaves	Caseworms are very common in the area of Khaspokharia village of west Singhbhum district in Jharkhand. Fresh leaves of pasu (Cleistanthus collinus) and sali (Boswellia serrata) are spread on the insect-infested field @ 5 kg leaves per 100 m2. Majority of insects (about 70–80%) are controlled with this practice. **Keywords:** caseworm (Nymphula depunctalis), pasu (Cleistanthus collinus), sali (Boswellia serrata), spreading of leaves	Shri Sanat Kumar Sawaiyan, Dumbisai, Chaibas, West Singhbhum (Jharkhand) 833 201
1420.	Control of banki disease of paddy by Sandhna	Banki disease in paddy is common in Chandwe village of Kanke block of Ranchi. To control the pest, sandhna is mixed with water. The water is then sprayed or sprinkled on the affected paddy plant. The benefit claimed by this method is more than 50%. Cost: benefit of this practice is approximately 1 : 6. **Keywords:** banki disease, paddy, sandhna	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834 004
1422.	Control of gall fly (Pachydiplosis oryzae) in rice	Gall fly (Pachydiplosis oryzae) is very harmful to rice crop. It damages whole crop of rice. Farmers of Tamar block of Ranchi district in Jharkhand use parso/persu (Creistanthus collinus) leaves for controlling gall fly. In this practice, fresh leaves of parsu/persu are collected and spread in the infested field without processing. About 10 kg leaves are required for 100 m² area. These leaves are spread at the initial stage of infestation. These controlled 70–80% insects. All farmers of the village use this age-old practice. **Keywords:** gall fly, Pachydiplosis oryzae, parso/persu, Cleisanthus collinus, rice field and spread	Shri R.S. Prasad Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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		required for 100 m² area. These leaves are spread at the initial stage of infestation. These controlled 70–80% insects. All farmers of the village use this age-old practice. **Keywords:** gall fly, Pachydiplosis oryzae, parso/persu, Cleisanthus collinus, rice field and spread	
1822	Pest management in rice	Farmers of Raipur district in Chhattisgarh are practising some methods to control pests in rice which are indicated here. Kodo straw is spreaded over stagnated water to control pests and salfi palm and karla sticks are installed in stagnated water to reduce the pests attack in rice field. The control of insects by salfi palm, kodo straw and karla sticks have some insecticidal properties which reduce the insect population. **Keywords:** kodo straw, salfi palm, karla sticks, standing water, alkalois	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492 012
1831	Rust control in paddy with garari  Garari plant used for control of rust in rice	Farmers of Seoni and Balaghat districts of Madhya Pradesh use leaves and branches of garari (Cleisanthus collinus) tree to control insect pests in paddy crop. The farmers collect branches of the tree from nearby forest generally at the time of local festival poley during August and place in the paddy fields in standing position. Usually 15–20 branches are placed in an acre of paddy area. After one month again in the month of September, about 10–15 bags of garari leaves are dispursed in the paddy field. The farmers reported that this controls insects and pests in paddy crop. Garari is a perennial tree with 40–50 height. Its wood is used in making house and agricultural implements. Datari used for mulching in paddy fields is also made with garari wood. Farmers reported that this also controls insects in paddy fields. **Keywords:** garari, Cleisanthus collinus, poley festival, datari	Training Organizer KVK, Seoni (Madhya Pradesh) 480 681
1839	Application of FYM just before transplanting for control of leaf folder	Paddy farmers of Chhindwara adopt the practice of applying two cart loads of FYM in an acre for over coming problem of leaf folder. It is spread just before transplanting. One precaution is taken that, FYM should be completely decomposed. FYM helps in killing the insect causing leaf folding. **Keywords:** FYM, leaf folder, transplanting	Shri Ranjay Kumar Singh Pl D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2066	Use of cycle tyre to control mealy bug in paddy	The discarded cycle tyre is burnt, dragged around the field and kept in wind-ward direction. The smoke and smell coming from the burning cycle tyre is assumed to repel the mealy bugs in the paddy crop, resulting in their reduced incidence. **Keywords:** cycle tyre, burning, mealy bug, paddy	Shri K. Lakshmana Ph.D. Scholar, P.G. Hostel, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2073	Burning of sudda in the nursery beds	Farm waste/trash is allowed to burn in the nursery bed before sowing. The heat thus generated by burning results in sterilization of nursery beds, besides addition of valuable potash to the soil in the form of ash. It is practised in chilli and all vegetables where nursery is raised. **Keywords:** burning trash, nursery beds	Shri Venkat Reddy Krishi Vigyan Kendra, Malyal, Mahabubad, Warangal (Andhra Pradesh) 506 101
2084	Burning of waste material in field to raise nurse	The stubbles and fallen leaves collected are spread on the nursery area uniformly and burned. Ploughing is done to incorporate them in the soil. The heat produced by burning sterilizes the soil and kills the harmful microbes and controls damping off in nursery. It is practised in late kharif and summer. **Keywords:** burning, waste material, nursery	K.V.S. Rami Reddy KVK, ANGRAU, Reddipalli, Anantapur (Andhra Pradesh) 515 701
2086	Use of ash in paddy nursery	Ash is dusted on the pre-germinated paddy nursery before the occurrence of heavy rain. This practice prevents toppling of seedlings and also accumulation of seedlings on one side. This is being practised by paddy growing farmers of Gooty region in Andhra Pradesh. **Keywords:** paddy nursery, heavy rain, dusting ash	Krishi Vigyan Kendra, ANGRAU, Reddipalli, Anantapur (Andhra Pradesh) 515701
2088	Control of swarming caterpillars in paddy	T h e swarming caterpillar in paddy is controlled by broadcasting boiled rice mixed with hen blood after making in the form of pellets. Smell of blood and rice attracts birds to the fields and they pick up the swarming caterpillars. **Keywords:** rice, swarming caterpillar, boiled rice, blood	Shri Dorai Raj Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2096	Effigy in the paddy field to scare away birds	By keeping one effigy per acre (a man-like toy made of rice straw wearing white dress) at the centre of the paddy field at the time of milky to grain-filling stage, the bird menace can be reduced. As the effigy appears like human, the birds fly off; thereby damage is reduced. **Keywords:** human-like effigy, paddy	Shri K. Lakshmana Ph. D Scholar, Room No 81, PG Hostel, College of Agriculture, Rajendranager, Hyderabad (Andhra Pradesh) 500 030

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2101	Tobacco plant powder in rice to control stem borer and leaf borer	Application of tobacco plant powder at 7–10 days after transplanting of rice in kharif effectively controls the stem-borer andleaf folder over chemicals, as it contains nicotine sulphate, which acts as a repellent. **Keywords**: tobacco extract, rice, leaf webber	Shri Sudhakar Reddy Yelapanoor, Valugodu, Kurnool (Andhra Pradesh)
2102.	Control of paddy pest with bio-pesticides	Erecting fishtail palm branches, jeluga @ 25–30 kg/acre, scattered once in the rice in rainfed uplands control the leaf-folder and stem borer. This contains an alkaloid which acts as a repellent. **Keywords:** paddy pest, bio pesticide	Shri Arika Sukku Thennulhaija, Kurupan, Vizianagaram (Andhra Pradesh)
23.	Control of termite in wheat by seed treatment with cow urine	Before sowing, wheat seed is treated with cow urine. Seed is dipped in cow urine, or cow urine is sprayed on the seeds. After drying the seeds under shadow, sowing is done. Attack of termites at germination is reduced. **Keywords:** cow urine, termite, wheat	Shri Ram Deo S/o Her Deo Jat, Blaya, Mundva, Nagaur (Rajasthan)
484.	Maize seed treatment with soot to control insect infestation	In this practice the farmers of Porba village under Phek district of Nagaland use soot, the black carbon deposit from kitchen, as seed treatment for maize. This soot is collected and crushed into powder form, which is then mixed with maize seed at sowing. This method prevents the seed from being eaten up by a particular ant. Thus, the germination rate of seeds is greatly enhanced. It has the efficacy up to the extent of about 70%. The practice is in use for the past 20–25 years by about 70% of the farmers. **Keywords:** soot, maize, germination	Shri Shekhozo T. Vadeo Porba Village, P.O. Pfutsero, Phek (Nagaland) 797 107
1835.	Use of asofoetida for seed treatment of Jowar to control ergot disease	Solution is prepared by mixing 75–100 gms of asfoetida in 1 litre water. Then it is mixed with the seed and dried under shed. The crop of jowar is free from ergot disease. **Keywords:** asfoetida solution, ergot disease.	Shri Ranjay Kumar Singh Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
2079.	Caterpillar-catching net	Caterpillar-catching net for trapping Heliothis caterpillars in sorghum seed-production plots. **Keywords:** sorghum, caterpillar-trapping net	Shri A. Maheswara Reddy Peddatekuru, Kallur, Kurnool (Andhra Pradesh)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2083.	Dusting of ash on sorghum for control of sucking insects and powdery mildew	Sucking pests such as aphids/ jassids can be controlled by dusting ash on sorghum leaves. It also controls the occurrence of powdery mildew. **Keywords:** ash, sorghum, pest control	Shri K.Setharamaiah Alinagar, Nandyal, Kurnool (Andhra Pradesh)
21.	Cow urine (gau-mutra) as seed treatment for gram	In Dugar village of Jodhpur district, there is a problem of termite attack on newly sown gram. To over-come this problem, the seed is treated with gau-mutra, which is collected in a big utensil. The treated seed is dried under shade, and then the sowing has to be done. It is being followed form last three generations. **Keywords**: gram, seed treatment, gau-mutra	Shri Narpat Singh, Dugar, Sheigarh, Jodhpur (Rajasthan)
469.	Use of cow urine to control storage pests of lentil	The farmers of Baghmara village, under Jalah block in Barpeta district of Assam use cow urine to control storage pests in lentil seed. Lentil is not extensively grown in this region but since it is highly susceptible to storage pests, farmers coat the seeds with cow urine before storing it. Neem leaves are also used as alternative method. About 20 farmers are using this practice since all the farmers do not grow lentil. The practice has been in use since 6 years. **Keywords:** cow urine, lentil seed, storage pest, neem leave	Shri Pankaj Kalita, Baghmaras village, Jalah block, Barpeta (Assam) 781 328
1810.	Control of pigeonpea pest by use of jaggery	Fine pieces of 2 kg jaggery are added in 1 liter water and boiled,and then 100 litres water is added to the jaggery solution and sprayed to the crop. About 70% pest is killed within 2 hours and 20% pest is killed in next 48 hours. The control is very effective at the time of flowering stage of pigeonpea plant. Jaggery in water along with 20g tobacco is also used. About 300 farm families of Dour village in Nanded district of Maharastra are practicing this method. **Keywords:** jaggery, pigeonpea, tobacco, ants, aphid	Shri V.R. Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
1811.	Control of incidence of sucking pests by dusting with wood ash	Fire wood ash is dusted uniformly on leguminous crops such as cowpea, wal etc., which acts as a barrier and prevents sucking pests like aphids and thrips from damaging the crops. This is a practice adopted by Shirwal villagers of Dodamarg taluk in Sindhudurg district of Maharashtra for the past 50 years and still 30 families are using the practice. **Keywords:** firewood ash, dusting, leguminous crops, aphids, thrips	Shri Narayan Baburao Desai, Shirwal, Dodamarg, Sindhudurg (Maharashtra) 416 511

Code No.	Title of ITK	Description of ITK	Name andaddress of discloser/facilitator
1813	Use of folk musical instrument to control pod borer	After sowing of seeds, the rural folk play music with tinki, tansa, tansi, etc., loudly. This avoids/checks pod borer (illi) attack on crops. It is said that this checks the adult insects to make pairs and mating resulting into growth check. **Keywords:** play music instruments like tinki, tansa and tansi, control of pod borer	Shri Swami Triptanandji C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
1814	Control of pod borer by dusting dung cake ash and smoke of burning tyre	Where there is attack of pod borer (illi) on the crop, the people use dusting of dung cake ash on the crop and make smoke by burning tyres and tubes. This makes the insects dull and fall down. **Keywords:** pod borer (illi), dung cake ash, smoke of burning tyres and tubes	Shri Swami Triptanandji C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
1815	Control of chickpea pod borer by neem seed extract	Shri Shaikh has developed a practice for controlling chickpea pod borer in crop by using neem seed extract. Dried 5 kg neem seeds are powdered and 10 liter water is added and kept overnight. The extract is filtered and 90 litres of water is added to get 5% neem seed extract. About 200 g washing powder is added with the extract for sticking and spreading of the extract on the leaves. Ten farmers in Soni village of Sangli district in Maharastra are practising this method since one year. **Keywords:** neem seed extract, washing powder, water, pod borer	Shri A.A. Shaikh Krishi Vigyan Kendra, C-4/3, V.S.S.S Karkhana Colony, Sangli (Maharastra) 416 416
1824	Mixed sowing of sorghum with pigeonpea and chickpea to control pests	Farmers in the villages of Solapur district mix-few grams of sorghum seed with pigeonpea and chickpea at sowing. These sorghum plants are equally distributed in the field at an interval of 20 to 30. These sorghum plants act as bird perches. The bird picks up the larvae of pests and feed on them. This ITK plays a role in methods of biological control, which is one of the important components of integrated pest management. It is being adopted since long back by the farmers in all the villages. **Keywords:** pigeonpea, chickpea, sorghum, bird perch	Dr G. Y. Purlekar Assistant Professor, ZARS, Solapur (Maharashtra)
1834	Use of curd for seed treatment of bengalgram	Bengalgram seed is treated with curd before sowing. The curd is spread over the seed just to smear it on seed coat. The seed is then dried under shed. Farmers of Nandurbar, Maharastra believe that there is less incidence of wilt disease by this method. **Keywords:** curd, bengalgram seed, wilt disease	Prof. P.S. Patil TrainingOrganiser, KVK, Dhule (Maharashtra) 424 004

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2068	Light trap to control leaf hopper and red hairy caterpillar	Lighting of fire during night is practised in the adjacent field of mesta and groundnut. The adult leaf hoppers (Amrasca biguttula) in mesta and red hairy caterpillar (Amsacta albistriga) in groundnut are attracted towards the light and fall into it. It is an age old practice. Recently modern lights are being used. **Keywords:** light trap, leaf hopper, red hairy cater-pillar	Shri K. Lakshmana Ph.D. Scholar, Room 81, PG Hostel, College of Agriculture, ANGRAU, Rajendra Nagar, Hyderabad (Andhra Pradesh) 500 030
2075	Shaking of pigeonpea plants for control of pod borer (Helicoverpa armigera)	During the peak period of infestation, the pigeonpea plants are shaken 2 to 6 times, depending on the population of larvae. The plant shake is to dislodge the caterpillar and at the same time these are collected in a ploythene sheet which is spread on the ground under the tree. These caterpillars are destroyed by burning. About 10–12 larvae are dislodged per plant, the success of shaking is rated as 97%. **Keywords:** pigeonpea shaking, pod borer	M.S.Chari Centre for World Solidarity, H.No. 12–13–148, Street No.1, Tarnaka, Secunderabad (Andhra Pradesh)
2097	Vegetative trapping of red hairy caterpillar	The use of Calotropis /Jatropha twigs @ 1 cartload/acre as trap in castor, sesamum and groundnut in the early rainy season attracts red hairy caterpillars due to the smell of the latex or chemicals contained in the leaf. The larvae are collected and burnt. It is more economical and easily accessible over the use of light/ pheromone traps. **Keywords:** red hairy caterpillar, trap	Shri Lingaiah, Secretary, (CROPS), 4–5–15 Venkannakunta, Jangoan, Warangal (Andhra Pradesh)
2100	Treating the bengalgram seed with well fermented butter milk	Bengalgram seed is treated with well fermented butter milk and shade dried at sowing leads to reduced incidence of wilt and dry root rot due to acidic nature of butter milk and this yeast affects growth of wilt-causing fungus. The treatment is environmentally safe, economically viable over the seed treatment with pesticides. **Keywords:** bengalgram, seed treatment, buttermilk	Shri K. Siva Rami Reddy Nagala Puram, Oudur, Kurnool (Andhra Pradesh)
25	Seed treatment of groundnut with kerosene oil for control of white grub	Farmers of village Bhutera, Bagronka Bas in Govindgarh Panchayat Samiti and Bhadhal in Sambhar Panchayat Samiti are facing problem of white grub in groundnut crop. They have evolved a technique to control the problem of white grub by providing seed treatment with 1 litre kerosene for 70–80 kg groundnut kernel. Kerosene oil is mixed with the kernel before sowing. With this treatment	Shri Harphool S/o Shri Rughunath, Shri Sarwan Kumar, S/o Shri Rughnath, Shri Ram Chandra, S/o Shri Lala Ram, Shri Mahadev, S/o Shri Satya Narayan,

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		they have minimized the attack of white grub. **Keywords:** kerosene oil, seed treatment, white grub	Shri Gorishankar, S/o Shri Nathu Ra Netra, Bhutera, Govind Garh Jaipur (Rajasthan); Shri Laxmichand S/o Shri Moti Ram Netra, Bagron ka Basvia Kaladera, Govind Garh, Jaipur (Rajasthan); Shri Sugan Lal S/o Shri Kishna RamTakher Shri Bhadhal, Sambhar Lake, Jaipur (Rajasthan)
166	Control of red hairy caterpillar in groundnut by trap crop	Cowpea is grown with groundnut as trap crop in mixed cropping system. Groundnut (100 kg seed/ha) and cowpea seed @ 5 kg/ha is sown. Cowpea attracts r e d hairy caterpillar, saving the main crop. This practice helps control the caterpillar attack on groundnut by 65%. While the insect feeds on cowpea, it is picked up by hand and destroyed. About 75% farm families of Kagawad village in Belgaum district of Karnataka are following this practice for the last 65 years. **Keywords:** cowpea, trap crop, red hairy caterpillar, groundnut	Shri Yashwant Sectaram Kagawad, Anthani, Belgaum, (Karnataka)
2071	Shri Yashwant Sectaram Kagawad, Anthani, Belgaum, (Karnataka)	The damaged audio tapes are tied horizontally over the field of sunflower at grain filling stage of maturity. The tape acts as a reflecting ribbon and the birds gets scared away and crop is protected from birds. **Keywords:** reflecting ribbons, sunflower fields	Shri Venkata Reddy Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2080	Use of oiled coir rope to repel the pigs in sunflower and groundnut crops	The coir rope is dipped in oil and sulphur is added to it, and the rope is tied around the field, which repels the pigs that damage and eat the sunflower and groundnut crops. It has advantage over use of electricity points to kill the pigs, as in every field electric lines are not available, moreover it involves very low cost. **Keywords:** oiled coir rope, sunflower	Shri Ramachandra Reddy Gadivemula, Kurnool (Andhra Pradesh)
2082	Raising of sorghum/ bajra as border crop in sunflower and	About 3–4 rows of sorghum/ bajra crop are grown around the main field such as groundnut and sunflower. These plants act as border crop for reducing the entry of pest and disease spores from	Shri Y. Jagamatha Reddy Koratamaddi, Gadevemula, Kurnool (Andhra Pradesh)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
	groundnut against viral diseases	other fields such as bud necrosis in groundnut, which also increases the parasites or beneficial organisms to the farmers. **Keywords:** border crops, sorghum	
1109	Management of painted bug in mustard by ajwain intercropping	Ajwain seed is sown with mustard seed. This reduces the attack of painted bug in mustard crop. Ajwain might act as repellent. This practice is followed in Mandia Khurd village of Rewari district (Haryana) since many years. **Keywords:** painted bug insect of mustard crop, ajwain, repellent	Dr Kapur Singh Chief Training Organizer, Krishi Vigyan Kendra, Rampura-Rewari (Haryana) 123 401
1796	Use of neem extract to control Oberia brevis and Decrisia obliqua in soybean	Oberia brevis and Decrisisa obliqua in soybean are controlled by spraying neem leaf decoction, prepared by collecting 6–8 kg green neem leaves. The leaves are boiled in 10 litres water till the solution is turned dark-brown and then it is filtered. About 7–8 litres of decoction is mixed with 70–80 litres water and sprayed two times at 5–6 days interval. About 60–70% insects are controlled effectively by this practice. This is being used from 15–20 years in Linga village of Mokhed block in Chhindwara district of Madhya Pradesh **Keywords:** neem extract, soybean pests	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128  Neem leaf extract used in control of insect pests in soybean
1797	Control of larvae of spotted bollworm and armigera in soybean	Spotted bollworm and armigera in soybean are controlled by spraying of ipomoea decoction. About 1000–1200 green leaves of ipomoea are soaked in 30–35 litres of water and boiled till the solution turn milky-white which is filtered after cooling. It is ready for spraying by mixing with 10–15 litres of water. Spraying is done twice at 5–6 days interval. By this practice 70–80% insects are controlled effectively. This practice is in use for last 10–15 years by 50–100 farmers in Linga village of Chhindwara district in Madhya Pradesh. **Keywords:** ipomoea, armigera, bollworm, decoction	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128  pomea leaf extract used in control of spotted ballworm larvae and armigera in soybean

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1826	Use of tobacco decoction to control the larvae of Heliothis armigera in soybean crop	Farmers of Azamgarh collect 1.5–2.0 kg green leaves of tobacco and boil in 5–6 litres of water till the solution becomes bark brown. Then it is filtered and kept for 6–7 hours for cooling. 4–5 litre decoction is mixed with 70–80 litres of water. The solution is sprayed over the affected crop. The practice is repeated at 5–6 days interval. This controls Heliothis armigera in soybean **Keywords:** tobacco decoction, spray, Heliothis armigera, soybean	Shri Ranjay Kumar Singh Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
519	Control of aphids by using neem extract	The extract of neem seeds/leaves possess insecticidal properties which is sprayed on the aphid infested crops. Thus the aphids are controlled effectively. This technique is cheaper than the chemical application **Keywords:** neem extrct, spray	Shri Hari Prasad Vashishth Assistant Agric. Inspector, Joshimath Chamoli (Uttaranchal)
2069	Escaping onslaught of Red Hairy Caterpillar (RHC) by postponing sowing of castor	Caterpillars which occur during the mid-June to end of July can be made to escape by postponing the sowing of castor from 3rd week of June to August. Later the larvae enters into pupation in the soil. But the delay in sowing the crop may encounter the moisture stress at terminal stages. **Keywords:** escaping, RHC, delayed sowing, castor	Shri R. Lingaiah, Secretary, (CROPS) 4–5–15, Venkanna Kunta, Warrangal (Andhra Pradesh)
2070	Early detection of RHC incidence	Farmers identify the presence of early instars of RHC on grasses and weeds a few days after soaking rains even before germination of crop. Farmers look for nibbling of leaves of grasses and weeds and later confirm it on germinated crop. Detection of early instars help in early control of RHC. Preventing migration, trapping caterpillars, identification of host spots for further treatment. **Keywords:** RHC incidence, early detection	Shri R. Lingaiah, Secretary, (Crops), 4–5–15, Venkanna Kunta, Warangal (Andhra Pradesh)
1821	Growing of sorghum plants in scattered manner in cotton field	In rainfed cotton, sorghum plants are sown in scattered manner, which provide avenue for birds to perch and eat larvae of pests on cotton. This is one of the method controlling cotton bollworm. The idea is that the sorghum plants attract the birds to eat grains and when they come for eating grains, they also pick the larvae on the cotton crop. This is a practice, which has been in use by the villagers of Chande of Dhule district in Maharashtra for 20–30 years and 20–30 farmers are using the practice. **Keywords:** cotton, sorghum, birds perch, larvae	Shri P. S. Patil Training Organiser, Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004

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2081.	Raising border crop in cotton/groundnut	Around 100 plants of castor per acre are grown on the field bunds in the Spodoptera-affected field crops, because of its broad leaves. Spodoptera lays eggs on castor rather than on field crop leaves and skeletenize the leaves. These leaves are removed from the field. **Keywords:** border crop, castor	Shri K. Lakshmanna Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
1837.	Use of neem oil for control of stem borer in sugarcane	Neem oil @ 3–4 litre per acre is sprayed with help of broom sprayer to control stem borer in sugarcane. The practice is followed by resource rich farmers **Keywords:** neem oil, cash crop	Shri Ranjay Kumar Singh Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
2095.	Galo disease control in sugarcane using Calotropis extract	By spraying the extract obtained from Calotropis twigs, i.e. 10 kg of twigs immersed in water for 10 days and extract is sprayed for 1 acre during December. It effectively controls the galo disease in sugarcane. **Keywords:** sugarcane, galo disease, Calotropis	Shri K. Lakshmana Ph. D Scholar, Room No 81, PG Hostel, College of Agriculture, Rajendranager, Hyderabad (Andhra Pradesh) 500 030
18.	Control of termite in wheat	For termite control in wheat 20 kg Calotropis leaves are decomposed in 150 litres water for about 15 days. This decomposed water is mixed with irrigation water to control termite in wheat crop in Ramchhodpura village of Unjha in Mehasana district of Gujarat. This practrice is cheaper, easy to adopt and does not have any adverse effect on the environment. **Keywords:** termite, wheat	Shri Patel Amrutbhai Lakhubhai, Ranchhod Pura, Unjha, Mehsana (Gujarat)
27.	Incorporation of tobacco residues in soil for controlling termite	Farmers incorporate sticks and rootlets of tobacco into the soil, using disc harrow, which controls termite in the field due to nicotine content in the tobacco debris. Shri Thakor Ishwarji Jujaji of village Rampura, Taluka Deesa of Banaskantha district of Gujarat practices this method. His farm has sandy soil. This treatment helps in controlling the termite. The practice is very cheap, economic and easy to follow. **Keywords:** termite, tobacco debris, nicotine	Shri Ishwarji Jujaji Thakur Rampura, Deesa, Banaskantha (Gujarat)
361.	Control of termites by Calotropis	About 8 to 10 kg Calotropis plant material is soaked in water for 24 hours, processed, boiled and filtered, and the liquid is poured on the termite-infested soil. Juice of Calotropis kills termites. This is being	Ms Mamata Mahapatra L 294 Barmunda, Housing Board Colony, Bhubaneshwar (Orissa)

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		followed in Makarbili village of Nawapada district in Orissa with 40–50% effectiveness. **Keywords:** Calotropis extract, termite control	
1104.	Termite control by kerosene oil	The farmers in Pandri Halwa village of Bareilly district in Uttar Pradesh use kerosene oil (2.5 litres/acre) in the termite-affected paddy/wheat/sugarcane plots at the time of irrigation. Kerosene oil acts as pesticide or repellent for termites. This practice is in use for the last 3–4 years with 15–20% of families in this village. Others do not follow the practice due to non-availability of kerosene oil, lack of knowledge and also due to the use of chemicals instead of this practice. **Keywords**: kerosene oil, termite control, paddy, wheat, sugarcane	Shri Shiv Kumar Pandri Halwa, Bhojipura, Bareilly (Uttar Pradesh)
1110.	Use of common washing powder to control termites in fruit plants	Due to the high cost and side effects of various insecticides, some farmers in Rawari district of Haryana are using washing powder for controlling termite in fruits plants. This is a very cheap practice, which costs about Rs 10 for treating 50 fruit plants while it is Rs 100 for same number of fruit trees, if other insecticides are used. It is a very effective practice which is in use for the past 5 years. **Keywords:** washing powder, control of termite, fruit plants	Shri Promod Kumar Training Associate (Horticulture), Krishi Vigyan Kendra, B.B. Ashram, Rampura-Rewari (Haryana) 123 401
1117.	Control of termites in sugarcane field by applying lime and salt	Farmers grow wheat, sugarcane and pearl millet in sandy loam and loam soils. About 60% to 70% of cultivated area is irrigated. Termite attack is observed mostly in sugarcane crop. Wheat crop is also attacked by termites. Lime and salt are very effective in controlling the termites in sugarcane field. Farmers apply 2.5 kg lime and 5 kg salt to the soil of sugarcane field to control termites. Sugarcane crop is saved from termites by 60% to 70%. This practice is in use in Bareilly and Shahjahanpur districts in Uttar Pradesh. **Keywords:** lime, salt, termite, sugarcane	Ms Husan Afzal Primary School Teacher, C/o (late) Ilyas Fatima, Vedon Tola, Bund Gali, Buduan (Uttar Pradesh)
1376.	Control of termites in capsicum and cabbage	Neem and karanj are used by the farmers of Karanjuatoli village of Ranchi district in Jharkhand for controlling termites. Powders of karanj and neem cake are mixed with soil when field is prepared for sowing. Karanj cake and neem cake are used for seeds, after extraction of oil from them. All the	Shri Vinod Pahan Karanjuatoli, Burmu, Ranchi (Jharkhand) 835 205

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		farmers of the village use this age-old practice. **Keywords:** termites, karanj (Pongamia pinnata), neem (Azadirachta indica), seed/cake	
1382.	Control of termite in paddy field	Farmers know that standing water in fields helps in controlling termites. In paddy fields if there is no standing water, the termite attack is prevalent and drying up of paddy crop is the visible symptom. If cowdung manure is used extensively and there is water shortage, the termite infestation is common. Flooding helps in reducing the population of termites by disrupting their life-cycle. The success rate of this practice is 98% and it is age-old practice followed by 65% of the farmers in the Bara Sigdi village of East Singhbhum district. **Keywords:** termite, paddy, cowdung, life-cycle	Shri Vibhishan Paryavaran Chetna Kendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand)
1386	Control of termite and other insect pests in paddy	This is practised in the Bara sigdi village of East Singhbhumi district of Jharkhand. Termite and insects/pests of root zone in paddy are controlled by fruits and leaves of ashan. These are broadcast in the paddy filelds infested with termites and other soil-borne insects. Fruits and leaves of ashan are bitter, acrid and toxic to insects/pests, which help in checking their population. This is age-old practice, highly successful and adopted by maximum number of farmers. **Keywords:** termite, insect/pest, ashan, toxic, paddy, fruits and leaves	Shri Sideshwar Jer Paryavaran Chetna Kendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand)
1419.	Control of termite by horse droppings in sugarcane field	Insecticidal properties present in horse drop controls termite infestation in sugarcane field. Horse droppings are mixed with the soil of sugarcane field @ 100 g/ha by ploughing and left for a few days. This ITK is practised in Trikuti village of Deoghar Block of Deoghar district (Jharkhand). It controlled 70% of termite infestation. Cost: benefit of this practice is approximately 1 : 10 **Keywords:** horse droppings, sugarcane field, termite control	Shri Satyendra Singh Agrarian Assistance Association, Bandarjori, Dumka (Jharkhand)
1421.	Control of white ants/termites in rice	White ants/termites are very common in the rice field. Farmers of Tamar black of Ranchi district in Jharkhand use to plough their field. White ants/termites are controlled by using a desi plough made of neem (Azacirachta indica) wood plough the field.	Ms L. Kispota Ms Seema Singh, Shri R.S. Prasad, Department of Extension Education, Birsa

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		It repels the insects and is very effective in protecting rice crop. All farmers of the village use this age-old practice. **Keywords:** white ants, termites, neem, plough, rice field	Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1338.	Use of cactus latex to control termites	One litre of cactus latex is mixed with 200 litres of water, stirred well and applied to termite affected plants. The same solution is used for drenching as well as seed treatment and dipping of grafts before planting. The attack of termite to both field and horticultural crops reduced to a considerable extent. This is practiced by the farmers of Nandubar (MS) **Keywords:** cactus latex, termite, seed treatment	Prof. P.S.Patil Training Organiser, KVK, Dhule (Maharashtra) 424 004
140.	Mechanical control of rodents	Shri E. Ganesan, an agricultural labour aged 50 years of Periya kannamangalam village in Nagapattinam district (Tamil Nadu) developed methods of rat trap. They hide themselves underneath the heap of paddy straw (muthu) to protect them from hot weather in summer. Rats are catched by hand and their teeth are removed and kept in wet gunny bag. He sells them at the rate of Rs 5 each. The suitable time for catching rat is between 10 a.m and 12 p.m during hot days. For controlling the house rat, a simple method has been developed by him. A big vessel (anda) is filled with chaffed paddy and water up to ¾ of vessel's volume Rats fall in it in search of grain and they are trapped. This practice is being in use for the last 15 years. **Keywords:** paddy grain, gunny bag, paddy straw, vessel (anda), cuffed paddy	Shri E. Ganesan S/o Shri Erumpaian, North Street, Periya kannamangalam, Keel Thanjarur, Nannilam, Nagapathinam (Tamil Nadu)
145.	Control of rat in paddy field by feeding cement-mixed food	To control rats in the field, food mixed with cement is used. When eaten by the rats, it leads to stomach swelling, which leads to death of rats. About 90% of the rats are controlled by this method in Khanapur village, Belgaum district of Karnataka. **Keywords:** rat control, paddy field	Shri Tukaram Narvekar Pate, Varkad Pate, Khanapur, Belgaum (Karnataka)
148.	Rat control in cococnut by gunny bag	To control rat in coconut, waste fertilizer polythene gunny bags are tied at 2 m height from the base of the tree. This is being practiced by 25 farmers for the last 5 years in Mamdur village of Coimbatore district in Tamil Nadu. **Keywords:** rodent control, polythene gunny bag, coconut tree	Shri P. Krishnasamy Perumal Koil Piruru, Mamdur, Karamadai, Coimbatore (Tamil Nadu) 641 104

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161.	Control of rats	Rats are controlled by using jaggery dipped cotton balls. Small cotton balls are dipped in jaggery water and are then placed wherever rats are seen. When rats come in contact with the balls, they swallow them. Swollen cotton balls inside the stomach lead to death of the animal. It is in use for several decades. About 30% of the farmers are practicing it in Koipuram, Ezhumatoor and Puramattom blocks of Kerala where the major crops are coconut, rubber, pepper, arecanut, banana, tapioca, nutmeg, ginger, turmeric, chilli, vegetable and paddy. **Keywords:** rat control, jaggery, cotton balls	Shri C.A. Mathew Chakkietangil,Thadiyoor, Pathanamthitta (Kerala)
471.	Rodent control by trapping	The farmers of Tuirial village under Tlangnuam block in Aizawl district of Mizoram use different kinds of rat traps for controlling the population of rats and other rodents and for consumption by lower class people as well. It is made of bamboo, rope and wood and these materials are locally available in plenty. Since 40 years the practice has been in use with some modification. A total of 30 farm families out of 50 follow this practice. There is some risk in using this because the traps are laid at night. Zinc phosphide is used as an alternative but it is dangerous for livestock. **Keywords:** rat trap, rats, bamboo, rope and wood	Shri H Manthianga Krishi Vigyan Kendra, Kolasib (Mizoram) 796 081
523.	Control of rats by glass powder	The intestine of the rats is damaged by consuming the glass particles causing its death. Glass is powdered and mixed with wheat flour then the ball of the mixture are placed in the rat holes.The rats are controlled effectively by this method. **Keywords:** rodenticide, glass powder	Shri Narain Singh Sakar, Bhagtola, Almora (Uttaranchal)
525.	Control of rats through fruits of kaunj	The fruits of kaunj possess small hairs which causes itching in animal as well as in human if come in contact. Fruits of kaunj are kept in rat holes. This causes severe itchig of rats when it come in contact with these fruits. Farmers effectively control rats through this method. The raw material is locally available. It grows abundantly in wild conditions. **Keywords:** kaunj, rat control, itching	Shri Madhavanand Joshi Salla, Shitalakhet, Almora (Uttaranchal)
1105.	Use of bhara/kans leaf for rat contro	Leaves of bhara/kans (Saccharum spontaneum) are collected from bunds of the fields or road sides, 5–6 leaves are placed on the bunds in a continuous row on all sides of the field to be saved from rats. The	Shri Sher Singh Manda, Bhojipura, Bareilly (Uttar Pradesh)

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		serrated margins of bhara/kans cause injury to the rats and thus prevents rats from damaging fields. The practice is followed by about 8–10% of families in Manda village of Bareilly district in Uttar Pradesh, and it is used for the last 4–5 years. Alternative chemicals like aluminium phospide are used for the same purpose. **Keywords**: bhara leaves, control of rat, field	
1114.	Rat control by bhara grass	3'-4' long pieces of bhara grass are kept on bunds continuously. This prevents entrance of rats to fields. Many villages and blocks of Districts Badaun, Bareilly, Rampur and Shahjahanpur in Uttar Pradesh follow this practice. **Keywords:** rat barrier, bhara grass	Mrs Husan Afzal D/o (late) Ilyas Fatima, Primary School Teacher, Vedon Tola, Bund Gali, Badaun (Uttar Pradesh) 243 601
1812.	Indigenous method of rodent control in pea field by kaitha fruit	Rats damage the pods of pea in the field. In place of using inorganic rodenticide, farmers use khaitha (kanith) fruits to control rats in pea fields. Pieces of kaitha fruits are dispersed around the pea field. This checks the rats to enter into the field. **Keywords:** kaitha fruits, rats, pea fields.	Shri Swami Triptanandji C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
1836.	Rat control in wheat by using flower/inflorescence of gliricida plant.	The tribal farmers of Dhule (MS) control the rats in wheat crop in rabi season by using flowers/inflorescence of Gliricidia plant. The rat holes are searched out in the field and then each hole is covered with one inflorescence branch once in a season at flowering stage of wheat. **Keywords:** Gliricidia, inflorescence, wheat, rat hole.	Prof. P.S.Patil Training Organiser, KVK, Dhule (Maharashtra) 424 004
11.	Use of aonla as a pesticide	Dried aonla is soaked in water and after filteration this aonla-soaked water is spread on brinjal crops for control of sundi and tela pests. **Keywords:** aonla, sundi, tela	Shri Vinesh Bharggara (Rajan), 7/275, Housing Board Colony, Hanumangarh Jn. (Rajasthan) 335 512
13.	Use of audio-casette roll as bird repellent	The audio-cassettte rolls tied across the field along the borders in the vegetable field produce a sound, which creates phobia (Entomology), in birds and acts as repellent, thereby avoiding the bird damage. It is being followed from the last 10 years in Gendoli village of Kpatan tehsil in Bundi district in Rajsthan **Keywords:** audio-cassate roll, bird repellent	Shri N L Meena Assistant Professor, Post Box No 4, Bundi (Rajasthan)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
15.	Spraying of neem leaf solution for control of pests in groundnut	Farmers of the village Zangorda and Vadhavi of Junagadh collect the fresh neem leaves. Then 1% solution or 6 kg of leaves per hectare are made into paste and mixed with water and sprayed on the standing crop of groundnut once at vegetation and then (second spray) at flowering. It contain to azadhirachtin which repels the sucking pests like jassids, thrips and Helicoverpa and act as oviposition deterrent. Keywords: neem, groundnut, pest control	Shri G. D Satish Kumar Scientist, Post Box No 5, Ivnagar, National Research Centre for Groundnut, Junagadh (Gujarat) 362 001
20.	Management of pests and diseases by fumigation in crops through guggul	To control pests and diseases, the crops are fumigated by guggul through burning it in fire near the fields @ 5 g/acre at intervals of 3 days. Keywords: guggul, pest and disease	Shri Harendra Singh S/o Shri Fatehdan Ji, Chandan, Jaisalmer (Rajasthan) 345 029
22.	Control of striga in sorghum and pearl millet crop	For controlling striga, Shri Ram Deo has reported his experiences in controlling the parasite by mixing 1 kg guar (clusterbean) and 250 g salt with 5 kg seed before sowing. With this practice the problem of striga was found to be less. Keywords: striga, sorghum, mixture of clusterbean with salt, seed treatment	Shri Ram Deo S/o Her Deo Jat, Blaya, Mundva, Nagaur (Rajasthan)
26.	Cow urine (gau-mutra)-based insecticide for crop pest management	Shri Ram Gauhala Trust, Mathania, Rajasthan has formulated cow urine (gau-mutra) -based insecticide. It has been developed on ayurveda concept. In Gaushala, gau-mutra is collected and mixed with neem leaves, garlic and tobacco in the following proportion: 1. Gau-mutra 100 litres 2. Neem leaves 40–50 kg 3. Garlic 5 kg 4. Tobacco (finely grinded) 5 kg After mixing, the material is sealed in copper utensil and is kept for a fortnight. Thereafter, it is boiled in steel container to reduce it by 50–60%. After filtering, ready-to-use insecticide is packed in plastic containers. One container of 5 litres costs Rs 250. For the last 3 years the trust has been formulating this gau-mutra-based insecticide. It has been accepted widely by the farmers of adjoining areas against the crop pests, particularly for sucking insects, such as jassids and aphids, and larva of cabbage and	Shri Ram Gaushala Umaidnagar, Mathania, Jodhpur (Rajasthan) 342 305

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		cauliflower. It is applied @ 10 ml per litre water. During the past 2 yars the Trust has sold insecticides worth Rs 5,43,799 to 500 farmers of the adjoining villages. **Keywords:** cow urine, neem leaf, garlic, tobaco, pesticide, jassids, aphids	
135	Production of bio-control agents	Shri N. Rajendran has identified and standardised the production methodology of bio-control agents such as Trichogramma accii for control of castor semilooper, Africaria parasite for sugarcane pyrilla, and reduvid bug (Rhinocaris marginatus) for coconut slug caterpillar, which are in large scale production. He has also identified predators of Eriophyid mite in coconut as anthocorid bug, Amplyscious sp. predatory thrips and staphytinidal beetle which he is using to control the mite. **Keywords:** bio-control agent, predotor, eriophyid mite, coconut	Shri N. Rajendran Rajendra Bio-control Laboratory, Sithar, Kesarimangalam, Bhavani, Erode (Tamil Nadu) 638 302
138	Herbal pesticide formulation for cotton	Herbal pesticide formulation has been developed by Shri Nagarajan to control pests in cotton. 500g neem seeds, 1000g tobacco, 100g Acorus calamus, 250g Asafoetida and 50g Sapindus emarginata seeds are ground and the extract is sprayed for one acre cotton to control pests. **Keywords:** neem, cotton, tobacco, Acorus calamus, asofoetida, Sapindus emarginata	Shri K. Nagarajan S/o Kethaian Gouda, Koralampatti, Konur, Dindigul (Tamil Nadu)
146.	Pest and nutrient management in crops by use of cow urine and dung	Cow urine and dung are collected, mixed with water and fermented for few days. After fermentation, the content is sieved and the extract is sprayed to control sucking pests and leaf cutters. Cow urine acts as germicide and cow dung provides nutrients to the crops. This practice is followed by 5% families for the last 25 years. **Keywords:** cowdung urine, pest control, leaf cutter, sucking pest	Shri Sreekanth Ramu Shirahatti, Harogeri, Raibag, Belgaum (Karnataka) 591 220
147	Silkworm disease management	For silkworm rearing, farmers disinfect the utensils and rearing house with 3% formaldehyde and 5% bleaching powder. However, a farmer (out of 5) in Pamaldinni village is successfully controlling 90% of the diseases in silkworm for the past 1 year by dipping the leaves, twigs and shoots of mulberry in a solution prepared by mixing 5 ml of extract from	Shri Siddaram Appayya Konganatli, Pamaldinni, Godak, Belgaum (Karnataka)

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		parthenium and tridax before feeding to the worms. **Keywords:** silk worm rearing, disinfectant, extract of parthenium and tridax	
149	Pest and disease control in paddy and vegetable crops	For controlling diverse pests and diseases in paddy and vegetable crops, a solution prepared from the leaves of Teris indica, Chloraxylon surtenia, Prosopis juliflora, Vitex negundo, Azadirachta indica and Nicotiana tobacum is sprayed. This is being practiced by 10 farmers. For the past 2 years in Kandepalayam village of Coimbatore destrict in Tamil Nadu. **Keywords:** leaf extracts, pest and disease control	Ms B. Rajammal W/o Shri Bathirappa, Gowder, Kandepalayam, Thekkampatti, Mettupalayam, Coimbatore (Tamil Nadu) 641 113
150.	Ward off mosquitoes by a simple device	A simple device developed by Shri. Sundarajan to ward off mosquitoes is mentioned here. Old blade is placed on the chimney of the kerosene hand lamp. Freshly peeled orange skin is placed on the old blade. The heat developed on the metal blade due to the lamp, it scorch the orange skin and the volatile essential oil presented in orange is vapourize and spread in that area. Mosquitoes are not tolerate this orange skin odour. Keywords: chimney, kerosene, hand lamp, orange skin, volatile oil, mosquitoe	Shri V. Sundarajan, Retd. Arts Teacher, 53, Singamada street, Srivilliputhur, Virudhunagar (Tamil Nadu) 626 125
152.	Pest and disease control in paddy using garlic and notchi leaf in cow urine	To control pests and diseases in paddy, a mixture is prepared using garlic, notchi leaf (Vitex negundo) and cow urine. One kg garlic and notchi leaf are soaked in 5 litres water for 5 days mixed with cow urine. The extract is mixed with water in the ratio of 1 : 1 and sprayed in the morning. Two farmers of Eandal village in Tiruvannamalai district of Tamil Nadu use this practice. **Keywords:** paddy, garlic, notchi leaf, cow urine	Shri Kandasamy Eandal Tiruvannamalai (Tamil Nadu) 606 602
163.	Uzi fly control in silkworm rearing	Control of uzi fly in silkworm rearing by the application of sour curd or buttermilk. Two to three cups of sour curd or buttermilk is kept in front of the silkworm rearing tray. Smell of curd or buttermilk attracts the uzi fly. If uzi flies are controlled, cocoon yield will be normal. About 25–40% control occurs, instead of using mosquito net to cover the rearing tray. Cocoon yield will be normal, uzi fly can be controlled. This is in practice in Nanjangud village of Mysore district in Karnataka. **Keywords:** curd, buttermilk, silkworm, control of uzi fly	Principal, J.S.S. Krishi Vigyan Kendra, Suttar, Nanjangud, Mysore (Karnataka) 571 129

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165.	Beating of drums to scare away birds	Beating drums is an effective method to scare away not only birds but also thieves. This is in practice in Serapattu village of Villupuram district in Tamil Nadu. When crops are at maturity stage, this practice is very effective. **Keywords:** drums, birds	Shri K. Kandan S/o Shri Kali Pillai, Serapattu, Kallakuruchi, Villupuram (Tamil Nadu
167.	Pest control using ash dust	Ash is used to control pests by dusting it on plants. Dusting of ash over the crops like ragi, thinai, samai, and varagu at the rate of 15–20 kg per acre effectively controls pests. About 25 farmers are using it for the last 10 years. This is in practice in Kariyalur village of Villupuram district in Tamil Nadu. **Keywords:** ash, pest control	Shri R. Kaliyappan S/o Shri Raman Kariyalur, Kallakuruchi, Villupuram (Tamil Nadu)
168.	Botanical alternatives in plant protection	Arali (Nerium oleander), datura (Datura stramonium), custard apple (Annona squamosa), etty fruits (Strychnos nux-vomis) and Gloriosa superba are taken, cut into small pieces and kept in a mud pot containing five litres of water. The mouth of the pot is covered with the lid and is buried inside the manure heap for a week. The content of the pot is heated with water and filtered when it is settled. The liquid is sprayed to the plants to control pests in an effective way; 500 ml to one litre is used for one acre at an interval of 10 days. The practice is in use for the last five years in villages of Dindigul district of Tamil Nadu. Out of 32 farmers in the village, 10 are using this practice to control pest. **Keywords:** Nerium oleander, Datura stramonium, Annona squmosa, pest control	Shri V.R. Iyappan Sukkampatti, Thadikkombu, Dindigul (Tamil Nadu)
170.	Pest management by using Cynadon	Root rot and damping off in tomato is controlled by applying Cynadon leaf extract. This is applicable only for tomato PKM (local variety) in Karikuttanoor village at Dharmapuri. Fresh leaves of Cynadon dactylon (doob in Hindi, arugampul in Tamil) are dried in shade. The dried sample is powdered and then mixed with water and placed in an air tight mud pot and left undisturbed for 24 hours. This mixture is filtered twice, first using gunny cloth and then with a white piece of cloth. The clear mixture is ready for use. One litre of this mixture is added to one litre water, which is sprayed either by using hand sprayer or by power sprayer. When tomato PKM seedling is 15-days-old, this mixture can be sprayed at frequent	Shri P. Krishnamoorthy Karikuttanoor, Thirumalvadi, Palacode, Dharmapuri (Tamil Nadu) 636 808

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		intervals until harvest. For 1 acre of land, 10 litres of this solution is recommended. Control of root rot and damping will result in good yield. It is best suited only for tomato PKM in Thai pattam (January season). **Keywords:** root rot, pest control, damping, tomato	
348.	Pest control by niran deoya or puka mara (interculturing)	Interculturing is done for trapping the pest and subsequently killing, thereby resulting in crop protection and good yield. About 50% farmers are adopting this practice for the last 100 years in Shibloon village of Burdwan district in West Bengal. **Keywords:** niran deoya, pest and disease management	Ms Madhumita Ghosh Shibiloon, Burdwan (West Bengal) 713 130
363.	Application of neem powder to get rid of house flies	About 10 g neem powder is mixed with 10 litres water and this solution is used for washing the floor to protect from houseflies. The practice is being followed by 20 to 30% of farming families of Makarbili village of Nawapada district in Orissa, in which 60 to 70% effectiveness was observed. It is hygienic over spraying of cowdung slurry, as neem acts as a botanical insecticide. **Keywords:** neem powder, housefly	Ms Subhashree Pattnaik C/o Shri P. K Pattnaik, Reserve Bank of India, Bhubaneshwar (Orissa) 751 003
466.	Methods of pest and disease management in paddy	Different methods are being used by farmers of Nalbari district of Assam for controlling different pests and insects affecting their rice crops. The practices are as follows: 1. Putting of bamboo stick and or branches for birds to sit in the nursery as well as in the main field. Birds act as predator and eat stem-borer and leafhopper, which affect the paddy at nursery and tillering stages. **Keywords:** bamboo stick and branches, birds, predator, stem borer and leaf hopper. 2. Moving a kerosene-soaked rope over the crop and draining out available standing water, to control caseworm in tillering stage of paddy. Cases made by caseworm fall down from the crop on standing water which is drained out completely **Keywords:** kerosene-soaked rope, paddy, standing water, caseworm, water draining 3. Throwing branches of Germany ban, biholongoni (Polygonum hydropipes) and	Shri Indrajit Barman, Junior Research Fellow, Institute of Social Change and Development, Chenikuthi, Guwahati (Assam)

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posotia (Vitex negudo) on standing water to control hispa and caseworm. All these plants act as repellent as they produce intolerable smell. These plants are applied during tillering stage.

Keywords: germany ban, biholongonia, posotia branches standing water, controlling hispa, caseworm

4. Throwing peels of citrus particularly of rabab tenga (Citrus grandis) on standing water to control stemborer. Peels of this fruit act as repellent to various pests of rice, particularly stemborer.

Keywords: citrus fruit peels, standing water, stemborer, paddy, repellent

5. Spraying of tobacco solution to control hispa in paddy. Solution of tobacco leaves, which is alkaline in nature, effectively controls the attack of hispa.

Keywords: tobacco-leaf solution, hispa, paddy, alkaline solution

6. To control hispa, excreta of goats are broadcast in paddy field, which repels the pest to fly away due to disagreeable odour of excreta.

Keywords: goats excreta, paddy, hispa, disagreeable odour

7. In order to control crabs in the field, raw cowdung @ 300 kg/ha (approx) is used in standing water in lowland areas. This disturbs movement of crabs and also produces unbearable odour to them, which causes crabs to go out of the field.

Keywords: raw cowdung, crab, paddy field, standing water, bad odour

8. To control bacterial leaf blight, raw cowdung @ 1 kg in 10–12 litres water is used. This solution is used as spray in the field. This method also protects the crop from cattle, as they do not graze on the Pest and disease management treated crop.

Keywords: bacterial leaf blight, cattle, raw cowdung, spray, graze

9. To control hispa infestation, thorny branches of ber (Zizyphus spp) are used in the field. These disturb hispa movement as well as causes injury to the pest and as a result they fly away from the field.

Keywords: thorny branches, hispa, movement, injury

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10. Boiled neem leaves and grinded neem seed solution is used as spray for controlling leaf-folder in paddy. Due to the bitterness of the solution, treated leaves and stems are not attacked by pest and also the bad odour produced by the solution repels insect pests.

Keywords: boiled neem leaves and grinded seed, spray, control of leaf folder, paddy, bitter taste, odour

11. Application of solution of keturi haldi (wild turmeric) rhizome as a repellent to pest. It produces bad smell and pests fly away from field, thereby the crop is escaped from pest attack. This solution is used to control hispa and stemborer in paddy.

    Keywords: keturi haldi solution, repellent, bad smell, hispa and stemborer

12. Crashed rhizome of keturi haldi is also used in different places in the field to control stem borer and hispa. This acts as repellent due to the disagreeable odour produced by it. This is used during tillering stage of paddy.

Keywords: crashed rhizome of keturi haldi, control of stem borer and hispa, repellent, disagreeable odour

13. Dead lizards, frogs or crabs are placed inside an inverted bamboo pipe and placed in stagnant water so that these animals touch water. They produce disagreeable smell, which repels all the major insect pests of rice. This is done during tillering stage.

Keywords: dead lizards, frogs, crabs, bamboo pipe, stagnant water, disagreeable odour, repellent, insect pest, rice

14. For controlling hispa in paddy field, dried posotia leaves are ginded and dusted in the field during tillering stage. Due to disagreeable odour of Posotia dust, the pests fly away from field

Keywords: hispa, paddy field, posotia leaves.

15. To control hispa infestation in paddy during tillering stage, kerosene oil is poured directly on the standing water. This makes the pest to fly away due to intolerable odour of kerosene.

Keywords: hispa infestation, paddy, kerosene oil

16. Hispa and stemborer pests are also controlled by drawing of standing water. Activities of hispa and stemborer are reduced due to non-availability of water in the field.

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Keywords: hispa and stem borer, draining standing water

17. Birds destroying paddy at maturity stage is controlled by beating empty tin or drum in the field. The sound produced from this scares away the birds from the field.

Keywords: bird, paddy, beating empty tin/drum, scare away

18. To scare away birds during maturity stage of paddy, carcass of crow is tied to a long pole, which is placed in the centre of rice field. Thus attack on crop reduces.

Keywords: crow carcass, scare away, birds, paddy

19. Small polythene bags or sheets are tied to a long pole and placed in the center of the field. Due to wind, polythene sheets or bags flutter and produce sound, which frighten the birds and thereby their attack is reduced.

Keywords: polythene bags, sheets, flutter sound, frighten birds, paddy field

20. A piece of black or red cloth is tied to a long pole and placed in the centre of the field, This scares away birds and thus minimizes their attack on paddy crops.

Keywords: black or red cloth, scares birds, paddy

21. Western method practiced to scare away birds in paddy field during maturity stage, is by the use of bell, which is placed in the field and operated by rope from a long distance.

Keywords: bell, paddy field, scare birds

22. Reels of cassettes are also used to scare birds from attacking paddy crops. The field is encircled with reels by the help of bamboo pests. Reflection produced from the reels frightens birds to fly away.

Keywords: reels of cassettes, paddy field, reflection of light, frighten birds

23. To reduce the attack of birds on maturing paddy, bamboo poles (2" sizes) inside which a thin wire is placed horizontally across the field with the help of two bamboo poles. When the birds try to sit on the bamboo pipe, it starts to roll as a result the birds cannot perch on it and they fly away.

Keywords: bamboo pipes, wire, paddy, bird, rolling of bamboo

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24. Rodent burrows in the fields are filled with water and when the rodents come out of the hole, they are killed by the farmers easily.

Keywords: rodent, water in burrow

25. To prevent any fungal and bacterial disease in paddy, a solution of neem leaves and grinded seed, soap/surf (detergent powder) and raw turmeric is applied. The prepared solution produces disagreeable odour and reduces the chances of disease occurrence. This practice is used during tillering and panicle initiation.

Keywords: neem leaf, grinded seed, soap/detergent powder and raw turmeric solution, disagreeable odour, prevents disease occurrence

26. Spreading of brown spot in paddy is checked by dusting of ash during panicle initiation.

Keywords: brown spot, ash, dusting, check spreading

27. Gandhi bug, attacking soft grain (milking stage), is controlled by use of dead frogs and crabs fixed in bamboo stick in different places of main field. The dead crabs and frogs play the role of attracting and the pest feeds/crowded over the dead frogs or crabs instead of sucking soft grains.

Keywords: gandhi bug, soft grain, dead frogs and crabs, attractant

28. Gandhi bug attacking paddy grain in milking stage is also controlled by making bonfire or by using light at night hours in the field. The pest gets attracted to these lights and gets killed in the fire. Thus attack on paddy is controlled.

Keywords: gandhi bug, paddy, bonfire or light, attractant

29. After harvesting, rice stubbles are burnt, which kills pest (stem-borer) and their eggs and, therefore, pest population in next crop season is reduced.

Keywords: burning rice stubbles, stem-borer, eggs, pest-population reduction

30. In order to reduce the rodent population in the next cropping season, the rodent furrows are fumigated with smoke of burnt paddy husk - Rodent die of suffocation by this process.

Keywords: rodent furrow, fumigation with smoke, suffocation

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		31. Another method applied to reduce rodent attack on next crop season is by digging of rodent burrows and killing them. **Keywords:** rodent burrows, digging, killing 32. To control major insect pests of rice, the tip portion of rice seedlings is cut before transplanting. Generally insect pests are present on the tip portion of rice seedlings. Hence removal of tip portion also reduces the insect pests. **Keywords:** cutting tip of rice seedlings, transplantation, reduction in pest population 33. Hibernating insect pests population are reduced by cutting the edges of border of the plots before transplantation. Pest hibernating in the border edges are killed and thus this population is reduced at later stages. **Keywords:** hibernating insect pests, cutting border plot, pest population reduction 34. To reduce stemborer infestation, summer ploughing is done before sowing. Pests and its eggs get injured/killed and hence attack of pest reduces in the next crop season. **Keywords:** stemborer pests and eggs, summer ploughing, pest population reduction	
468.	Use of neem to control pest	T h e farmers of Kachikatra village under Sidhi block in Bongaigaon district of Assam use neem to control pest in the fields. Neem seeds are crushed and soaked overnight in water to extract azadirachta substance. Residues are filtered out and the filtrate is used. The azadirachta substances found in the seeds prevent insects and also control nematodes and enhance soil fertility. Dried neem leaves are also used to control storage pest, which has an efficacy of controlling pest upto 50%. The material used is locally available in plenty. For about 2 years, the practice has been in use by about 10 farmers only because many farmers are yet to be convinced. Keywords: neem seeds and dried leaves, insect pest, neem extract, storage pest	Shri Anil Basumutari Village Kachikatra Sidhi, Bangaigaon (Assam) 783 380
470.	Use of ash to minimize insect pest	To control and reduce the attack of pests, the farmers of Bahari village under Subha block in Barpeta district of Assam perform dusting of ash on the seedlings of cucurbits. Ash, which contains boron,	Shri Uday Moral Bahari village, Subha, Barpeta (Assam) 781 301

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		i s considered to have insecticidal properties and because of its low cost and easy availability, is widely used by the farmers. This practice has been in use since 10 years by 25 farmers, since all the farmers do not grow cucurbits. Neem leaf powder is used as an alternative in the field. **Keywords**: ash, control of insect pests, cucurbits, neem leaf powder	
479	Use of ash in terraced fields	The farmers of Porba village and surrounding areas in Phek district of Nagaland mainly go for terrace field system of cultivation as water in this region is sufficient enough and they have adopted the use of ash in their fields, which prevents paddy from dying of unknown etiology after transplanting. In some fields, paddy does not grow well after transplanting and becomes yellowish, dies after a few days. But the farmers manage this problem by application of ash in the paddy field after about 2 weeks of transplanting. The reason could be neutralization of acidic nature of the soil in the field by ash. This practice has a very good effect, up to the extent of 70%. Around 80% of the farmers have been practicing this method for the past 20–25 years. **Keywords**: terrace field, ash, transplanting, acidic	Shri Shekhozo T. Vadeo Porba Village, Pfutsero, Phek (Nagaland) 797 107
481	Use of *moa* fish to control aphid infestation in mustard	In this practice a mixture is produced using turmeric, ripened chilly, rice powder, *moa* fish and water, and this solution is used for seed treatment in mustard (TM-2, IM-4 varieties) to control aphid. This practice is followed by farmers of Bahari village, Subha block in Barpeta district of Assam with 80% efficacy. The practice is adopted by all the farmers in the village since time immemorial. Seed treatment is also done by use of metadaxyl @ 6 g/kg of seed. **Keywords**: turmeric, ripen chilli, rice powder, *moa* fish, mustard	Shri Uday Moral, Bahari village, Subha, Barpeta (Assam) 781 301
483	Use of *hing* and turmeric powder to control wilt disease in brinjal	The farmers of Agomoni village in Dhubri district of Assam use a suspension o f *hing* and turmeric powder for controlling wilt infestation in brinjal (var. Barbengene, Pusa purple). The suspension is used as spray. Streptomycin @ 100 ppm or Captaf @ 0.3% as soil drenching is also practiced. About 35 farmers in the village have been following this practice since the last 2 years with very good efficacy but many	Shri Manoranjan Roy Agomoni - Dhubri (Assam)

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		farmers are yet to be convinced on its applicability. **Keywords:** hing, turmeric, brinjal, wilt	
521	Control of white grub by crushed seeds of apricot (Prurus armenica)	White grub is a major problem of hill agriculture. Losses due to white grub are very high. The kernel of appricot possess insecticidal properties. The seeds are collected and fine powder is made out of the kernel. The powder is mixed with cowdung or wheat and then spread all over the fields @ 50–75 kg/ha. It is done before sowing. The method is useful in controlling the grub for two years. **Keywords:** white grub, apricot, cowdung,cow urine	Shri Sundar Singh, Sakar, Bhagtola, Almora (Uttaranchal)
522	Pest management through planting of Dhatura alba	To protect the fields against the insect-pest and animals, farmers plant dhatura at the bunds of the fields. The foul smell of dhatura plants prevents the insect from coming near the field. At the same time the leaves and seeds of dhatura are poisonous thus the insects and animals don't eat them. The foul smell and taste of dhatura leaves create a barrier between the field and pest. The seeds are easily available in the village so the cost of this method is little. **Keywords:** dhatura alba, planting on bunds, repellent	Ms Mohini Devi, Bhagtola Almora (Uttaranchal)
682	Kerosene oil for control of insects	Kerosene oil drops are applied at the infected area with the help of cotton, in different parts of Himachal Pradesh. This practice is used when plants attain a height of four feet or more. It is in practice for last several years and is eco-friendly. **Keywords:** kerosene oil, cotton, insect and pest	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
686	Pest control with trip wires	Birds are the main pests in orchard trees at fruiting time as well as in crops like maize, wheat, mustard, cabbage, etc. Birds also harm vegetable crops like peas. These crops are protected from the birds by using small bamboo pipes, through which wire is tied between the branches passing over the field. Whenever a bird tries to sit over such pipes, it fails to find a suitable perch because of the pipe rolling over the wire. Farmers place small-diameter bamboo pipes through the wire, which are tied between tree branches passing over the fields. In the absence of stable perch, bird damage in a particular crop is minimized. Farmers find this practice quite effective and economical in the long run. Wires and bamboo	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		pipes are easily available in the village or local market. This ITK has been practised in most of the villages in district Hamirpur of Himachal Pradesh since time immemorial. **Keywords**: pest control, trip wires, bamboo pipe	
689	Control measure against insect pests	Tobacco leaves (2 kg), garlic (250 g), onion (200 g), dhatura (*thora* apple) 500 g, red chilli (250 g) and some *hing* (*Asafoetida*) are crushed and all these are kept with water in a pot and placed in cowdung heap and left for 21 days. A drum, which has a top at bottom, is taken and about 4 inches of sand is put in it. After 21 days the pot is taken out from the cowdung heap and hanged over the drum. A hole is made at the bottom of pot and is closed with cotton, as such that solution leaks in drips. One litre of this solution is then diluted with one litre cattle urine or 13 litres water and applied to insect pests. **Keywords**: tobacco leaves, garlic, onion, dhatura, red chilli, *hing*, cowdung, cattle urine	Shri Chet Ram Dhani Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)
690	Control of diseases and insect pests of plants	Blackening of cauliflower root is a common disease in Shimla region. Sometimes it causes death of cauliflower nursery as well as of plants. It is controlled by spraying a glass of cattle urine in nursery. **Keywords**: blackening of cauliflower root, cattle urine	Shri Deep Ram Verma Jagneri, Theog, Theog, Shimla (Himachal Pradesh)
691	Control of insect pests in crops	Major insect-pests of the crops are white larvae of potato (*gahali*) and black larvae that cut the plant. White larvae are controlled by use of *chulha* ash (*swah*) whereas black larvae are controlled by spray of kerosene oil. Ring borer cuts the stem of apple plant from outside and goes inside the stem. This insect is killed by use of kerosene oil. Piece of cotton dipped in kerosene oil is inserted in the hole of the insect in the stem with the help of iron wire. **Keywords**: white larvae of potato, black larvae, *chulha* ash, kerosene, ring-borer of apple	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)
694	Use of dried garlic rhizome for controlling gram *dhora* beetle in pulses	The farmers of Ner Chowa, Math, Burahli, Dolga, Lahardi, Banon villages of Balh and Sunder Nagar Blocks in Mandi district of Himachal Pradesh, use dried garlic rhizome for controlling gram *dhora* beetle in pulses. Dried garlic rhizome is used @ 100 g per 5	Dr S. K. Sharma, Professor Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya,

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		kg pulses. These rhizomes are placed in the bin where pulses are stored. About 2% farmers of the villagers are practicing it for the last 10 years. **Keywords**: dried garlic rhizome, gram *dhora* beetle, pulses, checking of damage	
695	Use of mustard oil to check spoilage by insect pests	To avoid the attack of stored grain insect pests, the farmers of Ratti, Soyara, Kapahi villages of Balh and Sunder Nagar blocks of Mandi districts of Himachal Pradesh, use mustard oil as polish on pulses like urd, *moong* and gram. In May-June, mustard oil about 5 ml per kg of pulses is used by the farmers to polish their pulses for storage. This is found to have a prophylactic effect, and 90% of the farmers of these villages are following it for the last five years. **Keywords**: mustard oil, check spoilage, insect pest, pulses	Dr S. K. Sharma Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
696	Use of wild mint to control stored grain insects pests	The leaves of wild mint (*Mentha species*) are dried and crushed into powder mixed with grain in the ratio of 1 : 100. Thus prevents the attack of stored grain insect pests and is followed by 2% of the farmers in Sehli, Tawn, Khilda, Dharanda, Dhaneshri, Salapad village of Sunder Nagar, Sadar and Balh development blocks in Mandi district of Himachal Pradesh. The practice is in use for the last 50 years. **Keywords**: wild mint, stored grain insect pest prevent damages	Dr S K Sharma Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
697	Pest control with cattle dung	This methos is adopted by the villagers of Yanlhang block of Himachal Pradesh. They collect sufficient amount of cattle dung from cattle yard and dilute it with very little amount of water. This makes it semi-solid mixture, which it is applied on both sides (inner and outer layer) of storage bin. Semi-solid mixture releases special kind of smell, which repels the insects from storage bin. The storage bin is made of *Cedrus deodara* wood. This practice is very effective, is adopted by maximum number of farmers in the villages, and it involve little cost. Now-a-days farmers use chemical pesticides in place of above-mentioned practice. **Keywords**: cattle dung, water, pesticide, storage bin, *Cedrus deodara*	Shri Tasi Rubjhar Ka, Yanlhang, Kinnaur (Himachal Pradesh)

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1099	Use of ash to control of pests and diseases in crops and irrigation to protect crop from frost	Mundelakelau village farmers in Delhi are adopting this method for control of pests and diseases in crops. Ash is dusted over the crop to protect insect pests. Irrigation is given to protect the crop from frost. Tweenty five farmers are practising this method. **Keywords**: ash, pest, diseases, frost, irrigation	Shri Jitendra Mundela Kelau, Nazafgarh (Delhi)
1113	Use of *cactus latex* to control soil borne insects	*Cactus latex* controls soil borne insects. Cactus plant are cut into pieces and immediately put into running water so that the latex is mixed with irrigation water. This controls soil-borne insects. These pieces of cactus are changed after every half an hour. This is practised in villages and blocks of districts Bareilly and Badaun in Uttar Pradesh. **Keywords**: *Cactus latex*, irrigation water, soil borne insects	Mrs Husan Afzal D/o (Late) Ilyas Fatima, Primary School Teacher, Vedon Tola, Bund Gali, Badaun (Uttar Pradesh) 243 601
1373	Control of red colour insect and Bihar hairy caterpillar by ash and kerosene oil	Red-colour insect and Bihar hairy caterpillar are leaf-eating insects. Wooden ash and kerosene oil are applied by farmers of Soba village of Ranchi dictrict of Jharkhand to control the insects. Mixture of wooden ash and kerosene oil is applied when insects appear on the leaf. It is practised on cucumber and bottle gourd crops. All farmers of the village use this age-old practice. **Keywords**: ash, kerosene oil, cucumber	Shri Ibrahim Ansari Soba, Burmu, Ranchi (Jharkhand) 835 205
1378	Control of potato blight by ash and *karanj*	Blight in potato is controlled by using wooden ash and *karanj* cake powder. *Karanj* cake powder is an extract of *karanj* seed, Burmu, which is atained after extraction of oil from them. Mixture of wooden ash and *karanj* cake powder is applied on the leaf when weather conditions are cloudy. All the farmers of Jhakurgaon and Chapatoli villages of Ranchi district in Jharkhand use this age-old practice. **Keywords**: blight, wooden ash, *karanj* (*Pongamia pinnata*), dusting	S h r i Pramod Kumar Mahto Jhakurgaon, Chapatoli, Ranchi (Jharkhand) 835 205
1379	Control of leaf-eating insects in cabbage and cauliflower through neem leaves	Leaf-eating insects of cabbage and cauliflower are controlled by using extract of neem (*Azadirachta indica*) leaf. Leaf-eating insects of vegetables are controlled by spraying extract of neem leaf on the vegetable leaves when leaf-eating insects appear. All farmers of Kakhra village of Ranchi district in Jharkhand use this age-old practice. **Keywords**: leaf-eating insect, cabbage, cauliflower, neem, extract	Shri Parasnath Mahto Kakhra, Burmu, Ranchi (Jharkhand) 835 205

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1383	Protection of field crops by planting trees of *arjun*, *karanj* etc.	This is practised in Bara Sigdi village of East Singhbhum district of Jharkhand. The common insect/pest and diseases of field crops can be controlled by growing trees along the bunds, which posses chemical having insecticidal properties. Trees like *ashan*, *palash*, neem *karanj*, *arjun*, *bhelwa*, *jamun*, *parasi*, etc. are planted along the bunds to protect the crops from pest attack and disease incidence. Farmers believe that these plants have properties to kill or repel the insect/pest. This practice is age-old and few farmers follow it **Keywords**: insecticidal, *arjun*, *karanj*, *bund*, *ashan*, *palash*, neem, *bhelwa*, *jamun*, *paras*	Shri Sideshwar Paryavaran Chetna Kendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand) 831 004
1385	Crop protection by ploughing and planking by weed of *kendu* etc.	Farmers of Bara Sigdi village of East Singhbhum district of Jharkhand plough the field by a plough made of *kendu*, *ashan* or *parasi* wood. The plough made of these wood are effective in controlling soil-borne pests/insects. Farmers believe that these trees have medicinal properties and wood has toxic effect on insects. Whenever fields are ploughed, *pata* is used for planking during field preparation and after baushening. This is age-old practice and generally adopted by all the farmers. **Keywords**: ploughing, planking, *pata*, *kendu*, *ashan*, *parasi*, insect/pest	Shri Sideshwar Jee Paryavaran Chetnakendra, Bara Sigdi, Potka, East Singhbhum (Jharkhand) 831 004
1390	Insect-pest control by ash in vegetables	Ash of wood or cowdung with kerosene oil is applied /sprayed on the vegetables or fruit trees to repel or kill the insect-pests. Villagers of Singhbhum district of Jharkhand believe that ash creates cracks in insect body and soak up the moisture from the insect and cause its death. This is being practised for last several years. One modification was made, i.e. addition of kerosene oil in ash. **Keywords**: ash of wood or cowdung, kerosene oil, vegetable crop, fruit trees, cracks, soak up the moisture	Shri Sanat Kumar Sawaiyan, Department of Extension Education, Ranchi Agricultural College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1392	Use of sinduwar (*Vitex negundo*) in control of aphids in pumpkin, bottlegourd, beans etc.	*Sinduwar* leaves has inseticidal property, and kills the aphids. Its leaves are boiled in water for 1–2 hours and the extract after cooling is sprayed by mixing with adequate water. The practice is followed in Jojodih village of Kora block in Deoghar district. Success has been observed up to 60–70%. Cost: benefit ratio of this practice is approximately 1: 4. **Keywords**: *sinduwar*, aphid control	Shri Pravin Soren C/o Jagriti Kedra, Madhupur Vavan Bigha, Madhupur, Deoghar (Jharkhand)

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1393	Insect (*jugnu*) control through indigenous method in horticultural crops	This is practised in Bagraisai village of Saraikela district of Jharkhand to protect the horticultural crops from *jugnu*. In this practice, cowdung and ash is broadcast on horticultural crops like bottle gourd, pumpkin, cabbage etc. to control the *jugnu*. In addition cowdung and ash also act as a plant nutrient, i.e. potassic fertilizers. They are broadcasted over the horticultural crops in the evening. This is age-old practice followed by 80% farmers in the village. **Keywords**: *jugnu*, insect/pest, cowdung, horticultural crop, potash, ash	Sahyagi Mahila Bagraisai, Rajnagar, Saraikela (Jharkhand)
1395	Control of pest and disease in paddy	Rice crop is protected from different pests and diseases by putting the branches of cashewnut (*Anacardium oxidentale*) in the standing crop. This practice helps repel the pests of paddy. This is age-old practice, adopted by 40% farmers in the village. **Keywords**: pest/insect, diseases, cashewnut, *Anacardium oxidentale*	Ms L. Kispota Ms Seema Singh Shri R. S. Prasad Department of Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1409	?Management of pests and diaseases by using plough made of neem tree	A majority of the villagers of Khaspokharia village of Tantnagar block in West Singhbhum district (Jharkhand) use *desi* plough made of neem (*Azadirachta indica*) for ploughing their land, affected by termites. They opined that neem has some medicinal properties which control the termites. When land is ploughed, due to friction of plough with soil particles, a little amount of neem ingredient left in soil and which controls the termites. This traditional wisdom is being in use since the ancient time without any modification. **Keywords**: neem (*Azadirachta indica*), *desi* plough, termites, medicinal properties, neem	Shri Sanat kumar Sawaiyan Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1795	Use of *mahua* flower to control insect *gaygwalan* (*Scalopendra* sp.)	*Scalopendra* sp. (*gaygwalan*) in soybean is controlled by application of 8–10 kg per acre of dry *mahua* (*Madhuka latifolia*) flowers at 30–35 days after sowing once or twice. The flowers are collected during summer, dried and stored for the use in coming crop. By this practice 90–95% of insect is controlled effectively. This practice is in use for 7–8 years in Linga village of Mohkhed block of Chhindwara district in Madhya Pradesh. 80% of the farmers use this practice. **Keywords**: soybean, *mahua* flower, *gaygwalan*	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128  *Mahua* flower used in control of *Scalopendra*

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1800	Use of crushed solution of heliothis larvae to control the small larvae	Farmers collect about 2–2.5 kg heliothis larvae from the heliothis infested soybean crop, boil in water after crushing, cool and the filtered extract is sprayed on the soybean crop. This acts as repellent by which the larvae of heliothis escape from the infected field. About 40–50 litres water is mixed and sprayed 2 times at 7–8 days interval. About 70–80% of insects are controlled effectively by this practice. It is 7–8 years old practice being followed by 30–40 farmers in Linga village of Chhindwara district in Madhya Pradesh. **Keywords**: soybean, heliothis larvae extract	Shri Ranjay Kumar Singh Sonapur, Azamgarh (Uttar Pradesh) 276 128
1802	Helicoverpa management by using chilli and garlic	Generally American bollworm (*Helicoverpa armigera*) is a serious pest causing 60% damage in cotton crop. To overcome this problem, 1.5 kg green chilli and 500 g garlic extract is added with kerosene mixed water (100 ml kerosene in 5 litres water). Soap Powder (75 g) and 100 litres water are added in the extract and sprayed for control of American bollworm. About 80% of Kolhar village farmers of Maharashtra are using this practice since last 10 years. **Keywords**: green chilli, garlic, kerosene, soap powder, American bollworm	Krishi Vigyan Kendra Babhaleshewar, Rahata, Ahmadnagar (Maharashtra) 413 737
1804	Use of chilli and garlic extract for helicoverpa management in cotton	Extract of chilli and garlic is applied to cotton for control of american bollworm (*Helicoverpa armigera*) infestation. The extract is found to be very effective in controlling this pest which causes up to 60% crop damage. The extract of chilli is obtained by crushing 1.5 kg of green chilli with water and similarly 500 g garlic is crushed and extracted in kerosene mixed water (100 ml kerosene in 5 litre water). The two extracts are mixed and 75g detergent powder is added to it. Then 100 litre water is added to it and used for spraying on the crop. This practice is used by 30% of the cotton growers of Dadh B.K, Dungapur, Kolhar villages of Ahmednagar district of Maharashtra, which is in practice for the last 8–10 years. Alternatively neem seed kernel extract (NSKE 5%) is used for the same purpose. **Keywords**: chilli and garlic extract, control American bollworm (*Helicoverpa armigera*), cotton, kerosene, detergent powder	Krishi Vigyan Kendra (PIRENS) Babhaleshwar, Rahata, Ahmednagar (Maharashtra) 413 737

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1806	Control of pests by use of *mahua* cake	Farmers of Pasadgaon village of Nanded district in Maharastra practice this method for control of pests in crops. *Mahua* (*Madhuka indica*) cake (100 g) is mixed with 1 litre water. The extract is mixed with washing powder and spraying is done. About 3% neem oil extract and 3% *mahua* oil cake @ 1 : 1 ratio is also prepared and sprayed for control of pests. **Keywords**: *mahua* cake, neem oil extract, washing powder	Shri V.R. Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
1807	Control of pests by using tobacco	One kg waste tobacco in 25 litres water is boiled for 20–30 minutes. The extract is filtered and 250 g washing powder in 5 litres water is mixed with the extract. Again 20 litres clean water is added in the extract for spraying. This is in practice for several years by Bhalki village farmers of Nanded district in Maharastra. **Keywords**: tobacco, washing powder.	Shri V.R. Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
1808	Control of pests by using castor	Farmers of Malegaon village in Nanded district of Maharastra are using this traditional practice. Castor seed (500 g) is powdered and boiled in 2 litres water for 10–15 minutes. The extract is filtered and 20–30 ml kerosene oil is added to this extract. About 250 g washing powder is added in 1 litre water and mixed in the extract and the extract is again added with 8 litres clean water for spraying. This is used for spraying on different crops to control various pests. **Keywords**: castor seeds, kerosene	Shri V.R. Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
1817	Control of birds by using audio cassette tape	Farmers of Baramati block of Pune district in Maharastra are practising this method to scar away the birds from the crop. The audio cassette tape is tied tightly above the crop. The light reflection in the tape due to the sunlight and scattering noise due to the wind are used to scare the birds. The losses due to birds are minimized up to 15% by this method. About 4–5 families are adopting this method since many years. **Keywords**: sunlight, reflection, wind, noise, loss minimized	Shri Taware Gopal Rao Malegaon, Baramati, Pune (Maharastra)

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1818	Use of trap crops for controlling pests	Farmers of Baramati block of Pune in Maharashtra practice this method to control pests. Inter cultivation of *bajra* in redgram, *bhendi* in cotton, merigold in tomato are practiced to control heliothis and fruit borer attack in crops. By adopting this trap crop method 30% infestation is controlled and the yield of the crops is increased up to 10–15%. Birds are attracted towards *bajra* grains and also pick up larvae in the redgram crop. About 53 families are practising this method since 10 years. **Keywords**: intercultivation, yield increase, pest reduce, heliothis, fruit borer	Shri Shankar Krishna Holkar, Shri Eknath Sopan Holkar, Hol-8 phata, Baramati, Pune (Maharastra)
1825	Use of ash to control insects	To control insects on crops, ash obtained from burned leaves, bark and stem of neem (*Azadirachta indica*) is dusted over the crops. About 75% of the farmers of Sanora, Algi and Garera villages of Karera block/taluka in Shivpuri district of Madhya Pradesh are practising it with effective results. This has been in practice since past 35 years. **Keywords**: ash of neem, insect attack	Shri Rajendra Sharma Sanora, Dinara, Karera, Shivpuri (Madhya Pradesh)
1829	Use of neem extract for pest and disease control in cotton and vegetables.	Farmers of Nanded collect about 5 kg of dried neem seeds and crush it. Then tie in a cloth and keep in 10 litre water overnight. The extract is made next day by beating the cloth with a stick. It is filtered and washing power is added alongwith water. Then the solution is sprayed. The biopesticide is used for control of bollworm, aphid, jassids, caterpillar in cotton and other vegetables. **Keywords**: neem seed, washing powder filter, biopesticide.	Shri V. R.ThakreT.A., KVK, Nanded (Maharashtra) 431 602
1842	Control of Bihar hairy caterpillar and sorghum argot by using bio-pesticide	One kg garlic is cleaned and ground and kept it over night in one liter kerosene. One kg green chilli is ground and boiled with 2 liter water. One kg brinjal is ground/tobacco powder is kept over night with 2 litre water. All the three mixture are filtered and mixed. 10 g *hing* powder is added in the mixture. 5 ml mixture is mixed with one litre water for spraying purpose. 2.5 liter mixture is required for spraying one ha field. The mixture is sprayed in 10–15 days interval at the time of pest incidence. The cost per spraying is Rs 500. About 200 farmers of Degaon village in Nanded district of Maharastra have adopted this practice since several years.	Shri V. R. ThakreTraining Associate (Agronomy), KVK, Pokharni, Purna Road, Nanded (Maharastra) 431 602

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2062	Neemcake as pesticide	**Keywords**: garlic, green chilli, tobacco powder, brinjal, *hing* Neemcake is applied to the paddy crop as a basal manure. It has pesticidal properties, which help protect the paddy crop from the brown plant hopper and mealy bugs, and improve the soil fertility. It is an age-old practice and is being followed by 80% of the farmers in Srikakulam district of Andhra Pradesh. **Keywords**: neemcake, pesticide	Shri K. Lakshmana Ph.D Scholar, P.G Hostel, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2063	Non-pesticidal management programme	Some of the non-pesticidal practices for control of pests in cotton, redgram and groundnut are as follows: Deep summer ploughing, trap crop as castor, neem-seed kernel extract, chilli garlic, tobacco decoction, release of Trichogramma, NPV, BT formulations and bird perching. These practices are being followed in the Ramayanpet, Medak district in Andhra Pradesh. **Keywords**: pest control, non-pesticidal, practices	Nava Jyothi Ramayapet, Medak (Andhra Pradesh)
2067	Use of polythene sheet to scare away the birds	The polythene sheet is tied to a long pole placed in the centre of paddy or mango fields with a small stick of 3–4 ft in the sides randomly. The fluttering sound made by the sheet due to wind make the bird pests fly away from the field, thereby protecting the crop from bird menace. It is practised in the Korlakota village of Srikakulam in Andhra Pradesh. **Keywords**: polythene sheet, bird scare	Shri K. Lakshmana Ph D. Scholer, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2072	Excess seed rate to suppress weed growth	In irrigated drylands, weed growth is higher and pose regular problem in cultivation. The weed growth is checked by adoption of higher seed rate, which suppresses weed emergence and leads to higher plant stand. It is being followed in Kambalepally village of Warangal district in Andhra Pradesh. **Keywords**: excess seed rate, weed growth	Shri M. Sudhakar Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2076	Mixing kerosene in dry sand to control brown plant hopper	The rice crop is heavily infested with brown plant hopper (*Nilaparvatha lugens*) at milky to grain-hardening stage. Water is completely drained and sand mixed with kerosene is applied, after 12 hours field is flooded and water is removed immediately. As kerosene makes the hopper unconscious for some time during flooding, on removal of water they go out of the field. It is a cheap method over use of *Novan* (DDVP). **Keywords**: rice, BPH, kerosene	Shri P. Rami Reddy Babanagar, Gosapadu, Kurnool (Andhra Pradesh)

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2078	Growing trees on the field bunds	Trees are grown on the field bunds around the crop (groundnut and sunflower), so that birds can sit on the branches of trees and eat the larvae of *Spodoptera* and *Heliothis* (caterpillars), thereby controlling the pests to a greater extent. **Keywords**: field bunds, trees, pest managemnt	Shri A. Maheswara Reddy Peddatekuru, Kallur, Kurnool (Andhra Pradesh)
2085	Using dummies to control birds	Dummy (a structure resembling human being made of cloth and paddy straw) is kept one or two feet above the crop canopy by using bamboo sticks, before harvesting. This practice helps scare away the birds from the field. This is being practised in Venkatapuram and Rotaripuram villages of Andhra Pradesh. **Keywords**: dummy, harvesting, paddy straw, bamboo sticks	Krishi Vigyan Kendra ANGRAU, Reddipalli, Anantapur (Andhra Pradesh) 515 701
2089	Sand/ash broadcast to control leaf folder	Broadcasting of sand/ash prevents the larvae of leaf-folder in rice from feeding on the leaves. It is done early in the morning, when there is plenty of mist, fog, so that it sticks on the leaf. The sand/ ash also aberates the skin of larvae and causes desiccation and death of larvae. **Keywords**: sand/ash, leaf-folder, rice	Shri Dorai Raj Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2090	Seed treatment	Greengram seed with cowdung slurry protects the seed from the stored grain pest infestation, prolongs the storage life, maintains seed viability and avoids spoilage of seed. It is easy to adopt over the use of chemicals for seed treatment. **Keywords**: greengram, seed treatment, cowdung slurry	Shri Rao, Amudala Valasa, Srikakulum, (Andhra Pradesh)
2091	*Ocimum* as a botanical insecticide	In the field *Ocimum basilicum* acts as insecticide by altering the levels of hormones in insects and also acts as deterrent. It is locally available and found to be grown in all farming situations. Being a botanical pesticide, it does not leave any residue. **Keywords**: *Ocimum*, botanical insecticide	Shri M. Papi Reddy, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh) 505 122
2092	Light traps on dark night (*amavasya*)	Small lamps and oil pans are kept in the paddy, chillies and tobacco fields here and there during night time. The nocturnal insects will be attracted to the light and fall in the oil, resulting in killing of the	Shri P.Mohan Reddy, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirman Samithi

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2094	Bird scaring with stones	insects. These lamps are locally available and this method is being practiced in all farming situations, which is cost effective and does not leave any residue. **Keywords**: light traps, dark night, nocturnal insects	Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
2098	Keeping *ajwain* in the cupboard infested with cockroaches	Scaring of birds with stones kept in a leather pouch tied with a string and releasing the stones to a greater distance prevents the bird attack to mango crop. It is better over the beating of boards to scare away the birds at the time of fruiting season. **Keywords**: leather pouch, stone, mango, bird scaring	Shri K. Lakshmana Ph. D Scholar, Room No 81, PG Hostel, College of Agriculture, Rajendranager, Hyderabad (Andhra Pradesh) 500 030
2099	Neem seed kernel extract against gram pod borer	Application of neem seed-kernel extract (15 kg of neem seed grond and soaked in 30 litres water for 24 hr by tying in a cloth; then the seed is mashed and is blended with 15 g soap water) @ 15 kg/acre on cotton during *kharif* controls the bollworm (*Heliocoverpa armigera*) effectively over chemical control. **Keywords**: neem extract, *Heliocoverpa armigera*	Shri B.Mohan Rao Nava Jyothi (Rural Development Society), NZB Road, Ramaiya Peta, Medak (Andhra Pradesh)
2310	Methods of seed treatment	Some of the traditional methods for seed treatment which increase resistance are: 1. Paddy seed in a gunny bag soaked in water and biogas slurry alternately for 12 hours. 2. Maize seed soaked in cow urine for 12 hours before sowing. 3. Hot water treatment of banana suckers 4. Dipping of cotton seed in biogas slurry 5. Mixing of ash with vegetable seeds. Keywords: seed treatment, methods	Dr G.Subba Reddy and Dr H.P.Singh, CRIDA, Santosh Nagar, Hyderabad (Andhra Pradesh) 500 039
14	Use of ash dust for control of sucking pests	Farmers in the Gendoli village of Kpatan tehsil in Bundi district of Rajasthan are using ash dust to control the soft-bodied insects in vegetables. The ash acts as antifeedent for insects, causing dehydration in soft bodied insects, ultimately leading to their death. It can be used both during *kharif* and *rabi* (rainy and winter seasons). There is no problem of pesticide residue, environmental pollution or pest resurgence. **Keywords**: ash dust, sucking pest, vegetables	Shri N L Meena Assistant Professor (Entomology), Post Box No 4, Krishi Vigyan Kendra, Bundi (Rajasthan) 323 001

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16	Dusting of wood ash for healthy seedling	Wood ash is dusted with hand or duster on seedlings of vegetables (tomato, brinjal, clusterbean) in the nursery as well as on the young seedlings. The wood ash acts as an insect repellent and protects the young plants from pest and disease attacks. It may be a good source of mineral nutrients without any social or environment damage. It is being used by most of the vegetable growers from generation to generation, in Sikvi-Karwon village of Sirkay and in Dausa district of Rajasthan. **Keywords**: woodash, vegetables, healthy seedlings	Dr S. R Meena Scientist,(Agricultural Extension) Central Institute for Arid Horticulture, Beechwal, Bikaner (Rajasthan) 334 004
19	Control of sucking pests in cotton and chilli	The sucking pests in cotton and chilli are controlled by application of 10 kg neem-seed kernels boiled in 15 litres water for 1 hour @ 200 ml/15 litres water. Application of neem-seed kernel extract 4 to 5 times at an interval of 7 days can effectively control the sucking pests. It is being followed in Varawada village of Mehsana district in Gujarat. **Keywords**: cotton, chilli, sucking pests, neem	Shri Patel Kanjibhai Prabhudas, Varwada (Post S V), Unjha, Mehsana (Gujarat)
126 (a)	Pest control practices	Shri. Michael has developed a practice for controlling pests in crops. Leaves of *thumbai* (*Leucas aspera*), *kuppaimeni* (*Acalypha indica*), *thulasi* (*Ocimum canum*), *Datura metal*, neem, *nochi* (*Vitex negundo*), 5 fruits of *varikkampattikaai*, neem cake and *iluppai* cake (*Bassia latifolia*) are pounded and soaked in water and kept for 10 days in earthen pot. The extract is filtered and 100 ml soap solution and 100 ml neem oil are added and sprayed to control insects. **Keywords**: *Leucas aspera*, *Acalypha indica*, *Ocimum canum*, *Datura metal*, neem, *Vitex negundo*, neem cake, *Bassia latifolia*, soap solution, neem oil	Shri K.S. Michael M. Ammapatty, Reddiar chatram, Dindigul (Tamil Nadu)
126(b)	Pest management in (cotton	A mixture of fishmeal and jaggery at 2 : 1 ratio is broadcasted on the cotton field to attract cranes and bulbus which will feed on prodenia worme. **Keywords**: cotton, prodenia control	Shri V. Manithiasamy Amarapoondi, Palani, Dindigul (Tamil Nadu)
126(c)	Pest management in cotton	The practice developed by Shri. Nachimuthu for control sucking pests in cotton are indicated here. Ten pieces of cotton cloth are soaked in turmeric solution and dried. The dried cotton cloth is again soaked in castor oil and tied in the in the fields in different locations under the chimney lamps. Thin cloth attracts the sucking pests.	Shri P. Nachimuthu Kanakkampatty, Palani, Dindigul (Tamil Nadu)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		Keywords: cotton pieces, turmeric, castor, chimney lamps, sucking pests	
144	Herbal pesticide for chilli and paddy	Shri. Dharmar has developed a herbal pesticide for control of pest and disease in chilli and paddy. 7.5 kg neem seeds, 4 kg leaves *kattunotchi* (*Vitex negundo*), 2 kg siru *thombai (Leucus aspera)* and 2 kg *perunthumbai* (*Leucas martinicensis*) are pounded well and soaked in mud pot containing 10 litres of cow urine. The mixture is allowed to ferment for a week. Mixture are filtered and the resultant material is used. One litre of the filtered material is filled in a sprayer tank along with soap water (100 g of washing soap scraps and soaked in water and diluted). Five litre liquid mixture is sufficient for spraying 60 cents of chilli field. 4 times application at 10 days interval from 25th day of planting. This practice controls pest and disease in chilli field. **Keywords**: herbal pesticide, chilli, paddy, neem, *Vitex negundo*, *Leucas martinicensis*, *Leucus aspera*, cow urine, soap water	Shri A. Dharmar Anaikaraipatti, (Tamil Nadu)
153	Fungal disease control in chillies, cotton and lemon	Fungal disease in chillies, cotton and lemon fruits in controlled by spraying a mixture, locally prepared called *panchagavya*. The mixture is prepared by mixing 5 parts milk, 2 parts curd, ½ part ghee, 2 parts cow urine, ½ part cowdung and 10 parts water. The mixture is kept for 7 days before it is sprayed in field where fungal disease is predominant. Spray of the mixture also controls leaf shedding and enhances flower setting. Ten farmers of Periakovilankulam village follow this practices for the last 3 years. **Keywords**: *panchagavya*	Shri S. Murugesan Periakovilankulum, Sankarankovil, Tirunelveli (Tamil Nadu) 627 953
169(a)	Control of heliothis in groundnut	*Heliothis armigera* in groundnut is controlled by spraying leaf extract of *Prosopis juliflora*. Total 200 ml of Prosopis leaf extract is taken in 10 litres water for spraying. This practice is in use in village Thummanayakkanpatty village of Madurai district in Tamil Nadu. **Keywords**: *Prosopis* leaf extract, *Heliothis*, pest control	Shri M. Jagadesan Thummanayakkanpatty, Peraiyur, Madurai (Tamil Nadu) 625 703

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
244	Control of cutworm in cotton	*Citrullus grandiflora* (*peirya kumuttikai*), *Cissus quadragularis* (*perandai kodi*), *Tecoma stans* (yellow *arali* seeds) and *Azadirachta indica* (neen leaves/seeds) are ground and paste is prepared. The paste is allowed to ferment as such for 10 days. Paste from *Sesbania grandiflora* is made separately and fermented. After 10 days, the fermented pastes are filtered though a thin cloth, diluted with required quantity of water and sprayed over the foliage. This controls the cut-worms in cotton very efficiently with no side effect. **Keywords**: cutworm, cotton, bio-pesticide	Shri S. Pidhai, Muniandi Koil Street, Jayanangalam, Periyakulam, Theni (Tamil Nadu)
344	Management of yellow stem borer in paddy by use of *parasi* (*Cleistanthus collinus*) leaf	Application of 75–150 kg *parasi* (*Cleistanthus collinus*) leaves by broadcasting once in the rice field at 3 days after transplanting controls yellow stemborer during *kharif*. All the rice-growing farmers in the Aralkocha village of Purulia district in West Bengal follow this practice for the last 50 years. **Keywords**: *parasi* leaf, stem borer, rice	Shri Kalyan Majhi Aralkocha Konapara, Hura, Purulia (West Bengal) 723 128
355	Felling of trees/bamboos on no-moon days (*amawasya*)	Felling of trees/bamboos is practiced on no-moon days, during which the plants have minimum water content in the branches, which reduces the incidence of insects/pests. It avoids the pest incidence by 80% (approximately) and is being practiced from time immemorial. **Keywords**: felling of trees, no-moon day	Shri M. Mohanty Senior Research Fellow, Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
447(c)	Pest and disease management by crop debris	The crop debris and weeds serve alternate hosts for different pests and diseases, and they propagate the fungal spores to the crop plants. Hence the destruction and burning of this debris helps eliminate the fungal inoculum from the field. **Keywords**: alternate host, fungal spore	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
447(f)	Use of cow dung for pest control	Cowdung ash is used for pest control in different crops. **Keywords**: pest control, cowdung, ash	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
447(g)	Rodent control	Fruits of wild *Solanum* sp. are used for trapping rodents. **Keywords**: rodent control, wild solanum	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
447(h)	Control of root and stem borer in paddy	Spraying mixture of kerosene oil and ash prevents attack of root and stem borer in paddy. **Keywords**: root and stem borer, kerosene oil, ash, paddy	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
447(i)	Control of paddy stem-borer	Light trap is used to control stem borer in rice. **Keywords**: paddy, stem borer, light trap	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
447(j)	Seed treatment of groundnut with kerosene oil to prevent bird/insect damage	Groundnut seed is treated with kerosene oil @ 1 ml/kg seed to prevent damage caused by birds and insects after sowing. **Keywords**: groundnut, seed treatment, kerosene oil	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
447(k)	Control of termite	Termites in the field are attracted by placing the green palm leaves in the field and are killed by burning the leaves. **Keywords**: termite, palm leaves, burning	Dr Dulal Chandra Manna Rathindra KVK, Sriniketan (West Bengal) 731 236
692	Kerosene oil for killing borers	Kerosene oil is used to suffocate, injure or kill the shoot and stem-borers of orchard trees. Kerosene oil prevents the contact of adult insects with the leaves. It is used to kill or repel the insects pests. Exposure to kerosene fumes kills the insect pests. The tissue borers in orchards are killed by using a flexible metallic wire which is inserted through the hole made by the borer into the gallery, then a small plug made of cloth soaked in kerosene oil is inserted into the hole and finally it is completely covered by a paste made of cowdung and clay. Kerosene is applied during the dormant winter season. This practice is cheap and easy to apply. Farmers have been using this method for the last more than 50 years. **Keywords**: kerosene oil, suffocate, stem borer, orchard tree, repellent effect	Ms Krishna HettaSenior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
1377	Control of potato blight with ash	This is practised, to prevent potato from leaf blight, by farmers of Soba village of Ranchi district in Jharkhand. The potato leaves are prevented from leaf blight by using wooden ash, which is dusted on the leaves at night. Wooden ash is very effective on the leaf blight. All farmers use this age-old practice. **Keywords**: potato blight, wood ash, dusting	Shri Nagheshwar Mahto Soba, Burmu, Ranchi (Jharkhand) 835 205

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1399	Insect control by ash	Villagers of Kuchai block in Sarikela district (Jharkhand) apply ash of wood in the field and mix it into the soil to control insects. This practice is used by a villagers and is being followed for the last several years without any modification made in practice. **Keywords**: ash of wood, mixed into soil, insect infestation	Ms Gita Kumari C/o K. N. Singh Munda, Matladih, Bagbera (Tatanagar), East Singhbhum (Jharkhand) 833 201
1400	Control of Bihar hairy caterpillar (*Spilosoma obliqua*)	In this practice, ash is dusted over Bihar hairy caterpillar. It repels the insects/pests. This practice has been found to be effective in protecting rice crop. This is age-old practice followed by the farmers in the Tamar village of Ranchi district of Jharkhand. **Keywords**: bihar hairy caterpillar, ash, insect/pest, rice crop	Shri R. S. Prasad Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1411	Biological control of pests	Farmers of Jiling and Maradih villages of kudu block in Lohardaga district (Jharkhand) use kerosene oil and *sindwar* leaves (*Vitex negundo*) to control hairy caterpillar. They opined that the *sinduar* and kerosene oil have some medicinal values and kills or repels this pest. It is reported that success has been observed in 40% of the cases. **Keywords**: kerosene oil, *sinduar*, *Vitex negundo*, hairy catterpiller, medicinal value, repels	Shri Krishan Ram Jiling, Pandra, Lohardaga (Jharkhand)
1413	Control of stem and root borer by extract of *Calotropis*	Stem and root borers are controlled by the help of *Calotropis* plant. In the practice, whole plant of *madar* (*Calotropis procera*) except the root is ground and is placed at the irrigation source. The extract of the plant flows with water into the field and controls the stem and root borers. It is in practice for last 50 years by maximum number of farmers in the Shapur village of Nawada district of Bihar. **Keywords**: stem and root borer, *Calotropis procera*, extract of the plant, *madar*	Shri Abdul Raoof Ryn Sahpur, Arena, Nawada (Bihar)
1416	Control of pests and diseases by spraying of starch, animal urine and dusting of cowdung ash	The sticky nature of starch and uric acid of animal urine helps in killing the a insects. Dusting of cowdung ash help in control of biting and chewing type insects specially aphids. Rice starch and animal urine are spread on the vegetable plants. These traditional practices are adopted by 85% farmers in the Kurchi village of Dhanbad district in Jharkhand. **Keywords**: pest, starch, uric acid, cowdung, dusting, biting, chewing insects	Shri Sitaram Mahto Kurchi, Govindpur, Dhanbad (Jharkhand) 828 109

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1417	Control of shoot and fruit borers by tobacco-soaked water with soap	The shoot and fruit borers are very common in Kowakol, Sokhodeora, Jorawardih and Mananiyatari villages of Nawada district of Bihar. Tobacco is soaked in water overnight and the extracted liquid is filtered and sprayed on the affected plants with soap or detergent powder. The ratio of water and tobacco in solution is 10 : 2. This is in practice for last 30 years by maximum number of farmers in the village. **Keywords**: shoot and fruit borer, tobacco (*Nicotiana tobacum*), soap/detergent, water	Shri Mahavir Singh Kawakol, Nawada (Bihar) 805 106
1428	Sterilization of soil for nursery	Farmers of Khakhra, Baraudhi, Hesalpiri and Kharkutali of Ranchi district of Jharkhand sterilizes the soil for minimizing of disease incidence. In this practice, nursery soil is sterilized by burning of straw and husk of paddy, wheat and fingermillet. This practice is in use since more than 30 years without any modification and is adopted by 140 farmers out of 150. **Keywords**: sterilization, nursery, disease, straw/husk, burn, paddy/wheat/ fingermillet	Shri Gopal Krishna Research Associate, IPM/NATP, Divyan KVK, Morhabadi, Ranchi (Jharkhand) 83 4002
1809	Control of fruit fly by *tulsi* leaf extract	Leaf extract of *tulsi* is kept in boxes in sapota field. The sapota fruitfly gets attracted to this extract within 1–2 minutes. Male fruitfly gets more attracted to this extract than female. After destruction of male, the eggs laid by female are destroyed, so that there is reduction in fruitfly population. About 25–30 *tulsi* plants are planted in 1 ha bitter gourd. The maximum cuts made in *tulsi* plant cause more vegetative growth. About 60 farm families in Sayal village of Maharastra are practicing this method since several years. **Keywords**: *tulsi*, bitter gourd, sapota, box	Shri V.R. Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
1820	Control of wilt in ginger by use of cowdung	To control wilt in ginger, the farmers of Bisapur village, Mohkhed block in Chhindwara district of Madhya Pradesh use solution of cowdung. Wilt is perceived by the farmers as the biggest disease for this crop. A solution is prepared with 2–3 kg of raw cowdung in 3–4 litres water to treat the seed of ginger. This treatment is done once and to cover one acre. It has an effectiveness of 80–90%. Out of 2000, a total of 1200–1400 farm families use this practice from time immemorial. **Keywords**: ginger, wilt, solution of cow dung, seed treatment	Shri Ranjay Singh Ph. D Scholar, (Agri. Extn), C/o Dr C B Singh, Dean, College of Agriculture, C2 Krishan Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1923	Control of pests by using gurvel, onion and turmeric	One kg gurvel pieces, 100 g onion pieces, 50 g chilli powder and 250–500 g turmeric are mixed with 1 litre water. The mixture isthoroughly stirred, boiled and filtered. Two litres of the filtered extract is mixed with 100 liter water and 100 g washing powder solution and used after 3 days for spraying. About 150 farm families in Dhamdhari village of Nanded district in Maharastra are practicing this method. **Keywords**: gurvel, onion, turmeric, chilli, washing powder	Shri V.R.Thakre Training Associate, Krishi Vigyan Kendra, Pokharni, Purna Road, Limbgaon, Nanded (Maharastra) 431 602
2064	Application of kitchen ash for pest control	Kitchen ash is dusted on the green leaf vegetables and bean plant surface as a thin layer. The layer of kitchen ash has the pesticidal properties and prevents the pest attack. About 92.5% farmers in the Randisa village of Srikakulam in Andhra Pradesh are following it is both rainfed and irrigated farming situation. **Keywords**: kitchen ash, pest control	Shri K. Lakshmana Ph.D. Scholar, P.G. Hostel, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2150	Growing of marigold in redgram	About 45 days old seedlings of marigold are planted in redgram+groundnut intercrops field or redgram as a sole crop. Marigold (*Tagetus patula*) acts as a trap crop for *Helicoverpa armigera*. Adult lays eggs in the flowers of marigold so that larvae can be easily controlled by spraying on marigold. **Keywords**: marigold, redgram, intercrop	Shri KVS Rami Reddy Krishi Vigyan Kendra, Anantapur (Andhra Pradesh) 515 701
2241	Growing cactus as fence	The cactus is planted as a fence around the field crops to protect the crop from animals. As the cactus plant is having needle like structure, there by preventing trespassing of animals. It is an age old practice practised by 52% of farmers in Kandisa village of Srikakulam district in Andhra Pradesh. **Keywords**: cactus, fence	Shri K. Lakshmana Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2305 2305(D)	Crop productionand protection	The practice pertaining to paddy cultivation are given below: *Preparatory tillage:* The practice of *rab* for raising rice nurseries is very common. Almost all the farmers followed the *rab* practice for destruction of weed seeds and control of diseases, thereby raising healthy seedlings. The *rab* practice is of two types: In soils near to sea coast farmers cover seed bed area by about 3–5 inches thick layer of dry leaves, twigs of small bushes, grasses or other dry refuse, set fire to it in	Dr N.D. Tawade Professor and Head, Department of Extension Education, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (Maharashtra) 415 712

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		April–May on the eastern end of the area, preferably in the evening, so as to allow it burn slowly. The evening sea breeze blows from west and east and as such it takes some time for the fire, set on the eastern side, to reach western side.In soils away from sea coast farmers cover seed bed area by about 3–5 inches thick layer of dry leaves (*kaval*) and grasses. One inch thin layer of fine soil is sprayed over it and water is sprinkled. Then dry cattle dung or other dry refuse is kept over it. This material is set on fire in April-May on the eastern end of the area. Farmers argue that thin layer of soil allows for the flow of the material spread in the seed bed area. This process of burning the seed bed area is locally known as *rab* or *dadh bhajane* or *bhajawan* and is followed everywhere in the region. The farmers follow this practice with a view to destroying the weed seeds, harmful microorganisms and insects and adding some manurial ingredients through the ash formed. They believe that it gives a better start to the young seedlings. *Sowing:* Since rains are due in the first week of June, the seed beds are ploughed twice and the clod crushing is done with the help of monger/stick and the area is levelled. Farmers sow paddy seeds early in June or in *mrug nakshatra* (constellation) either in anticipation of rains or in *rohini nakshtra* (constellation) or in some places immediately after rains. It is locally known as *pera*. Generally, 100 to 120 kg seeds are used for sowing an hectare of land. The seeds take about a month to come to the height suitable for transplanting and during this time, the cultivators get busy in preparing land for transplanting. *Dry sowing:* Dry sowing, which is known as *dhul- waf* or *dhul* perani is done in some places in the fourth week of May. The farmers told that due to exposure of seeds to heat, seed borne fungal diseases get destroyed and facilitates an early emergence of the seedlings. *Nursery management:* For control of *karpa* (rice blight) at nursery stage, the farmers spray a salt of 20% concentration on nursery beds. After spraying of salt solution, some farmers dust the ash uniformly by hand all over the bed. Due to this practice, rice blight does not occur in the field.	

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		Transplanting: Triangular method of Pest and disease management transplanting is followed by the farmers. Before transplanting, the tillage operations like *ukhalani* (light ploughing), *chikhalani* (puddling) and *gata phiravine* (planking/levelling) are performed by the farmers. *Ukhalani* is done after first monsoon showers to break the crust of the surface soil, so that penetration of the plough in the earth becomes easier for subsequent criss - cross ploughing. Farmers use poultry manure/gobar gas plants waste or farm yard manure or leaves of *kuda* (*Holarsbena antidysenterica*) as a manure. Puddling is done by means of a light plough to prepare fine soft mud- beds for transplanting the seedlings. A well puddled field holds water longer and keeps the plants green. After puddling, a wooden plank is dragged by bullocks over the field to level the land.As soon as the mud-beds get ready, seedlings are carefully uprooted from the seed bed, tied in small bundles called aawan and carried to *khachars* (rice fields) where they are finally transplanted. Transplanting is done by hand. Generally eight to ten persons are required for transplanting an acre of land. Ten to fifteen seedlings held in a bunch are simply pressed in the mud with a spacing of nine to twelve inches both way. Some farmers transplant paddy seedlings in triangular manner, so as to save labour and time in transplanting. *Weed control:* Most of the farmers follow this method of weed control in paddy field. Farmers raise the bunds and water is allowed to stagnate for seven days. Due to this, obnoxious weeds get destroyed and also water get destroyed. Further, water is kept as such for once more. This results into emergence of aquarious weeds which are later controlled by draining out water from the fields. *Insect/pest control:* For control of crab or rats in the *tarava* (seed bed area), some farmers keep small pieces of *phanas* (jack fruit) in the seed bed area due to which crabs get attracted towards the pieces of jack fruit. This diverting of attention of crabs ultimately saves paddy seedlings from probable damage by crabs.Use of traps or stick or *kudali* for control of rats: Before paddy is cultivated, the field is thoroughly checked for rat holes. The spotted out holes are destroyed with the help of *kudali* or stick. Farmers also use the trap made up of bamboo, which	

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		is placed in the field where the rat movements are high. *Eco-friendly methods:* Some farmers adopt the eco-friendly methods for control of rats, whereby situations are created to expose the rats to fall prey to dogs and cats.Constructing small bunds around each field for control of rats. The farmers argue that the small bunds (i.e. without too much height and breadth) around each make it difficult for the rats to dig holes. Other methods followed are: Farmers fill Pest and disease management broader mouthed earthen pots with cow dung mixed water, upon which a little rice is spread to attract rats. When the rats try to eat rice, they instantly fall into the cow dung mixed water and die. *Disease control:* For control of *karapa* (rice blight) at later stage of crop growth, almost all the farmers dust cow -dung ash uniformly all over the field by hand. *Harvesting:* Harvesting of paddy is normally over by the end of October. After the crop matures, it is cut close to the ground by means of sickles and left in the field for 2–3 days for drying, and after it is tied in bundles. These bundles are taken to a threshing yard or *verandah*. These bundles are stacked on a wooden platform locally called as *udavi* for 2 to 2.5 months (i.e. upto November- December). Then the bundles are threshed to obtain grains by beating these bundles against a wooden plank. The straw is also trodded under the feet of bullocks to obtain the remaining grains in the earheads. *Preservation of seeds:* The farmers preserve paddy seeds in *pendhi*/*kovali* for sowing in next year. Paddy straw along with grains (full matured) are three folded in such a manner that the grains remain at center and then tied in bundle by means of paddy straw. In this way, paddy seeds are preserved by folding paddy straw, which allows penetration of air and keep the seed viable and free from insect infestation at the center. *Seed treatment:* Most of the farmers give treatment to paddy seed for preservation. A thin slurry is prepared by mixing cow dung and urine of cow in 1 : 2 proportion. Paddy seeds are then soaked in this solution for half an hour and dried in shade. Then after completely drying these seeds are stored in	

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		kanagi with neem leaves (*Azadirachta indica*) and banyan leaves. At the end, the structure is covered with cow dung. *Paddy storage:* Almost all the sample farmers store paddy grains in wooden bins or boxes locally called as *lothars* or *hadapa* and *tattya* or *kangas* (bamboo mats made into hollow cylinders). *Kanga* is plastered on both sides with dung and its bottom is sink in the ground to a depth of nine inches, in the house or outside the house in a *verandah*. After thoroughly cleaning it from inside, paddy is filled in and some quantity of leaves of *kadu nimb* (*Melia azadirachta*) or fruits of *kubhali* or *triphala* (*Zanthoxylum rhesta*) or *gilkhand* or leaves of *nigadi* (*Vitex negundo*) or teak tree (*Tectona grandis*) are mixed in the grain (to prevent attack of storage pest) and covered with straw. The opening of the *kangas* is secured by light plastering or by stitching with gunny cloth. The size of *kangas* depends upon the quantity to be stored. *Kangas* are plastered on all sides by cow dung to keep away the insects from entering inside. **Keywords**: paddy, cultivation	
164	Management of *murda* disease in chillies	*Murda* disease in chillies is caused by infestation of thrips and mites, resulting in upward and downward curling leaves of the crop. To control this, farmers sow coriander seeds in between two plants of chillies in alternate rows. The odour of coriander repels thrips and mites. This practice is followed by almost all the farmers in Hulloli village of Belgaum district in Karnataka for the last 30–40 years. **Keywords**: *murda* disease, mixed cropping of chillies and coriander	Shri Babu Allapa Chougala, Hulloli, Hukkeri, Belgaum (Karnataka)
2087	Control of moth and weevil infestation in paddy	For every 50 kg of grain storage, 200 g salt is placed. In a bag of 100 kg paddy, 200 g of salt is added after filling 50 kg and the remaining 50 kg of grain is filled by addition of 200 g salt for every 50 kg grain to control the moth and weevil infestation in paddy. **Keywords**: weevil, paddy storage, salt	Shri G. Chandra Sekhar Principal Investigator, Progress, 12–13–626, NagarJuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)

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Soil Fertility Management

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
29	Use of plant material based manure on chillies	The plant-based manure is prepared by putting 2 baskets FYM, 2 baskets neem leaves, 10 kg urea and 10 kg single super-phosphate in a pit (4×2×2 feet) and then allowing them to decompose for 15–30 days. This rotted manure is applied to chilli 10 days after transplanting for an area of 0.1 ha. The cost involved is Rs 200. The farmers get an additional yield of 25–30%, which is nearly 2 quintals, costing Rs 500–1500. It avoids the incidence of termite and enhances better flowering and fruiting. It is being practiced in Tankarda village of Jaipur in Rajasthan. **Keywords:** chillies, plant material, manure	Shri Shankar Lal Jatawali, Chomu, Jaipur (Rajasthan)
1121	Blue-green algae bio-fertilizer technology	Shri Ganguly, Senior Scientist in IARI indicated that production of blue-green algae fertilizer in controlled condition assured maximum population of member species. The production technology is substantially improved with introduction of new and cheap carrier material like straw and multani mitti, which support higher microbial load with longer shelf life and considerably reduce the quality of inoculum per unit area. In this method blue-green algae are produced in poly-house or glass-house. The individual unit in the poly-house is RCC brick and mortar or polythene-lined pits on ground. The algae are grown individually in the medium and harvested and mixed with the carrier material. The dried material is placed in suitable-size packet (polythene), sealed and stored. One kg material is sufficient to inoculate 1 ha of rice field. This practice saves 25–30 kg N/ha and increases 10–15% yield. Multani mitti (fuller's earth) is recommended as a carrier material for its good-water holding capacity, good adhesive property, good buffering capacity and its support for higher algal load. The period of production time requirement is reduced to 8–10 days in this method. **Keywords:** blue-green algae, fuller's earth, straw, poly-house, glass-house, polythene, RCC	Shri A.K. Ganguly Senior Scientist, Planning Publication and Information Unit, IARI, New Delhi

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1429	Utilization of plant leaves for manuring	brick,mortar Farmers of Khijuria village of Dumka district of Jharkhand prepare plant leaf manure by collecting them at one place and allowing them to get decomposed. Then they apply this manure in the field after first ploughing of preparatory tillage. The materials are then incorporated well into the soil during next ploughing followed by planking. This practice maintains the soil fertility and increases the water-holding capacity of the soil. This is in practice for last several years by 60% farmers in the village. **Keywords:** plant-leaf, manure, decomposition, water-holding capacity	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
2116	Green manuring in situ and green leaf manuring in paddy	Green leaves which are available locally and the green manure crops like dhaincha, pillipesara, janum. Teluga grown in the field before paddy are incorporated into the soil at the time of final puddling. Green-manure crop seed is broadcast at 30–40 days before sowing of paddy. Green matter content adds organic matter to the soils and improves the soil fertility. **Keywords:** green leaf manure, paddy	Shri K. Samba Siva Reddy C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jaimaikunta, Karimnagar (Andhra Pradesh)
2118	Spreading of green leaves in paddy fields	Green leaves available are spread in paddy field 15 days before puddling and then incorporated in the field at the time of puddling, which ensures the addition of organic matter to the soil and this checks the emergence of weeds and improves the physical properties of the soil. **Keywords:** paddy, green leaf manuring, puddling	Shri Rangaiah Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
175	Pit manuring device	T o increase the efficiency of fertilizer and reduce the volatilization as well as leaching losses, Shri. Raju has developed an equipment called pit manuring device for use in sugarcane crop. The device is attached to the shoulder and operated easily by the use of handle. The capacity of the fertilizer tank is 5–10 kg. fertilizer passed through a hose pipe to the applicator tube. The sharp iron end of the device makes a small hole with a size of 2 inch breadth and 2 inch depth, which is used to deliver fertilizers near the root zone of the crop. 5 g of tank material (fertilizer/granules) is placed at the hole and filled by soil. The cost of the device is Rs 480.	Shri S. Raju S/o Rengasundar, Mohanur, Namakkal, Salem (Tamil Nadu) 637 015

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		Time taken to apply 1 acre is 28 hrs. This practice increase the labour cost and reduce the quantity of fertilizer up to 30%. The fertilizer is applied directly to the root zone of the crop. **Keywords:** pit manuring device, fertilizer, tank	
704	Collection and use of green pine needles for the preperation of compost	The farmers in upper Himachal Pradesh collect green pine needles for preparation of compost. The leaves, grasses and pine needles, which are used as bedding for the animals, get soaked with the excreta/urine of livestock and it is collected in the field, so that it becomes easy to be scattered in the field later on. All the farmers are using this method for the past several years. **Keywords:** green pine leaves, compost, bedding for cattle, excreta/urine	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 and Dr O.S. Shad C/o Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
705	Collection of dry pine needles for preparation of farmyard manure	In upper parts of Himachal Pradesh, farmers collect dry pine needles and use them bedding material for animals during winter where there is heavy snowfall. These needles, which get soaked with excreta or urine of livestock are collected in the corner of the field which is then used for preparation of FYM. **Keywords:** dry pine needle, bedding material, winter, excreta, FYM	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
714	Sloppy snow/rainfed terraced farming with compost.	The slopy terraced fields are generally made in the middle of the hillocks, having grass/bushes of fodder, fuel and timber trees at the top, as wel as at the bottom. They serve in minimizing soil erosion, conserving rain water and protecting crops from winds. In this field, a circle of the following crops is made in a period of two years: 1. Maize-beans (intercropping) sown during May/June. 2. Fallow land/field September to March/April (subsequent year) 3. Potato in March/April to August/September 4. Wheat/barley/gram September/October 5. Harvesting of wheat/barley/gram in May/June (subsequent year) 6. Maize sowing May/June. Maize is sown after harvesting of wheat/barley/gram. Well-decomposed compost is spread in field when the maize plants grow 12" or more in height.	Shri P. R. Ramesh Kamdli, Theog Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		Soil is added around each plant mixed with the compost and a pit is formed amongst the three/four maize plants which checks soil erosion and conserves water for all these maize plants if the rain does not fall during their flowering period. Besides the compost made of biomass, green leaves, coniferous tree needles and cow/buffalo dung also helps is conserving moisture in the terraced fields. *Potato crop:* After harvesting maize during August/September, the fields remain fallow during winter September to March/April. These fields allow water percolation from snow melting which is a slow process, and hence minimum soil erosim takes place. Compost is spread over these fields. The fields are then ploughed during February/March and more suhaga is placed over these fields to conserve water and, if rains fall after filling fields, they are also quite prone to absorb most of rain, which further promotes decomposition of compost if some quantity of the compost remains to be decomposed. The potatoes are sown in these well-ploughed fields by digging small pits, which conserve both soil and water, which promote plant growth to its maturity. Wheat/ barley is sown in September/October after harvesting of potato crop in August/September. The fields are ploughed twice after digging out potatoes. It takes more than 8 months to reap wheat-barley crop. This circle is complete and cropping pattern repeats the sequence. **Keywords:** sloppy terraced field, minimize soil erosion, consume rain water, crop cycle	
1427	Indigenous method of compost preparation	Almost all the farmers of Chotanagpur area of Jharkhand use self-prepared compost to get good yields of crops. Compost is prepared by putting waste materials of farm and house and cowdung etc. in a pit. They allow these to decompose over time. Water is sprinkled over the pit from time to time. After 6 months, decomposed material is dug out from the pit and applied to the crop plants. This method of compost preparation is being practised for the last thousands of years.	Shri Pankaj Kumar Agriculture Specialist Jan Jagran Kendra, Near Police Training College, Kanhari Hill Road, Hazaribagh (Jharkhand) 825301

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
707	Use of farmyard manure for improving soil fertility	**Keywords:** self-prepared compost, waste materials, pit, watering, decompose, plant nutrients Farmyard manure (FYM) is a rich source of plan nutrients, which enhances productivity of agriculutral crops with positive ecological consequences. FYM is a mixture of dung, urine, forest litter, agricultural and household waste including ash. Cattle sheds are constructed in the courtyard of the houses to make compost by utilizing household wastes, wood ash, dung and urine. Bedding material such as pine needles are added every week to keep the cattle shed dry. In such places cattle sheds are cleaned every day and above mentioned waste materials soaked in cowdung and cattle urine are stored in a pit and covered with soil to create anaerobic conditions, which facilitate its decomposition. FYM is spread in the field during winter season in empty fields. Use of farmyard manure has been in practice since time immemorial by the tribal and hill people of Himachal Pradesh at large. Now with the popularization of organic farming, its use is increasing every year and farmers now use FYM in place of chemical fertilizers. **Keywords:** FYM, soil fertility, cattle shed	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
706	Poultry manure and ash for increasing vegetable production	For enchanting the production of tomato, brinjal,capsicum and cauliflower, farmers use mixture of poultry manure and ash. This is in practice for last several years by the cold region farmers. **Keywords:** poultry manure, vegetable, ash, cold region	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
711	Use of ash	Inhabitants of entire cold desert region of Ladakh and Himachal Pradesh use cattle dung, shrubs and bushes as the main source of fuel. Ashes of these fuels are mixed with household waste or human excreta for increasing the nutritional value of soil, as it is rich in potash and phosphate. This is in practice for last several years by maximum number of farmers in the villages. **Keywords:** ash, cold desert, fuel, cattle dung, potash, phosphate	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1430	Utilization of waste material as manure and fertilizer	Farmers of Khijuria village in Dumka district of Jharkhand use surface soil of the dried ponds as manure. In the surface of pond, water hycinth	Shri Veeresh Kumar Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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		(*jalkunmiee*) and other waste materials like pond grasses, unutilized material of house, get decomposed and act like a green manure. This is in practice for last several years by 70% farmers in the village.	
1431	Use of egg shell and fish scales as manure	**Keywords**: waste material, manure, fertilizer, water hycinth, decomposition, pond grass Egg-shell and fish scales are used to manure the fruit trees like citrus, guava, papaya etc. in kitchen garden. Egg-shell and fish scales are put in the root zone of the plant without any processing. After their decomposition, they supply plant nutrients. This wisdom is being used by the farmers of Khaspokharia village of Tantnagar block in West Singhbhum district of Jharkhand from the ancient time. Fish	Shri Sanat Kumar Sawaiyan, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
2114	Use of donkey manure	scales are also used to repel the insects due to their bad smell. **Keywords**: egg-shell, fish scales, manure, fruit tree, root zone, decomposition, plant nutrient, repel, insect The donkey manure is added to the brinjal crop, which is rich in micronutrients and vitamins. It	Shri Banoih Bitcche Krishi Vigyan Kendra, Hehjai, Warangal (Andhra Pradesh) 506 101
2117	Organic manure (FYM) for soil fertility	probably results in good size/coloured brinjal fruits. Moreover, the donkey manure enhances organic matter content of the soil. **Keywords**: donkey manure, manuring Addition of farmyard manure @ of 5 cartloads/acre at the time of last ploughing in the tank-based farming for paddy, pulses and groundnut improves the soil fertility and supplies nutrient to the plant. It	Shri K. Lakshmana Ph. D Scholar, Room No. 81, PG Hostel, College of Agriculture, Rajendra nagar, Hyderabad (Andhra Pradesh) 500 030
708	*In-situ* manuring by cattle litter (cattle dung + urine)	is beneficial over continuous use of fertilizers as it improves the physical properties of soil and avoids pollution. **Keywords**: organic manure, soil fertility This practice is common in the uplands (*bari*) of middle and high hills where the cropping intensity is relatively low. Animals are moved form one place to another in rotation in order to manure the entire land. Depending on the season and location, animals are kept in the temporary sheds or in the open field. Farmers believe that urine and dung of a buffalo gathered for three days at one spot of land is equal to heavy application of compost. This is commonly	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		done in October/November, i.e. after the harvest of fingermillet and before planting of winter crops. The practice is repeated in March/April before maize or millet planting. Certain pieces of lands are intensively manured by keeping animals for a longer period where land is available for about 2 to 3 months after the harvest of the first crop. Constructing temporary sheds in the fallow lands, and keeping animals in these sheds for a few weeks can manure the entire area. Some farmers keep animals under the tree canopies for 1 to 3 nights to manure the orchard. This practice is in use since time immemorial in middle and high hills of Himachal Pradesh.	
709	Mixing of soil from cultivated land holdings with night soil for organic manuring	**Keywords:** litter, cattle, dung, urine, manure For increasing the soil fertility, farmers mix cultivated land soil with human excreta (night soil). Night soil is rich in nutrients and helps in easy ploughing during summer cropping. This is in practice for last several years by the farmers of cold desert. **Keywords:** soil, human excreta, night soil, plough	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
710	Adding fertile soil from bunds and field corners to agricultural crops	Farmers of Himachal Pradesh add fresh soil from bunds/field corners to improve the fertility of soil. This practice helps in weed control, and the area under crops remains the same. The soil of bunds or field corners is rich in nutrients and improves the soil fertility. In March/April the bunds and corners of the fields are dug out and weeds and grasses are	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
712	Softening of hard soils by ash	removed with the help of spade and clods, and then these are collected in the lower fields. This is in practice under rainfed and irrigated farming situations for last several years. **Keywords:** fertile soil, bunds, weed, nutrients, rainfed/irrigated	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
713	Use of sachik soil for higher crop yield	Ash obtained from cowdung, sheep/goat manure, fuel wood etc is scattered over the fields to softening the soil and improving the nutritional value of hard soil. This is in practice for last several years in Nubra valley of Ladakh and used for all crops. **Keywords:** hard soil, ash, cow dung, cattledung, softening	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
715	Method of preparation and transportaion of farmyard manure to the fields	Yellow soil (sachik) found in Tagloom area is used as manure and scattered in the field for enhancing crop production. This soil (sachik) is rich in nutritents and it is in practice for last several years by the maximum number of farmers of Ladakh. **Keywords:** yellow soil (sachik), manure, crop production Bedding material such as grass, leaves and pine needles etc. soaked with excreta and urine of livestock are collected at a place from January onward. In order to get better quality of FYM, a huge pit is dug and daily soaked material is thrown into it. In November or December, before or after snowfall, FYM is carried to the respective fields with the help of village farmers. From each family, one male member comes and transports FYM in kilta to the fields. Female members of the family do the work of scattering FYM. Care is to be taken that each and every portion of the field should get FYM alternately. This is practiced in Shimla district of Himachal Pradesh, followed for several years by a majority of the farmers. Some farmers employ labour to do the work. **Keywords:** bedding materials, grass, leaves and pine needles, soaked with excreta and urine, large pit, carrying to field by male, scattering by female	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh)171005 and Ms Krishna Hetta,Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
1846	Use of the soil under the trees of ficus group as a bio-fertilizers	Farmers of Sutgatti village of Belgaum district in Karnataka are practising this method to enhance the microbial content in the soil. Soil micro organisms are fixed more in the soil under the ficus group (navgrah plants). Use of the soil under the trees of ficus group increased yield upto 15–20%. This is being in practice since many years. **Keywords:** micro organisms, navgrah plants, increasing yield	Shri Abhaya Mutalik Dasai Bangalore (Karnataka)
1847	Farmers' wisdom in soil classification and fertility management	Farmers of Bisapur of Mahkhed block of Chhindwara district in Madhya Pradesh have evolved their own methods to classify and manage soil fertility in the putting the lands for various uses. For classification, properties related to land and soil are taken into account. Based on their methods, they have identified six types of soils put to agricultural use. Crops vary according to soil properties as well. In addition to it four types of soils are used for non-agricultural use	Shri Ranjay K. Singh C/o Dr. C.B. Singh, Dean College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1849	Improving soil health in citrus	Soil fertility management aspects cover following; summer ploughing; making large fields into small plots, mulching, cropping pattern, application of ash, ploughing and sowing across the slope, incorporation of crop residues, sheep/goat penning, use of organic manures and green manuring. **Keywords:** capability based land use, farmers' classification, soil fertility management	Scientist, Extension, National Research Centre for citrus (ICAR), Amravati Road, Nagpur (Maharashtra)440010
2115	Use of tank silt to improve soil fertility	Some methods practiced by farmers of Nagpur district in Maharashtra for improving soil health in citrus are indicated here. Vermi compost @ 2 kg/tree is applied in summer for the cooling effect in citrus. Castor cake @ 4–5 kg/tree mixed with FYM is applied to keep the tree green. Sheep droppings @ 500 g/tree is applied to increase rthe fruit size of citrus. **Keywords:** vermi compost, cooling effect, castor cake, FYM, sheep droppings, fruit size.	Krishi Vigyan Kendra ANGRAU, Reddipalli, Anantapur (Andhra Pradesh) 515 70
362	Improvement of physical and chemical properties of soil by rice husk	After drying of tanks, silt is collected and applied to the field @ 5–6 tones/ha to improve soil fertility. This practice enhances quality and yield of crops due to its nutrient content. This is being practised by Reddipalli and Chidella farmers of Andhra Pradesh since several years. **Keywords:** tank silt, soil fertility, quality	Ms. Sarbani Das 106812, Shatabdi Nagar, Unit 8, Bhubaneshwar (Orissa)
457	Testing soil pH by spitting	Productivity status of clay soil is increased by adding rice husk and chaffy grains at the time of field preparation, as it improves the aeration and organic matter content in the soil. It is being followed by 50 to 60% of the farmers of Makarbili village in Nawapada district of Orissa. **Keywords:** rice husk, soil productivity In this practice, the farmers of Birinasayek village, Titabar block in Jorhat district of Assam test the soil pH on prepared field after chewing betelnut with betelvine leaf, lime and tobacco. This is done for establishing proper stand of the new strains of planted rice seedlings and then quick initial growth. If the spit on the soil becomes black, the farmers come to the conclusion that preparation is sufficiently suitable for transplanting. If the spit remains red, the plot is ploughed again and the test is repeated. Even then the spit does not turn black, the plot is	Dr J.N. Khaund Retd. Professor, Assam Agricultural University, Uday Nagar, Club Road, Jorhat (Assam) 785 001

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		kept without transplanting and is ploughed again on the next day. It has a good impact, because it is observed that rice seedlings grow well in such well-prepared field. On the other hand, if transplanting is done in field, in which the spit remains red, initial growth of seedlings is very slow and some of the plants die. Mainly two crops are grown, viz. ahu during March– July and sali during July–December. HYV like J a y a , Manshuri, IR-8, Pankaj and local varieties (particularly during sali season) are grown. The	
1845	Use of bio- fertilizer made from cow horn	practice is in use since time immemorial in many places of upper Assam. Out of 56 farm families, 18 farm families have adopted this practice. Farmers who use country plough adopt this practice, because with power tillers and tractor, quick land preparation is done by only 2–3 ploughing and this practice is not applicable. **Keywords:** soil pH, spitting, betelnut, betelvine leaf, lime, tobacco, plough, transplanting In poor fertile soils of Linga village in Mohkhed block of Chhindwara district of Madhya Pradesh, the farmers mix the soybean seed with bio- fertilizer made from the cow horn as a culture. The dead cow horn is filled with black cotton soil and tied it with	Shri Ranjay Kumar Singh Sonapur, Azamgarh (Uttar Pradesh) 276 128
2111	Groundnut cake to improve soil fertility	cotton cloth and then kept in the moist soil during March–April. At the time of soybean sowing, it is taken out and crushed into powder. It is then mixed with 6–8 kg black soil, and broadcast along with the soybean seed. It has been in use since 70–80 years.It is believed that bio-fertilizer made from cow horn has special bacteria to fix atmospheric nitrogen and enrich soil fertility. **Keywords:** horn, bio fertilizer, soybean	Shri K.Lakshmana Ph. D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh)500030
2112	Improving soil fertility by using tank silt	About 80 to 90 kg groundnut cake is mixed with cowdung and is applied to the soil for about 1 acre before sowing paddy. Groundnut cake has manurial properties that improve the soil fertility under rainfed tank-based farming in the sandy loam soils of Kolakota village of Srikakulam in Andhra Pradesh. **Keywords:** groundnut cake, soil fertility Farmers broadcast enriched silt from the dried reservoir beds and soil from tank beds in the field	Shri K.Lakshmana Ph. D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2113	Organic manuring in mesta based cropping system	After harvesting mesta (Hibiscus sabdariffa), farmers keep the crop in the field as such for 7–10 days.Meanwhile, the leaves and twigs of the crop get dried and fall down in the field and add a lot of organic manure by ploughing within a week. About 90% farmers in Pedapalavalsa village of Vizianagaram in Andhra Pradesh are following this practice for the last 30 years. **Keywords:** organic manuring, mesta	Shri K.Lakshmana Ph. D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2193	Grazing sheep and goat in fallow fields for litter.	Sheep and goat are allowed to graze in the fallow lands before the season. The litter laid by these animals will add organic matter to the soil and improve the soil fertility and structure. **Keywords:** grazing, sheep, goat	Shri P. Ranga Reddy C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
437	Application of rice-mill ash to increase porosity of soil	Incorporation of 30 to 40 tractor loads of rice-mill ash before 15 days of planting/sowing in 1 acre of field increases the porosity by loosening the soil, which increases percolation of water through the soil. Because of high transportation cost, only 30% farmers residing around the rice mill of Basantpur village in Sambalpur district of Orissa follow this practice. **Keywords:** rice-mill ash, soil porosity	Shri Birabar Seth Basantpur, Dhankkauda, Sambalpur (Orissa)
2032	Stone surplus bund for safe disposal of water	The stones laid in layers on downward side of gradient serve as an outlet for safe disposal of run-off and prevent soil erosion. It acts as a barrier, reduces the velocity of wind, prevents the loss of fertile soil of cultivated land. As the drylands are prone to water and soil erosion, stone surplus bunds help overcome the problem of soil erosion. **Keywords**: stone bund, soil and water erosion	Shri P.K. Mishra and Shri N. Babjee Rao CRIDA, Hyderabad (Andhra Pradesh) 500 059

9

Farm Implements

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
180	Tractor-mounted improved cage-wheel	Shri R. Raja has developed an improved tractor-mounted cage-wheel for land preparation into good puddle to suit ideally for planting the seedlings of rice in the puddle seedbed. The diameter and size of the improved cage-wheel is slightly greater than that of the existing one, which costs Rs 6,750 componed with Rs 6,500 of the existing one. It saves time of operation by 25%. The pulling efficiency of the improved cage-wheel is also higher, as it prevents the gap of 2 inches formed during the puddling operation in the field. It can be used both with Mahindra and M.F. tractors, whereas the existing one can be used with Mahindra tractor only. **Keywords:** cage-wheel, tractor-mounted, puddling efficiency	Shri R. Raja Rajalakshmi Welding Works, Opposite Vivekananda Hospital, L.F. Road, Cumbum, Theni (Tamil Nadu)
191	Ploughing-implements	Ploughing instruments developed by Shri. Seetharaman are indicated here. Peria kalappai (Single plough): It is 2 feet long and 10" wide. The weight of the implement is 10½ kg and suitable for summer ploughing. The cost of the implement is Rs 375 and ploughing one acre in 4 hours. Sowing plough (Small plough): It is 1½ feet long, 9" wide and weighs 7 kg. the cost of the implement is Rs 300 and used for sowing the seeds. Two small ploughs are attached and single pair of bullock is used. Irattai kalappai (Two way plough): This plough is used in the fields already ploughed by single plough. This plough is used to open the furrow, sowing the seeds and covering of seeds. One acre is ploughed in 2 hours. The cost of the implement is Rs 650. This practice reduces the operating time when compared to other methods. Three way plough cum seed drill: Sowing the seeds, opening the furrow and covering of seeds are performed in line at required distance (usually 1 feet or ¾ feet) by this plough. Sowing the seeds in mixed crops at definite intervals is possible in this method. Fertilizer are also placed by this	Shri S. Seetharaman Sennamareddipatti, Vilathikulam, Thoothukudi (Tamil Nadu) 628 905

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		plough. The costs of the implement is Rs 660 and it weighs 22 kg. **Keywords:** single plough, peria kalapai, eruttai kalapai, seed drill, three way plough, fertilizer	
192	Tillage with neem-wood plough	For primary and secondary tillage operations, 250 farmers of Kalampalayam village of Coimbatore district in Tamil Nadu use wooden plough. The  An indigenous plough made up of neem wood plough can cover 0.5 ha per day. Use of this plough Coimbatore helps to maintain earthworm population in soil and control nematodes. **Keywords:** neem wood plough,tillage operation	Shri Rajendran Periya Thottam, Kalampalayam, Seeliyur, Mettupalayam, (Tamil Nadu) 641 113
201	Indigenous plough	Wooden plough is considered as an age-old implement for ploughing. This plough is made of wooden piece from the forest nearby. It is about 20 kg in weight. Before sowing, ploughing can be done thrice using this wooden plough for 20–40 days. About 55 farmers are still using. Cost is only Rs 4000 per piece; life of this instrument may be 1–2 years. Frequency of repair may be between 3–6 months. Ploughing cost per hour is Rs 100. Apart from self use, it can be given for hiring. **Keywords:** wooden plough	Shri Durai Pannagaram, Dharmapuri (Tamil Nadu)
371	Plough (desi langala) for tillage operation	Bullock-drawn desi langala is used for primary tillage, secondary tillage, puddling etc. during kharif and rabi. It covers an area of 0.3 ha per hour requiring draught of 35 kg, and opening of the soil without invertion with moderate pulverization. It costs about Rs 300 and its weight is about 25 kg. It is being used for a long time by almost all the farmers in Benakunda	Shri Bilash Nayak Benakunda, Bhanjanagar, Ganjam (Orissa) 761 126

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 An indigenous plough (langala) for tillage operations village of Ganjam district in Orissa. **Keywords:** desi langala, tillage	
373	Korala: wooden leveller (bullock-drawn)	Bullock-drawn wooden leveller, locally called korala, is used for levelling in small fields with moderate slope for sowing groundnut or planting rice. It covers an area of 1 hectare per day with a drought requirement of 40 kg. It costs about Rs 300, weighing 25 kg. It is being used for the last 30 years in Benakunda village of Ganjam district in Orissa. **Keywords:** korala, wooden leveller, groundnut, rice	Shri Satrughana Nayak Tulasipalli, Ganjam (Orissa) 761 126
530	Paniya main: an implement for puddling rice field	The indigenous instrument paniya main is used for puddling of rice fields. It is made from sanan (Dalbergia oogeinensis) wood, weighing 7.00 Kg and costing Rs 150 each. The life of the equipment is 30–35 years. The imlement is very effectve for hills where no other modernized farm implements are available. The material for making the implement is easily available and locally manufactured. **Keywords:** paniya main, paddling, rice fields	Shri Pan Singh and Shri Ramesh Singh, Dor, Phuli, Pitthoragarh (Uttaranchal)
722	Kudali: a traditional farming tool	Breaking the soil crust after irrigation and removing of weeds are important farming operations for which kudali is widely used. It is a simple traditional, multi-purpose tool, which is locally made. Its handle is made of a branch of sturdy wood and the operational part is of arrow-head shape; made of iron. It differs from khilna as its anterior end is flat instead of being pointed. This multipurpose tool is still widely used for different farming operation in all parts of Himachal Pradesh. **Keywords:** kudali, weed, soil crust, multi-purpose	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
723	Spade (phawra): a traditional farm tool	Earthling up, weeding, and digging are important farm operations for which spade is widely used.It is a multipurpose farming tool in which broad soil cutting plate, made of iron, is attached to wooden handle. It is a widely used traditional farm tool used for various farm operations throughout Himachal Pradesh. **Keywords:** spade, weed, digging, earthing up, multi-purpose	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
727	Wooden plough and jugra (yoke)	Local plough is made from the wood of kedar tree. The ploughs are made once in a year during December to January. The size of both plough and jugra varies according to size of bullocks. **Keywords:** local plough and jugra, kedar wood	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)
728	Use of broader plough	Ploughs are broadened by attaching wooden flat pieces to both sides of the iron blades. This is done to make soil more porous and fertile to enhance productivity. This method is preferred by one and all in Ladakh region of Himachal Pradesh. **Keywords:** wooden flat pieces, iron blades, broadened plough, porous soil, fertile, enhanced productivity	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1434	Kurur: wooden implemnt for land levelling	I t is cheap and simple equipment for land levelling. Rectangular wooden board tagged with iron chain on the front side (chain is pulled by brought animal) is slid over the ploughed unlevelled field. It carries the soil from upper side of the field to lower side and is levelled. The practice is followed in Asanbra village of Tethaitangar Block in Simdega district (Jharkhand). About 20% increase in yield was noticed due to levelled soil and equal distribution of soil moisture. Cost: benefit ratio of this practice approximately works out to 1 : 6. **Keywords:** kurur, levelling of land	Shri Anjelus Kerketta Aasanbera, Kathartoli, Latha Khaman, Simdega (Jharkhand) 835 235
1851	Three-tyne cultivator	The implement consists of three tynes with an iron shovel mounted on angle iron tool-bar, which performs shallow ploughing and intercultural operations. It has a capacity of 0.75 to 1.0 ha/day and is based on bullock speed of 2.5 km/ha. It performs ploughing and interculture operations in three rows at a time. Row-to-row spacing can be adjusted. When the shovels from one side wear out,	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton- Mill Road, Rajapeth, Amravati (Maharashtra) 444 606

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		it can be used from the other side. It performs sowing of seeds and fertilizers in rows with seeding attachment. **Keywords:** three-tyne cultivator, shallow ploughing, interculture operation, row-to-row spacing	
1855	Use of modified indigenous plough (Nagarnai) as seed drill for sowing of rabi Sorghum.	Nagarnai is a modified bullock drawn indigenous plough cum seed drill. It is used by the farmers of  Nagarnai—a modified plough-cum-seed drill Shindkheda (MS) for sowing rabi Sorghum. It is made up of locally available wood. In this seed is sown in a moist zone under rainfed condition for better soil contact. This gives good germination and yield. The implement costs 1/4th of modern seed drill. **Keywords:** Nagarnai, seed drill, sorghum	Prof. P.S. Patil Training Organiser, KVK, Dhule (Maharashtra) 424 004
2121	Nagali country plough: sowing	It is bullock-drawn primary tillage operation-implement, used both during kharif and rabi seasons for sowing groundnut and sunflower. The cost of operation per hectare is Rs 450 and work rate is 1–1.5 acres/day. It is made of country wood and MS plate, weighing 50 kg. Recently M.B. plough is used as a substitute. **Keywords:** bullock-drawn, tillage, seeeding, groundnut, sunflower	Shri B.John Westley Sr. Scientist (Agricultural Engineering), Agricultural Research Station, Anantapur (Andhra Pradesh) 515 701
2130	Nagali country plough: for sowing	Bullock-drawn primary tillage operation implement used both during kharif and rabi and for sowing groundnut and sunflower. The cost of operation per hectare is Rs 450 and work rate is 1–1.5 acre/day. It	Shri KVS Rami Reddy Krishi Vigyan Kendra, Anantapur (Andhra Pradesh) 515 701

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		 Nagali/Madaki—country plough is made of country wood and MS plate weighing 50 kg Recently M.B.plough is used as a substitute. **Keywords:** nagali, sowing	
199	Low-cost, labour saving seed drill	It is a hand-pushed implement made of steel frames and wooden handle. It can be used to sow a variety of millets and other bold-seeded grains. The depth of sowing, and the spacing between the rows and within the row can be adjusted. By using this implement seed rate can be reduced. For example, for dryland paddy the seed rate can be reduced to 12 kg per acre instead of normal 30 kg adopted by farmers; for 1 m2 population of 60 seeds is sufficient instead of 120 seeds. By using this seed drill the seed rate can be reduced to a greater extent while sowing. Cost of hand pushed seed drill is about Rs 3500. Shri Somasundaram developed it after 25 years of experiment and got the patent. **Keywords:** hand pushed seed drill, bullock, tractor mounted seed drill, groundnut, patent	Shri G. Somasundaram 36-A, Kakkanji Colony, A-Flat, Vyasarpadi, Chennai (Tamil Nadu) 600 039
2122	Enati gorru for sowing groundnut	Bullock-drawn enati gorru is used as a fertilizer-cum-seed drill during both kharif and rabi seasons for  Eenati gorru—an indigenous seed drill	Shri B.John Westley Sr. Scientist (Agricultural Engineering), Agricultural Research Station, Anantapur (Andhra Pradesh) 515 701

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		sowing groundnut. It covers an area of 5 acres/day. Cost of one acre is Rs 300/-, requiring a drought power of 300 kg. It is made of country wood, mild steel GI pipe and plastic pipe weighing 60 kg. **Keywords:** fertilizer-cum-seed drill, kharif, rabi	
1856	Direct seedling of onion/lucerne seeds by using hand operated tool  Hand operated seed drill	Direct seeding of onion/lucerne seeds is done by hand operated single bowl seed drill by the farmers of Ahmednagar district in Maharastra. It is a single purpose machine and man power is needed for operation. The cost of the implement is Rs 500 and it weighs 5 kg. 1.2 ha area is covered by a single pair of human labour in a day. The approximate life time of the implement is 3 years. The cost of operation is Rs 22/ha. 25 farmers of this village are being practiced this method since 10 years. **Keywords:** seed drill, single purpose machine, human labour	Head Department of Agronomy MPKU, Rahuri (Maharastra) 413722
2129	Gorru-sowing	Gorru is operated by a pair of bullock. It is used for sowing both during kharif and rabi, covering an area of 2 hectares/day. Used for sowing groundnut, it is  Gorru: an indigenous seeder made of country wood, GI pipe, ms plate and plastic pipe, weighing 45 kg and costs Rs 700. Modern implement used for this purpose is tractor-drawn seed drill. **Keywords:** farm implement, bullock-drawn seeder, Gorru	Shri B.John Westley Sr. Scientist (Agricultural Engineering), Agricultural Research Station, Ananthapur (Andhra Pradesh) 515 701

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
184	Groove type hand hoe	Groove type hand hoe is developed by Shri. Ramakrishnan to improve the work efficiency of the labour. Groove are placed at two places on the handle of the spade. The Rajapalayam, Virudhunagar first set of 12 grooves are points at ¾ th height of the spade at ½ inch intervals. The second set of 11 grooves are placed at 1 feet height. These grooves are designed as slightly deeper at the lower side of the handle than on the upper side. This provided additional grip and improve the working efficiency of the labour. **Keywords:** handle hoe	Shri Ramakrishnan S/o VenkataRaja, 49, Subburaja madam, (Tamil Nadu) 626 117
372	Bullock-drawn interculture plough	Bullock-drawn interculture plough goji langala is used for sowing and inter cultivation for groundnut. It is made of wooden body with an iron showel, which  Bullock-drawn plough for intercultural operations covers an area of 0.30 ha per hour and weighs 25 kg. It costs Rs 200 and being used for the last 30 years by almost all farmers in the Tulasipalli village of Ganjam district in Orissa. **Keywords:** goji langala, bullock-drawn, interculture, sowing	Shri Satrughana Nayak Tulasipalli, Bhanja Nagar, Ganjam (Orissa) 761 126
377	Cauliflower ridger	Human-drawn wooden plough with flattened iron plate placed in front is used for making ridges easily and promptly for planting cauliflower. The implement weighs 12 kg. with a cost of Rs 500. It is a labour-saving device compared with the modern implement and by using this 30 man days per hectare is saved for making ridges in cole crops (cabbage and cauliflower) during rabi season. It is being used by	Prof. L. R. Verma

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		40 families, out of 50 in Bandhartikra village of Bargarh district in Orissa. **Keywords:** cauliflower, ridger, wooden plough	
721	Khilna, a traditional farm tool	Khilna is a farm tool used for uprooting of weeds. It is made by iron-smith. The handle is made of a branch of sturdy wood and the tool itself is made of iron and shaped like an arrowhead. The tool costs about is 30–40 Rs and can be used approximately for 4–5 years. This is used by all the farmers in Himachal Pradesh for the last several years. **Keywords:** khilna, uprooting weed	Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 Shri Surendra Singh Dichao Kalam, Najafgarh (New Delhi)
1123	Wheel hand hoe (pahiya)	Shri Surendra Singh has developed an implement called wheel hand hoe, which is used for weeding purpose in cauliflower. It is a single purpose implement. Old wheel of bicycle with handle is used to made this implement and it weighs 5–6 kg. The cost of the implement is Rs 200 and it is driven by a single person. One ha of land is weeded in 15 hours. This implement is in practice for 15 years. **Keywords:** wheel hand hoe, bicycle, cauliflower, weeding	Dr. O.P. Ingle Head, Dept. of Extn. Edn. Dr. PDKV, Akola (Maharashtra) 444 104
1854	Indigenous interculture farm implement, hoe	Hoe is made up of wood, weighting 30–35 kg, available in Umerga (Maharashtra). It helps to crop remain weed free 85 to 90%. The implement is used in kharif crops. **Keywords:** wood, weed free, kharif	Shri K.Venkat Ratnam Muthur, Guntur (Andhra Pradesh)
2123	Gorru cum guntaka (interculture tool)	Manually operated steel gorru cum guntaka is used for many purposes like sowing and intercultivation in cotton and chillies. It weighs about 7 to 12 kg and it can be used both during kharif and rabi. The cost of operation per acre is Rs 50–70. It removes weeds with 60–80% efficiency. **Keywords:** gorru guntaka, intercultivation	Shri B. John Westley Sr. Scientist (Agricultural Engineering), Agricultural Research Station, Anantapur (Andhra Pradesh) 515 701
2125	Baraguntaka, covering seed  Baraguntaka—an indigenous blade harrow	Bullock-drawn baraguntaka, made of country wood and mild steel, is used for covering the seed immediately after sowing of groundnut and sunflower. It covers an area of 1.5 to 2 acres/day. The cost of operation per hectares is Rs 625. It is locally manufactured by rural artisans used during kharif and rabi. **Keywords:** baraguntaka, sowing, groundnut, sunflower	Shri B. John Westley Senior Scientist (Agricultural Engineering), Agricultural Research Station, Ananatpur (Andhra Pradesh) 515 701

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2126	Metlaguntaka: intercultivation in groundnut	Bullock drawn metlaguntaka, an intercultivation tool, used in groundnut during kharif and rabi made of country wood, GI pipe, MS sheet and costing about  Metlaguntaka—an intercultivation tool for groundnut Rs 250. It covers an area of about 1 ha/day with a cost of operation of Rs 500/ha. It is used at 25–30 days after sowing. It controls the weeds effectively between crop rows and break the continuity of capillarity and this act as a soil mulch. **Keywords:** intercultivation, weed control, soil mulch, groundnut	Shri B.John Westley Senior Scientist (Agricultural Engineering) Agricultural Research Station, Anantapur (Andhra Pradesh) 515 701
2127	Dhanti: intercultivation in ground nut	Bullock-drawn dhanti is used for intercultivation in groundnut. It removes the weeds effectively between the crop rows. It is made of country wood and mild  Dhanti—an intercultivation tool for groundnut steel and weigh about 40 kg per set. It costs Rs 400 made by rural artisan of the villages. It covers an area of 1 hectare/day with the cost of operation of Rs 500/acre. It is used during both kharif and rabi. **Keywords:** dhanti, intercultivation in groundnut	Shri B. John Westley Sr. Scientist (Agricultural Engineering), Agricultural Research Station, Ananatpur (Andhra Pradesh) 515 701

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2128	Dhanti guntaka: intercultivation tool	A bullock-drawn guntaka is used for successful inter-cultivation in castor. It is made of country wood and mild steel weighing about 40 kg. This is used during  Dhanti—an intercultivation tool kharif. It covers an area of 1 ha/day. It controls the weeds and acts as a soil mulch. **Keywords:** castor, intercultivation, soil mulch	Shri India Bharathidasan S/o Vijayakanth, Thanjakoor, Thiruppachethi, Manamadurai, Siviganga (Tamil Nadu)
188	Developing a weeding machine	To minimize the labour for weeding purpose a new type of weeding machine has been developed by Shri. India Bharathidasan. He has designed a weeding machine by using vespa engine (Scooter engine) which is found to be more pulling power. It is a petrol operated engine. One wheel is fitted in the front and other two wheels are fitted in back. A person can sit similar to the model of power tiller. It is more or less like a mini tractor but three wheeler. A small adjustable plough is fitted underneath of weeding machine. This iron plough helps to remove the weeds in sugarcane, banana and coconut. By using this machine 3 acre can be weeded in a day. Keywords: weeding machine, vespa scooter engine, iron plough, banana, coconut, sugarcane	Shri P. Annamalai Mellcapalyam, Gurusamipallayam, Rasipuram, Namakkal (Tamil Nadu)
196	Weeding equipment	Weeding equipment that can be operated by a single person is adopted in Kappampathi village of Rasipuram block of Namakkal district in Tamil Nadu. Horrow like bended iron rods are fixed in 4 feet width iron frame and 9 wooden stick is fixed in the centre of the iron frame to handle the operation. **Keywords:** weeding equipment	Shri A. Vetrichelian S/o Shri Ayya Kannu, Amman Engg. Work, Bommidi Main Road, Pappireddipatti, Dharmapuri (Tamil Nadu) 636 905
197	Single bullock-drawn weeding plough	This implement has been developed by Shri A.Vetrichelian of Dharmapuri district in Tamil Nadu. Single bullock-drawn weeding plough is being used for weeding purpose in banana and arecanut field for the last one year. **Keywords:** single bullock plough	Shri H. Lalthanpuia Training Associate, Krishi Vigyan Kendra, Kolasib (Mizoram) 796 081

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
487	Weeding tool (chemkawm)	Under this practice, the farmers of Seling village in Thingsulthiah block under Aizawl district of Mizoram use a weeding tool called chemkawm (local name) or hand hoe which is used as a multipurpose tool for dibbling seeds and for weeding as well. This is manufactured by local blacksmith, preferably with carbon steel. Also the old daos which have been used for years are also converted to this implement. It cost around Rs 50–70 per piece, which can be used for 2 years or more. Weeding efficiency is more compared t o the previously used tool known as tuthlawh by 50% (approx). This tool is operated single handed, with the other hand holding the weeds to collect and clean of weeds. The practice is in use for the past 50 years. Initially old daos were converted to this tool, but now a days vehicle spring, preferably Maruti Gypsy spring, is used for making it. This tool requires regular sharpening by blacksmith. An area of 0.01 ha per hour can be covered by use of this tool. **Keywords:** hand-hoe, chemkawm, weeding tuthlawh	Shri Benche Lal S/o Shri Ram Lal, Pandari Halwa, Bhojipura, Bareilly (Uttar Pradesh)
1125	Enhancement of spray efficiency	T o enhance the efficiency of spray of insecticide/pesticides/herbicides solutions on crops, farmers of Bhojipura village in Bareilly district of Uttar Pradesh, use to add kerosene at the rate of 200 ml per 12 litre of insecticide solution. The efficiency of the solution against the shoot borer and fruit borer have been increased remarkably by 20%. Besides the decline in pest attack, there is a saving of quantity of pesticides being used by 15–20% of the farmers. The practice is in use since 3–4 years with 12 farm families adopting it for different crops. **Keywords:** spray efficiency, kerosene oil, reduce pest attack, save pesticide	Shri Benche Lal S/o Shri Ram Lal, Pandari Halwa, Bhojipura, Bareilly (Uttar Pradesh)
193	Use of palai sickle for palm, arecanut and coconut garden	A traditional sickle with blade-like shape is used for cutting the tender fruits and branches of coconut, areacanut and palm trees in Tamil Nadu and Kerala. The sickle, weighing 500 g, is made locally which costs between Rs 100–150. When used, the sickle is sharpened daily with powder of red stone. **Keywords:** palai sickle	Shri S. Athithan Training Associate (Agril. Engg.) Krishi Vigyan Kendra, Vivekanandapuram, Coimbatore (Tamil Nadu) 641 113
374	Local sickle for weeding	Local sickle, called dauli, is a manually operated weeding tool, originated from North Balasore, in Orissa. This is manufactured by local blacksmith. The	Shri Surendra Nath Nandi Parulia, Asti, Balasore (Orissa) 756 026

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
529	Harvesting of wheat by nigal (Arudinaria falcata) sticks	tool has a weight of 200 g which costs Rs 6. The practice has been used by all the farmers for more than 50 years. Alternatively farmers use wheel finger weeder, rake weeder and manual weeder. **Keywords:** dauli, weeding tool Two sticks of nigal (Arudinaria falcata) each of two feet length are held by the person. The wheat spikes are held between the sticks and pulled upward. The spikes are removed and collected in the basket fitted on the back. Those spikes which do not remove are cut by sickel. The harvesting takes less time than the other methods. The efficiency of harvesting is much higher also. The technique is very cheap and thus is highly cost effective. **Keywords:** sticks of nigal, harvesting, wheat	Shri Ganga Singh, Bala, Midlakiya, Pithoragarh (Uttaranchal)
724	Drant	Drant is a sickle-like tool used for cutting heavy branches of trees and also to cut cobs of maize etc. It is heavier than sickle and weighs about a one kg costing about Rs 60 it is made by local iron-smith, which needs repairing by a majority of the farmers in upper parts of Himachal Pradesh. **Keywords:** drant, cutting branches, maize cobs	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1850	Improved sickle	Sickles of various types and shapes are being used by farmers for cutting crops. The efficiency of the sickles depends mainly on the shape of the blade, the material used for making the blade, length of handle and the type of grip. A crescent-shaped blade with a short cranked handle is suitable for a semi-circular cutting motion, while a straight blade fastened almost at a right angle to the handle (which is long and sometimes slightly covered at the end to give a better pull) is suitable for pulling out. A sickle with improved performance has been developed. The salient features of the sickle are: it has a high capacity (100–125 man-hours/ha), helps in close cutting of crops (resulting in extra amount of straw); has balanced design and is light-weight. It does not require frequent sharpening and has replaceable serrated blade. **Keywords:** sickle, cutting crops,serrated blade, crescent-shaped blade	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton- Mill Road, Rajapeth, Amravati (Maharashtra) 444 606

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
183	Coffee-berry pulper	A coffee-berry pulper, to separate the beans from the berry, has been developed by Shri P. Sudhakar, which is a simple and compact hand-operated device. In a round disc there are slots of the size of coffee berry. The berries are fed into the device through a side pipe. Operation of the handles on either side rotates the wheels. The pulp on the berries is separated from the beans by the rotating action without causing any damage to the beans. The separated beans come out through another pipe and are collected. The whole assembly of the pulper can be easily dismantled into small units, transported and re-assembled in a place where it is needed. The capacity of the pulper is 30 kg in each operation, depending on the diameter of the disc. **Keywords:** hand operated pulp separator	Shri P. Sudhakar Coffee Pulpering Work, Thasildar Nagar, Thmaraikalam, Periyakulam, Theni (Tamil Nadu) 625 601
185	Harvesting of coconut	To make the harvesting of coconut convenient and cost effective, Shri P. Karuppiah has attached a hydraulic jack, with a tractor, The hydraulic jack can be adjusted to carry a person on the top for harvesting the nuts at tree height. In this system, two persons (one tractor driver and one harvester) can harvest 10 acres in a day, where as by manual method two persons can cover 2 acres a day only. **Keywords:** hydraulic jack, tractor, coconut plucker	Shri P. Karuppiah Subbarayar Street, Gomathi Lathe Works, Virudhunagar (Tamil Nadu)
186	Coconut dehusker	The coconut dehusker, developed by Shri R. Jayaseelan, has one 1.5 HP electric motor that has been coupled through a belt to a long cylindrical metal rod. Two sharp blades are fixed at one side on the tip of the rod. The blades are at 9 inches length and at 1 inch internal. These blades on rotation help in dehusking the coconut easily to the desired level (150 nuts per hour). In a shift of 8 hours, 1200 coconuts can be dehusked by using this machine, which is cost effective as compared with manual dehusking. **Keywords:** coconut dehusker	Shri R. Jayaseelan J.J. Illam, 134-B Kulalar Street, Ramasamiapuram, Koomapatti, Virudhunagar (Tamil Nadu) 626 133
194	Coffee cherry huller	A leg operated, wooden made levered implement called as rate is used for separating the coffee beans from cherry. The implement weighs 20 kg and costs Rs 500. Its life is more than 25 years, requiring a repair once a year which is done locally. Two persons are required to operate the rate. The work rate of the implement is 10 kg/hour with threshing and cleaning	Shri T. K. Ponnamma W/o Shri Kariappa, Echoor, Ponnampet (Karnataka) 571 215

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		efficiency of 90%. The implement is in use in village Ponnampet of Kodagu district of Karnataka. **Keywords:** wooden implement, coffee cherry huller	
198	Coconut dehusker	Shri Hari Krishnan has developed an equipment for dehusking the coconut. This equipment has V-shaped blades, which are attached at the top of the 3 feet iron rod. These two blades get expanded by the use of the handle, which is attached to the iron rod. When coconut is kept in the top of the blade and the handle is pressed, coconut will be dehusked by the expansions of the blades. The cost of the implement is Rs 250. It is a single-purpose implement. The threshing efficiency and cleaning efficiency of this implement is 100%.Farmers are using this implements for the last 3 years in Anjur village of Chengelpet district in Tamil Nadu.  An indigenous coconut dehusker **Keywords:** coconut dehusker	Shri Hari Krishnan Pudu Colony, Chengelpet, Kancheepuram (Tamil Nadu)
200	Local method of butter making	Preparation of butter using hand operated wood beater is an age-old tradition. Wood available with an approximate weight of 1 kg is used as beater. 3 litres of cow milk is boiled and pasturized and converted into curd. This curd may be stocked for 3–4 days and transferred into a container or vessel and beaten up with the wooden beater for 30–45 minutes until granular butter is visible. Adding cold water to the container make it easier to collect butter floating on the surface. Wooden beater has been in use since time immemorial and other modern beaters have been in field for the past 15–20 years. From every 3 litres of cow's milk, 1 kg of butter may be obtained. 2 kg of butter can be made in an hour. One person can operate it but little exhaustive work. Cost of operation for one person is Rs 15 per hour. Compared to other	Shri K.M. Belliappa Hebbal Estate Devarpura, Kodagu (Karnataka)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		modern implement either steel or copper, cost of this wooden beater is only Rs 250 per piece. This is in practice in Kodagu district of Karnataka. **Keywords:** wooden beater, curd, butter	
202	Implement for threshing groundnut	It is a square-shaped blade-like structure of iron rod fixed to four legs and weighs 7 kg. When the harvested groundnut plant is fed into the machine,  An implement for groundnut threshing groundnut gets separated from the plant. Efficiency of this instrument is about 98%. The cost of the implement is Rs 200. About 20 farmers are practicing it for the last 2 years. Farmers at Chengelpet are using this thresher. **Keywords:** groundnut, thresher	Shri Parthasarathy Chengelpet, Kancheepuram (Tamil Nadu)
375	Tools for niger oil extraction	Dried and semipowdered seeds of niger are boiled through steam vapour in a specially designed pot made of siali (Bahania vahhil) leaves, called poda. The boiled seeds are transferred into small pots made of sasli bark called kala. These pots are placed in grooves made of wood, specially designed to extract oil. It is then pressed by heavy wooden poles and the oil is drained through the grooves of wooden plank and is collected. The tool weight is 8 to 15 kg and nearly 70 to 80% farmers are following this method for oil extraction in Chalanput vilage of Koraput district in Orissa. **Keywords:** niger, oil extraction	Shri Samara Murja, Chalanput, Semiliguda, Koraput (Orissa)  Niger oil extraction tools

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1433	Oil extractor-patni	The patni is fabricated with two flat locally available wood structures of similar weight, size, length and width. It is used to extract oil from different oilseeds. Oilseeds are crushed or first powdered and then filled in a container. The crushed material is kept in the middle of the flat wood and pressed from the other side with the help of round wood of about 5–6 length. It is hanged to the wood, acting as auchor, by two persons. Total oil is extracted by repeating the process for the second time. This indigenous method of oil extraction through use of patni is prevalent in Patratoli of Raydih block of Gumla district (Jharkhand). About 40% of the villagers use this practice, and the implement is prepared by locally available material. Cost: benefit is 1 : 7 approximately. **Keywords:** patni, oilseeds, extraction of oil	Shri Chandan Kujur, Demonstrator Colony, BAU, Kanke, Ranchi (Jharkhand) 834 006
1852	Improved hand chakki (mill)	The basic design of the chakki is based on the two-stone grinding method. It has a grinding capacity of 3 kg wheat flour/hr or 5 kg wheat dalia/hr. It can be adopted by every family in the rural sector. It's anticipated life is 20 years. **Keywords:** chakki, grinding, wheat	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444 606
2120	Bullock cart with lift facility	Bullock-drawn cart with lift facility is very useful for the transport of crop produce, fertilizer and crop residues throughout the year. This is suitable for transport of crop residue like jowar and paddy straw. This has been used by most of the farmers. **Keywords:** bullock-drawn cart, lift facility	Shri Siva Rama Krishna Reddy, S/o Rami Reddy, Allui, Uyyalawada, Kurnool (Andhra Pradesh)
178	Relay switch	Relay coil (switch) developed to stop motor pump automatically. It also operates in such a manners that it stops automatically if there is high or low electricity load (load changes due to fluctuations in the voltage). **Keywords:** voltage fluctuation, automatic stop of motor pump, relay coil	Shri J. Ponnusamy Rewinding Works, 6A/3, Kannan Motors, Athukadai thera, Rajaji Road, Srivilliputhur, Virudhunagar (Tamil Nadu)
182	Hydro-powered lift irrigation	Shri Paruchuri Madhu Konar of Guntur in Andra Pradesh has developed Gandharva hydro-powered lift irrigation system by effectively tapping non-conventional energy sources. He has installed the equipment at the farm of Shri O. Narayana Reddy, Repudi village in Phirangipuam. A check-dam of 5 feet height was constructed with reinforced cement concrete (RCC) across a rivulet passing though the	Shri P. Vivekanandan SEVA, 45 TPM Nagar, Virattipatty, Madurai (Tamil Nadu) 625 010

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		farm field in the village. The strength of the soil was assessed before erecting the check-dam. Though the normal depth of the rivulet from the water surface was 3 feet, it was enhanced to 5 feet in the upper reach of the check-dam. This ensured storage of water at a higher level. The check-dam has six crest gates, which would automatically get opened in the event of higher velocity of water flow or during flash-floods due to sudden rains in the catchment area of the rivulets. The water would fall from a height of 5 feet. A turbine is arranged at the water-fall and a couple of gear boxes are fixed to run the motor. The 15 rotations per minute (rpm) of the turbine would help the gear boxes run the motor with 1200 rpm. This generates the necessary energy to pump in water to tanks constructed at 15 feet height on the bund of the rivulet. The entire pilot project had the cost Rs 1.5 lakhs which is being utilized to cater to the irrigation needs of 50 acres of land. **Keywords:** hydro-powered lift irrigation	
187	Developing an oil engine with least pollution to environment	Shri Akasi developed a new type of oil engine, which is eco-friendly and environmentally safe. The oil engine produced less sound, less smoke emitting and have no health hazards. The muffler size in oil engine changed from 10 inches to a larger size of 20 inches diameter. Three tin sheets are taken with a diameter of 20 inches and fitted them into one, by welding carefully with a gap of 2 mm between each tin sheet. Holes are made in the old 20 inches diameter muffler. This modified muffler assembled is fitted with the 20 inches diameter silencer tube. The oil engine produce less sound and emits less smoke. The smoke emitted is white in colour instead of black indicating less carbon dioxide and carbon monoxide. **Keywords:** oil engine, pollution, encironment	Shri M. Akasi S/o Muthu Thevar, West Sivakasi, Muthukumar Vulcanising, Reserve line Opp, Sivakasi (Tamil Nadu)
190	Improvised dynamo	Shri Paul Raj developed a system by which subsidiary electric power is generated from the oil engine and used for industrial lighting. Normally the electric motor, which drives in the textile spindles, is connected to the counter shaft of the spindle through a pulley and belt system. Oil engines are also connected to the same counter shaft. The another end of the oil engine is connected to a dynamo. The dynamo used in the prototype is taken from an old	Shri J. Paul Raj S/o Joseph, 349 A Kamaraj Nagar, Settur,Rajappalayam, Virudhunagar (Tamil Nadu)

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195	Drip irrigation system	benz lorry engine. The out put from the dynamo goes directly to the lighting system of the production hall. The extra power is generated at no extra cost. The cost of the unit is Rs 5000. The normal maintenance cost of the unit is Rs 250 year. **Keywords:** oil engine, textile mill, electric motor, dynamo Some farmers of Pariakovilankulam village of Sankarakuvil block of Tirunelveli district in Tamil Nadu are using drip irrigation system for the last 3 years without any modification. They buried the main pine, latteral and sublateral pipes below the soil surface. A small pipe (16 mm) is connected with sublateral pipe and extended upward upto the base of the tree. A nozzle is attached with extended pipe through which water is dropped. **Keywords:** drip irrigation	Shri S. Murugesan Periakovilankulvan, Sankarakovil, Tirunelveli (Tamil Nadu)
576	Water propelled flour mill (gharat or panchakki)	Grinder is made of two round stones. Water power is used to operate the grinder. Water stream is diverted downwards thus it picks up the force due to gravity. **Keywords:** gharat, panchakki, flour mill, water power	Shri Rajendra Singh Gosain, Development Officer Bansoli - Sukhtoli, Kama Prayag, Chamoli (Uttaranchal)
1124	Animal power water lift pump	Shri Suresh Kumar of village Rajapur Maphi in Faizabad district of Uttar Pradesh has developed a system which is being used to lift water for agricultural use. It can draw 24,000 litre water per 12 hours. The cost of fabricating the system is Rs 6,580, which requires simple maintenance. The system is being used by 25 farmers for last 2 years 6 months in illage Rajapur Maphi in Faizabad district of Uttar Pradesh. **Keywords:** water pump, animal drawn, agricultural use	Shri Suresh Kumar Rajapur Maphi, Bhart Kund, Faizabad (Uttar Pradesh) 224 202
181	Converting an old tractor to an earth mover	Shri. Muthukumar has developed a new type of earth mover by adopting low cost technology .35 hp tractor is sufficient to modify and convert into an earth mover for excavating soil. The cost of the modified earth mover is cheaper than the new soil excavator available in the market. The modified earth movers cost is Rs 7 lakhs whereas the new soil excavator cost is Rs 20 lakhs. The modified earth mover is	Shri K. Muthukumar Vivekananda Earth Movers and Engineering Works, By Pass Corner, Opposite to Uma Maheswari Petrol Bunk, Dharapuram, Coimbatore (Tamil Nadu)

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		labour saving and the field operation is done in shorter period. **Keywords:** earth mover, soil excavator, tractor	
189	Flour preparation by thiruvai	Flour from millet grains are prepared by grinding in 2 piece wooden grinder by the farm families of village Arampoondy. The grinder is locally called as thiruvai. Flour prepared by use of thiruvai produces good smell as compared to the smell of the flour made in mill. Thiruvai is in use in the village for more than 10 years. **Keywords:** millet flour, thiruvai  Thiruvai—a device for flour preparation	Shri Kuppan S/o Shri Andiyannan, Arampoondy, Kallakuruchi, Villupuram (Tamil Nadu) 606 207
528	Dalaut for crushing soil pebbles	Dalaut is a hammer like structure made of sanan (Dalbergia oogeinensis) wood. The instrument is used for crushing the large soil pebbles. It weighs 1 kg and costs Rs 20 per piece which can be used for 10 years. The wood of sanan is strong and easily available. The implement is such that the work can be done more efficiently. **Keywords:** dalaut, soil pebbles	Shri Pan Singh Dor Phuli, Pithoragarh (Uttaranchal)
725	Karera, a pine-needle collecting tool	Karera is an iron tool with wooden handle, used for collecting pine needle and other dry leaves used as bedding material in cattle shed. It is manufactured locally by iron-smith. It weighs 100–150 gram and costs approximately Rs 20–25. The tool can be used for 8–10 years and needs repairing only once in 2–3 years. This tool is used in upper parts of Himachal Pradesh. **Keywords:** karera, collecting pine needle	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
726	Essential farm implements	The following farm implements are used in the area traditionally: plough (hal), jungra, digging spade (khudai kudal), balcha (joch) for joining plough with	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)

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		jungra farna (aam). darat/darati, belcha, jhawal, minhass, spray pump, bijiy tokari (basket for sowing), basola, etc. *Local plough: It is length is kept according to the size of bullocks. On an average, the length is kept 112 inches. Similarly, length of jungra also varies with a maximum of 2.5 feet.* *Kudal: The weight of local kudal is 1.5 kg.* *Darat: It is length is 18 inches and weight is 1.5 kg.* *Darati: It is length varies.* ***Keywords:** local plough, jungra, khudai kudal, balcha (joch), farua, darat/darati, belcha, jhawal, minhan, bijay tokari, basola*	
729	Traditional weighing balance system in hilly area	Due to poverty in hilly areas of Himachal Pradesh, people developed their conventional and indigenous systes for weighing. Mostly farmers use river stones (muller stones) as weights. These weights are standardized with their traditional weighing system obtained from their ancestors, and till date the farmers are following their ancestors for such standard weighing system. Weighing is done with double pan balance system. Balance system consists of handle, pans, and ropes. Handle is made up of hard wood of Cedrus deodara, the pans are made from skin of yaks, and ropes from yak hair for tying pans with handle. The leather of yaks used in pan making is first treated with salt and mustard oil for making it soft. This weighing system is popular because the whole communities in a specific region use the same parameters of weighing. This is important because weighing of cereals with these standardized weighing system solves many problems, such as cheating. This has been practised in most of the villages in Himachal Pradesh. **Keywords:** traditional weighing balance, river stones, standard weights, ancestor	Shri Chhering Dorge Kardung, Kardung, Kelong,Lahaul and Spiti (Himachal Pradesh)
1126	Checking radiator leakage in tractor using turmeric powder	About 20–30 g turmeric is put in the radiator of a tractor. Water in the radiator should be warmed up initially by running the tractor for about 15–20 minutes. The quantity of turmeric powder used depends on the severity of leakage through cracks or holes in the radiator. Increased quantity of turmeric may clog the radiator which virtually decreases the cooling capacity of the cooling system of the tractor	Shri Gyanendra P.M. Singh Training Associate (Agric. Engg), Krishi Vigyan Kendra, Allahabad Agricultural Institution (Deemed University), Allahabad (Uttar Pradesh) 211 007

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		which is the drawback of this technique. As an alternative to this, radiator is repaired by a professional radiator mechanic. Sizeable number of farmers of the Yamuna par region of Allahabad district in Uttar Pradesh are aware of the technology. **Keywords:** turmeric, check radiator leakage	
1127	Different agricultural implements developed by Punjab Agricultural University	1. Strip till drill—Used for direct sowing of wheat. Saves 15% fuel and 60% time 2. No till drill—Used for direct sowing of wheat. Saves 55–60% fuel and 75% time. However, applicability is limited to certain types of soils 3. Semi-automatic potato planters- Used for planting and ridging of potatoes. Saves labour, time and costly inputs like fertilizers, etc. 4. Automatic potato planters—Used for planting and ridging of potatoes. Saves labour and time. Operational efficiency and output are much better as compared to semi-automatic potato planters 5. Sugarcane cutter planter—Used for automatic cutting and planting of sugarcane sets.Saves labour and time 6. Wheel hand hoe—Used for interculture in row crops. Better weeding and saves labour and time 7. Vertical conveyer reaper- Used for harvesting of paddy, wheat and soybean. Saves labour and time 8. Tractor over the combine system—Used for harvesting and combining of wheat, paddy and soybean. Performance is better as compared to side-mounted comnines. 9. Sunflower thresher—Used for threshing of sunflowers. Operation is much faster as compared to manual threshers. 10. Maize thresher—Used for threshing of maize cobs with and without leaves Threshing is faster; saves time and labour 11. Harambha thresher—Used for threshing of wheat. Threshing is much faster as compared to conventional threshing system. Saves lot of labour and time 12. Potato digger—Used for uprooting of potatoes. Saves labour and time 13. Wheat straw combine—Used for converts left-over wheat stubble after combine harvesting to	Punjab Agricultural University, Ludhiana (Punjab) 141 004

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		wheat straw and transfer it to an attached trolley. Salvaging of left-over wheat stubble and saves labour and time. **Keywords:** different implements, agricultural use	
1129	Different tools and implements-phalsi, girali, rahat, chadas and gophia	*Phalsi:* Dense bushy plant branches are used for threshing wheat along with bullock. *Girali:* This is used for breaking clods. *Rahat:* This is used for lifting water from lower to higher fields for irrigation drawn by bullocks and camels. *Chadas:* Used manually for lifting water from small ponds in the fields. *Gophia:* It is made of rope used for prevention of birds against crop damages. Except phalsi, all the other practices are still used by the needy farmers. The practice has been in use since long time by the farmers of Haryana state. **Keywords:** phalsi, threshing, girali, rehat, lifting water, chadas, gophia	Shri Ganga Singh Pandu Pindara Communicated by Dr A.K. Mehta, Zonal Coordinator, ZCUI, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141 004
2119	Cotton plants puller (patla korra)	The cotton plants are uprooted after picking the cotton by a local implement patla korra. Cotton plants are kept with two iron rods at the bottom of the stem in the ground, and leaves are pulled by the yoke in opposite side of the implement. One man can pull one acre of cotton plants in one day. This practice involves removal of plant along with roots, so that field is free from stubbles. **Keywords:** cotton plant, puller, potla korra	Shri P.C. Narsi Reddy Pedda Kambalur Allagadda, Kurnool (Andhra Pradesh)
2124	Agricultural implements (plough, leveller, cart, shovel, sickle)	Use of these agricultural implements is advantage because the farmers in the villages are average holders and cannot afford huge investment. The cost of these instruments is reasonable and the repairs can be done in the village itself. **Keywords:** farm implements, country plough, leveller	Shri C. Bhaskar Rao 38–13–11/1, Laxmi Nagar, Marripalem, Visakhapatnam (Andhra Pradesh)
2312	Farm implements	Some of the traditional implements used for various operations are as follows: Country plough (seedbed preparation): It is an age old implement used for seed bed preparation. *Blade harrow:* It is a traditionally used in various parts of India in black soil for breaking clods and weed eradication.	Dr G.Subba Reddy and Dr H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Pradesh) 500 059

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		Sowing implements: Seed cum fertilizer drills are used for placement of seed and fertilizer at a desired depth. **Keywords:** Farming, sowing, weeding	
2259	Indigineous farm implements	Common tools used in Madwa village of Gogunda region in Rajasthan are hull (plough) and rapari. Plough: It is suited for shallow ploughing for this region. Its body is made up of dhawoda (Anogeiss sp.). Its wood is light and the plough can be easily lifted while crossing rocks. To reduce wearing, iron strips are fixed on lower side. It consists of single horizontal beam with four vertical sticks as bullock tying attachment. Rapari: A blade hoe in Kotra region is used for weeding and earthing up in line-sown maize crop. It has concave blades for cutting weeds, performing partial earthing up. **Keywords:** farm implements, hull, rapari	Shri K.S. Hooda Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
110	Tiller machine with seat and plough	Shri Thirumaran, farmer of Puliankulam village in Tamil Nadu has developed a seated tiller machine with a unique plough. The seat is made by wooden plank and mounted on a axle. Wheels are attached to this axle and the seat is detachable to the tiller body through a shaft. Alterations are made in the plough design so as to suit for dry land ploughing. The cost of the seat is Rs 1000. This plough makes the driver to drive comfortably for a long distance. **Keywords:** tiller, wooden plank, plough	Shri Thirumaran Puliankulam, Chekkanoorni, Thirumangalam, Madurai (Tamil Nadu)
179	Floating water motor	Adjustment of the motor for lifting water from a well, with increasing and decreasing level of water, is a tedious work that has to be performed by the farmers to irrigate their fields. To solve the problem, Shri P. Pichaimuthu has developed a platform where the motor is fixed and that floats on the water. The platform is made of six 100 litres plastic drums fitted with iron rings. The motor is fixed with nuts and bolts. One piece of the floating water motor costs Rs 5000. **Keywords:** plastic drum, floating motor	Shri P.Pichaimuthu Karmegham Lathe Works, Pandialingapuram, Kodumudi, Erode (Tamil Nadu)
312	Stone remover	Stone remover is an equipment used to remove stones in the agricultural field developed by Shri. Mahalingam. The stone removing device is in the spade shape and its end is in the form of fork but at right angles to the handle. The end of the fork remove the stones without disturbing the soil layer. One	Shri Mahalingam, Kalluthu, Uthapanayakanoor, Usilampatti, Madurai (Tamil Nadu)

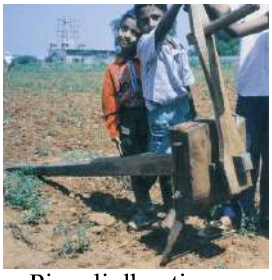
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		handle is fixed in a opposite direction and used to push this device resulting in improved effectiveness. Iron fingers placed between the forks prevent removal of soil along with the stones. The cost of the device is Rs 200. This practice saves labour charge and ensures to raise successful crops. **Keywords:** stone remover, spade, fork, handle, iron finger	
316	Harrow for tillage and intercultural operations	Bullock drawn, light weight harrow attached operations to a tractor to collect weeds has been developed. This harrow has 15 metal blades on a horizontal wooden frame. Metal blade helps in ploughing the field as well as for secondary tillage. **Keywords:** harrow, intercultural operation	Shri S.A. Ramachandran Ramah Steel Industries, Mannar Thirumalai Street, W. Pudhupatti, Watrap, Virudhunagar (Tamil Nadu) 626 116
319	Oil engine for drilling bore hole	Shri K. Sikkandar Batcha has developed a drilling machine of 2–4 inches diameter by using an ordinary 5 HP oil engine, suiting to the need of areas where the conventional drilling machine is not suitable when the soil profile is sandy. He makes a pit of 2 to 2.5 feet depth in the place where a bore well has to be drilled. The pit is filled with 150–200 litres water and a 5 HP oil engine is used to suck the water through foot-valve. The water is taken to a delivery hose of 2–5 inches hose, which is gradually reduced to 1 inch hose. Now water is forced to enter into a reduced diameter. At the tip of the hose a chisel made of iron with 2–4 inches width is inserted. Water is directed along the surface or sides of chisel. The chisel helps easy penetration, whereas the forced water enhances the penetration work and makes the operation smooth. In this method the hose pipe is lifted or rotated manually by hand at periodical interval. The water that has been forcefully poured outside is collected and recycled for the purpose of drilling the bore hole. Cost is only Rs 9,000–10,000. **Keywords:** oil engine, drill	Shri K. Sikkandar Batcha S/o Shri Konthal Mahammed, Pallivasal Theru, Koomapatti, Watrap, Srivilliputhur, Virudhunagar (Tamil Nadu)
320	Mini wood cutting and shaping machine	Mini wood cutting and shaping machine is an equipment used to cut ply woods and reapers developed by Shri. Guru. Iron rod with one inch diameter is fixed in 1.0 m Pattamangalam, length, 0.6 m width and 1.0 m height iron frame with breadth wise for the main axis. Cutting blade is fixed in the right side of the main axis. Three blades of 3.5 inches	Shri N. Guru S/o Narayanapillai, West street, Vadakalathur, Nagapattinam (Tamil Nadu)

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		long are fixed on the left hand side of the main axis. This blade is used to cutting and shaping the plywood and reapers. The main axis is connected with one hp electric motor through V-belt. This machine cuts 2–3 inches thickness of plywood and reapers. Two labours can cut 100 pieces of 1 m long and 3 inch thick reapers in 8 hours. **Keywords:** mini wood cutter, shaping machine, plywood, reapers	
321	Twining of fencing by iron needle	To minimize the labour cost for fencing work a new type of needle developed by Shri. Thangaian. The needle is L shaped, 3 feet length and made by 15 mm iron rod. It has sharp bend in the one end with a small hole in the tip of the needle. For tying the fencing materials like bamboos or prosofis thorny bunches coconut thread is used. While tying bunding materials twining of coconut thread is done from out side of the land. This practice gives good strength to the fence and also this is done for fresh fencing. Normally 2 labours are required for making fencing. By adopting this practice one labour can do the work. **Keywords:** fencing, iron rod, needle, coconut thread, bamboos or prosofis thorny bush	Shri Kovi Thangaian 34, Kumarapillai Street, Kottuchery, Karaikal (Tamil Nadu) 609 609
326	Duni bawa for water lifting	*Duni bawa* consists of metal sheet made of iron and long bamboo lever as Y-shaped structure. This device is used for irrigation in lifting water from the pond into the channel. It is an age-old practice, being	Shri Tapomony Ghosh Shibiloon, Burdwan, (West Bengal) 713 130



Duni bawa—a wate r lifting device

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		followed in the Shibiloon village of Burdwan district in West Bengal. **Keywords:** irrigation, lifting device, metal sheet	
442	Musala for processing of seeds	Musala is used for processing of paddy, ragi, niger and karanja seeds. In a spacious area of the house, a hole of 5"-6" diameter and 5"-6" depth is made on the floor with a flat stone at the bottom. The grains are kept inside the hole and beaten with musala, made of wood of 3 to 4 feet length having cylindrical shape with an iron ring attached at the bottom. This results in processing or grinding of the grains. About 60 to 70% of small and marginal farmers are using this musala. **Keywords:** musala, seed processing	Shri Samara Murja Chalanput, Semiliguda, Koraput (Orissa)
582	Padaliya main- a weeding implement	Weeds of the fields create hinderance necessiating their removal. It is done by hoing a wooden implement which has 5–6 wooden teeth (1.5 feet long) fitted on a wooden log. The implement has a beam for pulling. The instrument effectively removes the weeds. **Keywords:** padaliya main,weeding, implement	Shri Pan Singh and Shri Ramesh Singh, Dor, Phuli, Pitthoragarh (Uttaranchal)
1338	Implements for seedbed preparation	There are many implements which are in practice in the Kurchi village of Dhanbad district in the Jharkhand. Some of the ancient implements are desi plough, spade and bakhar (pata). These are operated by manpower or by animal power. The costs of the implements are Rs 200, Rs 100 and Rs 250 for desi plough, spade and bakhar respectively. These are used for ploughing the land, intercultural operation and land levelling. These implements are in practice for several years by maximum number of farmers. **Keywords:** implements, plough, spade, bakhar, cost, ancient	Shri Ram Bilash Mahato, Kurchi, Govindpur, Bagsuma, Dhanbad (Jharkhand)
2011	Sheetal pot for storage of food items	This is used for storage of vegetable, fruit, milk and cooked foodstuff to keep them fresh for about a week. Sheetal pot can be made easily by a village potter. There are two pots-one inside the other. The inner pot serves as a container while the outer one serves as a reservoir from which water evaporates through its pores. Continuous water evaporation produces a cooling effect and the water in turn cools the inner pot. A difference of 11 degree centigrate has been	Shri Nilesh Vinayakrao Kakade, Sushil Nagar, Rajapeth, Amravati (Maharashtra) 444 606

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		noted between the inner and the outer temperatures. Water is filled through an opening, which is on the upper side of the outer pot. A common lid is provided for both the pots. The lid has perforations on the sides which allow the vapours to escape from the stored material. The following precautions are necessary to get maximum benefits: 1. The inner pot should be clean and dry 2. Water used must be clean 3. The outer pot should not be left without water lest the inner pot would get heated and the stored materials become rancid. 4. Water should be changed daily. **Keywords:** sheetal pot, storage structure, fruits, vegetables, milk, cooked foodstuff	
2015	Improved stone grinder	A single steel ball- bearing is introduced in to the traditional stone grinder (chakki). The weight of the upper grinding stone is transferred to the pivot. These changes bring about considerable improvement by reduction in friction losses.The improved grinding system consists of an iron pivot with a concave cavity. A steel ball fits into the cavity. The functional efficiency of the traditional wooden collar of the upper stone is increased by fitting it with a screw device. The screw with the stone fits on the top of the ball in the pivot. Since the entire weight is shifted to the ball-pivot, the upper stone rotates smoothly, minimizing friction. Grain is poured in through the space around the top screw. The gap between the two stones can be adjusted according to requirements of grain processing. **Keywords:** grinder, steel ball-bearing, friction loss, iron pivot	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444 606
2039	Pingali dhanti for intercultural operations in tomato	Bullock drawn pingali dhanti can be effectively used for weed control in tomato both during kharif and rabi instead of hand weeding. It can cover an area of one acre per day with a cost of operation of Rs 150/ha. By adopting this, clean weeding is achieved. It costs about Rs 100. **Keywords:** pingali dhanti, tomato, intercultivation	Shri B.Narasimha Rao Meerkhanpet, Kandukur, Rangureddy (Andhra Pradesh)  Pingali dhanti—an intercultural implement

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577	Dandala weeding implement	This is a very specialized instrument for weeding and efficiently removes unwanted plants. As compared to the other weeding methods this is cheaper. Dandala is made of wood, in which 8 or 9 wooden pegs are fitted. This is drawn by bullocks to remove weeds. **Keywords:** dandala, weeding, implement	Shri Hari Prasad Vashishth Assistant Agric. Inspector, Joshimath, Chamolai (Uttaranchal)
2317	Low-cost and labour saving seed drills	M r Somasundram, a small farmer, belonging to Arangottai village, Trichy district in Tamil Nadu has developed a hand-pushed seed drill with one or two tynes, a bullock drawn seed drill with 3 to 5 tynes and a tractor-mounted seed drill with 6–11 tynes. T h e simple hand-pushed implement is made of steel frames and wooden handle. It can have one to two tynes, and it can be used sow a variety of millets and other bold-seeded crop. The depth of seeding and the spacing between the rows and within the row can be adjusted. This light implement weights about 30 kg and it costs about Rs 3500. It can cover about 0.2 hectares in a day. The bullock-drawn seed drill has steel frame work and a seed box. It has three to five tynes and can cover 0.8 to 1.2 hectares in a day. The cost of labour-saving implement is Rs 5500. The tractor-mounted seed drill has 8 to 11 tynes and it costs Rs 18500. It can cover one hectare in 2 hours. In these seed-drills the steel seed-pipes can be changed to suit the seeds of different size. T h e implements can be fabricated with local materials and this sturdy implement needs little maintenance. **Keywords:** hand-pushed seed drill, bullock-drawn seed drill, tractor-mounted seed drill, tynes, steel frame, wooden handle	Shri G Somasundaram 36-A, Kakkanji Colony, A-Flat, Viyasarpadi, Chennai (Tamil Nadu) 600 039
578	Dabla- an implement for threshing of wheat and barley	Dabla is a small bat like structure with grooves on it which is made from oak wood. The wheat and barley are efficiently threshed by dabla. The grooves which enhance threshing rate and reduce grain loss during threshing. The threshing efficiency is one q/day. The instrument is made locally so the cost of the equipment is low. **Keywords:** dabla, threshing	Shri Gokaran Ram Nai Basti, Balan, Madalkinya, Pithoragarh (Uttaranchal)

10

Post-Harvest Technology

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
378	Winnowing of paddy by ceiling fan	Farmers of Teliarsala village of Keonjhar district in Orissa are using power-operated winnower for winnowing paddy. About 80 watts power is required for operating this machine. It is a multipurpose machine. The machine has a weight of 15 kg, which costs Rs 750. It has a 10 year life-time capacity, requiring repair and maintenance once a year. About 15–16 quintals of paddy is winnowed per day. The cleaning efficiency is 98%. This is in practice since 10 years. **Keywords:** power-operated paddy winnower, multipurpose machine, cleaning efficiency	Shri Bharat Chandra Sahoo Training Associate (Agri. Engg), Krishi Vigyan Kendra, Judia Farm, Keonjhar (Orissa) 758 002
735	Curing of maize cobs	After harvesting, the maize plants are stacked in bundles, which upon complete drying improve the quality of the maize grains.The maize plants along with the stalk are harvested and tied into small bundles. The bundles from different fields are collected at one place and stacked in and upright positions. After a period of one or half month, the maize cobs are separated individually from the husk.This ITK is used throughout Himachal Pradesh, since time immemorial. **Keywords:** maize cob, stacking, upright position, seed quality	Prof. L. R. Verma, Department of Bio-Science Himachal Pradesh Universi Shimla (Himachal Pradesh) 171 005
736	Osmo-conditioning of pea seeds	Pea is the main vegetable crop in the hilly areas of Lahaul and Spiti. The snowfall in winter allows adequate time for germination to occur within the seed, and results in a better cash crop compared to the seeds sown in March/April. The pea is sown in the month of October-November before the snowfall in winter as it allows adequate time for physiological activities to occur within the seed and facilitates its germination. This ITK practice is followed throughout the Lahaul valley and Spiti of Himachal Pradesh since time immemorial for increased crop production. **Keywords:** osmo-conditioning, pea seed germination	Prof. L. R. Verma, Department of Bio-Science Himachal Pradesh Universi Shimla (Himachal Pradesh) 171005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2313	Post-harvest management	Drying and sealing in an air tight container are used for storage of grains, fruits and tubers, freezing for potatoes and cooling for hard fruits, roots and tubers. Fermenting for wine, smoking and salting for fish and meat, freezing for vegetables and fruits is being done to avoid post harvest losses. **Keywords:** post-harvest, storage	Dr G.Subba Reddy and Dr H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Pradesh) 500 059

11

Grain/Seed Storage

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
37	Storage of food grains	To overcome the problem of stored grain pests in cereals, the seeds are mixed with dried *neem* leaves. The seed gets the smell of neem leaves, which repels the insects. In pulses, a layer of soil is spread on the seed so that the larvae do not enter into the seed and thereby the damage is avoided. It is being followed in the Jagannathpura village of Unjha Taluk in Patan district of Gujarat. **Keywords**: storage, food grains, *neem* leaves	Shri Patel Madhubhai Hargovanbhai, Jagannathpura, Unjha, Mehsana (Gujarat)
38	Storage of cereals by *kinara* method  Kinara—a storage structure for cereals	In arid area, kinara is being prepared by the villagers. *Kinara* is most common in arid area of Jodhpur district of Rajasthan. Aarna (*Clerodandrum*) twigs are being used for prepraring kinara.The structure is being prepared either in bottle or tomb shape. After this they put plaster of cowdung, *murum*, ash and pearlmillet husk inside and outside the structure. Inside *kinara* they put plaster of ash and *gau-mutra* (cow urine). Rs 1,800–2,000 are being spent on the preparation of kinara of 20 to 25 quintals capacity. **Keywords**: *kinara* structure, cereals, ash, cow urine	Shri Bhanwar Singh, S/o Shri Sajjan Singh Bhati, Gilankor via Peelva, Balesar, Jodhpur (Rajasthan) 342 309
204	Storage of rice	Red pepper (*Capsicum* sp.) is kept in bags of rice to protect the grains against the storage pests. Turmeric powder is mixed with paddy and then stored to control weevils. These practices are in use for the last 10 years and 25 families in Nagapattinam district of Tamil Nadu are using it. ***Keywords***: red pepper, turmeric powder, storage-pest control	Shri A. Subramanian 9-B Uliyakkran Thoppu, Sirkali, Nagapattinam (Tamil Nadu)
214	Storage of rice	Leaves of neyveli *kattamanakku (Ipomoea carnea fistulosa)* or dried chopped leaves of wild tobacco (*Lobelia nicotianaefolia*) are mixed with rice to prevent common storage pests. Farmers of Sathyamangalam village of Puddu Kottai district in Tamil Nadu are using this for the last 4 years.	Shri M. Ponnusamy Melur, Sathyamangalam, Pons Garden, Puddukottai (Tamil Nadu) 622 501

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: *neyveli kattamanakku*, wild tobacco, storage pest control, rice	
216	Storing of paddy with neem leaves or coal fly ash	Coal fly-ash or paddy husk is added to store the paddy grains. A layer of neem leaf is also spread over the bulk grains. Neem fruit are also crushed into the walls of the storage. This is in practice for 8 years in Thuraiyur village of Trichy district in Tamil Nadu. **Keywords**: coal fly-ash, paddy husk, neem leaf, neem fruit	Shri T. Chandrasekaran Nettarelampatty, Thuraiyar, Trichi (Tamil Nadu)
223	Paddy storage in bamboo basket	The practice of grain storage in bamboo basket is in use in V K Palayan village of Erode district in Tamil Nadu. Paddy is kept in the bamboo basket made into conical shape. Paddy straw rope is tied around the storage structure very tightly. Grains can be stored for 6 months. Rat may spoil this structure for which proper care must be taken. Rs 250 is required for storing 1 tonne grain. **Keywords**: paddy straw, bamboo basket	Shri S Sakthivel, 711, Kamarapuram, V. K. Palayam, Sivagiri, Erode (Tamil Nadu)
532	*Kothar* for storage of seeds and food grains	The *kothar* is made of wood of deodar. It has 3–4 chambers to store various food grains. With this technique the food grains can be stored in large quantities (20–25 q), free from pest and diseases. Devdar wood has essence which repels insects. Though the construction cost is high (Rs 20000), yet the structures are more durable than other methods. ***Keywords***: grain storage, deodar, essence	Shri Govind Singh Rana, Sukhi, Jhala, Uttarkashi (Uttaranchal)
738	Use of turmeric powder and mustard oil for grain storage	A line of turmeric powder or mustard oil is drawn around the food grains/storage bin or in the path of ants or other insect pests of stored grains. This practice repels the insets of stored grains. Tumeric powder and mustard oil are easily available and it is in practice for last several years. **Keywords**: turmeric, mustard oil	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
753	Storage of food grains	This practices is specific to Kinnaur district but is followed in other regions of Himachal Pradesh also. Specific wooden houses are made away from family units for storage of grains. The grains are cleaned and dried before storage. Grains can be stored for months and years together. For generations, all the	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		farmers practise this. Dried walnut leaves are also incorporated during storage. **Keywords**: wooden house, storage of grain, walnut leaves	
754	Storage structure for cereal grains	A cylindrical structure is made with bamboo, whose inside is plastered with cowdung or clay. The container is placed on ground floor and grains are filled into the container through a small hole at the top. Another hole is made near the base to take out grains for use. Grains are cleaned and dried before storing. Dry leaves of *walnut/bhera/mint (pudina)* and neem are also used along with grains during storage. The practice is in used for many years by a majority of the farmers. **Keywords**: bamboo structure, leaves of walnut, *bhera*, mint, neem	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
760	Use of walnut leaves as repellent for insect pests of cereals and grains in storage	Many villages under Chirgaon block in Shimla district of Himachal Pradesh use walnut leaves (*Juglans regia*) to check insect pests in cereals and grains during storage. Grains can be stored well for one year by use of these leaves. The leaves act as repellent to the pests. The practice is in use for 200 years by most of the farmers. **Keywords**: walnut leaf, cereal and grains storage, repellent for insect-pests	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207
1136	Use of *neem* and salt for storage of wheat	The technique of storing wheat grains, disclosed by Ms Suneeta, W/o Shri Sanjay Kumar of village Champatpur in Uttar Pradesh is as follows. After harvesting, threshing and cleaning of wheat, it is sun dried. Then, the wheat seeds are treated with salt and *neem* leaves and packed in gunny bags. Finally the gunny bags are covered with husk (*bhusa*) for storage. This is in practice for the past 25–30 years by about 75% families in Champatpur village of Allahabad district in Uttar Pradesh. The grains can be stored safely for 5–6 months. The cost involved is about Rs 15 per quintal. As an alternative, the farmers use celphos tablets etc. **Keywords**: sun dried wheat grain, salt, neem leaves, gunny bags, storage	Ms Neeru Bala, Training Assistant (Home Science), Allahabad Agril. Institute (Deemed University), Allahabad (Uttar Pradesh) 211 007

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1137	Storing of rice by mixing with turmeric powder	Farmers of Kapurthala district of Punjab are using this ITK. Turmeric powder is mixed with rice for the purpose of reducing the insect damage in rice. Turmeric powder acts as repellent for insect pests. This method is in practice for long time. **Keywords**: turmeric powder, rice, insect, repellent	The Associate Director, (Training) Krishi Vigyan Kendra, Kapurthala (Punjab) 144 601
1138	Storage of wheat seed in *bhusa*	For storage, wheat seeds are first dried in sun. It is stored in gunny bags (100 kg capacity) in *bhusa* (husk) to protect the seeds from storage pests. The bags are kept in earthen/concrete store house. This practice is followed for last 10 years by 20 families in Bharana village of Punjab. **Keywords**: wheat seed, *bhusa*, earthen concrete store house	Shri S. Gurmit Singh, S/o S. Gurumukh Singh, Bharana, Ghal Khurd, Ferozepur (Punjab)
1139	Storage of wheat grain using neem leaves	About 59% farmers of Talwandi Fattu village in Nawanshahr of Punjab store wheat grains in cylindrical storage bins of 10 q capacity made of iron sheet. Before keeping the seeds, coating of neem-leaf extract of the inner side of the bins is made. After drying under sun, the grains are kept in the bins. After each 1 foot level of grain in the bins, 50 compound leaves of neem are placed over the grains. This practice which is in use for about 100 years gives a good protection of grains against the storage pests. **Keywords**: iron bin, coating with neem-leaf extract, neem leaf	Shri S Satnam Singh Gill, Talwandi Fattu, Mukandpur, Nawanshahr (Punjab)
1144	Use of dried leaves of *Lantana* to control insects in stored grains	*Lantana* leaves have insecticidal effect. Dried leaves of Lantana are mixed with dried grain (paddy, wheat, etc.) @ 1.00 kg per 100 kg grain and kept in closed bins. This is practised in many villages of Badaun and Bareilly districts of Uttar Pradesh. **Keywords**: cereal grain, *Lantana* leaf, storage bin	Dr Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Milia Islamia University, Jamia Nagar (New Delhi) 110 025
1145	Use of garlic bulbs to protect rice from storage pests	Garlic smell repells insects.About 1–2 garlic bulbs are placed in 5–10 kg rice in the rice bin for storage. Rice is protected from storage pests with little cost. The practice is being used in the villages of Bareilly, Shahjahanpur and Badaun districts of Uttar Pradesh. **Keywords**: rice, garlic, smell, repells	Ms Husan Afzal, Moh.Vedon Tola, Bund Gali, Badaun (Uttar Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1146	Wheat grain storage by *neem* leaf	*Neem* has insectcidal value. It is also a repellent. *Khatti* (a pit below the ground with a depth of 1 m and diameter of 2 m on the top and 1 m at the bottom) is made in a room of the house where there is no humidity.About 10 cm dried wheat straw is kept at the bottom with a layer of 1 cm dried *neem* leaves on top. Then 15 cm layer of dried wheat grain is covered with 1 cm dried neem leaves. The grain and neem leaves are kept alternativelly to fill the *khatti*. The *khatti* is closed with cloth and dusted with salt. It is covered with 10 cm yellow soil and then pasted with fresh cowdung. It costs Rs 200 to store 10 quintals wheat grain. **Keywords**: *khatti*, neem leaf, alternate layer, salt, cowdung	Dr Tungveer Singh, D-37, Medical Collage Campus, Meerut (Uttar Pradesh) 250 004
1147	Use of salt to protect rice from storage pests	Rice grain is protected from storage pests by using common salt. By absorbing water, salt desicates the insects to death. During filling the gunny bag with rice, crystals (5–6) of salt are put intermittently after each 10 kg. Treatment costs Rs 2 per quintal of rice. This is practised in Danpur village of Bulandshahr district of Uttar Pradesh. **Keywords**: rice grain storage, salt, desication	Shri Khamani Singh, Tubewell Operator, Water supply Department, Medical College, Meerut (Uttar Pradesh)
1148	Safe storage of wheat and other grains in the heap of wheat straw	The dry straw keeps away the humidity and maintains high temperature. This checks the insects to enter stored grains. Wheat,barley or other grains are dried in sunlight and filled in gunny bags. These bags are placed inside the heap of wheat straw. This is practised in Nayabas Kutubpur village of Bulandshahr district of Uttar Pradesh. **Keywords**: cereal grain, wheat straw	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No.38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1149	Protection of wheat from storage pests with lime	Lime has insectcidal effect. Lime powder is mixed with wheat grain after drying. This keeps the grain protected from insects. This is practised in Easepur village of Uttar Pradesh. **Keywords**: wheat grain, lime	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No.38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1435	Traditional method of grain and seed storage	In Mandu, Bero, Tamar and Arki blocks of Hazari-bagh and Ranchi districts of Jharkhand, majority of the farmers (about 95%) use mora made up of paddy straw and *koti* to store their seeds and grains. *Mora* is prepared by binding the heap of seeds/grains by the rope of paddy straw. *Koti* is a square or rectangular	Dr Sudeswar Prasad Singh, Programme Convener, Jan Jagran Kendra, near Police Training College, Khandari Hill Road, Hazaribagh (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		reservoir structure made of clay soil, paddy husk, sawdust and straw. Capacity of is about 500 kg and that of kota varies according to its size. These storage structures are being used since the ancient times without much modification in the structures. **Keywords**: *mora, koti*, binding heap of seeds/grains, rope of paddy straw, square or rectangular reservoir, clay soil, paddy husk, sawdust, straw	
1439	Safe storage of seed of maize and wheat	Farmers of Tikodih village of Nawada district in Jharkhand use this practice for safe storage of seeds of maize and wheat. Seeds of maize and wheat are mixed with dried fruits and leaves of *vantulsi* (wild *tulsi*) . The smell of *tulsi* keeps away the weevil and insects and saves grains from other storage pests. Leaves and seeds of *vantulsi* are dried and mixed in the ratio of 1 : 100. This is in practice for last 10 years by maximum number of farmers and involves little cost. **Keywords**: seed storage, maize, wheat, fruit/leave, *vantulsi*	Shri Md Farukh Ansari, Tikodih, Pahadpur, Nawada (Bihar) 806 106
1441	Control of weevil in wheat by *neem* leaves while storin	*Neem* leaves are collected and dried in shade. These leaves are mixed well with dried wheat seeds (dried under sun light). The leaves of neem are mixed with wheat seed in the proportion of 1 : 100 and stored in metal drum and *kothi*. About 60–70% of the seed grains are saved from harmful insects. This is in practice for last 40 years by 30% of farmers in the Loharpura village of Nawada district of Bihar. **Keywords**: neem leaves, wheat grains, storing of wheat, insect	Shri Krishnan Nandan Prasad, Loharpura, Nawada (Bihar)
1443	Preventing insect-pest attack in storage through use of *chatpata* leaves	*Chatpata* leaf has special type of smell which prevents insect-pest in storage. About 50 g *chatpata* is mixed with 100 kg rice for storage. It is kept in bag or any other storage structure. The practice is followed in the villages of Udwantnagar Block of Bhojpur district (Bihar) and has potentiality for further spread in the areas where *chatpata* plants are available. About 100% pest attack is controlled by this method.	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiyan, Sheohar (Bihar)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1445	Paddy-husk basket for paddy seed storage	The farmers store paddy seeds in paddy husk basket coated with soil to protect from rodents and insects etc. The storage structure protect the grains from heat and humidity. The paddy husk basket coated with soil is used as protective layer. The size of basket depends upon required quantity of sun-dried grain seed. It is packed well and coated with semi-solid soil. This method is mainly used to store the seeds of paddy by the farmers. It is followed by the farmers of Madhesera village of Bhutahi Block in Sitamarhi district of Bihar. It has been found successful in more than 70% of the farmers. Cost: benefit ratio of this practice is 1 : 6. **Keywords**: paddy husk, basket, semi-solid soil, paddy	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834 006
1446	Protect maize cobs from insect-pest by using smoke	Smoke keeps insects away from the stored grains/seeds. It maintains the optimum moisture content of the seed. This practice helps in preserving seeds for longer period. Maize cobs are hanged over the fire-place (*chulha*) of house to get smoke.The practice is followed in the Lalpur and surrounding villages of Ranchi district (Jharkhand). Success has been observed in 100% cases. **Keywords**: smoking, maize cobs, stored grain pests	Ms Sushmita Khalkho, 3/11 Income Tax Colony, Lalpur, Ranchi (Jharkhand)
1452	Storage of maize seeds	A majority of farmers of village Latpahari of Dumka district (Jharkhand) hang the cobs of maize (without shelling/removing leafy cover of cob) over the *kaccha chulha* (fire place) to receive smoke. Due to smoke, it remains safe from stored insect-pests and rodents. This is a traditional practice and is used for the last several years without any change. **Keywords**: cobs of maize, hanged over the *kaccha chulha*, smoke, remain safe	Ms Neera Sabita Jojo, Kurdeg Road, Samtoli, Gotra, Simdega (Jharkhand) 835 235
1457	Storage of rice in *mora* and straw	*Mora* is used by the villagers of Deori village of Ranchi district in Jharkhand for protecting the seeds or grains from the humidity, air, heat, etc. Rice stored in straw made *mora* is 100% safe. The climate of the region is sub-humid with average annual rainfall of	Shri R. S. Prasad, Deptt. of Extn. Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 Mora—paddy storage structure on wooden platform 1200 mm. This practice is technically perfect for last 100 years. **Keywords**: rice, *mora*, straw, humidity	
1464	Indigenous methods of grain and seed storage	Storage methods for seeds of different crops are as follows:  *Khancha*—a storage structure for grains  *Chhatka*—a storage structure for grains 1. About 50 to 100 g *sinduar* leaf powder is mixed with seeds of blackgram, pigeonpea, chickpea, lathyrus, ridge gourd, lady-finger, barbate etc and kept with dry sal leaves in a bag like container and hanged in the roof over the chulha in the kitchen. 2. Seeds of tomato, guava, bitter gourd, *khira* etc are pasted on the wall for storage. 3. Seeds of paddy are kept in bamboo baskets and the mouth is covered by paddy straw and mud. 4. Paddy seeds of the same variety are also stored in the storage bin made of mud in the house over raised platform. 5. Paddy seeds are stored in box made with wood. 6. Seeds of paddy are stored in *mora (pura)*. Mora is made of paddy straw and tied tightly with ropes made of paddy straw. Seeds can be stored for 5–10 years in mora where even rats cannot enter. 7. About 5 to 10 g paddy seed is stored in earthen pot. For storing seeds of maize, blackgram, greengram, lathyrus and pigeonpea, 250–500 g	Paryavaran Chetan Kendra, Bada Sigdi, Potaka, East Singhbhum (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		powder of *sinduar* leaves is mixed. 8. Fully matured bottle gourd, ridge gourd, etc. are kept in sun over the roof top. During rains, these are kept in shade. 9. Seeds of leafy vegetables, bitter gourd, kakri etc. are stored in cloth bag. **Keywords**: *sinduar, pura (mora)*, mudbin, woodbin, bamboo basket	
1865	Method of wheat seed storage	Wheat seeds are stored in gunny bags in houses and these bags are covered with dried straw of about 3 inches thick layer from all the directions including bottom. This practice ensures 100% seed protection from all storage pests including rodents. This is due to coverage of straw all around the seed material creating an anaerobic condition in the vicinity of seeds resulting in unfavourable condition for development and multiplication of storage pests. **Keywords**: dried straw, anaerobic condition, unfavorable condition for storage pests	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492 012
1870	Maize seeds stored by hanging on bamboo or woods	Most of the maize growers of Chhindwara district of Madhya Pradesh use their own seed year after year. Farmers store seeds by hanging on bamboo or wood  Hanging maize cobs for seed about 15 feet high from earth surface. The seed is free from moisture, insect pest and diseases. Storage cost is also reduced by approximate Rs 700 per ha by this method. The seed quality is also maintained. **Keywords**: maize, bamboo/wood, storage cost	Shri K.B.Tiwari, Training Organiser, KVK, Chandangaon Chhindwara (Madhya Pradesh) 480 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2144	Storing of rice grains with red chilli	Addition of 20–30 red chillies in one quintal of rice bag prevents the attack of stored grain pests. The pungent odour of red chillies acts as a repellent. **Keywords**: rice, storage, red chilles	Shri M Mangathai, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2151	Indigenous method of seed storage	Seeds of cereals and millets like sorghum, bajra and paddy are stored in bags, baskets made up of date-palm leaves and are mixed with neem leaves and ash. On the top it is sealed with cowdung and on the bottom with a paddy straw. Neem leaves contain insect anti-feedant properties, which help in long life of seed. **Keywords**: seed-storage, neem leaf, anti-feedant	Shri Mallaiah, Bastapur Village, Chevella (M), Ranga Reddy (Andhra Pradesh)
2152	Storing of rice bags by adding red chillies, crystallised salt and neem leaves	About 5 kg of crystal salt, 20–30 red chillies and 5–10 handfuls of dried neem leaves are thoroughly mixed with rice before bagging. Later the bags are also covered with dried neem branches. It minimizes the insect attack and improves the keeping quality of seed. **Keywords**: storing rice, red chillies, neem	Vijitha, Prakasam, Krishi Vigyan Kendra, Grama Nava Nirman Samithi, Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
382	Storing of paddy (rice) grains in earthen pits (*kahni*)	Paddy grains are stored in earthen pit of 12×6×6 feet with compacted floor spread with straw of 2' to 3' thickness, over which polythene sheet is spread and 4 wooden poles are kept at 4 corners up to 6 feet height. The whole structure is encircled with straw. Then paddy is kept up to a height of 2 feet above the ground, above which paddy straw is spread. After this, it is tied with paddy straw threads, completely covered with soil and plastered with cowdung. In this, 15 to 40 quintals rice are stored, which costs Rs 400 for construction of *khani*. It is being followed by all the members for a long time in Rishipur village of Ganjam district in Orissa. **Keywords**: *khani*, earthen pit, paddy storage	Shri R. K. Nayak, Rishipur, Ganjam (Orissa)
383	Storage structure for paddy grains	Paddy seed is stored in structures made of paddy-straw rope, locally called puduga by mixing the grain with *neem* or *begunia* leaf @ 50 g per 30 kg seed for 1 year, there by avoiding the damage to the seed from insects or diseases. Each structure can accommodate about 1 quintal seed. All the farmers are using this practice over a long time in Makarbili village of Nawapada district in Orissa.	Ms Namita Rani Mahapata, L-294 Baramuda, Housing Board Colony, Bhubaneshwar (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 Grain/seed storage structure **Keywords:** paddy grain storage, *puduga, begunia* leaf	
384	Rice grain stored in closed litter *(doli/kareli*)	The rice after drying is stored in litter (*doli or kareli*) made of bamboo splits of 8' height and 4' radius, with an inlet and outlet on the outer surface. It is smeared with cowdung slurry. The entire structure is kept at a height from rain water contact. It is cost effective and maintains grain quality both for seed and consumption purposes due to proper aeration. It is being practiced by 70% farm families for the last 40 years in Sadanandapur village of Balasore district in Orissa. **Keywords**: bamboo structure, cowdung, rice	Ms Bishnupriya Mishra, Training Associate, (Agriculture Extension) Krishi Vigyan Kendra Bhanjanagar, Ganjam (Orissa) 761 126
385	Storage of rice grains in earthen pits (*khani*)	Paddy seed is stored in *khani* (traditional storage structure) in which a pit is dug of size of 7'×6'×7'. The inner side is covered with straw ropes and straw is kept horizontally against it, the lower floor is covered with paddy husk, in which paddy grain is kept and covered with palm leaves and the outer side is smeared with cowdung slurry. The cost of storage structure is Rs 300. It is being used for the last 40 years in the Bausalundi village of Ganjam district in Orissa. **Keywords**: rice storage, *khani*, straw rope	Ms Bishnupriya Mishra, Training Associate (Agriculture Extension), Krishi Vigyan Kendra Bhanjanagar, Ganjam (Orissa) 761 126

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
386	Use of ash for control of weevil in maize	Ash obtained by burning the dry leaves of locally available plants are mixed with the maize cobs @ 10 g per cob and stored in gunny bags. This practice reduces weevil damage by 90%. It is being followed for the last 15 years by 40% farm families in Brainguda village of Kandhamal district in Orissa. **Keywords**: ash, weevil, maize cob	Shri Sridhar Nayak, Gadaguda, Kandhamal (Orissa) 762 100
488	Storage of maize seed	In order to preserve maize seed for sowing in the subsequent year, the farmers of Tlangnuan 'E' village under Thingsulthliah block in Aizawl district of Mizoram tie up matured maize cobs by the cob sheaths in bundles and keep over the fire place. This method has found to be good, as it is safe from insect attack due to continuous smoke treatment from the firewoods. Storage period is from August to March. No other material is used for preservation and the practice is followed by all the farmers from time immemorial. **Keywords**: maize seed, preservation, smoke treatment, fire place	Shri H. Lalthanpuia, Krishi Vigyan Kendra, Kolasib (Mizoram) 796 081
490	Indigenous method of storing maize seed in Nagaland	In this practice, the farmers of Sucünoma, Pfutsero, Porba, Sethikeima and other neighbouring villages in Kohima and Phek districts of Nagaland have adopted a method of storing maize seed as the farmers cannot afford to purchase fresh maize seed every year. Maize is the second important cereal grown widely in the state of Nagaland. The storage area is the kitchen of the house. The kitchen of the Naga houses in the villages are made of thatch roof. The roof is kept protruded, so that the walls of the kitchen are adequately covered. For the purpose of storing maize seed, the farmers select the wall that gets direct sunlight. They keep a gap of around 1 feet between the side walls and the roof. The maize cobs, three or four in number are tied up together, and several bunches of such tied up maize cobs are kept hanging with the help of rope or bamboo in the uncovered area between the wall and the roof and are kept through out the preservation period. Before storage, matured maize cobs are selected and allowed to dry for a week. The technology behind the practice is that the seeds are exposed to sunlight from outside and kitchen smoke from inside. The kitchen is kept aired through the uncovered space between the wall	Shri A.K. Khan, Technical Officer (T6), ICAR Research Complex, Jharnapani, Medziphema (Nagaland) 797 106

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		and roof. The practice has been found to be highly successful in preserving the seed. This method of preserving maize seed has good effect and could be seen in every village. The idea behind the practice is that when the seeds are given continuous sort of fumigating treatment, it cannot be damaged by insect, pest etc. All the maize growers in the villages use this practice from time immemorial. **Keywords**: maize cobs, kitchen, smoke, preservation, fumigating, sunlight	
32	Storage of pulse grain	The pulse seeds are mixed with sand in the ratio of 2 : 1 to overcome the stored grain pest problem. The grain becomes airtight as the sand penetrates down to the bottom. It absorbs moisture from the grain. The insects get crushed by the sand. Sometimes neem leaves are also mixed with the seed. Three layer of sand (4 inches) are spread in the floor of the storage structure. It is followed in most of the villages of Dausa district in Rajasthan. **Keywords**: storage, pulse grain, sand	Training Organiser, Krishi Vigyan Kendra, Khedla Khurd, Dausa (Rajasthan) 303 303
36	Storage of pulse crops	The seeds of pulses are allowed to dry for 2–3 days by allowing them to have contact with dew and are stored in an earthen pot, provided with equal amount of ash and the seeds are arranged in layers. This method of storage overcomes the stored grain-pest attack for up to 1 year. It is being followed by most of the villagers from a long time in the Barkhandia post of Dangs district in Gujarat. **Keywords**: pulse, gram, storage, ash	Shri Chaitu Bhai, Shri Dubal Bhai Birari, Barkhandia, Dangs (Gujarat)
39	Use of sand for safe storage of pulses	In *kharif* (monsoon season), greengram (*Vigna radiata*), *moth (Vigna mungo)* and cowpea (*Vigna sinensis*) are the major pulses of the Jhunjhunu district. In *rabi*, chickpea (*Cicer arietinum*) is the major pulse crop. After marketing of surplus produce, farmers of Menpura village of Panchayat Samiti Udaipurwati, Jhunjhunu district store pulses for their daily consumption by traditional method. They mix sandy soil with pulses in equal quantity to protect the grains from storage pest, especially *khapra* beetle (*Trichoderma granarium*). While storing pulses, they put layer of sandy soil.They use it from bottom of the bin to top, and close the mouth of the bin that checks insect attack and reduces moisture in storage.	Chief Scientist-cum-Head, Krishi Vigyan Kendra, Abusar, Jhunjhunu (Rajasthan) 333 001

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		Thus damage by *khapra* beetle is being checked. About 90% of the grains are protected by this method. **Keywords**: grain storage, greengram,cowpea, mothbean, sandy soil, khapra beetle	
205	Storage of pigeonpea	Pigeonpea grains are sun dried and mixed with laterite soil to protect the grain for one year. When pigeonpea is to be used as seed, it is mixed with the leaves of *vasumbu (Acorus calamus)* and stored. Farmers of Meensuruti village are using these practices for the last 4 years. **Keywords**: pigeonpea, grain, seed, red soil, *vasumbu*	Shri J Gokulakrishnan, North Yadara, Meensuruti, Jeyankundam, Ariyalur (Tamil Nadu) 612 903
210	Storage of mustard seed with sapota	After harvest of sapota (*Achras sapota*), the fruits are kept in polythene bags with mustard seed for ripening. One kg fruit is kept with 10 kg mustard seed. This practice is adopted by 50 farmers for more than 5 years in Karamadai village of Coimbatore district in Tamil Nadu. **Keywords**: sapota, mustard, ripening	Shri M. Jayakumar, Kuranoor Thottam, Medu, Karamadai, Coimbatore (Tamil Nadu) 641 113
215	Storage of blackgram	Blackgram (*Vigna mungo*) is mixed with fingermillet (*Eleusine coracana*) to control storage pests. This practice is used in Udumalpet block of Coimbatore district in Tamil Nadu. **Keywords**: blackgram, fingermillet, storage pest	Shri N. Ragupathy, X-Road Udumalpet, Coimbatore (Tamil Nadu)
217	Control of storage pests of cowpea	Storage pest gets controlled when cowpea seeds are mixed with dried roots of *Adathoda vassica (adathodai)* during storage. Chemical vasicin present in the plant roots prevents the attack of storage pests. About 500 g dried roots of *Adathoda* roots are required for 1 kg cowpea seeds during storage. About 25% of the villagers have been using this technique for the past several decades. This is in practice in Pathanamthitta district in Kerala. **Keywords**: cowpea, *Adathoda vassica*, pest control	Shri C.M. Mathew, Valiyacherupothril, Ayiroor, South Pathanamthitta (Kerala)
221	Treatment of pigeonpea with mud and termite nests	Pigeonpea seed is coated with red soil as well as soil from termites nest in 4: 1 ratio to keep it away from pests and beetles in storage. Seeds after treatment are dried under direct sunlight for 3 days and also left overnight in humid climate for 3 nights. Seeds are stored in fresh cloth bag for long term storage. If this method is used, seeds of pigeonpea fetch good market value at the time of sale. This is in practice in	Ms Rani, W/o Shri Rajandran, 20, Periya Thottam, Kalampalayam, Seeliyur, Mettupalayam, Coimbatore (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 Seed treatment of pigeonpea by red mud and termite nest mud Mettupalayam of Coimbatore district in Tamil Nadu. **Keywords**: pigeonpea, termite nest mud, storage	
750	Use of turmeric powder and mustard oil for storage of pulses	The farmers of several parts of northwest Himalayas are using turmeric and mustard oil as preservative in pulses. Pulses, specially *urad*, are mixed with turmeric powder and smeared lightly with mustard oil and then sealed in airtight container. For ages many farmers of the area are using the practice. **Keywords**: turmeric powder, mustard oil, preservative, pulses storage	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
758	Storage of seeds of chickpea and green pea	Application of dried red pepper helps protect the seeds against bacterial and fungal diseases. Wetted red pepper is applied to the seeds of chickpea and green pea, and these are dried in the sunlight. Now the seeds are stored in a bamboo-made container, which varies in size from 10 to 60 kg according to the need of the farmer. This practice is being followed by maximum number of farmers, for the last several years. It is easy to practice and it involves no cost because the red pepper is locally available. **Keywords**: bacterial, fungal, grain, red pepper, seeds	Ms Shanta Thakur, C/o Lokka Ram Thakur, Grand Hotel Shimpla, P.O. Shimla (Mall) (Himachal Pradesh)
1131	Storage of blackgram seeds mixed with mustard oil	Before storing, the seeds of blackgram (*Vigna mungo*) are cleaned. The seeds are mixed with mustard oil by hand. For 1 kg seed the requirement of oil is 10–15 ml. The oil-mixed pulse is stored in earthen pot (5–10 kg capacity) with the mouth of the pot being covered by dry cloth. The pots are kept inside the house in dry place for storing for 3–4 months. Some farmers keep the storage pots under sun once or twice	Shri Saheb Singh, Tobba, Barara, Saha, Ambala (Haryana) 133 104

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		during the storage. The chemicals present in mustard oil check formation of germs and fungus. Thus the seeds are protected from attack of insect pests and fungal disease. The farmers (35–40 families) of Tobba village in Ambala district of Haryana are using this practice for last 60–70 years. **Keywords**: sun-drying, cloth, mustard oil, earthen pot	
1142	Storage of gram and *moong* (pulse) seed	The farmers of Nandha village of Rewari district in Haryana construct a storage bin made up of clay and horse dung for storage of gram and *moong* (pulse) seed. The clay and horse dung is mixed with water and kneaded properly. A storage structure with a capacity of 1–5 quintals is constructed slowly, constructing only one foot daily and dried properly in the sun. After construction, the whole bin is painted by a mixture of ash and cow urine. The grain after cleaning and grading is dried in the sun for 2–3 days and then cooled at night before filling into the bin. One inch layer of ash is made at bottom and above which the grains are kept. After complete filling by grain, a layer of sand is made at the top and the whole structure is sealed with the same mixture of clay and horse dung, used for construction of the bin. **Keywords**: storage structure, clay, horse dung, gram and *moong* seeds, storage pests	Shri S.S. Rathore, Training Associate (Extention), Krishi Vigyan Kendra, B.B. Ashram, Rampura-Rewari (Haryana) 123 401
1143	Storage of pulse seeds in bin covered with ash	Layer of ash protects the insects. Instead of using fumigants for storage purpose, a protective layer of ash (2–5 mm) is spread over the grains. **Keywords**: ash, fumigant	Shri S. Shavinder Singh, S/o Shri S. Jaspal Singh, Ratta Khera, Block-Ghal, Ferozpur (Punjab)
1151	Protection of pulse grains from storage pests	A little quantity of mustard oil or *til* oil is mixed with pulse grains while storing. This protects the pulses from storage pests. This costs Rs 10–15 per quintal pulse grain. This practice is adopted in Razzi Sarai village of Etah district in Uttar Pradesh. **Keywords**: pulse grain, mustard oil, seasame oil	Shri Prem Pal Singh Arya, C/o Daal Chand, H. No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1442	Control of insect pest in storage of pulse crops like lentil, gram, pea and *arhar*	Linseed straw has some constitutent which checks insect-pest attack on pulses. Due to cover with linseed/wheat husk, air does not enter inside the grain. Hence moisture level of grain is maintained. Linseed straw is put in the floor and around the wall of storage place or room, and grain is put between the linseed straw and is covered with linseed straw or wheat husk.	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiyan, Sheohar (Bihar)

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		The practice is followed in the villages of Fatuha Block of Patna district (Bihar) and has potentials for spread in similar areas. About 100% grain is saved by this practice. **Keywords**: pulses, wheat husk, linseed straw	
1444	Storage of pulses in bin or *mora* with neem and *chatpata* leaves	Neem and *chatpata* leaves act as repellent and toxic agents against storage insect pests. Dired leaves of neem and *chatpata* are mixed with pulses stored in bin or *mora*. Dried 500 g neem leaves and 500 g *chatpata* leaves are mixed for 100 kg pulses. The practice is under use in Khalisha village of Udwantnagar block of Bhojpur district (Bihar). About 90% problem has been reported to be solved by this practice. **Keywords**: neem leaves, *chaitpatta* leaves, storage	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiya, Sheohar (Bihar)
1448	Protection of pulses from insects by keeping in gunny bag	Storage of pulses is done in gunny bag kept in *moras*. It remains in airtight condition and no insect attack is noticed. It is plastered with mud and cowdung. This practice is followed in Jojodih village of Tamar Block in Ranchi district (Jharkhand). Almost 100% grains are protected through this method against stored pests. **Keywords**: gunny bag, cowdung, *moras*, pulses	Ms Gita Kumari C/o K.N. Singh Munda, Matladih (Near Filter House), Bagbera (Tatanagar), E. Singhbhum, (Jharkhand)
1864	Storage of chickpea seeds using husk	Chickpea grains are preserved for seed purpose in earthen bins by using dry husk of the same crop. At the bottom, the husk is spread and then grains are filled in alternate layers with grains and husk. At the mouth, again husk is spread and mouth of the bin is covered with earthen lid, which is made airtight by plastering with dung and mud slurry. This has been in practice for the last 30–40 years by all the villagers of Mhasadi village of Dhule district of Maharashtra. **Keywords**: chickpea husk, earthen bin	Shri P. S. Patil, Training Organiser, Krishi Vigyan Kendra, Dhule (Maharashtra) 424 004
2139	Storage of pulse in earthen containers	 Storage of pulses in earthen pot To protect the grains from storage pests, the pulse seed are stored in earthen containers having a capacity of 12–13 kg by mixing the grain with ½ kg of sand and wood ash.The seed can be stored	Shri K. Lakshmana, Ph. D Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030

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		up to 3–6 months. About 77% of the farmers in Randisa village of Srikakulam district in Andhra Pradesh are following the practice for a long time. **Keywords**: pulse storage, earthen containers, sand, wood ash	
2145	Storage of blackgram and redgram seed with ash and dried neem leaves	After drying the pulses for low moisture content, burnt ash and neem leaves are added to the seed to prevent the attack of store grain pests and avoid the damage. **Keywords**: neem cake, redgram seed, as	Ms Nagamma, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2147	Wood ash for storing redgram	The fine wood ash powder is mixed with redgram seed and is stored which reduces the occurrence of storage pests. Ash acts as physical barrier and blocks respiration system of insects. The seed is also mixed with red soil/ drumstick branches to increase the viability of the seed. **Keywords**: wood ash, redgram, red soil, drumstick	Shri P. Vaikunta Rao, Konda Baridi, G.L. Puram, Vizianagram (Andhra Pradesh)
2153	Pulse storing by using groundnut oil or sesamum oil	Groundnut oil or sesamum oil @ 10 ml is thoroughly mixed with *dal* (pulses) and stored in an airtight container. This practice makes unfavorable condition and unfit for damage of pulses by the storage pests. Farmers of Dameta village of Elkathurthy mandal of Andhra Pradesh are practising this method. **Keywords**: dal, mustard oil, sesame oil	Ms Kommidi Swaroopa, C/o Prakasham Krishi Vigyan Kendra, Gramma Nava Nirman Samithi, Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh)
2154	Control of storage pests by using ash in pulses	Dried or wet ash is rubbed or mixed with pulses and stored in earthen pots to control pest attack. This is being practiced in Gumpula village of Odela Mandal in Andhra Pradesh. **Keywords**: ash, earthen pots	Ms V. Bhagyamma, C/o Prakasham Krishi Vigyan Kendra, Gramma Nava Nirman Samithi, Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh)
2161	Treating redgram seed with dung slurry during storage	To overcome the problem of storage pests, redgram seeds are stored by treating them with dung slurry and drying in shade. This reduces the pest infestation. **Keywords**: coating with dung slurry	Shri Chandra Sekhar, Progress, 12–13–626 Tarnaka, Hyderabad (Andhra Pradesh)
381	Storage of paddy and pulse grains in *olia*	Paddy or pulse grains are stored in structures made of paddy straw and paddy straw rope in a circular form locally called olia, for about 1 year. Cost involved in storing 1 quintal grain is Rs 100. The structure protect the seeds from pests and diseases	Ms Lakmi Nayak, Benakunda, Dihapadhal, Ganjam (Orissa) 761 125

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		This is an age-old practice and is being followed by 90% of the farmers in the Benakunda village of Ganjam district in Orissa. **Keywords**: pulse, storage, olia, paddy straw	
387	*Vitex negundo* leaf for preservation and storage of pulses	The seeds of pulses (greengram and blackgram) are mixed with ground powder of *Vitex negundo* to prevent the attack of weevils in gunny bags for about 9 to 10 months. It is being followed by 50% farmers in Rajanager village of Kendrapura district of Orissa. **Keywords**: *Vitex negundo*, seed storage, pulses	Shri M. Mohanty, Senior Research Fellow, NATP (RRPS), Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
390	Storage of greengram inside paddy	Ten kg greengram seed is put in a polythene bag and sealed. It is then put inside a paddy bag of 40–50 kg. By this method greengram seeds can be stored for a period of 1 to 2 years. The pest, which attacks the greengram, cannot enter through the paddy environ-ment. This is a low cost technology as compared to use of agro-chemicals like and EDB ampules and is being followed by 90% farmers in Salepali village of Bargarh district in Orissa. **Keywords**: greengram, storage, polythene bag, seal	Shri Tankadhara Barik, Salepali, Bargarh (Orissa)
392	Storing of pulse grains by using dry chilli	After drying and removal of chaffy grains and inert matter, the pulse seeds are mixed with dry chilli @ 1 kg per quintal and are stored in earthen pots, metal bins or tin containers with sand up to 3" to 4" on the top and bottom of the container. The seeds can be economically and effectively stored for 1 year, avoiding the infestation of stored grain pests. Pungency of the red chilli might have repelling action against the stored grain pests. It is being followed by all the farmers of Benakunda village in Ganjam district of Orissa. **Keywords**: pulse grain, storage, dry chilli	Shri Narendra Bisoi, Benakunda, Dihapadha, Ganjam (Orissa) 561 162
33	Use of *neem* leaves for storage of groundnut	To overcome the problem of store grain pests in groundnut, the farmers of Zanzarda village of Junagadh mix the seed with neem leaves @ 2 kg per 400 kg groundnut. The *neem* leaves have azadhirictin, which acts as an oviposition deterrent and repellent of storage pests. The problem of storage pests gets considerably reduced (up to 60%) by this treatment. **Keywords**: *neem* leaves, groundnut storage	Shri Satish Kumar, Scientist, Post Box No 5, Ivnagar, National Research Centre for Groundnut, Junagadh (Gujarat) 362 001

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211	Seed storage for long duration	Seeds of paddy (*Oryza sativa*), sorghum (*Sorghum bicolor*), *kelvaragu* (*Paspalum scrobiculatum*), *cumbu (Pennisetum typhoides)* and *samai (Panicum miliare)* are stored in a structure called uurai. The cost is Rs 250 and 500 to 700 kg seeds can be stored, free from rat and pests for the period of 2 years. The seeds are sun dried before storage. The structure is kept in dark place. **Keywords**: seed storage structure,uurai	Shri R. Subramamian, Pudupattu, Chengam, Tiruvannamalai (Tamil Nadu) 606 710
220	Seed storage in *ser*	Millet seeds are crushed with ash or dried chilies and placed in *ser. Ser* is a large pyramid like structure with different compartments. Different crops seeds  Ser—seed storage structure are stored in one ser. Storage period may be 1–3 years. For the past 25 years 20 farmers are using this storage in Villupuram district of Tamil Nadu. Capacity of the ser is 1000 kg. **Keywords**: millets, dried chilies, *ser*, storage structure	Shri Kali Gounder, S/o Shri Muthan, Melpachery, Kallakuruchi, Villupuram (Tamil Nadu)
222	Earthen storage bin	Storage of seeds in earthen pots is a very old tradition. The storage bin is structured in such a way that seeds are kept safely. The pot bins are constructed with the following dimensions: diameter 6 feet, height 10 feet, made of stones using red soil. Total capacity of the storage is 3–10 tonnes. *Ragi* grains are the major	Shri A. Ragunathan, S/o Shri Ayyamuthu, 4/18-B, Malamanoor, Potaneri, Mettur, Salem (Tamil Nadu)

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		 Earthen storage bin seeds stored in such bins. This has been in use for the past 50 years. About 20 families in this area are using this technique. Seeds are stored for a period of 1 year. Resources are readily available for the construction of the bin. Cost of construction is about Rs 500. **Keywords**: earthen pot, storage technique, *ragi*	
531	*Kothari of nigal (Arudinaria falcata)* for grain storage	The bin made from branches of gal (*Arudinaria falcata*), is used for storage of food grains like wheat, rice, barley, finger millets etc. The bin is plastered with mixture of cowdung and soil from both the surfaces and dried under sunlight. Leaves of walnut (*Juglans regia*) or apricot (*Prunus armeniaca*) are mixed with grains to protect from insects. In the storage bin, food grains are stored safely for a longer time. The raw materials are locally available and the cost of the structure is low as compared to the steel and iron boxes. **Keywords**: *kothari, nigal*, food grain storage	Shri Rajendra Singh, Kimohi (Sirgur), Kimoli, Chamoli (Uttaranchal)
535	Construction of moisture, heat and cold-proof storage bin	Farmers prepare different shapes and sizes of storage bins from bamboo sticks. The bins are plastered by cowdung and mud from both the surfaces. The stored food grains are protected from the pests. The size of the bins is kept as per the requirement. Grain is stored for 1 year safely. The storage bins are cheap and cost effective. These bins are used in most of the villages of Almora, Pithoragarh, Bageshwar and Champawar districts of Uttaranchal. **Keywords**: bamboo stick, cowdung, mud	Dr I. S. Bisht and +Shri P. S. Mehta, NBPGR, New Delhi 110 012

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739	Use of *peri* and *kothi* for grain storage  Peri for grain storage	Peri is made of sticks of *shahtoot (Morus alba)* or *bamboo (Bambusa arundinacea). Peri* of bamboo is plastered with cowdung and clay mixture only in the inner side wall and *peri* of *shahtoot* is plastered both sides (inner and outer) with cowdung and clay mixture. It is broad at the middle region and narrow at both ends. Big, sickle and hammer are used for its construction. Its lid is sealed with the help of cowdung and clay mixture. A hole is kept near the base to take out the grains. After taking out the grains, the hole is sealed again. *Kothi* is rectangular or cylindrical in shape. It is made of cowdung and clay mixture. It has a small opening in one of its walls to take out the grains. For construction of these storage structures, iron, wood, *shahtoot* and bamboo are required, along with help of skilled carpenter and iron smith. It is a cheap storage structure and materials used are also available easily. These storage structures are used by farmers of lower hills and valleys of Himachal Pradesh. **Keywords**: *peri, kothi, shahtoot,* bamboo, storage structure, cowdung, clay	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
742	A wooden grain-storage structure (*kuthar*)	*Kuthar*, a specially designed wooden structure, is used for storage of cereals, oilseed and pulses like *koda, bathua, chaulai, barley, wheat, rice, ogla*, soybean, lathyrus, beans, mash, sesame, gram, *kulthi*, maize etc. This practice is in use in the hill regions of Himachal Pradesh for the past 200 years. About 50 q can be stored. *Kuthar* is built on a stone basement and fabricated with knot-free deodar wood (*Cedrus deodara*) and stones covered with slated roof. The wooden walls are one inch thickness and are supported on the wooden beams of one foot height and 2–5 inches thickness. The floor is also made of 2.5 inches thick wooden slippers joined together on the wooden beams. The two sides of the slated roof are slanting with an angle of approximately 60 degree to each other. The kuthar is a two-storied structure, each having a length and breadth of 5 feet, and 10 feet height. The lower storey is partitioned into 3–4 chambers each, having a storage capacity of approximately 10 quintals. The upper storey is not partitioned into compartments. Entry to the lower storey is made by means of a wooden stain provided	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207

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		through a space in the upper floor. *Kuthar* is built at a distance of 10–30 m away from living house, the entry door is connected to the living or bed room, lay on iron chair fixed to a bell to ring alarm in times of theft. *Koda* and *chaulai* cereals can be stored upto 50 years, while wheat and rice can be stored up to 8–10 years. Walnut leaves are also used during storage. **Keywords**: *kuthar*, storage structure for grains, cereals and pulses, deodar wood, stone, walnut leaves	
744	*Kuthar*	*Kuthar* is a wooden storage bin constructed outside the house. Maize, wheat, jowar, rice etc. are stored in large quantity (6–7 charal or 480–560 kg grains/*kuthar*). Before storage, grains are properly cleaned and well dried. Dried leaves of *akhrot* are mixed with grains. Ash is also mixed with maize before storage. This structure can store grains for 2–3 years, and as per requirement grains can be taken out from the *kuthar*. The structure is constructed outside the house and there is no hole, therefore it is safe from rodents. This storage structure is being followed by 50% of the people of Shimla region and there is not any modification made till date. **Keywords**: *kuthar*, storage grains, dried leaves of *akhrot*	Ms Ganga Devi, Manjhgaon, Sarahan, Rampur, Shimla (Himachal Pradesh) 172 102
755	Use of bamboo seed bin	The seed bin, prepared from bamboo is used in many villages such as Galma, Kannaid, Chujwali, Jhakheru, Dhar, Kasmila of Balh and Gopalpur blocks in Mandi district of Himachal Pradesh for storing seeds and grains. These seed bins are plastered with mud and cowdung. Its capacity ranges from 1 to 5 quintals depending upon the choice of the farmers. Before storage, seeds and grains are dried in the sun. Though this is cheap, only 20% farmers are using it due to availability of metallic bin. Seeds can be stored for a period of one year in this structure. **Keywords**: bamboo seed bins, mud, cowdung	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
756	Seed storage in *fadd*	The houses in Jangehli village in Mandi district of Himachal Pradesh have 3–4 storage which is used for multipurpose. The ground floor, called *kawaon*, is used for keeping their animals and first floor is called *fadd*, where they store grains/seeds. Fadd is made of deodar (*Cedrus deodara*) tree and above the fadd is their kitchen. This is an age-old practice for	Shri Jeewa Nand Thakur Tehsil-Jangehli, Mandi (Himachal Pradesh) 175 047

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		these people, and now-a-days slight modifications are being made by the use of stones in construction of *fadd.* **Keywords**: *kawaon fadd*, storage of grains/seeds, *deodar* wood	
1140	Indigenous storage structures *bukhari/kunthla*	The farmers in Haryana use storage structures *bukhari* and *kunthla* and keep grains mixed with neem branches, match-sticks and sands. These were being used before the introduction of bins and *celphos*, and still are used by the farmers who cannot afford to buy bins. This is a cheap practice for safe storage of pulses against pests. **Keywords**: *bukhari, kunthla, neem* branches, match sticks, sands, pulses, pests, moisture	Shri Raj Pal Singh and Mohmmed Khera, [communicated by Dr A.K. Mehta, Zonal Coordinator, ZCU-I, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141 004
1437	*Dhan ka mora* (a type of storage structure)	Majority of villagers of Simdega block in Simdega district of Jharkhand keep grains in *mora. Mora* is a storage structure prepared from rope of paddy straw.  Mora —a storage structure for grains Grains, mainly rice, are kept in straw and tied with straw rope. This is known as *mora*. Villagers also use *chatka* made of bamboo and *dhelghi* to store grains. These storage structures have been used to store grains like rice, wheat and pulses for the last several years without any modification. **Keywords**: *mora*, storage structure, straw, rope of straw, *chatka, dhelghi*	Ms Lalita Lakara, Simdega, Chopotoli, Simdega (Jharkhand) 835 223
1454	*Tantara*, a platform for *mora*	This is used for protecting mora from soil moisture in the Khaspokharia village of west Singhbhum district in Jharkhand. *Mora* and stored grain may get	Shri Sanat Kumar Sawaiyan, Birsa Agricultural University,

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		destroyed if it comes in contact with moisture. If it is kept on *tantara*, it does not come to contact with moisture and remains safe for a long time. *Tantara* is a platform on which *mora* (straw made storage bin) is kept, it is made of wooden beams; wooden plates and pillars are made of rock. This is age-old practice, adopted by 25% of families in the village. **Keywords**: *tantara, mora*, platform, straw, moisture, wood/rock	Department of Extension Education, Kanke, Ranchi (Jharkhand) 834 006
1456	Earthen pitcher sealed with straw and mud	Seeds of different crops are kept in the earthen pitcher by the villagers of Aamlisha village of Ranchi district in Jharkhand. Earthen pitcher protects grains from the atmospheric wind, humidity and heat. Straw and mud are used to seal the mouth of earthen pitcher having varying capacities from 100 to 1500 kg. It is an age-old practice, and involves little cost. **Keywords**: earthen pitcher, straw, mud, atmospheric wind, humidity and heat	Shri R S Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1458	Storage of rice in *dimbini* made of bamboo	Rice is stored in bamboo-made *dimbini* by the farmers of Noorhi village of Ranchi district in Jharkhand. *Dimbini* protects the seeds from the contact of humidity and heat. Bamboo sticks are used to made *dimbini* sealed with the mixture of straw and mud tightly. The capacity of the bin varies from 100 to 2000 kg. This is an age-old practice and adopted by maximum number of farmers. **Keywords**: *dimbini*, storage bin, bamboo, straw, mud, humidity	Shri R S Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1459	Use of *mora* for storing paddy	This is used because of its variable storage capacity, made up of easily available raw materials. *Mora* protects grains from the atmospheric wind, humidity and heat. It is made of paddy straw. Rope is made by paddy straw and the grains/seeds are kept in the centre and paddy rope is wrapped tightly around it. The practice is being adopted in Bero village of Bero Block of Ranchi district. The success has been observed in 100% cases. **Keywords**: *mora*, paddy store	Shri Nelson Tirkey Bhitha, Ranchi University, Ranchi (Jharkhand) 834 008
1462	*Mora* - a grain storage structure	*Mora* is a storage structure in which rice, wheat, *marua* (finger millet), etc. are stored for a long time. It protects grains from moist air and water. It also protects grains from rodent and storage insect pests. It's size and capacity varies from 0.1 to 2.0 t. Farmers	Shri Ashian Jojo, Kurpani Mundatoli, Simdega (Jharkhand) 835 235

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		of Mundatoil Kurpani village of the Thaitanger block in Simdega district (Jharkhand) use *mora* to store grains for seed purposes. *Mora* is made by binding the heap of grains from all sides with the help of straw made rope. *Mora* is used as storage for the last several years without any modification made by the users. **Keywords**: *mora*, storage structure, moist air and water, rodent, storage insect pests, straw made rope, seed purpose	
2137	Grain-storage in big drums	Food grains are stored in big drums made of clay applied with paste of cowdung as a layer. The drum is closed after filling up it with grains with a clay plate. The cowdung prevents the attack of storage pests as it is believed to have pesticidal properties. About 5–10 quintals of seed can be stored. **Keywords**: grain storage, big drums, cowdung	Shri K. Lakshmana, Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2138	Grain storage structure with paddy straw	Paddy seed is stored in containers made of paddy straw called *kolagaram* in Telugu. About 100–200 kg paddy seed is stored for the next season. This structure helps to prevent the loss of vigour of paddy  An indigenous grain storage structure seed and protect from rodents. About 80% of the farmers in Srikakulam district of Andhra Pradesh has been following the practice. **Keywords**: *kolagaram*, paddy straw, paddy storage	Shri K. Lakshmana, Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2141	Storage structure, *butti*	The paddy seed is stored in a structure made of bamboo stick called *butti*. For next season fresh mud is applied as paste inside and outside the container every year before storing grains to prevent pest attack. It is an age-old practice and has been practiced by the farmers in Kandisa village of	Shri K. Lakshmana, Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030

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		 Butti—an indigenous storage structure Srikakulam in Andhra Pradesh. **Keywords**: seed storage, *butti*	
2142	Storing grains inside the houses	The grains are stored in granary rooms inside the houses. The granaries have low retaining walls to separate the different produce, so that the grains are not contaminated with each other. It is an age-old practice and is being practised by 95% of the respondents in Srikakulam district in Andhra Pradesh. **Keywords**: grain storage houses, granary	Shri K. Lakshmana, Ph. D Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2155	Storage of food grains	Kammapalle village farmers of Andhra Pradesh store food grains in *bottalu* (bamboo baskets), earthen bins, gadelu and *billalu* (earthen bins) for several years. These storage structures are made up of locally available materials like bamboo and clay. Farmers store grains, especially paddy, for two years. The grains are stored for household consumption and seed purpose for the next season. These structures vary in size, shape and material. The structure and capacity of the different storage structures are mentioned below. *Bottalu*: It is made of thin bamboo, and cattle dung slurry is pasted over it. The capacity of this structure is 1.5 tons. *Gadelu*: It is made of clay, and cattle dung slurry is pasted over it. Its storage capacity is about 0.75 tons. *Billalu*: This is similar to gadelu except in size. It's storage capacity is 0.2 to 0.3 tons. This storage	Shri P. Bhaktavatsalam Naidu, Kammapalle, Ramachandrapuram Mandal, Chittoor (Andhra Pradesh)  Different types of storage structures

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		structure is suitable for paddy, fingermillet and pearlmillet. **Keywords**: *bottalu, gadelu, billalu,* bamboo basket, earthen bin, storage structure	
2157	Storing seeds in earthen pots kept on planks in the kitchen	Storing of seeds in earthen pots/gunny bags, kept on planks suspended in the kitchen, prevent the loss of seed viability. The reason for this is that the smoke which is emitted during cooking prevents the attack of storage pests, there by preventing the storage losses. **Keywords**: seed storage, earthen pot, planks in the kitchen, seed viability	Shri Pathika Masaya, Thotagude, Kuntubai, Kurupan, Viziangaram (Andhra Pradesh)
2158	Dried bottle gourd as storage structure for redgram seed	Dried bottle gourd, locally called *anapathumba*, is used for storing redgram seed to protect it from storage pests, in addition to rodents. This is tied on the roof of the house. To increase the longevity of the seed, farmers add ash/red soil/ drumstick branches. **Keywords**: bottle gourd,redgram, hanging, ash, red soil, drumstick	Shri K.Tirupathi Rao, S/o Shri Sukku Sappagothali, Kurupan, Vizianagaram (Andhra Pradesh)
2159	*Anapathumba*, a storage structure	After cleaning the flesh in the bottle gourd, it is dried for 5–10 days and used for storing redgram/blackgram or greengram seeds of about 5–6 kg for 10 days by hanging on the roof of the house. The seeds remain free from rodents and insects. **Keywords**: *anapathumba*, redgram, blackgram, greengram, hanging in house roof	Shri Arika, Suryanaraya Kolsi, Kurupan, Vizianagaram (Andhra Pradesh)
2160	*Adda* leaf pot– a seed storage structure	*Adda* collected from forest, are stitched with small sticks into round shape and dried for 2–3 days. It is used for storing 5–10 kg of seed depending upon the size of the pot. To minimize insect and rodent attack, the seeds are mixed with red soil or ash. **Keywords**: *adda* leaf pot, ash, red soil	Shri G. Chittiyya, Kurupan, Vizianagaram (Andhra Pradesh)
388	Grain storage in *marai bandha*	The dried seeds of paddy and wheat are stored in a structure made of bamboo, straw and weeds, in a cylindrical shape, locally called *marai bandha*, for future use. It is being followed by almost all the	Ms Arati Biswas, Shibiloon, Bardwan (West Bengal) 713 130

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		 Marai, bandha for grain storage farmers for the last 100 years in Shibiloon village of Burdwan district in West Bengal. **Keywords**: *marai bandha*, bamboo, straw, weed	
489	Granary, a paddy storage structure	The farmers of Nsünyu village and surrounding areas in Kohima district of Nagaland store paddy in a particular structure which is meant for storage and preservation. This storage structure is about 8–9 feet in length, 5–6 feet in breadth and 5–6.5 feet in height from the ground level. The framework of storage structure is made up of seasoned bamboo (split and whole) and roofing is done by thatch. This structure is erected on the raised posts/pillars (4–6), which are made up of stone block at a height of about 2–2.5 feet above ground level. The structure is raised in order to facilitate proper aeration to the stored paddy grains and also to protect it from damage caused by domestic animals. The grains can be stored for longer period even up to 25–30 years. About 1500–2000 kg grain can be accommodated in a general storage structure. After threshing, full grains are separated from grainless husk by winnowing. The separated full grains are then stored in the structure. Also inert matters are separated from gains during storage. The storage structure is cost effective, costing around Rs 400–500 per structure. Materials used in the construction are readily available in plenty. All the farmers of the village use this method from time	Shri K. Kath, District Agricultural Office, Department of Agriculture, Dimapur (Nagaland)

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		immemorial with certain modifications in the roofing. Now-a-days, some farmers use GI sheets, timbers and planks. **Keywords**: granary, paddy grain, bamboo, thatch, aeration	
491	Storage of paddy grain in *khi*	Chakhesang and Angami Naga tribes of Phek and Kohima districts of Nagaland store paddy in a storage structure called *khi* in Chakhesang dialect. *Khi* is a large double-walled structure woven with good quality bamboo specially meant for storage of paddy. *Khi* is almost spherical in shape with flat bottom and a small round opening at the top. A cover is also made to prevent entry of rats and other rodents. Grains can be stored well for a long period of time. It is a good storage structure because grains can be stored for a very long period without deterioration in the quality of grains. Before storage, full grains are separated from grainless husk by artificial winnowing. The separated grains are then stored in the structure. About 60 tins (mustard oil tin) of grains can be stored in one storage structure. Some well to do farmers construct a separate house where about 20 *khi* are lined up for storage. The marginal farmers keep *khi* in the same house where they live. The materials used for construction of *khi* are locally available. It is highly cost effective and all the farmers in the villages have been using this since time immemorial. **Keywords**: paddy, *khi*, storage, bamboo, grain quality	Shri Rissi Vadeo, Porba Village, Pfutsero, Phek (Nagaland) 797 107
492	Indigenous storage structure for rice grain	In this practice, the farmers from all over the state of Assam store their paddy in a special type of indigenous structure, which is called tom in Brahmaputra valley and *mocha* in Barak valley regions. The structure is pumkin shaped and made entirely of paddy straw and strip of bamboo or murtta (*Clincyne dichotoma*). Bamboo or murtta is used for tying. A kind of wild fern locally named bihlongani is also used inside the structure, Approximately 25–50 kg seed can be stored in a single tom. Rice grains are dried and cleaned properly before storage and *bihlongani* leaves are placed inside the structure, upon which straw layer in sufficient quantity is placed at the time of storage. This storage structure is then kept in a safer place and the seed can be stored for	Shri J.K. Chaudhary, Krishi Vigya Kendra, Napam, P.B. No. 51, Tezpur (Assam)

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		about 6–7 months. Alternatively, gunny bags are also used for storage. **Keywords**: *tom, mocha, murtta*, bamboo, paddy straw, *bihlongani murtta*	
207	Storage of snake gourd and bitter gourd seeds	For the past several decades, 55% farmers of Pathanamthitta district of Kerala smear the seeds of snake gourd and bitter gourd with cow dung slurry and paste it on the wall. By adopting this practice, the seeds are protected from pests and diseases during the storage period. Moreover, repulsive action of cow dung protects the seeds from various pests and diseases. **Keywords**: cowdung, wall	Ms Yoycee John, Paduthodu House, Vellayil Tiruvalla, Pathanamthitta (Kerala)
208	Grain storage for house hold use	*Neem* leaf and red chilli prevent rice weevil and rice moth. Cooking oil is smeared over the pulse grains and properly dried in sun. After sun drying, it is stored in air-tight containers. Wood ash is also used in the storage to avoid pest. Seed stored by these methods will be free from pest for more than 6 months. **Keywords**: *neem* leaves, red chilli, wood ash	Principal, J.S.S. Krishi Vigyan Kendra, Nanjangud, Mysore (Karnataka) 571 129
209	Seed storage in kudhir  Kudhir/Thombai—seed storage structure	To protect seeds from storage pests to maintain viability of seeds, it is stored in a structure called *kudhir*, which is made from wooden pole with mud wall and then thatch cover. The height of *kudhir* is 3 meter, having a capacity to store 500 kg. It costs Rs 1000 to construct a *kudhir*. Millet seeds are dried, mixed with ash or powdered red chilli before bagging in gunny bags and storing in *kudhir*. Seeds stored in *kudhir* will have viability for 1–3 years. Twenty farmers of Melpachery village in Tamil Nadu are using *kudhir* for storing seeds for 25 years. **Keywords**: *kudhir*, wooden pole, mud wall, thatch, ash, chilli	Shri Kaligoundan, S/o Shri Muthan, Melpachery, Kallakuruchi, Villupuram (Tamil Nadu) 606 207
537	Storage technique for *colocasia*, ginger and turmeric	The green leaves of *malu* are thick and retain moisture for a longer time, possess latex and do not decay fast due to anti-fungal properties. This way, the rotting of tubers is avoided to a greater extent which the farmers of Lakhwad village in Dehradun district in Uttaranchal use to their advantage in storing of colocasia, ginger and turmeric. To store, the rhizomes are covered with the green leaves of the *malu* from	Shri P. S. Mehta and Dr I. S. Bisht, NBPGR, New Delhi 110 012

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		all sides. After covering it properly, it is kept inside a 2–3 inch thick layer of cowdung. The tubers are safely stored for the next season without losing moisture and vigour.The leaves of *malu* are locally available, and hence the cost is nil. **Keywords**: *malu*, cow dung	
752	Storage of tuber crops	Earthen pits are used for the storage of tuber crops like potatoes (*Solanum nigrum*), ginger (*Zingiber officinalis*) and colocasia (*Colocasia antiquorum*). Under ground low temperature enhances the shelf life of tuber crops. An under ground pit (1–2 feet deep) is dug in the field and a thin layer of grass is spread at the base of the pit to serve as a cushion prior to storage. The top of the pit (i.e. up to 6 cm) is covered with grass or soil and is raised slightly above the ground level to prevent entry of rain water into the pit. In some parts of the states, the top of the pit is plastered with cowdung. This ITK has been practised throughout Himachal Pradesh for a long period for enhancing the shelf-life of the plants. **Keywords**: underground pit, grass, soil	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
759	Storage of cucurbit seeds	In the hill regions, the cucurbit fruits are available between May and October. For storage of cucurbit seeds, farmers select some very well developed fruits. Farmer make a hole on the upper part of the selected fruit and fill a little amount of cowdung in it. After 10–15 days the inner part of the fruit is decayed except seeds. Now with the help of stick all dried seeds are collected. These are washed with water and again dried in the sun light. Dried seeds are collected in a vacuum container. It is easy to practise and involves no cost. This practice is being followed for the last several years by maximum number of farmers. **Keywords**: cowdung, well-developed fruit, cucurbit seeds	Ms Krishna Hetta, Deorighat, Theog, Shimla (Himachal Pradesh) 171 201
761	Storage of tomato seeds	For storing the seeds for one year, two kg tomato pulp is mixed with 2 kg fine soil. Small round shaped balls are made and hanged in the kitchen in the form of a garland with the help of a thin rope. This practice, which is cheap and easy to adopt, is followed in most of the villages of Theong tehsil of Shimla district in Himachal Pradesh for the last several years. **Keywords**: pulp, fine soil, round ball, garland shaped	Shri Devkant Prakash, Bhanghoj, Theog, Shimla (Himachal Pradesh) 171 201

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1438	Storage of vegetable seeds	This is practised in the Kakranayatoli village of Ranchi district of Jharkhand. Mixture of dry leaf of *sindwar*, wood charcol and kerosene are used to prevent vegetable seeds from insect/pest attack during storage period. This practice is used with seeds of pea, cucumber, long melon, okra, and sponge gourd. All families of the village use this age-old practice. **Keywords**: *sindwar*, wood charcol, kerosene	Shri Aklu Oraon Karanjuatoli, Baraudi, Burmu, Ranchi (Jharkhand) 835 205
1449	To protect potato from spoiling	To protect potato from spoilage, it is kept inside the heap of straw and whole straw heap is covered/plastered by soil. This practice is being followed by the farmers of Dimbudih village of Tamar block in Ranchi district of Jharkhand for the last several years. **Keywords**: straw heap, covered/plastered by soil	Ms Gita Kumari, C/o Shri K N Singh Munda, Maltaadi (Near Filter House), Bagbera (Tatanagar), East Singhbhum (Jharkhand) 831 002
1450	Checking spoilage of potato and onion through use of garlic	Garlic has many characteristic, which prevent spoilage in potoato and onion. Some garlics are kept with potato and onion to check spoiling during storage. The practice is followed in Seogi village of Kuchai block in Saraikela district (Jharkhand). Success has been observed up to 70%. **Keywords**: garlic, potato, onion, storage	Ms Gita Kumari, C/o K.N. Singh Munda, Matladih (Near Filter House), Bagbera (Tatanagar), E. Singhbhum (Jharkhand)
1455	Method to store tomato seeds	It is very safe method for storing tomato seeds in the Olmunda village of Gumla district in Jharkhand. After peeling of the tomato, seeds are dried under sunlight and are mixed with husk and then the seeds are kept in earthen pot. The openning of the pot is covered with cowdung and its capacity is 15–20 kg seeds with husk. Dry seeds are kept above 2.5 to 3 m from the *chulha* under moisture-free condition. This is in practice for last 80 years by maximum number of farmers in the village. **Keywords**: tomato seeds, storage bin, earthen pot, husk, *chulha*	Shri D. Oraon, Olmunda, Gumla (Jharkhand) 835 224
1461	Indigenous storage for ginger and *haldi*	This is in practice in Bero village of Ranchi district of Jharkhand. It is an under-ground storage practice in which inner side walls are covered with 1 inch thick layers of paddy straw and above that having 1 inch thick layer of paddy straw. Storage structure is made in the shade, away from any type of water drainage. It provides a better protection against attack of insect/pests. It is an age-old practice and adopted	Shri L. Tigga, Haji Chowk, Pithoria road, Kanke, Ranchi (Jharkhand) 834 006

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		by 60% of the total farm families. **Keywords**: storage bin, stem crops, paddy straw, soil, insect/pests	
1866	Storage of vegetable seeds	Vegetable seeds like *bhindi*, tomato, brinjal etc. are stored in bamboo, wrapped with *shevni* leaves. This practice of storage of vegetable seeds lasts for one year. Farmers of Raipur district in Chhattisgarh have adopted this practice. **Keywords**: bamboo, *shevni*	Director of Extension Indira Gandhi Agricultural University, Krishak Nagar, Raipur (Chhattisgarh) 492 012
1873	Preservation of seed material of garlic by hanging method	Garlic for seed purpose are preserved by hanging it at roof. Just after harvesting, the bulbs with green leaves are tied in twin bundles and tied to a bamboo. The bamboo is hanged under the roof horizontally with iron loop. The capacity is 16 kg of seed material and cost of storage is Rs 1.50 per kg. of bulbs. The seeds are preserved without any loss of viability. **Keywords**: garlic bulb, bamboo, viability	Prof. P.S. Patil, Training Organiser, KVK, Dhule (Maharashtra) 424 004
534	Storage of apple fruits in amaranthus seed	The amaranthus seeds provide soft bedding to apple fruits and thus it maintains freshness for a longer period. A layer of amaranthus seeds is laid and a layer of apple is kept over it. Layers can be made upto the capacity of the bin. Through this method apples can be stored upto 6 months. According to people the freshness of these apples remains intact. The seeds of amaranthus are locally available. The stored fruits fetch higher price in the off season. **Keywords**: amaranthus seeds, bedding, storage	Shri Govind Singh Rana Sukhi (Bhatwari) Uttarkashi, (Uttaranchal)
749	Storage of apple in underground pits	Storage of apple in underground pits is a traditional method for preservation of apple in desired temperature. The low temperature in underground pits enhances the shelf-life of the apple fruit. The fruits remain fresh for longer period for domestic consumption. Underground pits, prior to the onset of winter, are dug. Apples are packed into wooden boxes, which are then placed in the pit, and the mouth of the pit is covered with thatch and soil. This ITK is practised throughout the apple- growing areas of Himachal Pradesh since time immemorial. This traditional preservation technology has led to the concept of zero-energy chamber, which is becoming popular for the preservation of other farm produce. **Keywords**: storage, apple, underground pit, shelf-life, thatch, soil	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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751	Storage of citrus fruit (*galgal*)	In Mandi district, *galgal* fruit (*Citrus prendolemon*) is stored in pits, dug in the fields. At the base, a layer of ash is spread and then the fruits are placed in alternate layers of ash and fruit. The top of the pit is covered with ash and soil. The fruits can be stored for several months. A majority of the farmers are using this technique for the last several generations. **Keywords**: *galgal* fruit, pit, ash	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
2143	Wrapping of banana bunch with straw and dry leaves	The banana bunch is wrapped with dry leaves of banana to protect it from external pathogens and sunburns during fruiting season. **Keywords**: banana, wrapping of bunch, banana leaves	Shri T.Lingaiah, Krishi Vigyan Kendra, Malyal, Warangal (Andrha Pradesh) 506 101
389	Storing of coconut in *sangha*	Matured coconuts, after harvest, are kept in *sangha* (bamboo kept on the floor of room touching the roof) by tying with outer coir from the nuts in pairs. This practice is being followed by almost all the farmers of Satasankha village of Puri district in Orissa. **Keywords**: *sangha*, storage of coconuts	Ms Bishnupriya Mishra, Training Associate (Agriculture Extension), Krishi Vigyan Kendra Bhanjanagar, Ganjam (Orissa) 761 126
34	Grain storage with *neem* leaves	Grains or seeds are stored in storage bin by the majority of the farmers of Balaya village of Mundra panchayat in Nagour district (Rajasthan). These are well mixed with dry leaves of *neem (Azadirachta indica)* and kept in storage bin and the mouth of storage bin is closed. This practice protects the stored grains/seeds from storage insect-pests and rodents for 6 months to 1 year. Cost of storage is Rs 600–700. This storage practice is in use for the last several years without any modification. **Keywords**: grain/seed, storage bin, dry leaves of *neem*, protect, insect-pests, rodents	Shri Ganga Ram, S/o Shri Kishan ji, Balaya, Mundra, Nagour (Rajasthan)
35	Grain storage with ash	Grains and seeds are stored in storage bin and are covered by dusting the ash. This control measure protects the stored grains/seeds for 6 months to 1 year from storage insect-pests. Ash is collected from the house. This wisdom is in use in Kharnal village of Mundra panchayat in Nagour district (Rajasthan) for the last several years without any modification. **Keywords**: grains, seeds, storage bin, upper layer, dusting ash	Shri Sukhram Dholia, S/o Shri Jivan Ram, Kharnal, Mundra, Nagour (Rajasthan)

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206	Storage of paddy seeds	Paddy seeds are stored in a floor coated with cowdung slurry to avoid insect attack. A vessel filled with water inside the store room attracts the insects and reduces damage. Farmers of Inamkalathus village are practicing this method for the last 10 years. **Keywords**: paddy, cowdung, vessel, storage pest	Shri C Vadivel, Jothivinayagar Kovil, Inamkalathus, Trichy (Tamil Nadu) 621 303
212	Paddy and pulse seed storage	To protect seeds of paddy free from pests in storage, powder of *notchi (Vitex negundo)* and *pungam (Pongamia pinnata)* leaves are put on the top of the container or gunny bag for 1 year. Pulse seeds are dipped in castor oil and sun dried before storage for 1 year. Farmers have been using this practice for the last 8 years in Ganapathipuram village of Kanyakumari district in Tamil Nadu. **Keywords**: paddy and pulse storage, *notchi* and *pungam* leaf powder, castor oil	Ms Thavasimani, W/o Shri Chellathurai, Vaddakan, Kannakurichi, Ganapathipuram, Kanyakumari (Tamil Nadu)
213	Storage of rice	To avoid storage pest incidence in rice, the grains are mixed with leaves of *karukkurachi (Bassia latifolia)* and *aalimaram (Annona reticulata)* and then stored. This technology is very effective against storage pests and 100 farm families in Behampur village of Dindigul district in Tamil Nadu are using it for the last 10 years. **Keywords**: *karukkuvachi, alimaram,* rice storage	Shri T. Ramasamy, 123 Kaliamman Kovil Street, Behampur, Dindigul (Tamil Nadu) 624 003
224	Seed storage	*Kalanjium* and *ragi kuzhi* are used to store seed material. Bamboo sticks are used to prepare *kalanjium* of width 3–7 feet with 15 feet depth. The *kalanjium* is plastered with red soil mud.Before storing fingermillet husk is spread on the ground. Cow urine and castor oil are mixed and plastered. About 30 bags can be stored at a time. It is a permanent structure for long-term storage. The duration of storage is 2 years. About 30 farmers are practicing it and this has been in use for the last 30 years. The cost of the *kalanjium* is Rs 2500. The cost of the storage structure for *ragi kuzhi* is Rs 2000. *Ragi kuzhi* is nothing but the pit beneath the ground. This is in practice in Galigattun village of Dharmapuri district in Tamil Nadu. **Keywords**: *kalanjium, ragi kuzhi,* fingermillet, bamboo stick, seed storage	Shri Periasamy Galigattum, Kelamangalam, Dharmapuri (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
225	Seed storage using goat dung	Grain storage technique using goat dung is found to be very effective. Goat dung is dried and made into powder. For one gunny bag of paddy seeds, 100 g dry powdered goat dung is mixed to control storage pests. About 50 farmers are using this technique for the last four years and they have added *pungam* (*Pongamia pinnata*) leaves along with goat dung. Duration of storage of paddy may be for one year. **Keywords**: goat dung, paddy seeds storage, pests, *pungam* leaf, pest control	Shri Ramachandran F.T.C. Farmer Vetikonnam,Thukkelay, Nagercoil (Tamil Nadu)
533	Use of *bhabar* soil as pesticide against storage pests	All the farmers of Bidyana village in Tehri district of Uttaranchal use *bhabar* soil during storage of food grains. It is presumed that the soil either has some insect-repellent properties or some micro-elements are present that are detrimental to storage pests.The soil is dug and stones/ pebbles are removed from it. Thereafter it is kneaded into dough. The flattened dough is then baked into a kiln. After baking, the soil is spilt into small pieces and sun-dried to remove extra moisture. The small pieces are ground in the local water mills in the form of a fine reddish brown powder. This powdered soil is then used by farmers as seed dresser against storage pests.The formulation is quite effective in protecting the stored food grains.The technique is highly cost effective. **Keywords**: *bhabar* soil, mixing with grains	Dr I. S. Bisht, Shri P. S. Mehta, NBPGR, Pusa campus, New Delhi 110 012
536	Use of *dal* tree leaves for grain storage	The leaves of *dal* tree have a bitter taste and a foul smell which repels storage insects. About 100 g leaves of *dal* tree are mixed with the one quintal stored food grain. The leaves in storage bins minimize losses and without any adverse effect. **Keywords**: leaves of *dal* tree, storage	Shri Manoj Pandey, C/o Shri Jeevan Chand Pandey, Talipan Patia, Almora (Uttaranchal)
740	Innovative methods against stored grain pests	Different methods are adopted by the farmers aginst stored grain pest: 1. Seeds of wheat or maize are put in tin tank and sealed through the lid with the mixture of clay soil and cowdung. 2. A small amount of mustard oil is mixed with grain of greengram and mash (Phaseolus spp.) the attack of *dhora* (*Callasobruchus chinensis*) 3. A line of turmeric powder is applied around the heap of wheat grains to repel ants. 4. To repel rice weevil (*Sitophilus oryzae*), 2–3	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		drops of mustard oil is applied to stored rice grains, and applying turmeric powder on the hands, the rice grains are rubbed between the palms. 5. To avoid attack of *dhora (Callosobruchus chinensis)* in pulses, table salt or black salt are mixed with pulses before storing. **Keywords**: wheat, maize, tin tank, sealed, mustard oil, greengram and mash, *dhora*, turmeric powder, repel ants, rice weevil	
741	Use of dry leaves of *methi/bana* leaves to control insects during grain storage	Farmers of Hamirpur village of Himachal Pradesh are adopting a grain storage practice, which is mentioned here. Dried leaves of *methi, bana* and *bhangaru* are mixed with grains of rice, maize and wheat while stored in containers. This practice effectively controls the storage insect pests like rice moth, red rust and flour beetle. **Keywords**: grain storage, storage pests, *methi, bana, bhangaru*	Shri Ashok Thakur, Scientist (I/C), KVK Hamirpur, (Himachal Pradesh) 177 044
743	Indigenous method for grain storage	Storage of pulses and wheat is difficult. For it the farmers use *nagal's* drums. This storage bin is made of *nagal's* stems and coated from top to bottom with clay and cowdung mixture. This storage bin is eco-  Indigenous grain storage structure friendly, and is adopted by maximum number of farmers for the last several years. In it pulses and wheat can be stored up to 10 years and it involves little cost. **Keywords**: storage bin, *nagal*, clay, cowdung, grains	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
745	Grain/seed storage in wooden structure layered with cowdung and urine	Wooden box, locally known *khande*, is used for grain storage. Inner side of the box is plastered with cattle urine and cowdung. Grains are well cleaned and dried before storage. Bag of red chilli and *laung* (clove) is	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

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		hanged inside the box, which keeps insects away from the grains. **Keywords**: wooden box, *khande* plastered with cattle urine and cowdung, bag of red chilli and *laung*	
746	Method of grain and seed storage	Before storing, grains and seeds are dried over tent (*khahal*) in the sun. Well-dried grain is tested by keeping one grain between teeth to check proper drying. Grains are stored in *kurle* made of bamboo and other woods. *Kurle* is quite big in size which can store grains from 4–5 q to 8–10 q. Then it is placed at appropriate place and filled with grain. Walnut leaves are placed in these storage bins to protect grain from insects and pests (*kud*). **Keywords**: grain drying in sun, *kurle* for grain storage, walnut leaves	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
747	Hay and fodder storage for dearth period	Farmers in the hilly region have evolved safe, cheap and protective methods to store hay and fodder for use in dearth period. Hay or fodder is stored in open fields from September to October for meeting needs in winter. These are piled up in a circular shape with broad base and narrow top taking the shape of a pyramid or *telang*. A cloth made of yak hair, called *thobi* is used for covering these structures. Stones of heavy weight are used for pressing it and to keep the hay/fodder in place. This practice is in vogue for the last many centuries and still in use in both tribal and non-tribal areas of the Himalayan region. **Keywords**: hay, fodder, telang, *thobi*, yak hair	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
748	Use of walnut and sweet flag leaves against pests in stored grain	Grains for storage are cleaned and dried in the sun before filling into the gunny bags and then walnut or sweet flag (pond weeds) leaves are kept on the top. This method of storage of grain is followed by rural areas of Himachal Pradesh in western Himalayas and about 50% of the farmers are using it for the last several generations. **Keywords**: walnut leaves, sweet flag leaves, storage pests, grain	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
757	Insect pest control in stored grains	Dried leaves of *akhrot* and eucalyptus are mixed in stored grain. It's smell does not allow the entry of pests in storage bin. Beside, these leaves contain certain insecticidal substances too. This is in practice in hilly areas of Karsog (*mandi*) and in use since	Shri Chaman Rao, Research Scholar, Dep. of Bio-science, HPU Summer Hill, Shimla (Himachal Pradesh) 171 005

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		generations. **Keywords**: *akhrot*, eucalyptus, insect, pest, and insecticidal substance	
1132	Use of *neem* leaves, onion and garlic in storage	*Neem* leaves, onion and garlic are kept with stored grains to protect the grains from insect pests. Farmers of Dariyapur village in Raebareli district (Uttar Pradesh) consider that *neem*, onion and garlic have some insecticidal value, which repels the insect pests from storage grain. **Keywords**: *neem* leaves, onion, garlic, grain, insect pests	Ms Shakuntala Devi, Dariyapur, Rahi, Raebareli (Uttar Pradesh)
1133	Storing grain bag in chaff	Grains are packed in bags, and the bags are kept in the heap of chaff. This practice protects the grains from the storage pests and moisture, and grains remain safe for longer period. The indigenous practice is being followed by the farmers of Dariyapur village in Raebareli district (Uttar Pradesh) for several years. **Keywords**: grains, bag, chaff, insect-pests, moisture	Ms Shakuntala Devi, Dariyapur, Rahi, Raebareli (Uttar Pradesh)
1141	Safe storage of food grains by adding *neem* leaves	*Neem* leaves are used along with grains for storage. The strong odour of the leaves reduces the incidence of storage grain pests. This is practised for many years by 50 families of Baliar Khurd in Rewari district of Haryana. Celphos is used as fumigant as an alternative method. **Keywords**: *neem* leaves, stored grains	Dr Kapur Singh, Chief Training Organizer, Krishi Vigyan Kendra, Rampura-Rewari (Haryana) 123 401
1436	*Bita* method of storage	*Bita* is made of paddy straw with semicircular structure, which is having about 4 quintals of grain-storage capacity. Loss of grain in this method is very less (1 to 2%). Farmers of Kurchi village of Dhanbad district in Jharkhand use the storage bin (*bita*) to store grain for about 8 to 10 months. This is a very common practice for long time by all farm families in the village. **Keywords**: paddy straw, *bita*, storage bin, grain	Shri Dilip Kumar Mahto, Kurchi, Ghortoppa, Dhanbad (Jharkhand) 828 109
1440	Selection of cobs	The best cobs from the mass population are selected and best cobs are collected and a bundle is prepared of 10–12 cobs. These bundles are hanged under the roof of the house in open air along with barks. As per need, at the time of sowing the barks are pealed and seeds are used for sowing purposes. This is in	Shri Kaushal Kishore, Shri Harinarayan Mandal, Shri Pramod Mandal, C/o Training Organiser, Banka Jagatpur, Banka (Bihar) 813 102

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		practice for last 50 years by maximum number of farmers in the Maiharpur, Chutia and Rampur village of Bamka district of Bihar. **Keywords**: selection of cobs, bundle of cobs and seeds	
1447	Use of furnace ash in grain storage	A majority of farmers (about 90%) of Madhupur block in Deoghar district of Jharkhand are using furnace ash to protect grains from storage insect-pests. Furnace ash is mixed with grains @ 1 kg grain/2 kg ash, before storage. A success of 69–70% has been reported. This is being in practice for the last several years without any modification. **Keywords**: furnace ash, grains, storage insect-pest	Shri Varun Lal, Madhupur, Deoghar (Jharkhand)
1451	Control of ants in sugar	Clove acts as repellent and sugar is protected from ants in storage. About 10 cloves are kept in 1 kg sugar. This is practised in the households of Samtoli village in Simdega district (Jharkhand). It prevents completely the ant attack in storage of sugar. **Keywords**: clove, repellent, sugar	Ms Neera Sabita Jojo, Kurdeg Road Samtoli, Gotra, Simdega (Jharkhand)
1453	Use of *neem* leaves for grain storage	Raw *neem (Azadirachta indica)* leaves are used by all farmers of Segoi village of Kuchai block in Sraikela-Kharsawan district to protect grains from storage insect-pests. *Neem* leaves are mixed with well-cleaned grains of rice, wheat or in storage bin/structure. This practice is being in use for the last several years without any modification. **Keywords**: raw *neem* leaves, grains, storage insect-pest, storage bin/structure	Ms Geeta Kumari, S/o Shri K N Singh Munda, Matladih, Bagbera (Tatanagar), East Singhbhum (Jharkhand) 831 002
1460	Protection of seeds from insect pest	Leaves of *neem (Azadirachta indica*) are used in storage by people of Aamlisha village of Ranchi district in Jharkhand. Leaves of neem are used for protecting wheat seeds from insect/pest attack because it has alkaloidal and steroidal properties. In this practice, wheat grains are mixed with few leaves of *neem (Azadirachta indica*), which are kept in the container. This is an age-old practice and adopted by maximum number of farmers in the village. **Keywords**: *neem (Azadirachta indica),* wheat, insect/pest	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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1463	Storage of food grains using *sinduar* leaves	Insect/pest attacks on the seed grains are very common. It is controlled by *sinduar* leaves. *Sinduar* leaves are dried and mixed with grains for storage. One kg *sinduar* leaves for 100 kg food grains is required. By this practice, 70–75% food grains are saved from grain weevil. This is in practice for last 40 years by maximum number of farmers in the Nawada district of Bihar. **Keywords**: storage, food grains, sinduar leaves, grain weevil	Md. Mahmood Alam, Tikodin, Pahadpur, Kawakol, Nawada (Bihar) 805 106
1465	To protect cereals and pulses during storage through use of fingermillet heads	The fingermillet cobs have some smell and produce some chemical which helps in keeping away insect pests from stored grains. The mature cobs of fingermillet are put inside the grain stores along with rice, wheat and pulses during storage. It is used @ about 500 g cobs per 100 kg grains kept in pucca houses having partition walls. This practice is used by about 10% of the villagers in Rajpur of Nabinagar block of Aurangabad district in Bihar State and has potentials for its spread among farmers having pucca houses. About 85% grains are saved by this practice. **Keywords**: cereals, fingermillet, cob	Shri Ranjay Kumar Singh, Department of Extention Education, BAU, Kanke, Ranchi (Jharkhand) 834 006
1863	Use of dried *triphula* fruits in stored grain to avoid pest infestation	Dried *triphula* fruits (*Xanthoxylum rhetsa*) are used to prevent pest infestation in stored grain by the farmers of Kirlos village of Malvan taluk in Sindhudurg district of Maharashtra. Grains are sun dried 2–3 times and then stored in *kanagi* (made from bamboo) or in *mudi* (made from rice straw). At the time of filling the grains in storage structure, triphula fruits are placed at the bottom and above the grains and also between the grains at different layers. *Triphula* acts as repellent and thereby prevents insect pest from grains. The practice is used for 60 years and out of 53, about 20 farm families use this practice in the village. **Keywords**: *triphula* fruits, *kanagi*, *mudi*, repellent	Shri P.N. Sawant, Kirlos, Malvan, Sindhudurg (Maharashtra) 416 616
1867	Storage of grains with ash for seed purpose	After harvest, pulses and cucurbits are mixed with ash and stored in locally made container *kanagi* made of bamboo, or in *nirgudi* or *karanj* sticks for 1 year for seed purpose. The ash is mixed with seed grains in 1 : 0.5 (1 part grain with half part ash). The ash acts as a physical barrier for store grain pests. This practice is adopted by 50 to 60% farm families in	Dr G.Y. Parlekar, Assistant Prof of Entomology, ZARS, Solapur (Maharastra)

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		Solapur district of Maharashtra. The cost of storage for 5 kg capacity is Rs 10. **Keywords**: pulse grains, cucurbits, ash	
1868	Use of *neem* leaves for grain storage	The farmers of Garera, Algi and Sanora under Karera taluka in Shivpuri district of Madhya Pradesh use leaves of *neem (Azadirachta indica)* for protecting grains (wheat and chickpea) against storage insect, pest and disease. A separate room is made for storage which is made up of mud. Grains are stored in the room after mixing with neem leaves and packing in gunny bags. The grains are sun dried for 3–4 days before storing. About 5 kg of fresh leaves are used for 1 quintal grains. Storage room is kept free from humidity and generally made in a place where direct sunrays are falling. About 85% of the villagers are following it with 100% effectiveness and the practice has been in use since 40 years. **Keywords**: *neem* leaves, sun drying, chickpea and wheat, humudity free.	Shri Randhey Lal Yadav, Ganera, Dinara, Karera, Shivpuri (Madhya Pradesh)
1869	Neem leaves for seed storage	Certain grains like paddy, sorghum, pearlmillet, wheat etc are severely affected by grain moth and weevils. These seeds are, therefore, treated with neem leaves to prevent damages caused by these pests. For this, *neem* leaves are dried in shade for 2–3 days. The leaves are then mixed with grains, which can keep it insect free up to 8–12 months. The *neem* leaves act as insect repellent and it is believed that azadiractin present in neem makes the insect pest sterile, which prevents further multiplication. **Keywords**: *neem* leaves, grain storage	Shri N.V. Deshmukh, Ganori, Bhatkuli, Amravathi (Maharashtra)
1871	Use of mango leaves in stored parboiled rice to avoid rancid taste after cooking	The paddy is parboiled, shed dried and then fed to huller for dehusking. The dehusked rice is winnowed, sun dried and stored. At the time of storage green mango leaves are placed below, above and in between the grains in different layers. The pleasant smell of mango leaves helps in reducing deterioration of quality. Farmers of Sindhudurg follow this practice widely. **Keywords**: mango leaf, parboiled rice, rancidity.	Shri R.R.Thambe Manwan Sindhudurg (Maharashtra)
1872	Indigenous grain storage practices.	Farmers of Sangli used various storage structure for storing grains for a longer period without any loss in quality. There are 8 storage structure, i.e. gunny bag	Shri Saptami Ku. Jha Trg. Assoc. KVK, Sangli Maharastra 416 416

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		plastic bag, metal *bins/kothi*, storage drum, bulk heap, earthen pot, bamboo bins and wooden bins. The method of storing grains after harvesting and list of additives are also mentioned. Some of the additives are *neem* leaves, *nirgundi* leaves, oil wheat husk, onion bulbs etc. Mostly cereals and pulses after threshing dried under sunlight for some period then stored in these structure alongwith additives. **Keywords**: storage structures, construction material, cost, additives	
2140	Storage of *mesta* seed	The mesta seeds after drying are stored in earthen pots to prevent the red cotton bug (*Dysdercous singulatus*) attack to *mesta* seed. It can store about 10–30 kg seeds for 6 months. The storage structure is covered with clay to prevent the further attack of store grain pests. **Keywords**: storage, *mesta* seed	Shri K. Lakshmana, Ph.D. Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2146	Storing of grains and seed	For storing grains/seed, the farmers use following methods: 1. Mixing grain/seed with dried *neem* leaves and stored in *gadulu, banalu* 2. Mixing grain/seed with dry calcium powder and bleaching powder (3: 1), 3. Sun-drying the seed/grain immediately after *amavasya.* 4. Coating the pulse seed with *neem* oil.These practices keep the moisture at the desired level and repel the stored grain pests and harmful fungus. Keywords: seed, storage, calcium powder, gadulu, banalu	Shri M.Loka Reddy, Koilkuntla, Kurnool (Andhra Pradesh)
2156	Storing seeds in mud or bamboo baskets	Storing of seeds in the storage structures made up of clay, mud or bamboo sticks in the shape of big basket and kept at a height of 2–3 feet above the ground and covering with mud improve the quality of seeds compared to the storage in the bags for 4–6 months. Though some damage may occur with rats but this avoid the fly damage and having higher shelf life. This is used for storing groundnut and jute seed. **Keywords**: basket type, clay mud, bamboo, groundnut, jute	Shri C. Bhaskar Rao, 38–11–11/1, Laxmi Nagar, Marripalem, (Andhra Pradesh)

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2162	Indigenous method of storage of paddy seed	Paddy seed meant for sowing are stored in pots/baskets made of palm leaves of capacity of 3–5 kg mixing with Vitex negondo (vailaku) leaves. These  Vitex negundo used as plant additives in grain storage leaves are spread alternately in layers with paddy seed. This practice is having advantage over the treating seed with pesticides being less cost, as these vitex leaves available locally. The cost of storage per pot is Rs 5. **Keywords**: palm leaves, *vailaku*, paddy seed	
2314	Storage practices with inert dusts	Mixing of grains with inert dust reduces infestation by insects. Dust such as ash, fine sand, charcoal and clay are used. Some times *neem* powder is added to seed, as antifeedant and repellent to store grain pests. **Keywords**: seed, storage, neem, *neem* powder, dust	Dr G.Subba Reddy, Dr H.P.Singh, CRIDA, Santoshnagar, Hyderabad (Andhra Pradesh) 500 059
447 (l)	Use of *neem* leaves and ash in storage	*Neem* leaves and ash are added to the seed during storage, as *neem* leaf contain azadirachtin and ash contains potash, which prevent the damage of seed by storage pests **Keywords**: *neem* leaves, ash, storage	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447 (m)	Grain storage with paddy straw	Paddy straw *morai* is used to store the grains **Keywords**: paddy straw morai	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
218	Traditional method of storage of local variety of cucumber	Traditional method to store cucumber (*Cucumis sativus*) is by hanging it on the ceiling. This storage may be for a period of 6 months and more. Mature fresh cucumber without any bruises or blemishes with the stalk intact is placed horizontally and tied loosely with a simple knot at the centre with coconut leaflet	Shri Ramachandra Bhat, Uppangala House, Kumbdaje, Kasaragod (Kerala)

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		and hanged on the ceiling. This may be kept for 6 months to 1 year. It may be removed after observing its colour and texture. Long storage life is attributed to the use of only organic manure. Since the availability of cucumber is seen throughout the year, fresh one can be stored for a period of 6–12 months. Under non-availability of other vegetables, this may be taken for use. This is considered as health tonic because it cools body temperature. This also gets attraction at the time of *ugadi/vishu*, and considered as one of the offerings on the day to the goddess to bring prosperity in new year. This is in practice in Kumbdaje village at Kasaragod district in Kerala. **Keywords**: cucumber, traditional storage	
219	Storage of small bulb onions as seed	Matured small onion bulbs are harvested and made into small bunches. These bunches are then hanged on bamboo pole for drying. Hanging of bunches facilitates easy circulation of fresh air, and there is no secondary infection. Onion bulbs are properly dried and kept for next sowing season. Small and marginal onion growers of a village nearby Suttar are using this technique. Local small onion varieties are best for cultivation in this area. It is less expensive and no element of risk involved. Less labour intensive, user-friendly method. When compared to other practices this method is very cheap. **Keywords**: small onion bulbs, storage	Principal, J S S Krishi Vigyan Kendra, Suttur, Nanjangud, Mysore (Karnataka) 571 129
297	Waste products storage	Waste products, instead of disposing in backyards of houses, are disposed in a storage house made from cement and earth in village Malamabhoor, Potaneri Salem district of Tamil Nadu. Villagers are using this technique. **Keywords**: waste products storage, earth-cement storage house	Shri C. Balasubramanian, 4/12-A, Malamabnoor, Potaneri, Mettur, Salem (Tamil Nadu) 636 453
305	Traditional method of preserving raw jackfruit bulbs in brine	Storage of jackfruit (*Artocarpus integrifolia*) bulb for nearly 1 to 2 years can be done. This type of storage may be in large jars or plastic cans. Wide-mouthed mud pots (¾"-1" thickness) are used for the purpose, traditionally made at Neerapady, Yethadka (Kasaragod district in Kerala). The pots are cleaned thoroughly, dried and wiped before filling the bulbs. Raw, medium mature, firm fruits are cleaned to remove the seed inside and the slimy coating	Ms Vasanthi, W/o. Ramachandra Bhatt, Uppangala House, Kumbdaje, Kasaragod (Kerala)

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		surrounding it. Care is taken to see that it does not come in contact with moisture during the process. A handful of salt is sprinkled at the bottom of the pot as a layer. Cleaned bulbs cut into halves are spread in to 2" thickness over the salt. The bulb is again covered by a layer of salt (one handful) and the process is repeated till the pot is covered to the brim. Clean, dry arecanut sheath (fibres trimmed) is covered and heavy stones are kept on it to prevent the bulbs floating above the brine solution. It is covered with clean cotton cloth (2–3 layers, each layer tied separately). The bulbs can be used after steeping in salt for 3–4 months. Whenever required for culinary purpose it can be removed and used by blending with other food ingredients. Bulbs can be preserved this way for 1–2 years. Traditionally these pots were buried in soil (up to the neck) and covered on the top in rear portions of the house or sheds. In few places the laterite soil is caved and the pots or jars are kept airtight. Pots in continuous use may develop cracks due to brine. Mud pots, if used need to be handled carefully. Fungal growth may be seen on the top if it comes in contact with moisture while processing. Generally the layer is removed from the top and the produce is thoroughly washed and used. Surplus jackfruit during the season (March-April) is stored as per the requirement of the family. Storage is not necessary every year. The brined bulb is used to make *undalaka*, chips, curries and papads. It is an age-old practice. Best convenient food, readily available and varieties of curries can be prepared. Jackfruit (*Artocarpus integrifolia*) bulbs stored in mud pots are very soft and in plastic cans are very firm. Brined bulbs are considered as hot food in *karkidaka masam* (in Malayalam), aate (*tulu*) between 15th July-15th August. Socio culturally compatible, mud pots need careful handling, as per the age old practice inherited from ancestors. This is in practice in a village at Kasaragod district in Kerala. **Keywords**: jackfruit, bulbs, mud pots, *Artocarpus integrifolia*, papad	
379	Post-harvest storage of paddy grains in dug-out	Paddy seeds are stored in the pits of various sizes dug in the earth, lined with twisted paddy straw ropes, plain paddy straw and cowdung, which protect the seeds from rodents, fire and theft. The seeds stored	Shri Laxman Kumar Palata Singh, Agronomist, Indira Nagar, 2nd Lane, Industrial Estate Area,

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 *Dhankhani*—rice storage structure by this method are used in future, as these fetch higher price (Rs 200 per quintal of paddy) compared to other seed. The cost involved for storage is Rs 20 per quintal and is being adopted by almost all the farmers of the Narendarpur village of Ganjam district in Orissa **Keywords**: paddy, storage, pit dug in earth, higher price, rope, paddy straw	Berhampur, Ganjam (Orissa)
693	Application of leaves of walnut, *neem*, mentha and eucalyptus as insect repellent for storaged food grains	Spoilage of grains in barns by insect-pest attack is a very common problem faced by farming communities. Therefore, in order to avoid attack of insect pests in stored grains, the farmers make use of walnut, *neem*, mentha and eucalyptus leaves as insect repellents. Farmers store grain in the barns, which is commonly called *peru*. It is made of bamboo sticks and this container is completely covered by a paste of cowdung and clay. Approximately 5–6 leaves are kept at various depths of the peru during grain storage. The leaves of the above plants act as repellent of insect pests. For example, walnut leaves are astringent and the aqueous extract of fresh leaves possesses bactericidal properties, whereas mature leaves contain 9–11% tannin. Tannins are known to act as feeding deterrents. This is very effective among rural communities in various parts of Himachal Pradesh. **Keywords**: spoilage of grains, insect pest, leaves of walnut, *neem*, mentha and eucalyptus, insect repellent, cowdung and clay	Shri Rajeev Kumar, Room No. 32, D NBH-II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 and Dr S. K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
1052	Use of neem (*Azadirachta indica*) and eucalyptus leaves	Farmers use various indigenous practices to check insect pests in grain storage. They keep 5–6 leaves of *neem (Azadirachta indica)* and eucalyptus in the stored grain at various depths of the grain container.	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla

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	for storage pest control	This ITK is useful for controlling insect pests in stored grain because these leaves contain certain ingredients which act as a repellent or insecticide properties. Farmers in hilly area store the grains in wooden grain storage container. The grains are first dried in sunlight for 5–7 days and then kept under optimum condition in grain storage container. The leaves of *Azadirachta indica* (5–10) are kept at various depths of the grain container so that the repellent smell of these leaves keeps the insect pest away or kills them. This ITK has been practised in most of the villages in hilly areas of Himachal Pradesh since time immemorial. This ITK is applied to control insect pest attack in stored grains. **Keywords**: *neem*, leaves, eucalyptus leaves, pest control, grain storage	(Himachal Pradesh) 171 005
1310	*Chhika* (hanging basket) along with wrapping in *khadder* clothes	To store bread for long period and also to save it from cats and dogs etc, the farmers keep bread in *chhika* (hanging basket) wrapped in *khadder* clothes. This is used by all the people in Haryana state since long time. Other structure like refrigerator, oven, incubator, *jali* etc are also used. **Keywords**: *chhika, khadder* cloth, storage of bread	Dr A.K. Mehta, Zonal Coordinator, ZCUI, Transfer of Technology ICAR, PAU Campus, Ludhiana (Punjab) 141 004
1313	Protection of sugar and sugar products from ants	A few cloves are placed with the sugar or sugar products. This repels ants and all ants get away from the sugar or sugar products. This is practised by the villagers of Samaspur in Etah district of Uttar Pradesh. **Keywords**: sugar, clove, repellent for ants	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1403	Use of *bharbhari (Ocimum canum simo*) and sindwar (Vitex negundo) leaves for storing grains and pulses	Farmers of Deori village of Ranchi district in Jharkhand follow this practice to protect pulses from the attack of insect/pest. In this practice, leaves of *bharbhari (Ocimum canum simo) and sindwar (Vitex negundo)* are mixed with pulses before storing in the storage. Bin is made up of straw. *Sindwar* has steroidal and alkaloidal properties which is responsible for checking or controlling the insect/pest attack. It is an age-old practice and adopted by 89% of farmers in the village. **Keywords**: insect/pest, *bharbhari, sindwar*, storage bin, straw, bamboo, steroidal, alkaloidal	Shri R. S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1423	Protection of blackgram from insect by storing with fingermillet	Farmers of Deori village of Ranchi district of Jharkhand use fingermillet to protect seeds of blackgram from insect pests. Blackgram is kept with fingermillet in a container. About 46% of farmer in the village use this age-old practice. **Keywords**: blackgram, fingermillet, blackgram, fingermillet	Shri R.S. Prasad, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
2103	Seed storage by wood ash	Storing the gingelly seed mixed with wood ash after sun drying minimizes the storage pests infestation and thereby increases the seed longevity. **Keywords**: sesamum, seed storage	Shri Appalnaidu, Banam, Ponduru Mandal, Srikakulam (Andhra Pradesh)
2149	*Neem* leaves kept in paddy bags during storage	Dry *neem (Azadiracta indica)* leaves are placed along with paddy and stored in gunny bags results in reduced incidence of storage pests, as *neem* leaves act as insect repellent. It is eco-friendly, low-cost technology and is being practised from ancesters. **Keywords**: neem leaves, paddy storage	Shri KVS Rami Reddy, Krishi Vigyan Kendra, Anantapur (Andhra Pradesh) 515 701
1862	Control of storage pests of rice and pulses by use of *neem* leaves	The incidence of store grain pests like rice weevil and pulse beetle are controlled/reduced by mixing the grain with neem leaves in 100 : 1 ratio (grain: neem leaves). This practice is in use for last 12 years in Walgaon village of Amaravati district in Maharashtra. **Keywords**: *neem* leaves, rice, pulse, storage, pests	Dr K. S. Singh, Scientist, KVK 57, Congress Nagar, Amaravati (Maharastra) 444 701
699	Use of lime and wood ash for controlling stored grain insect pests in wheat.	This is a practice for controlling stored grain insect pests, followed by farmers of Rahdi, Chahdi, Jahmat, Tikkari, Cheywali and Trayamla villages of Balh and Gopalpur blocks in Mandi district of Himachal Pradesh. After harvesting of wheat crop, the grains are dried in sun and then lime @ 2 kg and wood ash @ 10 kg per quintal is mixed with seed. This practice is followed by 2% farmers of these village for the last 25 years. **Keywords**: lime and wood ash, stored grain insect pest, wheat	Dr. S.K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK Himachal Pradesh Krishi Vishwa Vidyalaya, Mandi (Himachal Pradesh)

12

Horticultural Crops

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
40	Use of mustard oil and turmeric powder in mango tree for boosting flowering and fruit setting	To break the alternate bearing and to enhance the flowering, the farmers in Chomu village of Jaipur district in Rajasthan adopted the flowering practice. They take 1 kg mustard oil mixed with 250 gms turmeric powder and make it as a paste and smeared on the old mango branches, which are pruned in September-October or after fruiting i.e. in April. The cost of this treatment varies with age of mango plant. It varies from Rs 100 to 200 per plant with an additional yield of 30–40% with additional benefits Rs 400–600 and is being practiced from the last 10 years. **Keywords**: mustard oil, turmeric powder, mango flowering	Shri Shankar Lal, Jatawali, Chomu, Jaipur (Rajasthan)
781	Sowing of banana with mango	The practices of planting young banana seedling with mango plants is adopted to reduce the moisture stress during dry period, thereby increasing the rate of survivability of the mango plants. At the time of mango plantation, farmers plant banana in prepared basin adjoining the mango plants in dry weather. This practice is followed by 40% of farmers in Jarol, Harabag, Churad and Thalag ki Dhar villages of Sunder Nagar block in Mandi district of Himachal Pradesh for the last 5 years. **Keywords**: sowing banana and mango, retention, moisture increased, survivability of mango	Dr S. K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
1156	Colour improvement during ripening of mango fruits	To have an attractive yellow colour of ripened mango, 1 gram of turmeric powder is mixed with 50 g of carbide and used for 10 kg mango fruits. This is done especially during rainy season and for some of the early varieties of mango which do not have attractive colour even if fully ripened, which reduces market value of the product. This appealing yellow colour attracts the consumer and fetches good price; and an increase of Rs 2–4 is observed than the ordinary mango. The practice is being used since last 8–10	Shri Pappu, S/o Shri Rajjul, Rithoura, Bareilly (Uttar Pradesh)

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		years by about 12 farm families of Labhera village in Bareilly of Uttar Pradesh. **Keywords**: turmeric powder, attractive yellow colour, ripened mango, carbide, increased market value	
1880	Use of green *arush* leaves for mango ripening  Arush plants–leaves used for mango ripening	The mangoes in Sonapur village of Jahanaganj block of Azamgarh district in Uttar Pradesh are ripened by using *arush* leaves by spreading a layer of 2–2.5 kg straw on which 2 kg *arush* leaves and 25 kg mango are spread. This process is continued till 25 kg mango remains on the top, on which *arush* leaves and 2.25 kg straw and 5 to 6 kg clay soil is spread. After 8–9 days mango is completely ripened and ready for consumption. About 4–5 kg green *arush* leaves are required. It is being followed by 80% of mango growers since 70–80 years. **Keywords**: *arush* leaves, straw	Shri Ranjay K Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128
1883	Use of paddy straw for ripenning of Alphonso mango	The mango fruits harvested at 75–80% maturity are packed in bamboo basket or wooden boxes. The paddy straw is used as a packing material while packing the fruits. The paddy straw increases the temperature, which is essential for release of ethylene, a key element in ripening the fruits. It is kept for 8–10 days in paddy straw. It has been in practice from last 50 years in Asgani village of Malvan taluka of Sindhudurg district of Maharashtra. **Keywords**: paddy straw, mango ripening	Shri P. S.Paruleka, Gaorai, Kudal, Sindhudurg (Maharashtra)
2164	Use of neem cake in mango	For improving the fertility status of mango-growing soil, about 83% farmers of Perumali village in Vizianagaram district of Andhra Pradesh apply 500 g neem cake and a pinch of diammonium phosphate per seedling during monsoon every year up to 5 years age of the tree. This is an age-old practice of the farmers. **Keywords**: seedling, neem cake, diammonium phosphate, 5 year	Shri K.Lakshmana, Ph.D Scholar, Room No. 81, P.G. Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2165	Prevention of flower and fruit shedding in mango	The flower and fruit shedding in mango is prevented by digging a trench of 2–3 ‘ deep around the trees. To this, approximately 5 kg common salt and 40 to 50 kg organic matter are added and then covered with soil. It is practised at 15 days before the onset of monsoon. About 72.5% of the farmers adopting this	Shri K.Lakshmana, Ph. D Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		practice for last 30 years in Kandisa village of Srikakulam district in Andhra Pradesh. **Keywords**: mango, fruit flower shedding	
2169	Removal of bark in circular manner on mango	By removing bark in circular manner on mango stem, plant bears more flowering and fruiting thereby better yields compared with the normal plants. **Keywords**: mango, higher fruiting and removal of bark	Shri K Swami Naidu, Vadada Gara, Srikakulam (Andhra Pradesh)
228	Banana stem injector	Bunchy top disease in banana is a common locally known as *mudikothi* in Tamil Nadu. This is controlled by injecting certain chemicals into the pseudo-stem. Syringe is developed by Shri Manoharan. Injector is made of stainless steel. The syringe has a piston which pushes the chemical into the stem. Bottom of the syringe is connected to a plastic tube. The other end of the plastic tube is immersed in a plastic bucket that holds the chemical. The valve is used to regulate the quantity of fluid to be injected. Once the fluid is filled in the syringe the valve automatically closes. After the liquid has been injected the valve opens thereby allowing the fluid from the tank to enter the syringe. **Keywords**: stem injector, bunchy top disease in banana	Shri N. Manoharan, Raj Engineering, Dindigul Road, Vatalagundu, Dindigul (Tamil Nadu)
229	De-suckering in banana, herbal pesticide for eriophid mite, weed control in paddy and drip irrigation for watermelon	The practices developed by Shri. Subramanian for de-suckering in banana, herbal pesticide for eriophid mite, weed control in paddy and drip irrigation for watermelon are mentioned here. Iron rod tied with cloth in the tip is dipped in the kerosene and flamed with wire. The flamed iron rod is inserted to the selected rhizome of the plant where the sprouts are germinated. The practice effectively controls suckers. *Herbal pesticide for eriophid mite*: 500 g dried chilli powder, 500 g dried tobacco leaves powder and 500 g dried *malaipurasu* leaves are ground well and dusted over the bunches at the rate of 750 g to each palm during the emergence of inflorescence to control eriophid mites. *Pest control in paddy*: 1 kg dried chilli powder, 5 kg waste tobacco leaf powder and 5 kg fine sand are mixed and dusted over to the paddy crop to control ear head bugs and fulgarid attack. *Weed control in paddy*: Green manure, Calotropis is incorporated in the soil before puddling. After	Shri P.R. Subramanian, 4/98 pattakaran pudur, Annur Mettypalayam, Annur, Coimbatore (Tamil Nadu) 641 653

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		puddling, the land is leveled and water is allowed to stand for one day. Water is drained and allowed for drying for 6 days. One more puddling is performed before planting of paddy seedlings. This practice controls the weed germination. 100 g neem kernal powder is applied at the time of ploughing in two equal splits is practiced to control nut grass (*Cyprus rotundus*). Drip irrigation for water melon: Holes are made at the bottom and water is allowed inside to the holes of the damaged watermelon fruits. The fruit is then placed over on the root portion of the watermelon plant. This practice not only saves the crop from drought but also helps the fruits to attain maximum size. **Keywords**: de-suckering, banana, iron rod, kerosene, cloth, chilli powder, tobacco leaves powder, ear head bug, fulgarid, paddy, sand, Calotropis, Cyprus rotundus, neem kernal powder, watermelon, drip irrigation	
395	Detopping of suckers of banana for multipurpose benefits	Detopping the suckers of banana at 2 to 3 leaf stage twice or thrice makes the suckers hardy and uniform. By this practice survival percentage of suckers is 95% and the fruits are harvested within 10 months after planting. **Keywords**: detopping suckers, banana, early harvest	Dr Debabranta Basu, RRS, NAZ, BCKV Gayeshpur, Nadia (West Bengal) 741 234
1882	Use of rice husk, saw dust for filling of banana pit	The banana suckers are planted in trenches of 3 feet depth, which are filled with a mixture of saw dust/rice husk and soil (2 : 1) yield 30–40% higher over planting banana in pits of size 2×2×2 feet at Asgani village of Malvan taluk of Sindhudurg district in Maharashtra. The saw dust/rice husk retains for longer time, and after decomposition, the compost acts as organic manure, which results in better growth of rhizomes, producing robust fruits and giving higher yields. **Keywords**: banana, rice husk, saw dust, trenching	Shri Pratap Sadanand Parulekar, Gaorai, Kudal, Sindhudurg (Maharastra)
494	Use of Albizia leaves for faster ripening of banana	I n this practice, for faster and better ripening of bananas, the farmers of Nsünyu, Kontsünyu, Tseminyu and neighbouring villages in Kohima district of Nagaland use *Albizia* leaves locally called *Ameghon*. The practice is that leaves of *Albizia* are collected and kept in an empty carton or wooden box or sack. Then the bunch of banana is chopped off	Dr Kapenlo Thong, SRF, NATP, NRC on Mithun, Jharnapani (Nagaland) 797 106

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		from the main stalk and placed inside. After this, it is wrapped properly and kept for ripening. In about 3–5 days almost all the bananas will be ripened. The colour of the ripened banana is much better than by other methods. This method takes less time for ripening. Different varieties of bananas like *Jahaji*, local etc. are cultivated. The plant material used is locally available. This practice is used by about 80% of the banana farmers for the past 20–30 years. Alternatively, some farmers wrap banana in jute bag (sack) and keep it above the fire place (smoke treatment) or keep in the wooden box for ripening. **Keywords**: *Albizia*, banana, ripening, colour	 Albizia leaves for quick ripening of banana
495	Use of common salt to improve shelf-life of *Jahaji* banana	This practice is followed by the farmers of Nsünyu village in Kohima district of Nagaland. The practice is to improve the shelf-life of *Jahaji* banana and also to get yellow, ripened fruits, which is normally green even if fully ripened. A small hole is made in the main stalk of the matured banana and a little quantity, about a teaspoon full of common salt is poured into the hole. It is then kept in the corner of the house for ripening. The salt gets absorbed and is distributed to every part of the banana and thereby improves the shelf-life.It has a good effect as the shelf-life can be increased to some extent and also the colour of ripened banana can be turned yellow, if so desired. About 50% of the farmers in the village follow this practice and the practice has been in use since 15–20 years. **Keywords**: shelf-life, *Jahaji* banana, common salt	Shri Sanenpfu Magh, SDAO, Tseminyu, Kohima (Nagaland) 797 109
496	Use of smoke for banana ripening	In this practice, the farmers of Chumukedima, Medziphema, Sethikema and Sovima in Dimapur district of Nagaland use smoke for ripening banana especially during winter season. A pit is made so that it can accommodate the matured green bananas. Bananas are kept in the pit. It is then covered by a tin sheet. Only one small hole is left from one side of the pit. At the opening of hole, some dry and green leaves or twigs are burned to push smoke into the pit. When sufficient smoke is produced, the hole is closed by wet soil and tin sheet and the sides are closed with wet soil. Again in the next day, the hole is opened and smoke is produced by burning leaves and twigs. The process is done for 2–3 times. Every	Dr (Mrs) Anamika Sharma, Training Assistant (T5), ICAR Research Complex for NEH Region, Jharnapani (Nagaland) 797 106

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		time the pit is to be closed with wet soil. The rationale behind this is that smoke in the closed chamber produces heat as well as ethylene gas which is a ripening agent for banana. Within 4–5 days, around 30 bananas get ripened. But care should be taken not to allow the banana to be overripened, which happens if the pit is not closed properly and not opened after 4–5 days. This practice has a good effect because the taste of banana is not affected unlike the case of calcium carbide. The practice is in use for a long period by about 80% of the farmers. As an alternative method, some farmers, after harvesting fully matured bananas, wrap it in jute bags and keep it over the fume of *chulhas* (i.e. about 4–5 ft height). Some make a stand over the chulhas. No additional labour is involved, but it takes more time to ripen bananas. **Keywords**: taste of banana, pit, smoke, calcium carbide	
1889	General care of orchard.	Fencing of *babul, palash* tree on farm bunds to protect orchard from winds. Application of sulphatic fertilisers should be avoided and neem cake to be applied for good vegetative growth and plant vigour **Keywords**: *palash, babul*, fencing, sulphatic fertilizer, plants vigour	Scientist (Extn.) NRC citrus, Nagpur 440 010
1890	Overcoming the problem of flowering, fruit set and fruit drop	Avoiding use of chemical fertiliser and using FYM can solve the problems. Quality fruits with shine and tightness will be obtained. **Keywords**: chemical fertilizer, FYM, quality fruit	Scientist (Extn.) NRC citrus, Nagpur 440 010
1891	Ensuring fruit quality.	Avoiding application of chemical fertilisers and application of urea can increase the yield. Application of poultry manure @ 1 kg/tree or caster cake mixed with FYM gives tight skinned and shiny fruits. **Keywords**: urea, poultry manure, castor cake, FYM, shinny fruits	Scientist (Extn.) NRC citrus, Nagpur 440 010
1468	Use of lemon juice to increase the productivity of citrus	Some of the farmers of Banka and Katoria blocks of Banka district in Bihar are using the lemon juice mixed with water (25 to 30 ml per litre of water) as foliar spray in citrus trees at the time of flowering stage. The acid content of juice might be helpful in more setting of fruits. This is in practice for last 10 years by maximum number of farmers in the village. **Keywords**: lemon juice, productivity of citrus, acid content	Shri Yogendra Mandal, Shri Radha Mohan Singh, C/o Training Organiser, Banka, Jagatpur, Banka (Bihar) 813 102

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493	Boiling of lemon juice for preservation	In this practice, the farmers of Zemabawk village under Tlangnaum block in Aizawl district of Mizoram practice a method for preservation of lemon juice by boiling. This practice minimizes spoilage and the lemon juice extract can be stored for longer period. No other preservative is used for this practice. The practice is a new one and has been in use since 5 years. About 25 out of 33 farmers follow this practice. The remaining farmers dispose off the harvested fruit directly to the market. **Keywords**: lemon juice, boiling, preservation for longer duration	Shri H. Manthianga, Krishi Vigyan Kendra, Kolasib (Mizoram) 796 081
238	Budding in citrus with different varieties	Five varieties, *viz., narthangai, kodi lemon, kalyani, sathugudi* and local are budded together in a single citrus plant to get harvest of different varieties. **Keywords**: citrus, budding	Shri K. Veerapan, Tamaraki colony, Sastri Nagar, Tamaraki, Sivaganga (Tamil Nadu) 623 562
231	Raising acid lime seedlings by simple method	Shri. Thangaraj native of Punniapuram in Tamil Nadu developed a simple method of raising acid lime seedlings. The empty polythene bags used for packing fertilizer are stitched together to a size of 2' height and 3 feet width. The tank silt is filled up to 2' height and well decomposed farm yard manure is spread on the surface. 400–550 seeds are dibbled in the seed bed. Water sprinkled at the rate of 100 litres through a rose-can daily twice in morning and evening to kept soil moist. Acid lime fruits are procured in December-January and the seeds are kept for sowing in monsoon. The root proliferation is good and seedlings are grown more vigorously in this method. **Keywords**: acid lime seedling, farm yard manure, seedling growth, root proliferation	Shri K. Thangaraj, S/o Karuppiah, Punniya puram, No 268 Karpaga Natchiar Koil, Thenkasi, Tirunelveli (Tamil Nadu)
41	Burial of deadsnake nearlemon tree for higher fruit yield	Burial of snake is practiced in Dangs district of Gujarat to have more fruits in lemon plants. In this location, non-poisonous snake *dhammo,* having length of 1.5–2.0 m is found. Occasionally, if people find any dead *dhammo* snake, it is buried around the lemon plant in ring form. The practicing farmers have been benefited with increase of fruiting. It is being applied once a year, which gives higher bearing and with increased size of fruits. This practice is also useful in other fruit trees, viz., mango, apple, sapota and custard apple, but is being more useful for lemon.	Ms K.R. Dalvi, Gaurya, Ahwa, Chikatiya, Dangs (Gujarat)

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		Hovever, this practise has stigma of religious belief and, therefore, many farmers do not adopt it. **Keywords**: *dhammo* snake, burial, lemon, fruit yield	
780	Traditional pollination technologies in apple orchard	For enhancing productivity and profitability of apple crop, efficient agents of cross-pollination are essential because most of the commercial apple varieties grown in India are self incompatible. Keeping in view this problem, farmers in north-west Himalayan region of Himachal Pradesh have been employing different traditional/ innovative pollination techniques to ensure higher fruiting. These are: hand pollination, topwork or grafting of pollonizer cultivator, use of pollen dispenser and spray of sugar syrup/honey to attract pollinator at the time when apple crop is in bloom. **Keywords**: cross-pollination, apple, hand-pollination, topwork, grafting, sugar syrup, honey	Shri Mohan Singh Gawai, Sandhu, Theog, Shimla, (Himachal Pradesh)
234	Removal of fog in grape by smoking	Whenever there is fog in the atmosphere it forms water droplets on the leaves of the grapes, which prevents spraying of fungicide or insecticide to the orchard. To dry the leaves of grape, four out of six grape orchard owners smoke the orchard by burning neem (*Azadirachta indica*) leaves and small branches in morning. About 125 kg neem leaves are used for 1 hectare. This practice is being followed for the last 6 years, yielding good results. It is believed that smoke of neem leaves act as germicide. **Keywords**: orchard, neem, grape	Shri Basavagonda H. Patil, Kulagod, Gokak, Belgaum (Karnataka) 591 250
777	Localised green-house condition in grape cultivation	Under severe, cold desert condition, farmers of Nubra valley in Himachal Pradesh grow grapes by creating a warmer microclimate under localized greenhouse condition. Within the greenhouse, warmer niches are located for grape cultivation Vines are grown in pits by regulating the temperature of the basins. Pits are filled with locally available crushed stone, branches, grass, hay and soil. This warms up the microclimate of the basin, which is otherwise cool due to the sandy soils. The vines are also wound with warm clothes, gunny bags or wooden baskets for protection against the cold during the first 2 years. **Keywords**: grape cultivation, greenhouse condition, pits, basins, regulate temperature	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
401	Increase in yield of guava by tying of stem with iron wire	One iron wire, tied around the trunk of the guava plant before flowering just as it cuts the top portion of the bark, results in advancement of flowering by 15–20 days and 30 to 40% higher yield because iron wire stops the movement of nutrients from upper part to the lower part.This practice is being followed by 60 to 70% farmers for the last 20 years. **Keywords**: tying iron wire, guava, flowering	Ms. Sukanti Das, C/o Sri N M Das, Gandhi Marg Amalapada, Angul (Orissa) 759 122
403	Off- season flowering in guava	On the basis of expectation farmers bend down the branches of guava about 45 to 60 days before, in plants of age from 3 years to 8 years. The farmers bend down the branches towards outer periphery to open the centre and allow penetration of sunlight. After 25 to 30 days, new shoots emerge from the bent portion, which bears profuse flowers.This practice results in 39% increase of flowering in early summer and 28% increase in flowering in late autumn. Off-season flowering fetches Rs 590 to Rs 600 per plant, instead of Rs 150 to Rs 180 per plant in the normal season. **Keywords**: guava, off-season flowering, bending of branches, light penetration	Shri Dipankar Saha, Training Organiser, Ramakrishna Ashram KVK, Nimpith Ashram, South 24-Parganas, (West Bengal) 743 338
1160	Treatment for increasing productivity of jackfruit by application of fish	For increasing fruiting in jackfruit, some farmers of Pipara Kalan village in Ballia district of Uttar Pradesh apply small fishes around the root zone of the 10–12 years old tree. This practice has been introduced by three farmers since last few years. **Keywords**: small fishes, root zone	Shri Sunil Kumar Singh, Pipara Kalan, Ballia (Uttar Pradesh) 277 054
141	Control of rhinoeros beetle in coconut by using *Clerodendron*	Rhinoceros bettle (*Oryctes rhinoceros*) is one of the major pests of coconut. It mainly breeds in cattle dung, decaying stems etc. To control the pest at the breeding ground itself, raw leaves and stems of the seed *ottavaren* (*Clerodendron* sp.) are put in cowdung pits and mixed thoroughly. When grubs come in contact with the plant parts, they become malformed and die. Experienced farmers have observed considerable reduction in the pest population by adopting this method. This practice is adopted since several decades by most of the farmers of Koipurram, Ezhumatoor and Puramatton blocks of Pathanamthitta district in Kerala. In village Koippurram, 40% of the farmers adopt this practice to control the pest. **Keywords**: coconut, rhinoceros beetle, cowdung	Shri P. S. Ibrahim Pammathu Shaji Manzil, Kulsekharapathy, Pathanamthitta (Kerala)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
157	White grub control in coconut	White grub attack on coconut can be controlled by using jaggery powder, a practice reported from Theni district in Tamil Nadu. The powdered material is dusted in and around the grub holes to attract ants which act as predators. This is in practice for the last five years. Five farmers are using this practice in Periakulam village at Theni district. Cost per one dose Rs 2. **Keywords**: jaggery, white grub control, coconut	Shri R.P. Murugan, Perumalkovil Patty, Periakulam, Theni (Tamil Nadu)
158	Rhinoceros beetle control in coconut	To control rhinoceros beetle (*Oryctes rhinoceros*) in coconut, the oil extracted from castor (*Ricinus communis*) seeds are mixed with water and filled in mud pots. The pots are placed near the coconut leaves where the beetles are trapped. This practice is adopted by all the farmers of Perumal Kovilpatty village for last 5 years in the fields, where the occurrence of the beetle is more. **Keywords**: castor oil, trap	Shri R.P. Murugan, Perumal Kovilpatty, Sathan Kovilpatty, Devadanapatty, Periyakulum, Theni (Tamil Nadu)
160	Control of termites in coconut	Termites are controlled by planting *Curcuma aromatica* in coconut basin. Curcumin in the plant prevents the colonization of termites. Planting Curcuma (*Curcuma aromatica*) at the basin also leads to better utilization of space. About 5–6 Curcuma rhizomes are required for each coconut basin. Continuous use of pesticide or insecticide is reduced due to its planting, which controls termites. Yield from both coconut as well Curcuma is boosted. This is in practice for the past several decades.Good income is obtained from both coconut as well as curcuma. About 40% of the farmers are using this practice in Koipuram, Ezhumatoor and Puramattom blocks in Pathanamthitta district. **Keywords**: *Curcuma aromatica*, coconut, termites, bio-pesticide	Shri P.A. Isac, Pandicheril Mepurath, Kuttoor,Thiruvalla, Pathanamthitta (Kerala)
169 (b)	Control of rhinoceros beetle in coconut	Cowdung slurry in wide-mouthed vessel is kept at ground level under coconut plantations to trap the rhinoceros beetle (*Oryctes rhinoceros*). This practice is in use for the last 5 years by the coconut growers of Thummanayakkanpatty village in Madurai district of Tamil nadu **Keywords**: cowdung slurry, rhinoceros beetle, coconut	Shri M. Jagadesan, Thummanayakkanpatty, Peraiyur, Madurai (Tamil Nadu) 625 703

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1943	Girdling practice in irrigated *ber*	In *ber*, after pruning, girdling is practised on branches of size 3–4 mm before flowering and fruiting. The soils of Mulegaon and Mohol villages of North Solapur district in Maharashtra are light and shallow. The soil nutrients are not sufficient to meet the nutrient requirement. So the practice of girdling helps in controlling fruit drop and increase yield under irrigated conditions. **Keywords**: *ber*, girdling, soil nutrients	Dr A.R. Bangar, ADR, NARP, 97, Raviwar Peth, Pox Box No. 207, Solapur (Maharastra) 413 002
136	Control of insects in vegetable crops	To control insects in cucumber crop, spraying of sheep dung mixture is done. Tobacco extract is sprayed as natural insecticide to control pests in kitchen garden. These practices are in use for the 5 years by the farmers in Thiruvalaputhur village. **Keywords**: sheep dung, tobacco extract, insecticide	Shri S. Kannan, Puthagaram, Thiruvalaputhur, Mayiladuthurai (Tamil Nadu) 609 205
394	Use of teak leaves in bitter gourd for multipurpose utility	Bitter gourd sown spots in the fields are covered with teak leaves by putting a mud ball as weight. After germination, small holes are made on the leaves, so that saplings can come out through the holes. This practice protects the seed from birds and conserve soil moisture at root zone at the initial stage, resulting in survival of plants by about 95% in the Ghoragachha village of Nadia district in west Bengal. **Keywords**: teak leaves, bitter gourd, mulch	Dr Debabarata Basu, RRS, NAZ, BCKV Gayeshpur, Nadia (West Bengal) 741 234
397	Aerial cultivation of cucurbits with torn fishing nets	Cucurbitaceous crops grown by the side of pond, drainage canals, and farm boundaries are made to crawl over a bamboo pole and torn fish catching net with support of coconut coir rope during late summer to early *rabi*, which helps produce hanging fruits on pond and irrigation channels. The farmer can earn at least Rs 1,200 to Rs 1,400 from a 30 m length of pond or land side and can avoid the rotting of fruits as in normal cultivation. This practice is being followed by 50% farm families on Jouthra village of South 24- Paraganas district in West Bengal. **Keywords**: cucurbits, aerial cultivation, torn fishing nets, fruit rot	Dr Dipankar Saha, Training Organiser, Ramkrishna Ashram, KVK, Nimpith Ashram, South 24 Parganas, (West Bengal) 743 338

398	Artificial hand pollination for assured and increased production of pointed	Due to indiscriminate use of pesticides, insect pollinators are decreasing. To substitute this insect pollination, farmers grow male plant separately in 1: 40 ratio of male to female, and collect the pollen from them and dust on the female flowers at the early morning till the end of the season. By this hand-	Dr Debabrata Basu, RRS, NAZ, BCKV, Gayeshpur, Nadia (West Bengal) 741 234

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		pollination, 90% of the pollinated flowers set fruits and ensure higher productivity. This practice is being followed by 40% farm families i n Kantabelia village of Naidia district of West Bengal. **Keywords**: pointed gourd,separate cultivation of male plant, hand-pollination	
402	Use of *hing* to induce female flowering in cucurbitaceous crops	A vertical incision of 1 cm is made on the stem and *hing* (asafoetida) is inserted with a knife and wrapped with a piece of cloth, resulting in appearance of flowers after 20–25 days. By this, auxin production is hampered and flowering starts and it prevents the maleness in plants and yield is found to be increased by 30 to 40%. This practice is followed by 60 to 70% farmers of Makarbili in Nawapada district of Orissa. **Keywords**: cucurbitaceous crops, hing, flowering	Ms Sukati Das, C/o Shri N. M. Das, Gandhi Marg, Amalapada, Angul (Orissa) 759 122
772	Drying of cucumber and pumpkin seeds	In Mandi district of Himachal Pradesh, seeds of cucumber and pumpkin are mixed with wood ash and then placed on a plate under the sunlight. Sun drying of its seeds with ash mixed increases the shelf-life of cucumber and pumpkin seeds. Dried seeds can be sold at premium price in the market and can be stored for a long period. This practice is adopted for last several years by a majority of farmers. **Keywords**: cucumber, pumpkin, seed, ash, sunlight	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1159	Use of fish water to increase the yield of bottle gourd.	Fish water may contain valuable nutrients required for cultivation of bottle gourd. The water obtained after washing the fish is given to the root zone of bottle gourd. This gives more yield. This is practised by the farmers of Amaon village in Ballia district of Uttar Pradesh. **Keywords**: fishwash, nutrient for bottle gourd	Shri A. Rai, Amaon, Ballia (Uttar Pradesh)
1162 1153	Raising of Cucurbitaceous crop in sand dunes under water scarcity conditions	In south western districts of Punjab, specially in Muktsar and Faridkot, a number of sand dunes are prevalent which are uncultivable and there is no facility of irrigation water. The underground water in brackish is natural. About 100 families, mostly muslim, utilize these sand dunes for raising cucurbits (long melon, water melon, musk,melon and pumpkin) taking the lands on lease from the land lords. The farmers dig trenches on sand dunes, which are 6 feet deep and 3 feet wide. The trenches are dug apart at a distance of 4 feet. In some cases the depth of the	Shri Mohamad Amir Kadri, C/o Malkit Auto Service, Bus Stand Bhange Wali, Seer Wali, Muktsar (Punjab)

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		trenches is at the point where moisture is available. Two to three seeds of cucurbits are sown at a distance of 1 foot in October-November. Farm-yard manure @ 12 tonnes/acre is applied before sowing. The seeds are covered with soil after sowing. The farmers go on putting soil with the germinating seedlings and bring the plants up to the surface of the soil, leaving the roots at a depth of about 6 feet below in moist zone. During February, sponge gourd is sown in the trenches by dibbling. The cucurbits, sown in October-November, come to bearing in March and the vines are dried up in the month of June. Meanwhile fruiting starts on sponge gourd, which continues up to October. The process thus restarts. **Keywords**: deep trenching, moist zone seeding	 Raising cucurbits on sand dunes
1469	Propagation of ivy gourd/small gourd	Propagation method gives healthy and stout plants with good yield. Vegetative propagation of ivy gourd/ small gourd is done by stem -cuttings in February-March in homestead or in medium land. About 1 m long cuttings of 2–3 cm thickness are coiled in form of ring and are used for planting. It is planted in basins of about 60 cm diameter and 25–30 cm depth. FYM, sand and soil are mixed and the cutting is covered by it. After 15–20 days, shoots appear from the nodes. Thicker cuttings sprout earlier. This is being followed since long without any modification by all the farmers. **Keywords**: propagation, ivy gourd, small gourd, stem-cutting, planting and FYM/sand/soil	Ms Melani Marandi, Qr No. B/54 (7), Dhurwa, Ranchi (Jharkhand)
1476	To make cucurbit plants resistant to drought and to increase its fruiting capacity in the river-bed of Bagmati	In river-bed of Bagmati, pits of 1.2 m×0.6 to 0.9 m are made. Pits are filled with mixture of sand and compost in 6 : 4 ratio. The seeds of cucurbits are planted after 2–3 days and covered with thin layer of soil and flooded with water. After 2 or 3 days again the sown seeds are covered with a thin layer of soil and flooded with water. This practice is continued till the germination of seeds. Along with the pit another pit is dug at about 5–6 depth till water comes from underground.The cucurbits planted with this method gave good yield. The practice is adopted in the villages of Dostiyan Panchayat of Purnahiya block of Sitamarhi district in river-bed of Bagmati river. Almost 100% plants became resistant by use of this practice gave 60% more yield compared to common	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiya, Sheohar (Bihar)

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		practice. About 50–60% more income generated through this technology compared to other practice. **Keywords**: cucurbits, sand, compost, river basins	
1884	Use of rice- water to increase fruiting in bottle gourd	The farmers of Bisapur village, Mohkhed block in Chhindwara district of Madhya Pradesh apply the waste obtained from washing of rice to the root of bottle gourd to increase fruiting. Only those crops which are nearby to their hut /house get this treatment. About 1–2 litres is used for 3–4 plants once daily. This has an efficiency of 80–90%. A total of 1500–1600 out of 2000 farm families practice this method from time immemorial. **Keywords**: rice water, fruit, yield, bottle gourd.	Shri Ranjay Singh, Ph. D. Scholar, (Agri. Extn), C/o Dr C B Singh, Dean, College of Agriculture C2 Krishan Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1886	Use of sugarcane juice solution for increased yield of fruits in cucurbits	Five percent solution of sugarcane juice is prepared and sprayed on cucurbit crops. This practice enhances the number of fruits in cucurbits. This is due to the hormone present in the sugarcane. About 40–50% of increase in fruiting has been observed by this practice. Farmers of Bisapur in Madhya Pradesh are adopting this practice since time immemorial. **Keywords**: sugarcane juice solution, cucurbit, hormone	Shri Ranjay K. Singh, Ph.D. Scholar (Agri. Extn.), C/o Dr. C.B. Singh, Dean, College Agriculture, C-2 Krishi Nagar Coloney, Adhartal, Jabalpur, (Madhya Pradesh) 482 004
1892	Traditional practice for early germination of bitter gourd  Raising of bitter gourd in polybags	Farmers of Chhindwara block in Madhya Pradesh has developed a new technique for early germination of bitter gourd which is mentioned here. Healthy bitter gourd seed is dipped in water for 24 hours. Then the seeds are wrapped by leaves of castor and tied with a piece of jute beg and kept 1 feet below in the FYM pit for 2–3 days. This practice develop heat on the bitter gourd seeds for better germination. About 150–200 farmers are using this practice since 9 years. **Keywords**: castor leaves, jute beg, FYM	Shri K.B. Tiwari, Shri R.C. Sharma, Shri A.K. Saxena, Dr. Rupendra Khandwe Krishi Vigyan Kendra, Chandangaon, Chhindwara (Madhya Pradesh) 480 001
1112	Use of ash on cucurbitaceous crops to control red pumpkin beetle	Ash covers the leaves so that the insects cannot eat the leaves. Ash, produced in every household in the kitchen by cooking food, is dusted on the leaves of the cucurbitaceous vegetable crops, like bottle gourd, sponge gourd, ridge gourd, muskmelon, cucumber, etc. This prevents leaves from being eaten by red	Shri Vinod Kumar, Sohna, Siddharth Nagar (Uttar Pradesh)

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		pumpkin beetle and the crop is saved. This ITK is practiced in Sohna village of Siddharth Nagar district of Uttar Pradesh. **Keywords**: ash, cucurbitaceous crops, leaf eating beetle	
366	Use of kochila (*Strichnos nuxvomica*) and cowdung compost in brinjal for controlling fruit and shoot borer	Cowdung, 10 kg *kochila* seed powder and 25 kg *kochila* leaf are put in a compost pit of 10×3×3 feet by mixing thoroughly. Then 10 litres cow urine is added to the pit for 10 consecutive days and covered with soil. After 2 months the compost becomes ready. This compost (5 gm) is added to each plant once at the time of sowing and at 45 days after planting. Due to its repellent action, incidence of shoot-and-fruit borer is reduced. **Keywords**: *kochila*, cow urine compost, brinjal, fruit and shoot borer control	Shri Bivison Pradhan, Badakodanda, Ganjam (Orissa)
396	Control of wilt in brinjal with introduction of sorghum (Johnson grass) in the rotation	Sorghum bicolor (Johnson grass) is grown as fodder crop in April-May. After harvesting the crop, brinjal is planted by keeping roots of Johnson grass in the field. This results in zero incidence of wilt disease in the moderately infested plots and reduced incidence in the heavily infested plot. Farmers also get green fodder during dry months of the year. This is being practised in Jeligachhia village of Nadia district in West Bengal. **Keywords**: brinjal, wilt control, sorghum, crop rotation	Shri Debabranta Basu, RRS, NAZ, BCKV Gayeshpur, Nadia, (West Bengal) 741 234
1467	Cultivation of brinjal and tomato in undulated upland rainfed condition	Cultivation of drought resistant brinjal and tomato varieties are noticed in September when the moisture is available in the field. It is practised under the problem of cultivation of the crops in the scarcity period of irrigation water. It involves little cost and is in practice for last several years in the Jhunai and Pahari villages of Dhanbad district of Jharkhand. **Keywords**: cultivation, brinjal, tomato, moisture, irrigation	Shri Ravilal Marandi, Jhunai Pahari, Nirsa, Dhanbad (Jharkhand)
1477	Pest control in vegetable crops by spraying leachate of bamboo pieces	Tender bamboo shoot is cut into small pieces and kept in a pot with water. After 2 to 3 days, it is applied or sprayed in vegetable crops like brinjal and tomato. After 15 days of transplanting it is applied at 15 days interval. About 100 litres water is used/ha. These 10 kg tender bamboo shoot are used for 100 litres	Shri Viswesh Kumar C/o Shri S.P. Singh, Kataiyan, Dostiyan, Sheodhar, Sitamarhi (Bihar)

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		water. The practice is followed by vegetable growers of Udwantnagar block of Bhojpur district (Bihar). About 60% more economic returns was obtained by the farmers compared to other practice. **Keywords**: bamboo pieces, brinjal, tomato	
1885	Cutting of root of brinjal during transplanting to avoid infertility probem	The farmers of Bisapur village in Chhindwara district of Madhya Pradesh cut the root of brinjal before transplantation to overcome infertility problem. With this practice, 60–70% impact is achieved, possibly by hormonal effect. This practice has been in use since time immemorial and presently it is used by about 1500–1600 farmers. **Keywords**: brinjal, infertility, hormonal balance, root cutting, transplanting	Shri Ranjay K. Singh, Ph. D. Scholar (Agri. Extn.), C/o Dr C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Coloney, Adhartal, Jabalpur, (Madhya Pradesh) 482 004
346	Control of tomato wilt by turmeric and asafoetida extraction	Ten gram each of turmeric and asafoetida are dissolved in a litre of water. The seedling root is dipped in this solution before transplanting to control wilt in tomato, and 83% of plants are saved. This practice is being followed by 40% farmers for the last 10 years in Nikhira village of Balasore district in Orissa. **Keywords**: tomato, wilt, seedling, root dip, turmeric and asafoetida	Shri Ramakrishna Giri, Nikhira, Balasore (Orissa) 756 023
1161	Control of mosaic in tomato by spraying hing solution	*Hing* (asaphoetida) has the medicinal value. *Hing* solution is sprayed on tomato crop at the time of infection, to control mosaic virus. This practice is followed in Senduria village of Ballia district in Uttar Pradesh. **Keywords**: tomato, mosaic, asafuetida solution	Shri Sanjai Ojha, Senduria, Sohaon, Ballia (Uttar Pradesh)
1881	Dipping of sedlings of Solanaceous vegetable crops in cowdung urine slurry	After uprooting of seedlings, the roots of seedlings are dipped in cowdung and urine slurry overnight before transplanting in main field. This practice help in formation and development of new roots. The auxins and nitrogen in the urine and dung helps in better root growth and early establishment. It has been practised for last 50 years by 70–75% of farmers in Sindhudurg district of Maharashtra **Keywords**: Solaneceous vegetables, root, dipping, cowdung, cow urine	Shri G.A. Sawant, Gaorai, Kudal, Sindhudurg (Maharashtra)

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1157	Use of own seed by cauliflower farmers	Own seed of early cauliflower is good in quality and the seed is easily available at proper time, giving early crop for better price. Farmers of Tikri village of New Delhi produce own seeds of early cauliflower for good-quality crop. **Keywords**: early cauliflower, better price	Shri Ummed Singh, Tikri Kalan, Nazafgarh (New Delhi)
235	Ridge planting of lady's finger	For higher productivity, seeds of lady's finger (*Hibiscus esculentus*) are being sown on the sides of ridges. This practice is adopted by 80–100 farmers for the last 10 years in Mettupalayam of Coimbatore district in Tamil Nadu. **Keywords**: lady's finger, side planting	Shri B.R. Gopalsamy, Kuranoor, Medur, Karamadai, Mettupalayam, Coimbatore (Tamil Nadu) 641 113
232	Establishment of summer planted cassava setts	Farmers make cones of jack fruit (*Atrocarpus heterophyllus*) leaves and place them over the planted setts of cassava in summer. This practice of putting jack leaf cone over the cassava setts provide a partial shade, thus preventing excess moisture loss from the setts in summer, leading to better establishment of the setts by 12–15% and cutting down the irrigation requirement by 30%. This is in practice for more than 25 years and about 20% of the families are using it in Kerala. **Keywords**: cassava sett, summer planting, jack leaf	Shri Velayudhan Kadayarapudhen Veedu, Panayarakonam, Balaramapuram, Thiruvananthapuram (Kerala)
767	Underground preservation of colocasia (*Colocasia antiquorum*)	Colocasia (*Colocasia antiquorum*) tubers, if stored in the open, lead to dehydration, decay and spoilage. It can be preserved in its natural form in the underground pit. Colocasia is harvested in September. In order to keep it fresh till next sowing season and for table use, it is stored in pits about three feet deep. After two layer of colocasia, one foot layer of soil is put on the top. By doing so, colocasia can be preserved as fresh for long period of time. This method of storage of colocasia is in use for the last several decades throughout Himalayan region. This traditional preservation technology has led to the concept of zero-energy chamber, which is becoming popular for the preservation of other farm produce. **Keywords**: preservation, colocasia, underground pit, zero-energy chamber	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1470	Propagation of	*Colocasia sp*. is an important source of food and is rich in carbohydrate for use by poor farmers. Young leaves and petioles are cooked like other greens;	Ms Melani Marandi, Qr No. B/54 (7), Dhurwa, Ranchi (Jharkhand) 834 004

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		roots/tubers can be used in raw or dried form. Propagation of Colocasia is done by root cuttings. For rainy season crop, small root cuttings with an eye is planted in pits of 1 m×1 m in which mango leaves and dried cowdung are filled and burnt. Now roots are planted on the burnt manure ash after a day or two in May/June. After that the pits are covered with dry twigs and branches of mango, guava etc. It is irrigated at an interval of about 3–4 days. Land tilling is done in August when the plant gains a height of 1 m above ground level.The crop is harvested when it is ready in January. It is a feasible, low-cost technology to get a good yield. This is in practice for last several years by all the farmers in the Kori village. **Keywords**: propagation, colocasia, carbohydrate, root cutting, pit, cowdung, mango, guava, harvest	
1475	Reducing bitterness and controlling/preventing insect attack in sweet potato (*Ipomoea batatas*)	*Mahua* flowers have some characteristics to minimize the bitterness and make soil sterile to keep away the insects. During planting of shoot of sweet potato, flowers of *mahua (Madhuca indica)* are placed in the furrow of soil at the interval of about 30 cm. The practice is followed in the villages of Ranchi district of Jharkhand and has potentiality for its further spread where mahua plants are available. About 80% problem is solved in checking the bitterness of sweet potato and insect pest attack. Cost: benefit of this practice is 1 : 3. **Keywords**: bitterness, insect control, *mahua* flowers	Shri Viswesh Kumar, C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiya, Sheohar (Bihar)
239	Enhancement of onion productivity	By applying 75 kg fresh cassia leaves mixed with 125 kg cowdung, bulb size and onion yield is increased to 25–30%. Improvement in onion bulb colour may be from light red to dark red if this mixture is applied. This is best suited under irrigated condition for a local variety of onion. Best season is rabi. Depth of sowing may be 10 cm. Five farmers are using this technology for more than 10 years. **Keywords**: onion, cassia leaves, cowdung slurry, bulb colour, bulb size	Shri S. Gopal, Training Associate, Krishi Vigyan Kendra, Tamil Nadu Veterinary and Animal Science University, Kundrakudi, Sivaganga (Tamil Nadu) 630 206
1154	Use of local variety of onion	Farmers of *Gummenhera* village in New Delhi are cultivating local variety of onion (*bandurgarh*). This local bandurgarh variety of onion gives higher yield and has higher price in market when compared to other varieties. The colour and appearance of the local	Shri Ombeer Singh, Gummenhera, Najafgarh, (New Delhi)

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		variety of onion is also good. All farmers in this village are cultivating this variety since 20 years. **Keywords**: local variety, onion, *bandurgarh*, yield	
1155	Use of lona for increasing yield of garlic	*Lona* is collected from the side of the wall of house and applied on the garlic field to increase the yield of garlic. Farmers of Binayakpur in Raebarely district (Uttar Pradesh) believe that *lona* is a good manure and supply much nutrient to plant and it increases the yield. **Keywords**: *lona*, wall of house, increase yield, garlic	Shri Hardwar Binayakpur, Bachrawa, Raibarely (Uttar Pradesh)
1158	Colour improvement of onion bulbs	In local market, rate of dark-red, purple or pink colour onion bulbs always remain higher than of light red colour bulbs. However, the non-availability of good-quality seed of such colour varieties always remains hindrance for onion growers. To overcome this problem, the farmers of Kadasan, Patrehdei, Rajjupur and Rajjoli villages of Sahazadpur block in Ambala district of Haryana have developed a technology to improve the colour of onion bulbs from light red to dark/red/pink/purple colour for getting higher prices. The procedure which they are adopting is dying of mother bulbs by dipping in synthetic dye, drying it in shade and storage. The bulbs are then planted as per the local common techniques. After the maturation of seed umbels, the crop is harvested. In the next cropping season, the bulb crop is grown by using the treated seed in the same way of other seed. Interestingly, the bulb crop grown from treated seeds reproduces almost the same colour bulbs as the colour applied to the mother bulbs. The produce fetches high prices. **Keywords**: mother bulb, dying	Shri Ravindra Kumar, S/o Shri Laza Ram, Kadasan, Sahzadpur, Ambala (Haryana) 134 202
1474	Nutrient management in onion (*Allium cepa*) and garlic (*Allium sativum*)	The *ragi* straw ash is rich source of NPK and it contains more potassium, which is required more in onion or garlic. About 1.2 to 1.5 m deep and 0.9 to 1.2 m wide pit is prepared, and ragi dry straw is burnt in the pits. Ragi straw ash is covered with thin soil layer up to 2 to 3 months. After that, this compost is used in onion or garlic crop. The practice is prevalent in the villages of Namkum Block of Ranchi district in Jharkhand. After appliation of this compost, farmers not applying any chemical fertilizers with this practice are getting approximately equal yield	Shri Ranjay Kumar Singh, Department of Extention Education, BAU, Kanke, Ranchi (Jharkhand) 834 006



Burning fingermillet straw into ash for nutrient management in onion and garlic

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		as that of chemical fertilizers. About 70% more income is obtained with this practice compared to chemical fertilizer used plots. **Keywords**: *ragi* straw, onion, garlic	
1887	Control of leaf blight (*karpa*) in onion	Farmers of Wadala and Darphal village in North Solapur taluka of Maharashtra drag empty gunny bag over the onion crop early in the morning when *jaldhui* is observed and irrigate the crop immediately after *jaldhui*. Due to irrigation early in the morning the sporulation is minimized. About 30–35% saving in yield loss is observed in *kharif* by avoiding leaf blight infection. **Keywords**: leaf blight, onion, gunny bag, morning	Shri R. N. Kate, C/o Dr. A.R. Banger, ADR, NARP, ZARS, Solapur (Maharastra) 413 002
497	Use of straw for higher productivity of rhizomatous crops, in Nagaland	In this practice, the farmers of Molbong, Khoibong and Medziphema villages in Dimapur district of Nagaland use straw for higher productivity of rhizomatous crops. The purpose of this method is to get higher germination rate and healthy growth of the crop. The practice is that, after ploughing the field, several furrows are made in the field. The soil dug out from the furrows is kept along the line. The furrows are then filled up with dried straws (paddy straw, grass straw etc). The seeds of rhizomatous crops such as ginger and turmeric are then sown over the straw. After sowing, the straw is covered by soil. This method of planting has been observed to be highly successful in achieving higher germination rate particularly in ginger and turmeric, which are grown extensively in this region. In fact, some of the ginger and turmeric producers have attracted exporters. In this practice there is higher germination rate because the seeds get proper environment in the form of moisture, temperature and humidity. Straw also provides enough space for the seeds to grow and expand. Straw is converted into organic manure at a later stage. This practice has a satisfactory result with about 40% of the farmers following it for the last 15 years. The material used for this practice is cheap and locally available, but not in plenty and this is the reason why all the farmers cannot adopt this practice. **Keywords**: straw, ginger, turmeric, germination, proper environment	Shri Roko Chase, Medziphema Dimapur (Nagaland) 797 106

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
230	Cardamom drier	Cardamom drier developed by Shri. Nagoormeeran by adopting low cost technology. Aluminium sheets are kept inside the iron drum (the iron drum is erected on a triploid stand) and aluminium sheets to convey uniform heat to dry the cardamom pods by the heater which is kept below the iron drum. The drum is operated by a handle to give rotation. The moisture content of the pods is reduced to 8% by this process. The dried pods are allowed to pass through the out let pipe and collected in a box like structure. In a single operation 15 kg cardamom pods are dried in 3 hours. The cost of this implement is Rs 5000. The working efficiency of this equipment is high and it is easy to transport. **Keywords**: cardamom drier, cardamom pods	Shri M. Nagoormeeran, S/o Mohammed Yusuf, Pattapuli, Thenkarai, Periyakulam, Theni(Tamil Nadu)
236	Sustainable production of organic black pepper	The innovations of Shri P.A. Francis, a marginal farmer of Calicut district of Kerala has culminated in the development of model to ward off dreaded foot rot disease and sustainable production of black pepper. The components of production technology are briefed here. *Variety:* Karimunda/Cropping *system:* Sole for penetration of adequate sunlight required to escape from root rot disease. *Preparation of planting material:* Cutting runners just below the node to restrict to single root system. *Planting time:* With onset of south-western monsoon. *Method of planting:* Surface planting of saplings very close to the standard followed by taking a mound around mulching. *Standard:* Jack, maintaining a height of 18"-2" *Depth of planting:* Planting on the surface of the soil without making a pit. *Spacing:* Wider spacing of 14'×10' for better solar interaction. *Implement used for planting:* Spade Cover management to reduce impact of rain drop: Use of mulch (green leaves, dry leaves, coir pith etc.) around the vine a little away from base and maintaining cover crop of *Mucuna bracteata* in the garden. *Fertilizer management:* Additional nutrient supply through bone meal, groundnut cake and farm yard manure from known sources. No use of chemical	Shri P.A. Francis, Cheruvalli (H), Kayanna, Koorachundu, Calicut (Kerala) 673 526  Organic farming of black pepper

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		fertilizers, through which sudden change in growing environment is avoided. Manuring is done by starting with outside sources at planting and gradually increasing the quantity and then progressively decreasing and completely switching over to the internal organic resources such as leaves of standard and cover crop. *Drought management*: It is done by the following practices. Mulching of basins with green leaves/dry leaves/ any other organic waste. Painting of stem upto one meter height of ground vines with slacked lime. Shading of main stem upto one meter height by tying with dry areca/coconut leaves. Removal of off-season spikes. Maintenance of perennial and luxuriant leguminous cover crop throughout the garden Retention of few branches of the standard crop for protecting the vines from scorching sun. Digging of isolation trenches to reduce root competition from neighboring plots. *Vine management tool*: A light-weight, low-cost, and easy to handle tripod with adjustable legs has been developed by using locally available materials for various operations such as tying the vines, de-spiking, harvesting and pruning of the standard. **Keywords**: black pepper, sustainable production, disease free vine	
769	Crushing of coriander seed (*Coriandrum sativum*) with shoe before sowing	Before sowing the coriander seed, seeds are crushed with shoes for breaking the hard strata of seeds. This method facilitates seed germination and enhances crop production. It appears that the coriander seeds, enclosed in hard testa, which with mild crushing by rugged surface such as that of old and used leather shoes, are saved from any injury during mechanical stratification. This ITK is used throughout Himachal Pradesh, which facilitates the seed germination. **Keywords**: coriander seed, crushing by shoe, germination	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
766	Techniques for raising horticultural crops	A. (i) For better pollination, Royal variety of apple is grafted with Red Golden or Golden apple. It is experienced that grafting at pink bud stage results best given. (ii) Bottle is filled with water and cutting of Red Golden or Golden apple (which bears flowers) is planted in it and hanged in Royal apple tree. (iii) Polythene bag is filled	Shri Chet Ram Dhani, Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		with clay soil and cutting of pollinator is planted in it and hanged in Royal apple tree, and irrigated daily. B. Five cut goat's hair and clay soil are kneaded and used in all types of grafting. C. Small branches bearing fruits are pruned with a slanting cut above 4 to 6 inches and treated by paste. D. Trunks of trees are plastered with two parts soil and one part of fresh cowdung, cattle urine and linseed oil. It protects trees from insect pests. E. If rain occurs during flowering period of apple, peach, groundnut etc., they are sprayed with water after mid-night. And if temperature falls down and there is possibility of flower dropping, urea (2 kg urea/200 litres water) is added to the water before spraying. F. To protect *parsimmon* from bird, fruits are contaminated with an insecticide and sugar solution. By eating it, the birds die or never come again. **Keywords**: *parsimmon* G. To protect groundnut from insects, godh, mixture, prepared from 2 parts of soil, 1 part of fresh cowdung with cattle urine is plastered on the stem of groundnut. **Keywords**: *godh*	
2093	Dusting ash on vegetable plants	Fire wood or dung cake burnt ash is dusted on the vegetable plants by hands to avoid the infestation of sucking pests like aphids. It is being practised in Huzurabad and surrounding villages of Karimnagar district in Andhra Pradesh under vegetable based farming system. **Keywords**: dusting ash, vegetables, sucking pests	Shri P. Narayana Reddy, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirman Samithi, Jaiprakash Nagar, Karimnagar (Andhra Pradesh) 505 122
240	Increasing the germination of solanaceous tropical vegetable	The germination of solanaceous tropical vegetables such as tomato, brinjal and chilli is increased by the application of this practice. A mixture of 10 ml of 3 days old buttermilk is mixed with 40 ml water and kept aside for 3 days. The mixture is ready for use. Seeds of solanaceous vegetables are soaked in this mixture for 6 hours and the treated seeds are dried under shade to remove excess moisture. Germination percentage may be 80%. Local variety of tomato CO-3 is best suited to the treatment. The practice is	Dr S. Sendur Kumaran, Krishi Vigyan Kendra, Tamil Nadu Veterinary and Animal Science University, Kundrakudi, Sivaganga (Tamil Nadu) 630 206

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		applicable only for 6 to 12 months old seeds. Sometimes coconut or palmyra toddy is used as a substitute to buttermilk. **Keywords**: tomato, brinjal, chilli, buttermilk, solanaceous vegetables, coconut toddy, palmyra toddy	
393	Bagan kara (*gardening*)	*Bagan kara* is the method of raising fruits and vegetable crops in small area to meet daily requirement of farmers by involving the family members. Different types of vegetables and fruit crops like cabbage, onion, gourd, coconut etc. are being produced. It is protected from animals by staking bamboo mats. About 80% of the farmers are following this method for the last 100 years in Shibiloon village of Burdwan district in West Bengal. **Keywords**: *banga*, gardening, vegetables, fruit crops	Shri Tapomoy Ghosh, Shibiloon, Burdwan (West Bengal)
400	Application of *churn curd* for control of fruit drop	Application of 500 ml churn curd at the base of kagzi lime and oranges 3 to 4 times at an interval of 5 to 6 days results in 30 to 40% fruit-drop control over the  Application of churen curd to control fruit drop untreated plants. The cost involved per application is Rs 10 per plant, and it is being followed over the years by more than 80% farm families in Katarbanga village of Sambalpur district in Orissa. **Keywords**: *churn* curd, fruit drop, lime and oranges	Ms. Yashabati Sahu Katarbanga, Rengali, Sambalpur (Orissa)
539	Use of binda (*Colebrookea labiatea*) leaves for ripening of fruits	The technique is used for ripening of fruits. In this technique a layer of *binda* leaves is prepared and unrippened fruits are kept on it. It is then covered from all sides by the leaves. The fruits get ripened in a week time. *Binda* plants are easily available and the cost of the technique is very low. **Keywords**: *binda*, ripening of fruits	Shri G.C. Tonakhya, Kot, Pauri Garhwal (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
764	Plantation of base (*Salix tetrasperma*) for moulti-purpose use	Base plantation is used to check soil and water erosion as well as various purposes in house hold. Its leaves are used as fodder, wood as fuel and also making various house hold articles such as *kilta* (big basket), *tokra* (small basket) etc. Base, which is locally available, is planted to check soil and water erosion, as its roots have firm grip over the land. A healthy branch of the tree is planted in the monsoon season. An interesting fact is that if branch is planted in the manner it is growing, same plant (base) would be obtained. But if the branch is planted in reverse order, in upside down position, that gives another type of plant which is locally called having a different look. This ITK is used in various parts of Shimla district of Himachal Pradesh for checking soil and water erosion. **Keywords**: base, root system, soil erosion, basket making	Shri Devkant Prakash, Bhejheog,Theog, Shimla (Himachal Pradesh) 171 201
768	Indigenous practices in horticulture	The following practices are followed in horticulture: 1 . Apple seeds are separated and dried before storing. 2 . Apple seeds are kept in sand for one month for germination. 3 . Preparation of seed beds and planting of germinated seeds in the beds. 4. Grafting is done after one year (during first week of March) at the height of 10 inches. The apple plants are ready in next one year. 5 . Normally three year old plant is planted in the field in 3'×3' pits filled with compost-mixed soil. 6 . For seed, an indigenous variety of apple (non-descript) is better, which produces disease and pest resistant plants. Apple seed is not good for nursery. **Keywords**: apple seed, grafting in apple, apple nursery, seed storage in sand	Shri Netra Singh Thakur, Village Kataru, P.O. Sangahwana, Mandi (Himachal Pradesh)
770	Protecting tree trunk from goats	This practice is adopted by west Himalayan cold desert farmers, especially farmers of Kinnaur district of Himachal Pradesh. In this practice small growing trees trunks are wrapped by gunny bags or small tin sheets for protection against animals. It is used to protect saplings and small trees from livestock in winter, thus enhancing their survival rate. It is in practice in winter season when alternative forage in	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		cold desert is not available for the last several years by a majority of farmers. **Keywords**: tree, trunk, cold desert, Himalayas, sapling, livestock, gunny bags, tin sheet, animals	
771	Curing of *chilgoza (Pinus gerardiana*)	*Chilgoza* is a very nutritious dry fruit, eaten mostly in winter season. *Chilgoza* seeds are separated from the cones by collecting the harvested Cones at one place and covering them with pine needle, leaves and soil. After 15–20 days, the *chilgoza* cones are cut open, using a sharp-edged axe (*behla*). With a gentle strike, the seeds are easily separated. The procedure of covering harvested cones with pine needles, leaves and soil possibly helps in maintaining desired temperature and humidity inside the heap, which results in the curing of the cones. This ITK is used in hilly areas of Kinnaur district of Himachal Pradesh. People from the village are invited to separate the seeds. While working they exchange their experiences and disseminate their acquired knowledge. Thus they develop amicable social relations. **Keywords**: *chilgoza*, cone, curing with pine needle, leaves and soil	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
773	Drying of fruit under open sun	Different kinds of fruits are grown in Himachal Pradesh. After selling in the market, left fruits are cut into small pieces and dried in open sun for later use. Sun-drying is a traditional method followed in hilly region of Himachal Pradesh. Open sun-drying of fruits such as apple, apricot, wild apricot and local grapes etc. is a traditional method of fruit preservation. Reduction of water content during sun-drying protects fruits from spoilage. Sun-drying is done for 15–20 days continuously. The dried products are collected and stored in bags for use during lean period.Sun-drying of fruits is practiced in Shimla, Sirmour, Kullu and Chamba districts of Himachal Pradesh. Using the dehydration principle, this ITK has led to the discovery of solar drier, which are now popular amongst the farmers. **Keywords**: sun-drying, fruits, shelf-life	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
774	Pruning of fruit trees	Pruning of fruit trees is a traditional practice. It is used to improve the general health of the tree and helps in maintaining the balanced foliage distribution with proper aeration and sunlight penetration. So	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla

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	trees	pruning is an integral part of orchard management practices. Users experienced that pruned plant usually have lesser pest infestation and do not easily succumb to pest attack. Pruning of fruit tree is performed during the dormant season to create the proper frame, provide symmetry to the tree and also ensure balanced growth. Pruning of old, damaged and weak portion of the tree encourages new growth of branches, which are healthier and strong. It also prevents the trees from breaking/uprooting due to heavy snowfall. Pruning is done with a special iron sickle.This ITK is practiced throughout the Himachal Pradesh for fruit trees. **Keywords**: pruning, fruit trees, sunlight, pest infestation, uprooting	(Himachal Pradesh) 171 005 and Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005
775	Use of smoke for protecting fruit crops from forest damage	Farmers of lower parts of Himachal Pradesh collect dry leaves or dry grass in the shape of heap and these are burnt to protect the fruit crops from frost damage. This practice reduces frost injury to vegetative parts of plants and endures better crops, This is in practice in cereal-based subsistence rainfed farming as well as in rich high-value cash crops grow for last 40–50 years by about 5% orchardists. **Keywords**: fruit crop, frost, fire, vegetation, cereal, orchar	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
776	Apricot grafting	In this practice scions (sweet types) are grafted over bitter forms of wild apricot. Three-four persons in the village who have learnt this art carry out the job. Grafting in local language is called *kalam* and *dambu*. In *kalam*, half lamina along with peptide is inserted in the peeled part of the stalk and the bark removed thereupon is used for tying the union. Then scion 2–3 years old is preferred. *Dambu* is practiced on one-year-old seedling. In this case, a cut is made in the bark at the point of bud, and with slow rotatory movements the whole piece of cylindrical bark from the cut part to the top of the upper part of the stem is removed like cap of a pan. It is then reinserted and tightened so that the petiole region of the scion gets proper union with the stock. Before using *kalam* for grafting, it is kept in water for 3–4 hr. This practice is specific to Ladakh region in Himachal Pradesh, where majority of the farmers are practising it for several years. **Keywords**: apricot grafting, *kalam, dambu*	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
778	Smoking of orchard	In winter when the temperature falls below freezing point of about 12 degree centigrade, orchards become highly prone to frost and in such conditions smoking of orchards protects fruit trees from frost injury. It is the cheapest and easiest way of saving trees from frost injury. This is the practice in Hindu-kush Himalayan region of Himachal Pradesh by a majority of the farmers from several years **Keywords**: orchards, smoking, frost injury	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
779	Drying of vegetables	In Shimla, Sirmaur, Kullu and Chamba areas in Himachal Pradesh, vegetables like tomatoes, cabbage, turnip (*stalknd leaves*), mustard leaves and beans are sliced and dried under sunlight. These dried vegetables are kept under the sun for 15–20 days for continuous drying and are preserved and used in the lean period. Due to sundrying the water is removed from fruits and vegetables, which reduce water activity and spoilage. Dried products are stored in black polythene sheets and covered with thin muslin cloth. This is in practice for last several years by all farmers in the village. It is cheapest and easiest method. **Keywords**: vegetables, sun, spoilage, lean period	Dr P.C. Sharma, C/o Dep. of Post-Harvest Technology, Dr. Y.S. Parmar, University of Horticulture, Nauni, Solan (Himachal Pradesh) 173 230
1471	Paddy straw roof in nursery beds for protection of seedling	In sandy loam soil nursery plots become dry within 2 or 3 days after irrigation. Temperature also varies and affects germination of seedlings. Seedlings are also destroyed by rain drops. Due to roof like structure in nursery plot, moisture is maintained for long time, temperature of the nursery field is maintained and seedlings are protected during germination from sunray and rainfall. In nursery bed 30 cm high paddy-straw roof is prepared with the help of bamboo sticks. The vegetables like brinjal (*Solanum melongena*), cabbage (*Brassica oieracea var capitata*), capsicum (*Capsicum annum*), cauliflower (*Brassica oleracea var cauliflora*) and tomato (*Lycopersicon esculentum*) are raised with this practice. The practice is common in the villages of Namkum block in Ranchi district (Jharkhand) and has potential for its spread in similar environments. About 80% nursery problems are solved through this practice. About 50–70% more benefit is observed as compared to the practice of nursery plots without such structures. **Keywords**: paddy-straw roof, vegetables, nursery, sun, rain	Shri Ranjay Kumar Singh, Department of Extention Education, BAU, Kanke, Ranchi (Jharkhand) 834 006

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1472	Nutrient management in vegetable in kitchen garden	Villagers of Karawan village of Bhojpur district in Bihar use this practice for healthy growth of vegetables. Less flowering and fruiting and fruit drop are common phenomena. To solve these problems, 3 to 4 egg shells are applied near the root zone, which are great source of nutrients like phosphorus which enhances growth, flowering and fruiting and control fruit drop in cucurbit vegetables. This is in practice for last several years by maximum number of villagers. **Keywords**: nutrient management, kitchen garden, flowering, fruiting, growth, fruit drop, egg shel	Shri Vishwesh Kumar, C/o Satyendar Prasad Singh, Kataiyan, Eostiyan, Sheohar, Sitamarhi (Bihar)
1473	Techniques of transplanting fruit saplings/grafts	This technique increases organic carbon and humus and it also loosens the soil. For planting saplings/grafts of mango, litchi, jackfruit etc. pits are dug a month before and then dried leaves are burnt in it. After that the pits are filled with fresh cowdung. An insect, *bhewra* decomposes cowdung and also loosens the soil, which enhances plant growth. The practice is followed in Barmasa village of Sahara Block in Deoghar district (Jharkhand). This ITK has been found very effective as 100% plants survive with vigorous growth. **Keywords**: organic carbon, planting, fruit trees	Shri Barun Lal C/o Lok Jagriti Kendra, Madhupur, Deoghar (Jharkhand)
1888	Increasing the yield and quality of ber, pomegranate and papaya fruits	The farmers of Nanaj and Mardi villages of north Solapur district of Maharashtra prepare a mixture of organic manures and 10 kg cowdung with 1 litre cow urine in 50 litres water. Application of 5 litres of this solution per tree to ber, pomegranate and papaya at initial vegetative, flowering and fruiting stages was found to be beneficial for increasing the yield and fruit quality. **Keywords**: organic manure, cowdung, cow urine, fruit crops, yield, quality	Dr A.R. Bangar, ADR, NARP, ZARS, Solapur (Maharashtra) 413 002
2166	Cultivation of fruit trees, vegetables crops and flower plants	For generating long and short term, and regular income, the farmers of Ganivada, Nidighattu and Sambayyapalem villages of district Vishakapatnam of Andhra Pradesh utilize land for cultivation of fruit trees (mainly mango, sapota, jack fruit and coconut); vegetable crops such as brinjal, *bhindi*, gourds, chillies, onion, etc and flower plants. Such activities keep the farmers engaged throughout the year, obtaining food items for home consumption and	Shri C. Bhaskara Rao, 38–13–11/1, Laxmi Nagar, Marripallam, Vizianagaram (Andhra Pradesh)

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		getting monetary returns intermittently. **Keywords**: land use, fruit crops, vegetable crops, flower plants, labour engagement, intermittent income	
2168	Application of *jaihu* on main stem of mango	The dieback disease and scales in mango orchards is controlled by application of *jaihu* in early *kharif* season. It is applied with the help of brush on the affected portions of the plant. It is a low cost technology, the raw materials are locally available and effective in control. **Keywords**: *jaihu*, control of dieback, mango	Shri Srinivasa Reddy, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirman Samithi, Jaiprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
28	Use of cowdung for better vegetative growth of plants	Application of fresh cowdung on the pruned branches of ber, mango, lime, jamun etc. results in better vegetative growth and development of plants. In addition, the number and vigour of branches of the plants with late and poor branching and growth also increase. The planting is done after pruning the plant. This practice is being used from generation to generation by most of the farmers in village Karwan, of Dausa district in Rajasthan. **Keywords**: cowdung, vegetative growth, mango, ber	Dr S. R Meena (Agricultural Extension), Central Institute for Arid Horticulture, Beechwal, Bikaner (Rajasthan) 334 006
125 (a)	Organic farming cultivation and coconut based land use system	The practices of organic farming cultivation and coconut based land use system developed by Shri. Kuppusamy are indicated. *Coconut based land use system:* About 150 coconut seedlings, 35 mango, 12 acid lime, 20 sapota, 15 guava, 40 *kariveppilai (Murraya koeniji)*, annual moringa, pomegranate, 120 teak and 35 neem are planted in 2 acre land. Coconut seedlings are planted at 30×30 feet distance. Mango seedlings are planted in the centre of every four coconut seedlings. In between young coconut seedlings teak, neem, thespesia, *subabul*, bamboo are planted. When the coconut tree matures cut the other trees after attaining the required girth (7–10 years). Mango trees raised through seeds grow fast and withstand adverse condition rather than graft. *Boosting of crop by organic manure:* The liquid manure prepared by boiling tamarind fruit juice and *vayvilangam (bidanga)* are applied to the root zone to boost the growth of the curry leaf. This practice enhances the flavour of curry leaf. *Ant colonies encourages the growth of trees:*	Shri Kuppusamy, Gengavaram, Kanakkankuppam, Gingee, Villupuram (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Coconut trees having ant colonies exhibit more growth. This may be due to availability of oxygen from ant colonies to coconut roots. *Deep soil profile encourages vertical growth of trees:* Deep soil profile without rocks encourages vertical growth of neem and teak. Rocky layers in shallow depth encourage more side shoots rather than vertical growth. *To induce coconut trees to bear nuts:* Coconut trees which did not bear nuts after 10 years of planting have been induced to yield by making 2" wide hole at 5 feet height of tree trunk (from the ground) by driller. The trees started bearing nuts from the following year. Coconut trees which yielded only slender nuts (90% nuts slender) were also treated by drilling a hole in the trunk. *Curing the wounds in trees:* Wounds or injuries caused to the bark of trees like jack, teak, Thespesia (due to various reasons like using hand hoe or crow bar etc.,) will lead to secondary infestation of fungi and damages in the outer coat of the tree. In order to set right the affected portion, coir pith and red soil are mixed thoroughly with little water. This paste is smeared over the affected portion and covered with polythene sheet. *Mixing bio-fertilizer with red soil*: Equal quantity of well rotten compost and red soil or tank silt are mixed thoroughly. Phosphobacteria and azospirillum are added and kept for 10 days. Application of this mixture to the field ensures good seedling growth. *Compost preparation*: Agricultural waste and farm yard manure are heaped for 5 months. Lime and tank silt are also applied. Water is sprinkled in a frequent interval. **Keywords**: organic farming, tamarind, curry leaf, ant colonies, neem, teak, mango, coconut, coir pith, water, azospirillum, red soil, agricultural waste, lime, tank silt, cow dung	
126 (d)	Coffee cultivation practices	The practices developed by Shri. Sundararaj, farmer of Thandikudi village, Dindigul district of Tamil Nadu for coffee cultivation are mentioned here. Lemon grass is spread over the nursery bed of coffee, after sowing the coffee seeds. Heat is maintained by this practice and quick germination is achieved. Farm yard manure is spread at a height of 6 inches in	Shri M. Sundararaj, Thandikudi, Kodaikanal, Dindigul (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		10×3×4 feet tank like made of asbestos sheet. Four inches jack leaves and 4 inches waste berries are also spread over the farm yard manure. Again farm yard manureis spread at 6 inch height followed by drumstick leaves to 4 inch and coffee waste to 4 inch height and finally covered by gunny bags. After 3–4 months it is ground and made a powder. This powdered compost is applied to nursery beds. **Keywords**: lemon grass, coffee seeds, waste berries, farm yard manure, asbestos sheets, jack leaves, drumstick leaves, compost, gunny bags	
126 (a)	Paired row system of coconut planting	Shri. Venkatachalam, farmer of Malayandipuram, Dindigul district in Tamil Nadu has developed paired row system for planting coconut. There is 40 feet spacing between 2 rows in pair. The seedlings are planted in rows in a zig-zag manner to reduce the competition between the trees. In this paired row system more than 25 seedlings are planted when compared to other method of planting. In between the pairs intercrops are grown. **Keywords**: paired row system, coconut seedlings	Shri M. Sundaramati, Sr. Lecturer, Faculty of Agricultural Rural University, Gandhigram (Tamil Nadu)
132	Rodent control in coconut	Empty fertilizer polythene bags are placed around the coconut tree at a distance of 7–10 feet.This practice is used to control rodents, by the farmers of Mettupalayam, Coimbatore district in Tamil Nadu. **Keywords**: coconut, rodent control, polythene bag	Shri N. Sadhasivam, Veerapuram, Mettupallayam, Coimbatore (Tamil Nadu)
176	Use of waste tea powder as manure for jasmine	Used tea powder is mixed as a manure with farmyard manure for jasmine. The manure is applied at the base of the plant. This practice helps in obtaining higher yield and big-sized flowers. Incidence of pest damage, particularly by insects, is reduced. Thirty flower growers of Kuranoor Thottam village of Coimbatore district of Tamil Nadu are using this practice for 5 years. **Keywords**: tea waste, pest control, higher yield, jasmine	Shri S. Yuvaraj, Kuranoor Thottam, Medur, Mettupalayam, Coimbatore (Tamil Nadu) 641 113
177	Manure from coconut waste	Manure is prepared from wastes of coconut by putting it in compost pit. With this practice, cost for purchase of fertilizer is avoided. Also pest and disease occurrence is minimized. This is being practised by two farmers of V.K. Palayam village of Erode district in Tamil Nadu. **Keywords**: coconut waste, compost pit, manure	Shri S. Sakthivel, 7/1 Kumarapuram,V.K. Palayam Sivagiri, Erode (Tamil Nadu) 638 109

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370	Sprouting in yam by cowdung slurry	Tuberous roots of yam are divided into many pieces, weighing about 150 to 200 gm, dipped in freshly prepared cowdung slurry, dried in shade and kept in sand for sprouting. This results in sprouting within 5–6 days, giving 100% germination. Application of cowdung slurry prevents the entry of microorganisms, loss of moisture from the cut ends and supply the nitrogen; required during initial stages. By this practice the farmers get additional income of Rs 10,000 per acre over planting only tops of the tuber. It is being followed by almost all the yam-growing farmers in Benakunda village of Ganjam in Orissa. **Keywords**: yam, germination or sprouting, cowdung slurry	Shri Narendra Bisoyi, C/o Binayak Bisoyi, Bhanja Nagar, Gangam (Orissa) 761 126
380	Seed extraction in tomato by using rice bran	Ripened tomatoes of elite varieties are squeezed by hand on well- spread rice bran @ 1 kg rice bran for 1 kg seed extraction. After thorough mixing and drying  Tomato seed extract using rice bran for 24–48 hours, the bran is separated from the mixture by hand winnower. Healthy and clean tomato seeds are preserved. All 100% tomato-growing farmers are adopting this practice in Khairmal and Dumal villages of Kalahandi in Orissa. **Keywords**: tomato, seed extraction, rice bran	Shri Dilip Kumar Bastia, Scientist, RRTTS (OUAT) Bhawanipatna (Orissa) 766 001
391	Lemon juice as a substitute of hydrochloric acid for tomato-seed extraction	For 100 g manually-extracted wet seed of tomato, lemon juice of 2 fruits is added and is kept for 2–3 hours. Later the seed is washed properly and dried under shade for 4–5 hours. Lemon juice works as a substitute of hydrochloric acid, which results in 100% germination and cost is also low. Almost all the tomato-growing farmers of Benakunda village of Ganjam district in Orissa follow this practice. ***Keywords***: lemon juice, tomato-seed extraction	Shri R.C. Bisoyi, C/o Shri Udayanath Bisoyi, Benakunda, Dithapadhal, Ganjam (Orissa) 761126

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444	Preservation of *tal saj* (tender palm nuts) by green *karanja* leaves (*Pongamia pinnata*)	The tender palm nuts are covered with soft green leaves of karanj to avoid spoilage by drying, dehydration and micro-organism. It provides coolness to the nuts for 1 or 2 days, which otherwise get converted into hard pieces. **Keywords**: *talsaj*, preservation, *karanj* leaf	Shri M. Mohanty, Senior Research Fellow, Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
447 (n)	Tissue-cultured banana	Rathindra KVK has introduced tissue-cultured banana in Birbhum district of West Bengal. **Keywords**: tissue culture, banana	Dr Dulal Chandra Manna, Rathindra KVK, Srinikethan (West Bengal) 731 236
447 (k)	Rodent control	Tyre is cut into pieces resembling snake,which are spread in the field to frighten the rodents in vegetable crops. **Keywords**: tyre, snake	Dr Dulal Chandra Manna, Rathindra KVK, Srinikethan (West Bengal) 731 236
538	Underground storage of potato and citrus fruits	The underground technique is for storage of potato and citrus fruits. It is believed that low temperature of earth can protect the stored crop from rotting. A 3–4 feet deep pit is dug. Base and walls are well covered with a layer of dry grass. After putting the harvested crop in the pit, it is covered with a layer of grass. After that the pit is well covered with soil. By this method the crops like potato, colocasia and citrus can be stored for a season without rotting. **Keywords**: storage of tuber crops and citrus fruits	Shri Madhavanand Joshi, Salla, Shitalakhet, Almora (Uttaranchal)
883	Apricot drying on the tree	Farmers in high-altitude, dry areas of Kinnour district of Himachal Pradesh do not harvest fresh apricot at harvesting period but are allowed to dry on the tree itself. Due to very low relative humidity the apricots dry well on the trees. Dried apricots are of excellent quality, not obtained even after adopting modern techniques of drying. This practice enables the avaibility of fruits in all seasons, specially when there is no supply of fruits to this region. It is adopted by maximum number of farmers. **Keywords**: apricot, harvest, relative humidity	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1081	Mulching in potato	To reduce weeds and maintain moisture level in the field, the farmers of Burhaoo village in Siddharthnagar of Uttar Pradesh follow the practice of covering the field with paddy straw after sowing potato. This has found to have an increased yield of 10–15%. About 70–80 farmers have adopted this	Dr Ashok Kumar, Training Associate (Horticulture), KVK, Sohna, Siddharthnagar (Uttar Pradesh) 272 193

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		 Mulching in potato practice and it is used for the past 15–20 years. Some farmers are not aware of the advantage of mulching and the traditional practices like weeding and earthing are being followed. **Keywords**: potato field, covering with straw, reductiion in weeds, moisture conservation	
955	Indigenous greenhouse condition for grapevines	Under severe, cold desert condition, farmers of Nubra valley in Himachal Pradesh grow grapes by creating a warmer microclimate by localized green house condition. Within the green house, warmer niches are located for grape cultivation. Vines are grown in pits by regulating the temperature of the basins. Pits are filled with locally available crushed stone, branches, grass, hay and soil. This warms up the microclimate of the basin, which is otherwise cool due to the sandy soils. The vines are also covered with clothes, gunny bags or wooden baskets for protection against cold during the first one to two years. **Keywords**: grape cultivation, green house condition, pits, basins, regulate temperature	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1150	*Sheetal* for preservation of vegetables and fruits	The preservation of vegetables and fruits by *Sheetal* is very useful. *Sheetal* keeps the vegetables and fruits fresh for several days during the summer season. It keeps temperature low by absorption of heat. *Sheetal* is made of two earthen pots, one big and one small. The small pot with vegetables and fruits is placed in the bigger one and clean water is filled between the space of the two pots. *Sheetal* is then placed in a heap of sand. It keeps the temperature low.The materials used in *Sheetal* are of low cost. The total cost will not be more than Rs 15. *Sheetal* can be used for 15–	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025

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		 Sheetal for preparation of vegetables 30 days, after which the pots need to be changed. This practice is in use in many villages in Badaun and Bareilly districts of Uttar Pradesh. **Keywords**: low-temperature, fruit and vegetable storage, *sheetal*	
1432	Nutrient management in vegetable crops	The waste water from washing of fishes is used for irrigation purpose in vegetable crops especially in pumpkin. This practice enhances crop growth and fruiting. Farmers of Khalisha village of Bhojpur district of Bihar are adopting this practice since several years. **Keywords**: waste water, washing of fishes, pumpkin, crop growth, fruiting	Shri Ranjay Kumar Singh, Boys Hostel No. 1/311, Birsa Agricultural University, Ranchi (Jharkhand) 834 006
2305 (c)	Management of fruit and vegetable crops	Indigenous practices for raising fruit and vegetables crops are given below. Mango (*Mangifera indica L.*) is one of the most important garden crops of the district earning foreign exchange. Alphonso is the well known variety having large area in the district. The traditional cultivation practices followed are described below: *Plantation of mango*: Almost all the farmers construct a small circular stone wall gadga around the tree trunk by strong winds. On *katals* (bare rocks) mango plants require most care in the early stage. Earthing is done regularly to give support and also to provide sufficient ground for the feeding roots to grow and develop. After earthing, a small circular stone wall gadga is constructed to support the	Dr N.D. Tawade, Professor and Head, Department of Extension Education, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (Maharashtra) 415 712

tree against strong winds from southern and the western sides.

Manures and fertilizers: In a pit (approximately

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		1 × 1 × 1 ft. size) a mixture of tree leaves of *ain (Erminalia tomentosa), kuda (Holarrhena antidysenterica), kinjal (Terminalia paniculata)* and dried cow dung is spread to form a thick layer, over which a mixture of salt and ash in the proportion of 1 : 2 kg is applied. The farmers follow this practice at the time of plantation of grafts to prevent termite attack and better start of the planted grafts. *Application of mud derived from khajawan*: For better development of tree, farmers use mud derived from khajawan to mango tree. They also apply approximately 2 kg dried powder of haid fish (Sardinella longiceps) near root zone. Sometimes application of fresh haid fish near root zone by digging the soil is also practiced as a good fertilizer to mango crop. This practice is generally done in the month of June, that is, before the commencement of rain. *Application of fertilizer prepared from human excreta* : Some of the sample farmers burry excreta near root zone in the month of September as a fertilizer to the crop. *Application of fish manure*: Most of the farmers apply approximately 2 kg of dried fish powder in a circular trench around tree trunk in the month of September. It is the most popular method adopted for early fruit bearing in mango. Before flowering (i.e. in the 2nd week of October) farmers apply dried cow dung or shenki along with black salt in 3 : 1 proportion around the tree trunk in circular trench. The black salt is added so as to prevent the attack of termites. The quantity of above said preparation varies as per the age of the tree. For small trees (up to 5 years) it is 4 to 5 kg and for big trees (above 5 years old) it is 10 to 12 kg. Only two irrigation at an interval of 4–5 days are given after this practice and later on no irrigation is given to the orchard. III. Insect, pest and disease management. *Application of cow dung slurry*: Most of the farmers apply cow dung slurry on the tender leaves of newly planted grafts to avoid the damage by stray cattle. *Spraying of cow urine*: Some farmers use fresh cow urine for spraying on tree trunk where termite attack is observed. *Dusting of ash along with gamexin powder*: For	

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		control of red ants, some farmers dust the ash mixed with gamexin powder in proportion of 2 : 1 on ant nests. *Use of neem extract for control of mango hopper*: Some farmers use extract of neem tree leaves (*Azadirachta indica*) for control of mango hopper. A spray solution in 1 : 3 proportion i.e. 1 part of neem extract along with 3 parts of water is prepared for spraying on blossom. The farmers argue that neem extract acts as a repellent and anti- reproduction agent in mango hoppers. *Dusting of cow dung ash for control of khar (powdery mildew)*: The farmers dust cow dung ash on small developing fruits by hand. After *rathsaptami* (by the end of January) velocity of wind increases which minimizes the possibilities of incidence of *khar* attack. *Fumigation*: For reducing fruit drop in mango, traditionally most of the farmers adopt this practice. In this practice, the dried tree leaves are collected in a heap form at various places, scattered all over the orchard, a day before setting the smoke in the orchard. Next day, in early morning hours, the smoke is prepared by setting fire in the collected tree leaves at various places in the orchard. Farmers told that this practice reduces fruit drop in mango. *Removal of the bark to control fruit drop*: This is another method followed for control of fruit drop. If fruit drop is observed in mango, the farmers remove outer cover (bark) of tree trunk of 2 to 2.5 cm width in a circular manner. The farmers believe that the practice reduces fruit drop in mango. *Application of large quantity of water*: Some farmers applied large quantity of water to reduce fruit drop in mango. *Girdling*: To reduce fruit drop in mango some farmers practice girdling method in their orchard. The practice is as follows. In September 2.5 to 3 cm wide bark is removed at 3 to 4 feet height from the base of the tree. A copper wire is tied on the exposed stem by taking two rotations of copper wire, above which a strip of black cloth is tied tightly. The farmers believe that the natural lightning, affects copper wire positively due to which the tree bears good quality fruits. The black strip is tied on the girdled part at the end to avoid the entry of insects, pests, fungi or	

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		water into the exposed part. This practice results in lowering down the rate of fruit drop, thereby increasing the mango yield considerably. *Application of stem extract of dinda:* At the time of harvesting to avoid red ants, the framers apply extract of the stem of dinda tree (*Leea macrophylla*) on exposed body parts. The extract is very sticky in nature due to which mouth parts of red ants get into it ultimately protects the harvester. *Use of ash is to protect mango harvester from red ants:* This is the another practice followed very commonly to protect the mango harvester from red ants injury. The mango harvester applies ash all over the body at the time of harvesting of mango. *Prediction about bearing of mango:* Some farmers believe that whenever *chinch (Tamarindus indica)* production is more, in the same year production of mango is less and vice- versa. *Coconut:* (Cocus nucifera) gardening is usually concentrated on the sandy soils of the coast, but it is also found in the interiors. Most of the gardens are pretty old and therefore, cultivators have mainly to look after their maintenance, which consists of (1) replacing old palms, (2) cleaning and weeding, (3) manuring, (4) irrigation and (5) pest control. Traditional technologies used by the farmers are described here under. *Nutrient management:* Before the onset of monsoon, most of the farmers apply FYM or twigs of trees like *bhad or karanj (Pongamia pinnata)* in a circular trench around the palm, as a manure. *Application of salt to the palm:* Before the onset of monsoon, some farmers apply approximately ½ to 1 kg black salt (*khadi meeth*) per palm in a circular trench near root base and then cover with soil. The quantity of black salt to be applied varies as per the age of the palm. *Application of fresh fruits of kumbhal*: For more fruiting of coconut, some farmers burry approx. 10 to 15 kg fresh of *kumbhal (Sideroxylon tomentosum)* near root zone of the palm in a circular trench. The farmers told that this practice enhances fruit bearing in coconut. *Insect pest control*: For reducing incidence of rhinoceros beetle, most of the cultivators kept gardens clean and, the beetle is pulled out from the affected	

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		palm by means of iron hook and then holes are plugged with sand. *Plantation of sonchafa in the vicinity of coconut orchard*: In case of coconut and arecanut, male and female flowers do not mature at the same time. Therefore, fertilization is based on cross pollination by agents like honey bee. The natural cross pollination process by wind is accelerated by establishing honey bee colonies in the farm,. Hence most of the farmers planted sonchafa in the vicinity of coconut and arecanut orchards. The aroma of the *sonchafa* attacks honey bees in the orchard, resulting into maximum pollination. *Extraction of neera to increase coconut yield*: Some traditional farmers argue that when a coconut palm is left for extraction of neera, it increases the life span of coconut palm and after discontinuing this practice, they observed increases in fruit quantity on palm than the previous years. *Arecanut*: Arecanut (*Arecah catechu L.*) or *supari* is also an important garden crop in Ratnagiri district and broadly, the principles involved in the upkeep of arecanut gardens are similar to those for coconut gardens. But as many of these gardens are situated on varkas lands, more care is taken with regard to watering, manuring, control of pests and diseases. The traditional practices followed by the arecanut growers are described here under. *Manuring*: For increasing the yield of arecanut and also coconut, some farmers dig soil around the palms and burry 25 to 45 kg pieces of *nivdunga* (*Euphorbia neriifolia*) cactus or *hurya* plant (*Sapium insigne*) or *kuda (Holarrhena antidysenterica)*, or *rui (Calotropis gigantean)* plants in the soil in circular manner. Due to this practice, yield of nuts increases. The farmers believe that any plant species having natural ooze or gum secretion nature, when applied to arecanut or coconut palm during monsoon season, results in production of more nuts. *Control of cracking of arecanuts*: When cracking of arecanuts in observed on the palm, some farmers follow the following practice. During the month of October-November, ½ to 1 inch size hole is bored on the trunk of the palm upto inner core, 3 to 4 inches from the base. This practice results in checking the extra nutrient uptake, which finally leads to control	

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		of nut cracking on the palm. *Plantation of tall tree species to prevent sun scorching in arecanut* : Sun scorching in arecanut, locally called as *dakshin lagane*, is observed due to intense sunlight from southern side and also due to the thin delicate nature of stem itself. To prevent this, some farmers plant tree species having tall growing habits such as suru, Acacia species or karanj (*Pongamia pinnata*) etc. on the southern side of orchard. Removal of outer seed coat of arecanut for early drying and better quality nuts. After harvesting of arecanut fruits, the thin delicate outer coat of nuts is removed from three sides using a local sickle and then the nuts are dried in the sunlight. This practice results into early drying and better quality nuts for storage. *Banana*: Banana (*Musa parodisiaca*) is grown on small scale in the district, mostly in the kitchen gardens. Traditional practices adopted by the cultivators are given below. *Removal of flower cone to increase size of bananas*: Most of the farmers follow this practice to increase the size of bananas. During bunch development phase in banana, after 10 days of formation of tender fruits, the flower cone is removed. To prevent oozing of the plant sap, a polythene bag filled with 50 g of ash mixed in 100 ml of water is hung at the tip of the bunch. Farmers told that this practice ensures production of larger size fruits. *Application of lime for early ripening*: For early ripening in banana, some farmers apply *chuna (lime)* on the banana fruits. This also ensures a good yellow colour. *Burning of soil to control bunchy top disease of banana*: Most of the farmers remove all the infected suckers from the field. Then the soil is dug and exposed to sunlight for two days. Later, *bhusa* (saw dust) is spread on the infected area and fire is set for slow burning of soil. This practice controls occurrence of bunchy top disease in banana. For protecting banana fruit bunch from monkeys, some farmers tie a jute or gunny bag around the fruit bunches in the garden. *Jackfruit*: Jackfruit is one of the important fruit crops of the region, holding a prominent place in peoples diet. Some of the traditional practices	

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		followed by the farmers are given here under. *Application of cow urine and smoke treatment for better jackfruit production*: Some farmers apply approximately one liter of cow-urine regularly near the trunk of the jackfruit tree at a weekly interval Before the flowering stage, smoke treatment is given to the tree. The smoke is prepared by burning *dhup* (Indian copal) and dried cow dung powder near the tree trunk, 2–3 days after application of cow-urine. This practice results in increasing the yield of jack fruit considerably. *Growing black pepper*: Some farmers trail the wines of black pepper on jack fruit trees. According to them, by this practice black pepper yields more. *Cashew*: Cashew is one of the commercial crops as important as alphonso mango. No much attention is paid once the seedlings get estabilished.Use of outer seed coat of cashewnut seed coat as a repellent to snakes. The fumes generated by burning of cashewnut seed coat in the houses is believed to keep the snakes away. *Vegetables*: Vegetable cultivation is mostly limited to the period commencing from post paddy harvesting to the end of February. Due to heavy rainfall in the district, *kharif* season is not suitable for vegetable cultivation. Vegetable are also taken as intercrops in the gardens, which explains the absence of uniform cultural operations in the district for a particular vegetable. As a result, large scale cultivation of vegetables is rarely found. Traditional technologies used by the farmers cultivation of vegetables are described in detail in the following paragraphs. Brine solution treatment for *bhindi* (okra) seeds. Before sowing of the okra seeds, farmers give brine solution treatment to seeds. The seeds of okra are soaked in brine solution prepared by dissolving 100 g salt in 1 liter water, for an half hour. Later, the seeds are dried in shade and used for sowing, which enhances okra yield. *Seed treatment for chilli*: Some farmers dry the seeds of chilli in sunlight and store in an amber coloured glass bottle. At the time of sowing, the seeds are once again exposed to sunlight for 10–15 minutes and then soaked in water for half an hour and used for sowing purpose. This treatment retains viability of seed.	

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		Manuring: In case of brinjal and chilli, the farmers apply fresh/dried cow dung along with water through irrigation water channel, before commencement of flowering. The farmers argue that it reduces evapo-transpiration and adds nutrients to soil. *Intercropping*: Some farmers sow the *harbhara* (chickpea), in the main crop of watermelon. Chickpea fixes atmospheric nitrogen in the soil, which is utilized by watermelon crop and results in increasing watermelon yield significantly. *Insect, pest and disease management*: Plantation of marigold on the bunds of vegetable field. Some of the farmers grow marigold crop on the bunds of vegetable crops, to prevent insect pests attack. Due to cultivation of marigold, insect pests get attracted towards marigold crop and thus, ultimately saves the main vegetable crop from insect peat attack. Marigold cultivation also enhances pollination in the main vegetable crop and results in increasing the yield appreciably. *Placing of earthen pots painted with white lime in between the crop*: In watermelon or vegetable fields, some farmers place *madaka* (an earthen pot) painted with white lime in between the crop. Farmers told that due to this, the insect pests get attracted towards the earthen pots and ultimately save main crop by diverting attention. *Control of mar (die back) and holim (stem borer)*: Before planting of chili and brinjal seedlings, the farmers dip the roots of seedlings in a solution prepared by the mixing 15 liters of cow dung water and 100 g asafoetida powder for half an hour. This practice results into control of stem borer and dieback disease. *Insect, pest and weed management practice for chilli*: Most of the farmers follow this practice in chilli crop. During transplantation of chilli i.e. when seedling is 25 to 30 days old, drills are prepared at a distance of 20 cm apart in the plot. In these drills, alternately a mixture of ash and vari (*Panicum miliaceum*) in equal proportion is applied and then immediately chilli seedlings are transplanted in these drills. In the alternate drills, where seedlings are not transplanted, leaves of kuda (*Halarrbena antidysenterica*) are buried, also twigs of kuda are placed in between the crop. The stem borer gets	

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		attracted towards *vari* and ultimately saves the crop from pest infestation and also due to bitterness of kuda leaves, the stem borer infestation is reduced appreciably. Application of kuda leaves, after decomposition, results in improving soil fertility. *Dusting of ash for control of powdery mildew*: Most of the farmers dust ash for control of bhuri (powdery mildew) disease on cucurbitaceous crops. *Preservation of various kinds of yams and rhizomes of turmeric*: The farmers follow the following practice for storage of various kinds of yams and rhizomes of turmeric for seed purpose. A pit of 1×1×1 feet size is dug, then at the bottom of the pit *rangoli* (white sand) is spread in a layer of 1½ inch thickness. Thereafter, the rhizomes or seed yams are placed in the rows in the pit again covered with a thin layer of *rangoli*. Finally, the pit is covered with soil. This process preserves rhizomes or seed yams in good and viable condition. *Seed storage*: Farmers stick the seeds of cucurbitaceous crop on the inner side of house walls, for sowing during next season. Cucurbitaceous crops seeds are gelatineous in nature, which easily stick on the walls and are also saved from attack of insect pests. *Protection against storage pests*: For storage of seeds of cucurbitaceous crops, the farmers store seeds, mixed with ash and soil, in small earthen pots. Later, the pot is covered with soil paste. The seeds remain good, viable and free from storage infestation. **Keywords**: mango, banana, arecanut, jackfruit, coconut, vegetables, cultivation	
2065	Beating boards to scare away the birds	Farmers in Kandisa village of Srikakulam district in Andhra pradesh beat the boards in orchards to scare away the birds from the orchards. The sound from beating boards makes the birds fly away, finally resulting in reduction in number of damaged fruits in the orchards crops. **Keywords**: beating boards, birds scaring	Shri K. Lakshmana, Ph. D Scholar, PG Hostel, College of Agriculture, ANGRAU, Rajendranagar, Hyderabad (Andhra Pradesh) 500 030
2132	*Guddeli* to uproot ginger	Good harvest with total recovery of ginger with less power is obtained by use of *guddeli* at harvest. It is easy to operate and cost of operation per hour is 300. The cost of *guddeli* is Rs 60 per piece. *Keywords*: *guddeli*, ginger harvest, total recovery	Shri Pandu, Girgitpally, Vikarabad, Rangareddy (Andhra Pradesh)

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12	Seed treatment in cucurbits with cow milk to reduce bitterness and enhance germination	The seeds of cucurbits (*karela*, Lauki, *kakri*) are soaked in cow milk for 5–6 hours to reduce the bitterness, to get good quality, and improve the germination up to 15–20%. It boosts up the plant in early stage of growth in cucurbits. It is economical, socially acceptable and environmentally safe. It is being followed in Amortiya village of Hindoli taluk in Bundi district in Rajasthan. **Keywords**: cucurbits, seed treatment, cow milk	Shri Moolchand Jain, Associate Professor (Horticulture), Post Box No 4, Bundi (Rajasthan)
17	Dusting of ash on chilli for control of aphids	Ash collected from the *chulha* is sieved into a fine powder and dusted on the chilli crop with a piece of gunny cloth. This ash effectively controls the aphids on chilli crop. It is being practised in Khardosan village of Deesa Taluk in Banaskantha district of Gujarat. **Keywords**: ash, chilli, aphid control	Training Organizer, Krishi Vigyan Kendra, Gujarat Agricultural University, Deesa, Banaskantha (Gujarat) 385 535
24	Dusting of ash on onion for enhanced growth and disease resistance	In Jhunjhunu district of Rajasthan, onion is grown as a major crop during *rabi*. Farmers of Menpura use the practice of dusting ash on the standing crop of onion for better growth and disease control. They have been getting 20–25% more yield and 10–15% improvement in the keeping quality of onion due to this practice. Farmers are also adopting the practice to dust ash in nursery on the seedlings. Ash is obtained either from their own houses or from the village. Villagers use cow dung cake, wood sticks etc. as local fuel. **Keywords**: ash, onion, garlic, keeping quality	Villagers of Menpura Village, Udaipurwati, Jhunjhunu (Rajasthan)
154	Pest control in coconut and quality control in banana	1. Copper coin is put in the pit at the time of coconut planting. It controls the soil-born diseases and insect pests. 2. For quality control in banana, bunch of banana fruit is covered by its leaves. It helps in improving fruit quality, fruit colour and avoids cracking of banana fruit.These two practices are being in use by 50% of the villagers in Nagercoil of Tamil Nadu Keywords: copper coin, coconut, soil-borne diseases, banana, quality	Smt Anandham, W/o Shri Xavier, Ramapuram, Nagercoil, Kanyakumari (Tamil Nadu)

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156	Control of Oryctes rhinoceros beetle in coconut	For control of Oryctes rhinoceros beetle in coconut, 30% farmers of Ozhuginasery Graman village in Kanyakumari district of Tamil Nadu keep leaves of *kollinchi (Tephrosia purpurea)* **Keywords**: rhinoceros beetle, *Tephrosia purpurea*	Shri Krishnaswamy, House no. 19 Ozhuginasery Graman, Nagercoil, Kanyakumari (Tamil Nadu)
159	Control of rhinoceros beetle in coconut using castor	Coconut trees are generally affected by rhinoceros beetle (*Oryctes rhinoceros*). The pest is controlled very effectively by using castor oilcake mixed with rice soup. Castor cake is mixed with rice soup or water in a mud pot. The pot with the mixture is buried in the soil with its mouth open at soil level. Keep this in the field for a period of 1 week. As the mixture gets fermented, it develops a smell, which attracts the beetles to the pot, resulting in the death of beetles. Pest infection in coconut by red palm weevil, is also reduced by this method. About 15% of the villagers are using this technique. Coconut yield improves if they are free from beetles. This is in practice in a village at Pathanamthitta district in Kerala. **Keywords**: rhinoceros beetle, coconut, castor cake, rice soup, red palm weevil	Shri Thomas Mathew, Nehru Yuva Kendra Pathanamthitta (Kerala)
162	Local remedy for the control of bud rot in coconut	Bud rot occurs in all coconut growing states which caused by the fungus *Phytophthora palmivora* and *Phytophthora meadiaii*. Farmers apply a mixture of ash, salt and powder blue in equal proportions, after removing the decayed portion of the crown. Since salt is fungistatic in nature and in higher concentrations, it can arrest fungal growth. Powder blue has disinfectant quality. Ash, salt and powder blue in equal proportion acts as a fungicide. The disease incidence is very severe during monsoon in arecanut and coconut trees. About 70% of the arecanut farmers spray 1% bordeaux mixture to control both bud rot as well as *mahali* (a disease affecting the nuts). Government may take some steps to popularize this technique since this is found to be very effective. About 75% of the farmers are using this practice. This has been in use since 25 years. Earlier powder blue was not added, but over the years this mixture is modified by adding powder blue. The practice is found in Kasaragod district of Kerala. Keywords: ash, powder blue, coconut bud rot, *mahali disease*, arecanut	Shri Lukose Kadalikkatil, KRIPA Palavayal, Kasaragod (Kerala)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
237	Control of leaf and flower eating pests of cucurbitaceous plants with wood ash	The leaf and flower eating pests of cucurbitaceous vegetable crops are controlled by dusting wood ash. The ash is sieved before use. The dusting is repeated two or three times depending on the level of attack or infestation. Ash with sharp physical structure prevents the insects from feeding on the leaf. In Thanjavur district 95 farm families are using this practice. **Keywords**: wood ash, leaf- and flower-eating pests, cucurbitaceous crops	Ms R.Rajeshwari, Training Associate, BMT Krishi Vigyan Kendra, Usillampatti, Manayerripatti, Sengipaati, Tanjavur (Tamil Nadu) 613 402
352	Control of fruit and shoot borers by using *vaira* root extract in vegetables	Fruit-and-shoot borers in vegetables (brinjal and cabbage) is controlled by spraying the extract obtained from 10 to 12 kg of *vaira* root and diluting with 500 litres water. About 60 to 70% farmers are adopting this practice for the last 20 years. *Keywords*: fruit and shoot borer, brinjal, *vaira* root extract	Shri Balabhadra Naik, Pakjhola, Koraput (Orissa)
360	Control of pests and diseases in vegetables by application of soap and kerosene	One soap cake is dissolved in 10 litres kerosene. The solution is sprayed with a broom on the infested field 30 to 40 days after sowing to control the insect pests in solanaceous crops. About 50 to 60% farm families are following this practice for a long period with 30 to 40% effectiveness in Makarbili village of Nawapada in Orissa. **Keywords**: pests and diseases, vegetables, soap cake, kerosene	Ms B. Behera, Department of Agril. Economics, OUAT,Bhubaneshwar (Orissa) 751 003
399	Control of fruit and shoot borer in brinjal by using *ranbeli* tree bark	Finely ground bark of *ranbeli (Feronia hyperthusa)* tree (12–13 kg) is soaked in 50 litres water for 8 to 10 hours, and this solution is dissolved in 500 litres water to cover 1 hectare of brinjal crop. This increases the yield by 20% over untreated plot. *Ranbeli* bark extract is 80% efficient as compared to recommended practices, because the chemicals present in the bark of *ranbeli* reduces the fruit and shoot borer incidence. It is being used by 50 to 60% Karmers in Pakjhola village of Koraput district in Orissa. **Keywords**: *ranbeli bark* extract, brinjal fruit and shoot borer	Shri Satyaban Naik. Pakjhola, Semiliguda, Koraput (Orissa)  Ranbeli–a plant used for controlling fruit and shoot borer in brinjal

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
462	Use of ash for control of pest infestation in Cucurbitaceae family	The farmers of Chumukedima, Sethikema, Bade, Sovima etc. under Dimapur district of Nagaland use ash for control of pest infestation in vegetable crops belonging to Cucurbitaceas family (bottle gourd, cucumber etc). In this practice, ash is dusted over the leaf in the early morning before the dew-drops over the leaf are dried up. The ash thus gets stuck on the leaf and prevents the insect pest to have direct access to the leaf. The dusted ash also acts as a repellent for the insects. Thus the proper growth of the plant is achieved without much damages caused as these insects normally start their attack through the leaf. This practice has a very good effect and is reported to have been able to control the insect infestation up to 50%. Deep ploughing is also another method to kill the insects and pests in the soil as well as to provide exposure of the soil to the sun. All the farmers growing these vegetables, which roughly constitute about 30% of the village population, follows this practice. This practice has been in use since time immemorial with no major modifications. **Keywords**: ash, pest, deep ploughing, cucurbitacea, dew-drops, dusting, repellent	Shri A.K. Khan, Technical Officer (T6), ICAR Research Complex, Jharnapani (Nagaland) 797 106
467	Use of molasses to control fungi in coconut	In this practice, mollases (uncrystallized syrup drained from raw sugar) is applied into the crown of coconut to prevent growth of fungi. This is widely practiced by the farmer of No. 2, Serfanguri village under Gossaigaon block in Kokrajhar district of Assam. Application of lime is also followed as an alternative method. The practice has been in use for the past 15 years by all the farmers. **Keywords**: molasses, crown of coconut, fungus	Shri Kudrat Ali, Serfanguri No-2, Gossaigaon, Kokrajhar (Assam) 783 360
482	Use of *puthi* fish to control fruit and shoot borer in brinjal	A few farmers of Basugaon village in Kokrajhar district of Assam have adopted a method to control fruit and shootborer in brinjal (*Barbengene,* Pusa Purple varieties). In this practice, a fish called puthi (in Assamese) is allowed to rot in earthen pot and the liquid is used, which acts as insect repellent. Other chemicals like Phavate or Fuvadone granules @ 2.5 g/plant are also used. The practice is in use for the last 8 years by very few farmers, because many farmers are yet to be convinced of it. **Keywords**: *puthi* fish, brinjal, fruit and shoot borer	Shri Mukul Das, Basugaon, Kokrajhar (Assam)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
520	Control of root and stem borer of apple by tobacco *tar*	Tobacco contains nicotin which is sedative at lower level and poisonous at higher level, Tobaco is used for killing shoot borer in apple. When the infestation of shoot borer is observed on apple trees, farmers use the tobacco tar for its control. The tar is collected from the smoke pipe and filled in the bores with the help of a stick (sink). The pest is trapped inside and dies due to suffocation. This method is cheap and locally available.The *tar* is the residue of the smoke pipe. **Keywords**: shoot borer, apple, tobacco, tar	Shri Govuind Singh Rana, Sukhi, Jhala, Uttarkashi (Uttaranchal)
524	Control of insects in vegetable through roots of *hardang* plant	For control of insects in vegetables the juice of the roots and stem of *hardang* plant is sprayed on vegetables. It is supposed that the basal part (root and stem) contains some toxic chemicals that kill the insects. The root and stem of the plant are crushed and mixed with water and sprayed over the vegetable crops. If the intensity of insect is severe then the juice prepared from the roots and stems is directly sprayed on the crops without diluting with water. The effectiveness of this herbal pesticide is claimed to be very high. The plant used in this practice is a herb and grows abundantly in the forests. People collect it from the forest free of cost. **Keywords**: *hardang*, extract, spray	Shri Shambhu Prasad, Saimwal Triyugi Narayan, Chamoli (Uttaranchal)
527	Use of fine yellow soil for treatment of stem disease in apple	Yellow soil contains some anti-fungal compound which is used to control stem disease in apple. The affected part of the tree is scraped, a paste of fine yellow soil is applied and tied with a cloth. The stem disease of apple is cured. The method is highly cost effective. **Keywords**: fine yellow soil, stem disease, apple  Stem disease infested apple tree	Shri S.P. Saimwal, Triguninarain, Chamoli (Uttaranchal)

Code No	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
681	Ash as pesticide for vegetable crops	Wood ash or cowdung ash is spread over or around the vegetables, pasted on the seeds of various crops and mixed with soil for controlling the insect pests in crops. Ash suffocates the eggs and larvae of insects and prevents the contact of adult insect pest on the leaves. This enhances productivity of the crops. In most of the villages in hilly area, farmers use dried cowdung and wood for fuel purpose. The ash obtained is spread over the soil and around the vegetables with hands. Some times farmers sieve the ash before putting or spreading the ash on onion and garlic plants. This ITK, which is cheap and eco-friendly, is in practice in most of the villages in hilly mountain terrain of Himachal Pradesh since time immemorial. **Keywords**: wood ash, spreading, pest control	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
683	Innovative methods against vegetable pests	To prevent vegetables from attack of caterpillars, lighted earthen lamp having mustard oil (mitti ka diya) is placed near the base of the vegetable stem tendril, eg. *ghia kaddoo (Cucurbita pepo), ghia tori (Lufffa aegyptiaca*) in the evening. To check fruit dropping in cucurbits, an oblique cut with the help of knife is made in the stem. A small amount of hing (*Asafoetida narthax*) is put into it and the portion is wrapped with polythene bag. **Keywords**: vegetables, caterpillar attack, earthen mustard-oil lamp, prevent, fruit dropping, cucurbits, cut, hing	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
684	Use of ash in vegetables against insect pests	Dusting of chulha ash on vegetable crops control insect pests, viz. beetle, leaf-defoliating insects, minor thrips and aphids. Control is done by the growing vegetables on small scale. Ash acts as a detergent. The chewing and sucking type of insects find it difficult to chew plants due to deposition of ash. Ash also contains certain minerals which act as insect-pest repellant. Spreading of *chulha* ash is done on standing vegetable crops like onion, okra, brinjal, tomato and cucumber to protect them from attack of insect pests, mainly from pumpkin beetle, hadda beetle, leaf defoliating insect, leaf minor, thrips and aphids. *Chulha* ash is easily available in every house. However, chemical insecticides are not practised in the kitchen garden because they can not afford the costly chemicals.Farmers of Hamirpur district mainly grow vegetables on small scale in kitchen gardens.	Ms Krishna Hetta, Senior Research Fellow, Mountain Research Development Associates, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: *chulha* ash, vegetable crops, control of pest, cheap, detergent, repellent	
685	Innovative methods against pests of fruit plants	In winter, a mixture of calcium, *alsi* and kerosene is applied on the stem up to the height of 4–5 feet from the stem base. This prevents the upward movement  Pest control in fruit plants through use of lime mixed with ash of cow-dung cake and applied to the crop thrice at vegetative stage (just before flowering and finally at fruiting stage). This practice is being followed for last several years by maximum number of farmers in the village as it is easy to practice and involves little cost. **Keywords**: insect, kerosene, cow dung, brinjal and pumpkin, flower	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (HimachalPradesh) 171 005
698	Protection of brinjal and pumpkin from pests.	This ITK is being used for controlling of yellowing and drying of leaf in potato. This also increases the size and weight of tubers. In this practice, farmers mix 10 kg of wooden ash, 50 g of phenyl powder and 10 g of tobacco leaf powder. This mixture is dusted over the potato crop in the morning time. This practice is being used by the farmers of Shimla district in Himachal Pradesh for controlling the pest on potato. This practice has been used from several years by maximum number of farmers. **Keywords**: wooden ash, phenyl, tobacco leaf powder	Ms Sodi Devi Village Madaper, Tehsil-Theog, Shimla, (Himachal Pradesh) 171 201
700	Protection of potato from pests and diseases	This ITK is being used for controlling of yellowing and drying of leaf in potato. This also increases the size and weight of tubers. In this practice, farmers	Ms Krishna Hetta, Deorighat, Theog, Shimla (HimachalPradesh) 171 201

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		mix 10 kg of wooden ash, 50 g of phenyl powder and 10 g of tobacco leaf powder. This mixture is dusted over the potato crop in the morning time. This practice is being used by the farmers of Shimla district in Himachal Pradesh for controlling the pest on potato. This practice has been used from several years by maximum number of farmers. **Keywords**: wooden ash, phenyl, tobacco leaf powder	
701	Protection of cabbage from pests	Cabbage is one of the important cash crops of Shimla district. In the cabbage plants a special type of pest spoils the inner portion of cabbage, the cabbage remains loose, and ultimately plants fall down. Ash and cow urine are used to protect the cabbage plant from insect pests. This ITK is useful to check insect pests and also to enhance cabbage productivity. Cow urine may have certain chemical, which have inseticidal properties. *Treatment of Seed*: Before sowing seeds, special soil preparation is done. Place is selected and on that cowdung is collected in a heap and a spark is burnt inside. The ash thus obtained is mixed properly with soil. Healthy seeds are dipped in cow urine for 10–15 minutes before sowing *I n cabbage plant*: A small insect damages the inner portion of the plant. Farmers collect fresh cow urine in a earthen pot. It is kept in underground pit for 8–10 days. When cow urine is spoiled completely, one glass of this is mixed with 1–2 litres of water and is sprayed in the affected crop. This ITK has been practised in most of the villages in tehsil Theog of Shimla district in Himachal Pradesh in the past. Now-a-days other insecticide and pesticides are available in the market used by the farmers. Hence this ITK is used only by a few farmers. **Keywords**: cabbage, pest control, cow, cowdung, crop productivity	Shri D.P. Bhaghoj, Theog, Shimla (Himachal Pradesh) 171 201
1107	Use of ash for the control of sucking pests in vegetables	Farmers of Kapurthala and Sultanpur districts in Punjab are using ash to control sucking pests in all vegetables, especially in cucurbits. Farmers are practising this method for a long time. **Keywords**: ash, sucking pests, cucurbits	Associate Director (Training), Krishi Vigyan Kendra, Kapurthala (Punjab) 144 601

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1111	Insect control in brinjal, tomato and cauliflower by ash	Inspects in brinjal, tomato and cauliflower are controlled by dusting chulha ash at the rate of about 20 kg per acre. Dusting of ash is done manually by hand while taking 2 kg ash in some pot and while walking in th field. This is done normally when the wind is not blowing. Dusting on the crop is beneficial if near by field is affected by insects. Dusting is useful one or two days before flower formation in cauliflower, while in other crops it can be done after flowering, while in other crops it can be done after flowering also. **Keywords:** chulha ash, control of insects in brinjal, tomato and cauliflower, dusting.	Shri Prem Pal Singh, 751/3, Jagrati Vihar, Meerut (Uttar Pradesh)
1197	Use of *neelgai* dung to act as *neelgai*-repellent in potato crop	Neelgai dung collected from the place of their night stay and solution is prepared in sufficient quantity of water. The solution is sprayed on the standing crop of potato to save from grazing of neelgai. The farmers of Maigi Nagla village in Bareilly district of Uttar Pradesh follow this practice with 70–85% crop saving, depending on the coverage of the solution. The practice is in use for the past 4–5 years by 12–15% families in the village. Others use chemical (Phorate 10 G/celphos tablet in guava) for the same purpose **Keywords:** neelgai dung solution, spray, pototo crop, prevention of neelgai grazing	Shri Dharam Pal Singh, Maigi Nagla, Fareedpur, Bareilly (Uttar Pradesh)
1374	Control of fruit borer in brinjal by sindwar leaf extract	Fruit borer in brinjal (Solanum melongena) is a common problem in the Kakhra village of Ranchi district of Jharkhand. Dilute solution of sindwar leaf extract and chillies powder is sprayed on the leaf for controlling the fruit borer. The dilute solution is sprayed on the leaf once a week. This practice is used by all the families of the village. **Keywords:** fruit borer, brinjal (Solanum melongena), sindwar and chilli powder)	Shri Prashant Mahto, Kakhra, Burmu, Ranchi (Jharkhand) 835 205
1375	Control of black diamond moth in cabbage and cauliflower	Light is used by the farmers of Kakhra village of Ranchi district in Jharkhand, because light attracts the insects. Moth insects of cabbage and cauliflower are controlled by lighting at night in the field with torch (*masal*) which attracts the insects. All farm families use this age-old practice. **Keywords:** moth insect, cabbage, cauliflower, torch (*masal*) and light	Shri Dheeraj Lal Mahto, Kakhra, Burmu, Ranchi (Jharkhand) 835 205

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1380	Use of Ammonium sulphate to control leaf-curl virus in chillies	Farming community of Banka district in Bihar, particularly the farmers of Chandan block, are cultivating chilli as a major cash crop. But due to leaf curl virus, which is a serious disease in chilli, 25–30% reduction in yield has been recorded. No control measure such as spraying of endosulphan has been proved as much efficient as their own practice which they have developed over time. Simply they use ammonium sulphate as nitrogenous fertilizer (basal as well as split) in controlling this disease. This is in practice for last 8 years and its success rate is 70%. **Keywords**: ammonium sulphate, leaf curl virus, chilli, endosulphan	Shri Basudev Marik, C/o Training Organiser, Banka, Jagatpur, Banka (Bihar) 813 102
1384	Control of aphid, mites and borer in vegetable crops	Farmers of Bara Sigdi village of East Singhbhum district in Jharkhand believe that ash content of ashan wood is toxic in nature. Pests like aphids, mites and stem borer are common in vegetables like tomato, beans, brinjal etc., and can be controlled by broadcasting ash of *ashan* wood. Ash of *ashan* wood is toxic in nature and it kills the insects/pests by asphyxiztion, when it is broadcast in infested vegetable crops. This practice is successful in controlling pests/ insects in vegetable, it is age-old practice and adopted by majority of farmers. **Keywords**: aphid, mites, stem borer, ashan, vegetable, toxic and asphyxiation.	hri Sideshwar, Paryavarn Chetna Kendra, Bara Sigdi, Potka, East Singhbhum, (Jharkhand)
1401	Control of wilt in tomato through use of tobacco leaves	This is very common practice in Chhota Kadal village of Saraikela district in Jharkhand. This practice is used to cure tomato plants from wilting. Tobacoo leaves are soaked in water for 24 hours and boiled in 1 litre water. About 10–15 ml of this solution is mixed with 1 litre water and spraying is done on affected plant. Tobacco solution helps in repeling insect/pests from the field. **Keywords**: wilt, tomato, tobacco solution, spraying	Shri J. L. Mahato, Chotakadal, Sahyogi Mahila, Rajnagar, Saraikela (Jharkhand)
1402	Control of pests in tomato by custard apple fruit solution	This is very common practice in Pondugiri village of Saraikala district of Jharkhand. Custard apple (fruits) is soaked in water for 12 hours and this solution is mixed in 1 litre water. Spraying is done on affected plants. The custard apple (fruit) solution repels insect/pest from the field and it is effective in protecting tomato plant. This is age-old practice followed by	Shri Raju Hansda, Pondugli, Rajnagar, Saraikela (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		maximum number of farmers in the Pondugiri village. **Keywords:** wilt, tomato, custard apple fruit, spray, insect/pest, solution.	
1415	Control of insects in vegetables by spraying urine of domestic animals and tabacco-soaked water	Insects on leaves and fruits of cucurbits, cowpea and ladyfinger are very common. These are controlled by spraying urine of domestic animals. Tobaco soaked water is also sprayed to control the insect attack. This age-old practice has been adopted by 60% farmers in Bahadurpur village of Dhanbad district of Jarkhand. **Keyword:** insect, leaves, fruits, spray	Shri Nepal Chandar Ojha, Bahadurpur, Bagsuma, Dhanbad (Jharkhand) 828 109
1798	Control of diamond back larvae of cauliflower	The diamond back moth and other small insects in cauliflower are controlled by spraying 40–50 litres of asafoetida extract. About 100–150 g asafoetida is  Asafoetida–used in control of diamond back larvae in cauliflower boiled in 1 litres water for 10–15 minutes and sprayed with broom after cooling with 40–50 litres water per hectare. It is done twice. About 50–60% insects are controlled effectively by this practice. About 30-40 farmers are using this practice for last 4–5 years in Linga village of Chhindwara district of Madhya Pradesh. **Keywords**: soybean, diamond back moth, asafoetida	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1799	Control of small insects in cauliflower by *dinkamali*	Small insects in cauliflower are controlled by spraying 50–60 litres solution per hectare of *dinkamali* extract (250–300 g *dinkamali* per litre water is boiled for 10–15 minutes). The extract is diluted in 40–50 litres water and sprayed with broom covering 1 ha. It is practised by 30–40 farmers from last 4–5 years in Linga village of Mokhed block of Chhindwara district in Madhya Pradesh with 60–70% insect control. **Keywords**: cauliflower, *dinkamali*	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		 Dinkamali decoction used in control of insect pests in cauliflower last 4–5 years in Linga village of Mokhed block of Chhindwara district in Madhya Pradesh with 60–70% insect control. **Keywords**: cauliflower, *dinkamali*	
1801	Control of potato tuber moth by using *neem* khali	Tuber moth in potato in Sonapur village of Jahanaganj taluk of Azamgarh district in Uttar Pradesh is controlled by broad-casting 8–10 kg neem khali (crushed *neem* seed) during the field preparation. This practice controls 80–90% of insect infestation and is being followed since 40–50 years by 30–40% farmers. **Keywords**: *neem* khali, potato tuber moth	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276128
1803	Control of pests in vegetables by use of seeds of *Embelia ribes*	Farmers use seeds extract of *Embelia* ribes along with neem seedcake or *neem* oil and cow urine for control of pests in vegetables. The use of this decoction was found good in controlling sucking pests like aphids, thrips, jassids etc. The extract is obtained by crushing 100 g *Embelia ribes* seed into powder and boiling in 1 litre water. This decoction is sieved and used along with neem oil (500 ml) and cow urine (500 ml) to be finally mixed with 100 litres water and used for spraying on crops. The extract is applied at flowering stage of the crop. The use of this practice is comparatively cheaper than use of chemical insecticides. This has been in practice since ancient times by farmers of Loni, Ragni, Mandapur villages of Ahmednagar district of Maharashtra. This practice has relatively slower affect. **Keywords**: *Embelia ribes* seed extract, vegetable crops, neem oilcake, cow urine	Krishi Vigyan Kendra, Babhaleshewar, Rahata, Ahmadnagar (Maharashtra) 413 737

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1819	Control of mealy bugs and jassids in fruit tree	Sticky substances (greece) is pasted/smeared on the underneath of the stem of the fruit tree to control the insect movement from soil to the tree. This is due to the insect which got sticked by the fruit tree. Farmers of Baramati block of Pune district in Maharastra are practising this method since many years. **Keyword:** stickly substances, greece, insect control	Agricultural Development Trust Baramati, Pune (Maharastra)
1823	Use of *chhachh* for controlling the wilt and fungal problem in garlic	Framer of Bisapur village of Chhindwara district of Madhya Pradesh are practising this method to control wilt proble in garlic. One kg garlic pulp is treated with 150 ml chhachh for sowing. This seed treatment controls wilt and fungal diseases in garlic due to its acidic nature. This is in practice since time immemorial and 80–90% of the problem is solved. **Keywords**: *chhachh*, garlic, wilt, fungal disease	Shri Ranjay K. Singh, Ph.D. Scholar (Agri. Extn.), C/o Dr C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Coloney, Adhartal, Jabalpur, (Madhya Pradesh) 482 00
1828	Use of *Emblica ribes seed* extract for control of pests in vegetables.	The extract of 100 g *Emblica* ribes seed is obtained by crushing seed into powder and boiling into one litre water. The decoction is sieved and used alongwith *neem* oil (200 ml) and *cow* urine (500 ml) to be finally mixed with 100 litres of water. The use of this decoction is found to provide good control of sucking pests like aphids, Jassids and thrips in vegetables. This is practiced by farmers of Ahmednagar. The cost benefit ratio to be 1 : 0.8.The extract acts as ovicide, anti-fungal and anti-microbial. **Keywords**: *Emblica ribes seed*, cow urine, *neem* oil, decoction, sucking pest, vegetables	KVK, Bhableswar, Rahata, Ahmednagar (Maharashtra) 413 737
1832	Insect and pest control in citrus	For control of bark eating caterpillar, kerosene or mixture of camphor cake linseed oil and edible soda is used. Black fly can be controlled by spraying mixture of kerosene and soap where as leaf miner controlled by spraying neem decoction and termite by using *neem* cake. **Keywords**: bark eating caterpillar, black fly, leaf miner, termite, kerosene, soap, soda, camphor, *neem*, linseed oil.	Scientist(Extn.), NRC Citrus, Nagpur 440 010
1833	Use of animal urine and *neem* oil for control of mealy bug in pomegranate	Animal Urine and neem oil used in proportion of 1 : 1 per litre of water. When pest incidence increases, the solution is sprayed twice or thrice at 2–3 days interval. The animal urine and neem oil have the ability to control insect by reducing feeding and inducing sterility in animals. 80% result is obtained. **Keywords**: animal urine, neem oil- Mealy bug	Shri Ashok Patil Taware,Malegaon Baramati, Pune (Maharashtra)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1840	Control of wilt in tomato by using turmeric powder	About 15–20 g of turmeric powder is put into 1–1.5 litres of water to make a solution. The solution is sprayed over the affected crop. The antibacterial property of turmeric kills the bacteria causing wilt in tomato. This is mostly practised by resource poor farmer of Chindwara (Madhya Pradesh) to control wilt to a great extent **Keywords**: turmeric, wilt, antibacterial	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.), C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1841	Disease control in citrus.	Phytopthora can be controlled by wettable sulphur powder or mobil oil. Mixture of *Dikemali*, Copper sulphate and edible oil or mixture of Trichoderma and FYM is also applied to control the disease. **Keywords**: copper sulphate, trichoderma, FYM	Scientist (Extn.), NRC Citrus, Nagpur 440 010
2077	Keeping cement or mud tubs of fermented *neem* powder in the middle of coconut for attracting rhinoceros beetle	Placing of 2–3 mud tubs with well-fermented *neem*cake in the coconut gardens attracted the adult rhinoceros beetle. They fall in the tubs and thereby are controlled. **Keywords**: coconut, rhinoceros, *neem* powder fermentation	M. Venkata Swami, Hussanapuram, Orvakallu, Kurnool (Andhra Pradesh)
2167	Smoking of orchards	Burning of residue trash mulch and dried leaves in the cashew orchards minimizes the pest incidence and flower drop in the orchards. It is a low cost technology being practised in Bommika village of Srikakulam district in Andhra Pradesh by almost all the farmers. **Keywords**: smoking, orchards, disease control	Shri S.Narasimha Rao Bommika, Bujra, Srikakulam (Andhra Pradesh)

13

Veterinary and Animal Husbandry

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
50	To check reproduction in sheep by use of loop (thread made) in the reproductive organ of male sheep	Reproductive organ of male sheep is tied with a thread (loop) at the front side to check reproduction in sheep in summer season to avoid mortality due to heat. **Keywords:** loop, thread	Shri Shetan Singh, S/o Shri Hori Singh, Dhamsar, Jaisalmer (Rajasthan)
60	Breeding and management practices of endangered Malani horse breed of Thar desert	Malani horse breed is very famous in the country which is existing as endangered breed in Malani area of Barmer district of western Rajasthan. Malani is a part of Gura-Malani tehsil of Barmer district. After independence this breed is becoming rare in the country. Malani breed is famous for its activeness, sturdiness and very fast in approaching short distance. Besides, it has many additional peculiarities in comparison to English horse breed, eg. it is very hardy. It can survive even in odd conditions and can spend the life in open grazing, whereas English breed is very delicate and requires constant care and stall-feeding. Malani horse is very faithful to its owner/rider. It is said that in battle fields Malani horses provide services to rider till death. There are many examples that Malani horses took their wounded owners from battle fields to safe places. History of Malani horses is full of royalty. Former thakurs or landlords of village Naya Nagar are one of the old landlords who are well known in this area in maintaining Malani horse breed. During the pre-Independence period Nagar was their jagir. They have ruled since Vikram Samvat 1472 (ad1415) till Independence. Therefore experiences in maintaining this endangered horse breed by Rawat Shri Prithviraj Singh, father of Shri Mahendra Singh Nagar is the result of transfer of knowledge from generation to generation.They have evolved their own techniques of breeding, feeding and management of Malani breed. Rawat Shri Prithviraj Singh is very famous in	Shri Mahendar Singh, Shri Hanumant Singh, Naya Nagar, Guda Malani, Badmer (Rajasthan)

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this regard and is being consulted by many authorities of Government Departments.

Breeding method

1. Horse breed is known with the type of mare. Hence their interest is more in maintaining more mares rather than stallion. Stallions are used for crossing purposes.
2. With their technique they produce colt having the colour of their choice. While crossing the mare, they put another horse in front of it having different colour patches on the legs, tail and back etc. They produce colt of that type.
3. Just after crossing, water is poured on the thighs of the mare, so that sperms without fertilizing may not come out with the urine of mare.
4. For testing of conception of the mare, they take the mare after 3 months to the stallion. The conceived mare will never like to stand with it, other wise the mare would like to stand very close to the stallion.
5. They have very accurate calculation of the period of calving. The mare produces colt after 11 months and 21 days of conception.

Feed and feeding

1. Ratab-moth beans 1 kg, Gur (jaggery) 250 g and ghee (Butter oil) 250 g. Boiled moth bean is mixed with jaggery and ghee, and fed to the animal till the stallion or mare become healthy. This costs Rs 1,500 to 2,000 per season.
2. Milk 10 kg and honey 250 g daily for 2 months during the winter to the young colts. Cost comes to Rs 8,000 to Rs 10,000.
3. Butter 150 g and haldi 10 g for 5 months to the colts when suckling is being discouraged. This feeding practice involves cost of Rs 2,500.

Curing of diseases

1. *Stomach problem:* The horse-keepers are facing one of the dangerous problem. They usually adopt 2 treatments:

a. They put licks in the horse's ear. Due to this, the horse frequently shivers and trouble is over.
b. Millet bran (Panicum tripodium) (250 g) and half a piece of betalnut (pan supari, Areca catecu

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		L.) are mixed, and 2 small laddoos are prepared and given to the sick animal. **Keywords:** Malani horse, breeding, feeds, heath care	
802	Cattle breeding for higher productivity	Offspring of cow and yak, produced as a result of cross-breeding, gives higher yield of milk. Breeding is done through traditional way when the animal is in heat period. The local breed cows are generally poor and yaks are brought from Ladakh for cross breeding. Crossbreds are considered superior. Generally a cross between the Tibetan/Ladakh yak and the Kullu cow is made. The cow, locally called rai, is crossed with the yak and the progeny of this cross is churu (male) and churi (female). The churu is smaller than the bullock of the plains, hairy all over, with a long tail in back and white colour. It is strong for ploughing, but does not procreate. churi is not a high yielder of milk and gives approximately three kg milk daily. The off-springs born of the mating of the yak, and churi are given the nomenclature of gara in the case of male and gari for female. Gara is not utilized for further breeding. churi and bangsa (another local breed of ox) gives birth to togo (male) and tolmo (female).The cross breeds of gari and yak and lari and yak are respectively known as laru (male) and lari (female) and brimdzo (male) and bree (female). Garu and laru like churu do not procreate. The cows are generally brought from Kullu and yaks from Zangskar in Ladakh. This ITK has been practised for higher productivity in most of the hilly tribal areas of Himachal Pradesh since time immemorial. **Keywords:** breeding, cow, yak, higher milk production	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
845	Traditional animal breeding for increased milk production (yak and cow)	T o increase milk production, the farmers of Kurdang village in Lahaul and Spiti district of Himachal Pradesh go for crossbreeding of yak and cow, whose offspring called thopo in Keylong area. The hybrid yields 3 kg milk at a time, which is an increase of 20% milk yield. Breeding is usually done in July and August, during grazing. This is an age- old practice which is still very popular in the hilly regions. Alternatively, artificial insemination is done. **Keywords:** cross breeding of yak and cow, thopo	Shri Nawang Chhering Karpa, Kurdung, Keylong, Lahul and Spiti (Himachal Pradesh)

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1172	Feeding of maanpatta and germinated oat to induce heat in cattle and buffalo	To induce heat, maanpatta and 500 g of germinated oat are given to the cattle and buffalo for 4 days. This practice is being followed by the farmers of Naikanilika Purwa village of Raebareli district in Uttar Pradesh for the last several years without any modification. **Keywords:** heat induction, maanpatta, germinated oat	Shri Ram Verma, Naikani ka Purwa, Amawa, Raebareli (Uttar Pradesh)
1177	Feeding insects hosted on Babool tree to bring the female animal into heat	Farmers of Sonarhi and Terhi villages of Banda district of Uttar Pradesh use to give insects hosted on babool tree to their cattle and buffaloes to eat, for getting them into heat. The insect seems to contain excellent type of hormone which might induce heat in the animals. The insect is collected from the babool tree and a single insect is cut into small pieces and put into the bread and fed to the needy cow or buffalo. **Keywords:** insect hosted on babool, cow and buffalo heat, hormone, induction of heat in cow and buffalo	Shri Ranjay K. Singh, Ph.D. Scholar, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1185	Making successful conception after natural service by giving a mixture of kattha, chhoti dudhi and corriander to the cow/buffalo	Farmers of Banda district of Uttar Pradesh prepare the mixture of kattha, chhoti dudhi and moist corriander, and give it to the cow/buffalo after mating/service with sire. This makes the animal to conceive successfully and the animal does not reverse to heat. About 10 g kattha with 100–150 g chhoti duddhi and 100–150 g corriander is crushed with little water and made into a solution/paste. This solution is given to the animal at the rate of 200 ml with water. This is repeated at least four times for 4 days. Pumpkin pulp is also given to animals as an alternative. **Keywords:** making conception successful, kattha, chhoti dudhi, corriander, pumpkin pulp	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1222	Identification of heat period of the female animal	Livestock owners, especially the Yadav community, have good wisdom to know the heat period of cow or buffaloes. On account of the indicators, farmers decide that the cows/buffaloes have come in heat period and they should allow them to mate. Frequent urination, special sound making, running of male animals around the female, coming of the vaginal mucus and sudden reduction of milk amount are some important symptoms of heat in the animals as followed by the animal keepers of Sonapur village of Azamgarh district in Uttar Pradesh. **Keywords:** heat period, urination, special sound, mating	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004

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1278	Anoestrous management in animal	Pigeon waste might have the property to control anoestrous in animal. To induce oestrus, pigeon waste is given orally in raw form without mixing any thing  Pigeon waste for anoestrous management by farmers of Bhujia village in Bareilly district of Uttar Pradesh **Keywords:** anoestrous, pigeon waste	Shri Om Prakash, S/o Shri Manohar Lal, Bhujia, Bhojipura, Bareilly (Uttar Pradesh)
1284	Checking of antoestrous in heifers	To induce oestrus and for showing heat symptoms in heifers, pigeon waste, mixed with jaggery, is fed to heifers 2–3 times a day. The disease is cured up to 60%. Treatment cost per animal is Rs 10–15. This is practised by the farmers of many villages in Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** antoestrous, pigeon waste, jaggery	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi)110 025
1545	Use of harad and mustard oil to bring cattle in heat	Sometimes though the animal get mature, it does not come in heat. Harad have some heat-inducing quality, therefore it is used to induce heat in animals. Harad seed is first mixed with mustard oil and given orally to the animal in which heat is to be induced. It is 50-year-old practice and adopted by 30 farmers out of 200 in Samba village of Muzaffarpur district. **Keywords:** harad, mustard oil, animals	Shri Amresh kumar, Sambha, Maraul, Muzaffarpur (Bihar)
1583	Inducing heat in cows and buffaloes by feeding bamboo rhizome	Bamboo (Dendrocalamus strictus) rhizome contains high level of minerals and vitamins and brings the animal in heat. Cows and buffaloes in anoestrus condition are fed one to two pieces of 2 to 3 feet of bamboo shoot for 2 days, which induces heat in the animals and its success is about 65%. This is in practice for last 18 years by farmers of Ashanpahari village of Dumka district in Jharkhand. **Keywords:** bamboo rhizome, anoestrus condition, cows and buffaloes	Shri Veeresh Kumar. Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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1915	Feeding of growing bamboo shoot (karil) to induce puberty to young animals	The problem of young cows and buffaloes not coming to heat period due to various disorders is solved by feeding the animals with 500–600 g of new growing bamboo shoots (karil) for 2 times a day (morning and evening) for 2–3 days. This practise breaks the sterility and brings animals to puberty. About 80–90% farmers practice since 70–80 years in Sonapur village of Jhanaganj block of Azamgarh district in Uttar Pradesh **Keywords:** young she animals, puberty, karil	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1916	Feeding of manpatta leaf to bring the animals to heat	Sometimes, animals (cows and buffaloes), become sterile after 2 to 3 calvings. In order to bring these animals to heat they are fed with 50–60 g of manpatta  Manpatta plant used for inducing heat in cow and buffalo leaf pieces with bread two times daily (morning and evening) for about 4–5 days. The leaf of manpatta acts as catalyst to secrete hormones, responsible for heat period. This practice has an efficiency of 80–90% which has been adopted for 70–80 years in Sonapur village of Uttar Pradesh. **Keywords:** manpatta, old-she animals, heat period	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1954	Use of mustard vegetable extract to bring the cow in heat	Fresh green leaves of Green rai are collected and crushed to prepare the extract. The extract is given to the needy animal at a dose of 400–500 ml for 4–5 days. This brings heat within 2 days. **Keywords:** green rai leaves, heat onset.	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh)

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1955	Use of fried grains of lentil and salt for onset of heat in buffalo	For onset of heat, the animals is given 400–500 g of lentil seeds fried, crushed and mixed with 50–55 g of salt. The dose is given two times a day for 5–6 days. The mixture act as catalyst in hormone secretion. **Keywords:** lentil, heat, hormone secretion	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh)
2201	Use of ground brinjal to bring animal in heat	Feeding of animals with 3 kg ground brinjal (Solanum melongena) fruit locally called vankaya for 3 days continuously helps the animals to come to heat after 2 weeks, as it stimulates the folicular growth and ovarian release. The cost involved per application is Rs 1 per animal. **Keywords:** brinjal, heat inducer	Shri Dorai Raj, Training Organiser, Bhagvatual Charitable Trust KVK, Haripuram, Rambili Mandal, Visakhapatnam (Andhra Pradesh) 531 005
2276	Anestrus	Farmers in the different areas of Rajasthan are following different practices for anestrus *Jodhpur-Nagore* 1. One or two chirami are ground and pearlmillet flour is added. It is given thrice on alternate days. 2. One kg clusterbean is fed to animal for 10 days *Jaisalmer* 1. One or two chirami are ground and pearlmillet flour is added to it. It is fed thrice to animal on alternate days. *Barmer* 1. Two litres of buffalo milk is mixed with 250 ml castor oil. It is fed to the animal. *Ajmer-Nagore* 1. One kg. rice is boiled in water after grinding and it is fed to the animal. **Keywords:** anestrus, chirami, pearlmillet flour, castor oil	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
44	Use of shallu/hallu (Lapidium satium) in animaration	About 250 grams shallu is crushed into fine powder and is fed to the animal along with the animal ration per day per animal. It increases the milk production up to 250–500 ml per day, increases the quantity of fat in the milk, corrects digestive disorders and increases stamina in the animals. The cost involved per application or treatment is Rs 8 per day. It is being followed over years in the Reta and Bhujpura of Dausa district in Rajasthan. **Keywords:** shallu, animal ration	Training Organiser, Krishi Vigyan Kendra, Khedla Khurd, Dausa (Rajasthan) 303303

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54	Barley feed for weak animals	Cattle, bullock or buffalo become very weak due to ill feeding or over burden of work. Villagers of Birae of Jodhpur district in Rajasthan feed the animal with barley feed by soaking overnight in water @ 2 kg per day for at least 15 days. It results in increased weight and health recovery. Most of the animal keepers apply these treatments. It costs Rs 50–100. **Keywords:** barley feed, animals	Shri Md. Barkatt Ali, Cheenpa, Birae, Jodhpur (Rajasthan)
256	Increasing milk production in cow	To increase milk production of local breeds of cows, horsegram grains are fed to them daily. This practice is used by 15 farmers for the last 8 years in Pungampalayam village of Coimbatore district in Tamil Nadu. **Keywords:** cow milk, horsegram	Shri K. Sampath Pungampalayam, Karamadai, Coimbatore (Tamil Nadu)
557	Use of bichchu (Urtica dioica) grass to enhance milk production in animals	Bichchu grass (Cajourina) is fed to the lactating animal to increase milk production. The grass contains high protein. It is fed to the animal like fodder. This practice is used by all the farmers of Bhagtola village in Almora district of Uttaranchal since years. **Keywords:** *bichchu grass, cajourina*, milk production, fodder	Shri Ram Singh Bhagtola Almora (Uttaranchal)
790	Management of fodder to feed animals during winter	In the cold desert area, there is plenty of marginal land that is not fit for cultivation. However, on such marginal land during dearth period, wild grass is cut for stall feeding. The hilly areas of Himachal Pradesh remain snows bound for almost six months in a year. In this period farmers face fodder problem. For this, each cultivator therefore keeps a sizeable portion of his holding for raising fodder crops or grass to meet the problem of shortage of fodder during winter. This ITK is practised in hilly area of Lahaul and Spiti district of Himachal Pradesh to ensure appropriate use of marginal land and sufficient supply of fodder during dearth period. **Keywords:** fodder, marginal land, dearth period	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005 and Shri Devkant Prakash, Bhajheog, Theog, Shimla (Himachal Pradesh)
803	Pasture management by rotational grazing	For rejuvenation of pastures in higher reaches of north-west Himalaya in Himachal Pradesh, herders follow a rotational grazing whereby the animals are regularly moved from one pasture area to another. It has been realized that such a rotational grazing protects the pasture lands from over-grazing and	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		increases forage production. **Keywords:** north-west Himalayas, protection of pasture, overgrazing, forage production	
807	Grazing in upper reaches for pashmina goats	Good pasture resins in deeper gorges and severely cold nallahs in upper reaches are specifically used for grazing of the pashmina goats. This practice is specific to Ladakh region of Himachal Pradesh, which is followed to get high-quantity Pashmina wool. Pashmina wool is highly priced in the market and it is a good income-generating source. Majority of farmers of this region are practising it for several years. **Keywords:** good pasture, cold nallah, grazing, pashmina goats, pashmina wool	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
812	Reduced milk production in cattle due to bashkar	The farmers in Sarkaghat tehsil of Mandi district in Himachal Pradesh know that if milking cow consumes a particular white insect present on the grass, milk production is reduced. This condition is locally called bashkar. Therefore awareness is made to prevent consumption of the insect. **Keywords:** eating of insect, reduced milk production, awareness	Ms Savita Devi, PO Gopalpur, Tehsil, Sarkaghat, Mandi (Himachal Pradesh)
843	Feeding red pepper (Capsicum frutescens) for enhanced milk and wool production	Ground red pepper (about 100 g) is fed orally with feed to the goat, sheep and yak for increased wool and milk production, especially in rainy season. Two to three doses after a gap of 15 days are sufficient. Red pepper may have some influence on hormonal balance and it might be able to restore nutrients (protein) in body.This is practised in most of the villages in hilly area of Lahaul and Spiti and Kinnour district of Himachal Pradesh. **Keywords:** red pepper, hormonal balance, enhanced milk and wool production	Shri Dharam Chand Negi, Kalpa, Rekangpeo, Kinnour (Himachal Pradesh)
1188	Use of mixture of ajwain, fenugreek, sugar and pigeonpea to increase milk of cow and buffalo	When the cow or buffalo does not yield the desired quantity of milk as per the breed, the farmers of Sonarhi and Terhi villages of Banda district of Uttar Pradesh give the mixture of 50 g ajwain, 150 g methi (fenugreek), 500 g sugar and 500 g pigeon pea crushed and cooked in 1 litre water to the animal. This mixture is given twice a day, in the morning and evening. If the animal does not take easily, the farmers use bamboo stick to give them.	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: increasing milk yield, ajwain, fenugreek, sugar, pigeonpea	
1192	Use of a mixture of mustard oil, sugar, pulse grains and unripe banana finger to increase milk yield in cows and buffaloes	When a cow or buffalo does not produce the desired amount of milk according to the breed, the farmers of Sonapur village in Azamgarh district of Uttar Pradesh, use a mixture of mustard oil (300–400 ml), sugar (400 g), pulse grains (250 g) and unripe banana finger (4-6). About 400–500 g of the mixture is fed at a time twice a day for 6–7 days. This practice has been effective since 60–70 years and used by 200–300 farmers in out of a total of 1000 farmers. **Keywords:** mustard oil, sugar, pulse grains, unripe banana finger, increased milk yield in cow and buffalo	Shri Ranjay Kumar Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128
1217	Prepartum feeding with special ration	Apart from the usual feeding, special ration is given two months prior to parturition. Cooked wheat porridge (3 kg wheat porridge + tasteful of common salt) is given daily two times a day, half in the morning and half in the evening. On every third day halwa is prepared from ½ kg wheat flour, 250 ml mustard oil and 250 g mollases and given at night before sleeping. This practice is folllowed in Nazafgarh area of Delhi. **Keywords:** parturition, special ration, wheat, mollases	Ms Savitri, W/o Shri Ramesh Dalal, 35M. Block, Gopal Nagar, Nazafgarh (Delhi)
1223	Proper feeding system for the pregnant animal	When the cows and buffaloes become pregnant, the farmers take special preventive measures and care in feeding. Most of the Indian buffaloes mostly mate in September and October, and carrot is mostly available in March and April. In these months farmers use carrot @ 2–3 kg per day to feed their animals. While in the off-season, they use 400–500 g seed of lathyrus for the same purpose. Farmers do not allow feeding of paddy straw. This ITK is practiced by the farmers of Sonapur village of Azamgarh district in Uttar Pradesh. **Keywords:** pregnant animal, carrot, lathyrus	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1269	rich milk from buffaloes by feeding cottonseeds	Cottonseeds have high nutritive value with high proteins. About 1 to 2 kg cotton-seeds are dipped in water for 20–24 hours and are fed to buffaloes along with concentrate. This increases 2–3% fat contents in the milk produced by the animal. Milk production is also increased by 10–20%.This is adopted in many villages of Bulandshahr, Etah and Aligarh districts	Shri Yogesh Singh, A.T.13, New Shastrinagar, Izatnagar (Bareilly) 243 122

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		of Uttar Pradesh. **Keywords:** milk fat, cotton seed, increase in milk production	
1485	Indigenous feed for pigs	Farmers of Tangar village in Ranchi district of Jharkhand use rice bran and residues of rice bear (haria) as a feed for pigs. Rice is staple food and rice bear (haria) is common beverage of tribals. Both are found commonly and easily and are rich source of carbohydrate and minerals. Rice bear has nutritive value, which consists of carbohydrate, calcium, iron and vitamin with minerals. This is age-old practice in Tangar village and adopted by 60% farmers in this village. **Keywords:** rice bran, rice bear, haria, mineral, beverage	Shri Sibna Minj, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1499	Increasing milk production in desi cow	Sometimes there is reduction in milk production after calving. So cows are fed protein concentrate to improve milk yield. The concentrate is mixed with normal feed and given to cows. Protein rich concentrate is prepared by mixing mustard cake, safflower cake, linseed cake and salt with water. About 200–250 g protein rich concentrate, mixed with normal feed, is given to cow twice a day for 2–3 days. Cost of one time meal is not more than Rs 8. All the farmers of the village use this practice. **Keywords:** desi cow, milk, protein-rich concentrate, mustard, safflower, linseed	Shri Lenga Purty, Angadia, Khetiatanger, Chaibasa, West Singhbhum (Jharkhand) 833201
1512	Indigenous feed for animals	Farmers of Simdega village of Ranchi district in Jharkhand use mahua (Maduca indica) as a feed for animals during dry season of summer. Ripe fruit of mahua is good source of carbohydrate for animals, which provides energy to animals and is considered best nutritious feed for them during dry summer season. It is age-old practice and adopted by 100% farmers in Simdega village. **Keywords:** mahua (Maduca indica), animal, carbohydrate, mineral, nutrition	Shri Saleman Khalkho, Mariam Toli, Samtoli, Simdega (Jharkhand)
1555	Indigenous tonic for improving cattle health	Onion (250 g), mustard oil (750 ml) or yellow mustard (250 g), desi egg (raw 6) and mahua beer (750 ml) are mixed together and given orally to the weak cattle and buffalo. This practice improves the cattle health. Farmers of Basobar village of Hazaribag district in	Shri Badri Paswan, Shri Dungal Thakur, Shri Indo Thakur, Shri Shibu Thakur and Shri Rupan Thakur

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Jharkhand are adopting this practice for several years. **Keywords:** mustard oil, onion, yellow mustard, desi egg, mahua beer, cattle health	Basobar, Daru, Hazaribag (Jharkhand) 825 313
1594	A mixture to increase milk production in cattle	Most of the villagers of Islampur block in Nalanda district of Bihar use kali til (black sesame) to increase milk production in milch animal. Powder of 250 g kali til (black sesame) and 250 g mishri (sugar candy) are dissolved in water and given to milch animal for 5 days during lactation period. Success has been observed in 80% of the cases. This indigenous practice is being in use for the last several years without modification. **Keywords:** kali til (black sesame), increase milk production, milch animal, mishri (sugar candy)	Shri Ajit kumar, S/o Shri Shiv Nandan Prasad, Kasimpur, Dariapur, Nalanda (Bihar) 801 303
1928	Increasing milk yield in cows and buffaloes	The milk yield in cattle is increased by feeding the animal with 100 g earthworm, 1 kg jaggery and 2 kg sesamum by mixing thoroughly. It is fed to the animal daily twice for 2 days before milking. This practice is followed from last 20 years, which is giving good results in the Nerpinglail village of Morshi block in Amaravathi district of Maharashtra **Keywords:** earthworm, jaggery, sesamum	Dr V. B. Shirbhate, Krishi Vigyan Kendra, 57, Congress Nagar, Amravati (Maharashtra) 444 701
1934	Use of animal urine to enrich protein in dry fodder	The farmers of Soni village in Sangli district, Maharashtra, collect animal urine in pots and use for treating dry fodder like wheat bhoosa, sorghum, (Sorghum vulgare), sugarcane crop (Sacchrum officinarum) to enrich protein content. The dry fodders are chaffed and about 3–4 litres of urine is applied at a time. The practice has been in use for 5 years by 15 farm families. **Keywords:** animal urine, fodder, enriched protein	Dr Bharat Singh, Training Organiser, Krishi Vigyan Kendra, C-4/3, VSSS Karkhana Ltd., Sanghli (Maharashtra) 416 416
1956	Use of Dudhia Kharkara plant increasing milk production in cattle.	Dudhiya kharkara plant is collected and about 1–2 kg plant chopped into pieces. The same is given to the needy animals continiously for 7 days. It increase milk production of cattle. **Keywords:** Dudhiya Kharkara plant, Milk production	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

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2175	Feeding a mixture of celery seed and garlic improves milk secretion during lactation period	Two spoonsfuls of celery seed and two pods of garlic eaten by lactating mothers for three days immediately after delivery improve milk secretion during lactation period. **Keywords:** milk secretion, celery, garlic	Ms Narasamma, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2177	Grazing of fingermillet	Cattle are allowed to graze the top of fingermillet crop before heading. Farmers believe that it enhances the ear size and controls diseases of leaf. The scientific reason for this practice is that it prevents lodging of the crop, reduces evapo-transpiration and induces heading. About 60% of the village farmers are practising this method since several years. **Keywords:** heading, control diseases, prevent lodging	Shri Nimmake Narayana, Gumma, G.L.Puram, Vizianagaram (Andhra Pradesh)
2183	Feeding nalleru pasaru, pig oil (fat obtained from pig) + gingelly cake for strengthening cattle	For strengthening of cattle nalleru pasaru + pig oil (fat obtained from pig) + gingelly cake are mixed and fed to the cattle before puddling. By this practice the cattle is strengthened for puddling. **Keywords:** feeding cattle, nalleru, pig oil, gingelly cake	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626. Nagar Juna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
2199	Feeding cattle with khali and extract of kalimi plant leaves to check loose motion	The cattle are fed with the leaves of a spinous plant (kalimi) by crushing and mixed with khali (partially fermented rice washed water) to control the problem  Kalimi plant leaf used for control of loose motion in cattle of loose motion. This ingredient and diluent are available naturally. It is cheap as compared with chemical control. **Keywords:** cattle, loose motion, fermented rice water, kalimi leaf	Shri P. Venkaiah, Girgitpally, Vikarabad, Rangareddy (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
43	Use of kala jeera (Nigella sativa) as a medicine for animals	Minor diseases in the Rita and Bhujpura villages of Dausa district in Rajasthan are cured by using 250 g kalajeera crushed by adding the ghee, and 500 g of jaggery. The mixture is divided into 3 doses and given through drenching for 3 days. It helps in removing the nestrus condition of the buffalo, increases the digestibility and controls conjunctivitis in animals. **Keywords:** kala jeera, medicine, animals	Training Organiser, Krishi Vigyan Kendra, Khedla Khurd, Dausa (Rajasthan) 303 303
243	Control of bacterial infection in animals	The leaves of pepper (Piper nigrum) and garlic (Allium sativum) are crushed and the selvin juice is mixed with butter milk or goat's milk, and it is administered to the infected animals. **Keywords:** bacterial infection, pepper, garlic	Drs T. Raj Bavin, Reslin, and T. Radhakrishnan Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
258	Control of warts in cattle	Warts, generally seen as papillomataous growth over the skin in cattle, is treated by applying a paste prepared from ginger and onion. Clean onion and ginger in equal quantity are thoroughly ground to make paste. The paste is applied over the growth 4–5 times a day for all the breeds of cattle and for all age groups. This is in practice for many years by the tribes who own dairy animals in Kerala. **Keywords:** ginger, onion, control warts	Dr G. Mony Training Associate (Animal Science), Krishi Vigyan Kendra Mitranikatan, Vellanad, Thiruvananthapuram (Kerala) 695 543
795	Dried ginger (sonth; Zingiber officinalis) for higher income	Sun-dried ginger is sold at a premium price than the ordinary one. It is sold as sonth, which has medicinal value especially to cure throat infection. Fresh ginger upon soaking in water is rubbed against a gunny bag or placed in bamboo basket to remove the peel. The coarsely peeled ginger is then dipped in lime solution followed by rinsing and drying under the open sun. The dried product is called sonth. This ITK practice is used throughout Sirmour district of Himachal Pradesh since time immemorial. **Keywords:** dried ginger,lime solution, cash crop	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
808	Use of turmeric and mustard oil for wound healing	A mixture of turmeric powder (Curcuma domestica) and mustard oil (Brassica juncea) is prepared in the ratio of 5 : 1 and this paste is applied on wound and is practised by every villagers in the district of Mandi in Himachal Pradesh. This has been practice for ages. **Keywords:** paste of turmeric and mustard oil, applied to wounds, heal wounds	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
810	Use of sarson (mustard oil) for stomach problem in cattle	Mustard oil (Brassica campestris) is used for treating stomach problem in cattle by the farmers of Ghorab village of Nagsota Bagwan block in Kangra, district of Himachal Pradesh. This is practised by a majority of the farmers for many years with effective results. **Keywords:** mustard oil, cattle, stomach problem	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
824	Use of Micromeria biflora, Helmis lanceolatus and Triochoderma indica herbs for treatment of post partum in cattle and buffalo	Post-partum prolapse is very common in cows and buffaloes. Administration of herbs such as Micromeria biflora, Helimis lanceolatus and Trichoderma indica cures prolapse of vagina and uterus. This is practised by many farm families of Hatwas village of Nagrota Bagwan in Kangra district of Himachal Pradesh for many years. Alternatively in the market are used. **Keywords:** post partum prolapse, administration of Micromeria biflora, Helimis lanceolatus and Trichoderma indica, cow and buffalo, cure	Shri Rajeev Kumar, Room No. 32 D, NBn II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
827	Use of hot soup of jeera (cumin) and garlic	The farmers of Samloti village of Nagsota Bagwan block in Kangra district of Himachal Prasdesh treat their animals suffering from fever by feeding hot soup of jeera (Cumin caraway) and garlic (Allium sativum). This has been practice since long time with very good results. This treatment also improves the digestion of the cattle. **Keywords:** soup of jeera and garlic, feeding, fever cure	Shri Rajeev Kumar, Room No. 32 D, NBn II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh). 171 005
1166	Reducing heat stress by feeding wheat flour with drinking water	Wheat flour @ 500 g is added with drinking water and orally administered. Villagers of Ladpur in Delhi are practising this method for reducing heat stress in cattle. **Keywords:** wheat flour, heat stress	Ms Phoolwati, W/o Shri Jwala Singh, Ladpur, Kanjhawla (Delhi)
1242	Treatment of FMD by besan chapati	Besan (chickpea flour) is used for treatment of FMD. Two chapatis of 250 g besan daily for three days are fed to the suffering animal from foot-and-mouth disease. The cattle are also made to walk on hot sand. This treatment costs Rs 5 per animal. This ITK is in practise in Tulaserpur village of Bareilly district of Uttar Pradesh. **Keywords:** FMD, besan chapati, hot sand	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology, IVRI,Izatnagar, Bareilly (Uttar Pradesh) 243 122

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1257	Treatment of lantana poisoning in animals	Salt is anti-poisonous. About 150 g common salt is roasted and mixed with wheat flour and paste is prepared. This paste is given orally to the lantana affected animal and animal is allowed to drink water as much as it can throughout the day.It costs Rs 5 per animal. **Keywords:** lantana poisoning, salt, wheat flour	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1502	Preventive medicine for cattle	Cattle are made to work in agricultural field in adverse conditions, i.e. from summer to rainy season, in hot, cold and wet conditions. Therefore they are given the medicine to prevent any kind of further sickness or weakness after working in the fields. In this, all the cattle (both healthy and sick ones) are fed with 200 g mixture of onion, bhelwa seed and sal leaves after all the agricultural work in fields requiring the help of cattle has been accomplished. Farmers believe that the above mentioned ingredients help in preventing the cattle from infection and exhaustion. This is in practice for last several years by maximum number of farmers in the Bagraisai village of Saraikela district of Jharkhand and involves little cost (about Rs 3 per animal) **Keywords:** onion, bhelwa seed, sal leaves	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikela Kharsawan (Jharkhand) 831 002
1536	Treatment of eye infection in buffalo through use of aparazita leaves	Aparazita climber has high medicinal value. Juice of aparazita leaves is applied in infected eyes of buffaloes, which gives soothing effects to eyes and removes redness. This practice is followed in Rajnagar village of Saraikela Block in Saraikela district (Jharkhand) and has potentiality for further spread. About 60% success is reported. Cost: benefit is 1 : 10 approx. **Keywords:** aparazita, cattle, eye infection	Sahyogi Mahila, Bograisai, Rajnagar, Saraikela (Jharkhand)
1539	Use of aparazita leaves to cure eye infection	Aparazita climber has high medicinal value and leaves of aparazita are used for treating eye infection in buffaloes. Juice of aparazita leaves is applied in infected eyes of buffaloes, which gives soothing effect on eyes and removes redness. This is very popular age-old practice, having 60% success rate. Practice adopted by maximum number of farmers in the Rampur village of Ranchi district of Jharkhand. **Keywords:** aparazita, buffalo, eye infection, leaves	Sahyogi Mahila, Rajnagar, Saraikela (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1540	Use of bengsag (mandukparni) as an antizymotic	Bengsag (mandukparni) has such medicinal properties that it is used as an antizymotic in animals. In this practice whole plant is mixed and taken orally as a source. It is age-old practice and adopted by maximum number of farmers in the Okhargarha village of Ranchi district of Jharkhand. **Keywords:** bensag/mandukparni, antizymotic	Shri A. Kumar, Sambha, Marken, Muzaffarpur (Bihar)
255	Control of diarrhoea in poultry birds	For curing diarrhoea in poultry birds, small onions are cut into small sizes, mixed with arrack (country liquor) and fed to the birds. Twelve farmers of Thondamuthur village in Coimbatore district of Tamil Nadu are following this practice for the last 5 years. **Keywords:** small onion, country liquor, poultry	Shri S. Subramani Thondamuthur, Coimbatore (Tamil Nadu)
406	Bone fracture in livestock	Bone fracture in livestock is treated with a fine paste obtained from grinding about 100 to 200 g of adsangal (an orchid) plant. It is tied with the help of  Adsangai–an orchid species used for treatment of bone fracture strip of cloth, supported by 3 to 4 pieces of bamboo sticks. The leaves have some medicinal properties, which act to join the bones. About 60 to 70% farmers adopt this practice. **Keywords:** bone fracture, livestock, adsangal	Shri Patitoila, Gapalput, Semiliguda, Koraput (Orissa)
540	Plastering of broken bones and joints by harjodan (Acanthus ilicifolius)	A paste is prepared out of harjodan (Acanthus ilicifolius) plant. A thick layer of this paste is applied over the broken bone of the animals. The plaster is very effective. It is claimed that the broken bones get repaired quickly through this method. The cost of this method is less than the modern method and it is locally available. **Keywords:** harjodan, bone fracture, plaster	Shri Harsh Singh Bisht, Doba, Almora (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
541	Plastering of bones by paste of black gram and branches of syaru plant	A paste of black gram (Phaseolus radiatus) is used as a plastering material. The paste of the pulse becomes very hard after drying. The wood of syaru is used to give support to broken part. A thick paste of black gram is prepared. A thick layer of paste is applied over the broken part. To give spport, 4–5 branches of syaru wood are tightly tied by a cloth or rope. The method is quite effective for joining the broken bone of the animals. **Keywords:** plastering agent, black gram, syaru wood	Ms Vijendri Devi Kumathi, Latasera Uttarkashi (Uttaranchal)
559	Chamarmeva (Ulmus wallichiana) plaster for broken bones	The paste prepared from the branches of jaamar or chamarmeva is very elastic. It becomes very hard after drying. The paste is used as plastering agent for both animals as well as human. Branches of jaamar are collected and bark is removed. Then a paste is prepared from the bark. This paste is applied over broken bone.This treatment repairs broken bone within 15 days. This method is used where no other medical facilities are available. **Keywords:** bone fracture, plastering	Shri Hukum Singh, Kothali, Narayarbagarh, Chamoli (Uttaranchal)
819	Treatment of fractured bone by use of mahandoo plant	Fracture and bones in domestic animals are treated using mahandoo plant leaves. Bamboo sticks are used to support the plaster. This is an effective and cheap method followed by Kotaroo villages of Thunag Tehsil in Mandi district of Himachal Pradesh with effective results. But people prefer to use veterinary medicines available in the market/hospitals for treatment of fracture, because they do not want to take risk. **Keywords:** fractured bone, treatment with mahandoo plant leaves, bamboo sticks	Mr Suresh, Village Kataroo, PO Sulghada, Tehsil Thunag, Mandi (Himachal Pradesh)
842	Treatment for fractured bone by use of turmeric paste mixed with human hair	Animals suffering with fractured bone are very common and are having lot of pain. Application of turmeric mixed with human hair helps join the fractured bone. About 200 g turmeric is mixed with 500 g human hair and oil is applied to the fractured bone. This is covered with small sticks of bamboo and tied by cloth. This practice is being followed for the last 10 years by maximum number of farmers in the village. It is easy to practice and involves very less cost. **Keywords:** animal husbandry, veterinary science, bone, turmeric, hair and bamboo	Shri Deep Ram Verma, Village Ghagri, Tehsil Theog, Shimla (Himachal Pradesh) 171201

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861	Treatment for bone fracture in cattle	Bone fracture is treated with the juice extracted twigs from grape. Twigs of grapes are crushed with muller and juice is collected by squeezing the twigs in cotton clothing. About 20 ml juice is poured over the fractured bone and then tightly packed with cotton clothing as plaster. Wooden sheets are used to keep the bones in their usual position. This juice is quite effective for recovery of fractured bone. The treatment is given for a week. Kulfa tink (20 ml), extracted by same procedure from chulli plants, is poured over fractured bone and bandaged. It is also effective for treatment of fractured bone. These practices are in use in Nalo (Ka) village in Kinnour district of Himachal Pradesh. **Keywords:** bone fracture, grape twig extract, kulfa tink extract, recovery	Shri Lamcho, Nalo (Ka), Yanthan, Kinnaur (Himachal Pradesh) 211 207
864	Treatment for fractured bone in cattle by manu	Farmers in hilly areas of Kardang village in Lahaul district of Himachal Pradesh generally practice this method for treating the fractured bone in cattle. Manu is a herb used for the treatment of fractured bone. Manu herb is ground well and its extract is spread on the fractured bone and covered tightly with the use of cotton. This practice helps in repair of the fractured bone. **Keywords:** fractured bone, manu herb	Shri Prem Singh, Kurdarg, Keylong, Lahul and Spiti (Himachal Pradesh)
1202	Herbal preparation for fracture healing	Castor oil is applied on affected part of the cattle and paste of barna (Crataeva nurvala) is applied over castor oil treated part and bandaged. Fresh bandage is applied on every third day. Seven such applications are made to the fractured animals. Farmers of Ganeshpur village are practising this method for several decades. **Keywords:** castor oil, Crataeva nurvala, fracture healing	Dr. Jawaharlal and Shri R.R. Singh, Division of Pharmacology and Toxicology, IVRI, Izatnagar (Uttar Pradesh) 243 122
1567	Remedy for fractured bones in animals through paste of bandailata	Bandailata may contain some medicinal element which treats the fractured bones. Bandailata (branch of bandai) is crushed to make paste and it is plastered on the fractured organ and tied, for a week. The practice is followed in village Garja of Simdega Block in Simdega district (Jharkhand). The success has been observed in 90% of the cases. Cost: benefit is 1 : 10 apporx. **Keywords:** fractured bone, bandailata	Smt. Kanak Tirkey, Pathalkudwa Munda Kocha, Ranchi (Jharkhand) 834 001

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1576	Cure of bone fracture in animals by herbal treatment	Farmers of the Sukurhuttu village of the Ranchi in Jharkhand use natural medicine on fracture. In this practice, paste of bark of pojo tree, chandrasur, brown salt, onion, garlic and harjor leaves are applied on and around the broken bone. The fracture will be all right within 15–20 days. After every 2–3 days the old paste is removed and fresh one is applied on the fractured area. This 100 years old practice is practised by all farmers. **Keywords:** bone fracture, pojo tree, chandrasur, brown salt, onion, garlic, harjor leaves, animals	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006
1590	Technique of curing bone fracture in animals	Harjor is a perennial climber, which is used in treatment of bone fracture in animals as well as in human being. This practice is being used by the villagers of Samtoli village of Simdega district in Jharkhand for the last many years. Paste is prepared by crushing the harjor plant and it is applied on the fracture part and then tied along with sticks. At every 3 days interval, it is replaced by fresh harjor paste and this process is continued for 2 to 3 times. **Keywords:** harjor, bone fracture, paste, applied on fracture  Harjor plant used for healing fractured bone in animals	Ms Sushmita Khalkho, C/o Dr. Niva Bara, Deptt. of Extension Education, BAU, Ranchi (Jharkhand) 834 006
1597	Ganthjore grass to cure fractured bone in animals	The tribals of Lohardaga district of Jharkhand are using this practice from early days. The ganthjore grass is plucked and then converted into paste by pressing it. After that the deformed/fractured bone is settled and kept in exact position and then the paste is applied on the affected areas from every side and tied with cloth tightly. It is very useful and animal recovers within 20 days. **Keywords:** ganthjore grass, fractured bone, animal	Shri Rajiv Kumar Jha, Department of Fisheries, RVC, Kanke, Ranchi (Jharkhand) 834 006
1961	Use of green leaves of Gurbel to treat the bone dislocation	To treat the bone dislocation, most of farmers of Dindori district of Madhya Pradesh prepare extract mixture of about 100 gms of Gurbel leaves, 100 gms of root of banana and equal amount of roots of Mandar alongwith 50–60 gms of cactus stem by	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony,

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		crushing them together. After that water is added to prepare doses. The mixture is given with the help of bamboo @ 150–200 ml./dose, thrice daily till recovery. **Keywords:** Bone dislocation, *Gurbel* leaf.	Adhartal, Jabalpur (Madhya Pradesh) 482 004
243	Diarrhoea management in cattle	To control diarrhoea in cattle, farmers feed the affected animals with banana (*Musa paradisiaca*) flower and turmeric. Astringent action of banana flower and antiseptic effect of turmeric helps control diarrhoea in cattle. About 75% of the farmers of Peravoorani village in Tanjavur district of Tamil Nadu are following this practice for the last 10 years. **Keywords:** banana flower, turmeric, diarrhoea	Shri S. Kamaraj, Mesakadu Veeriankottai, Peravoorani, Tanjavur (Tamil Nadu) 614 802
281	Diarrhoea control in cow	Use of sapota and jackfruit leaves to control diarrhoea in livestock particularly cow is under practice in a village in West Bengal. About 4–5 unripe sapota (*Achras zapota*) fruits are crushed with one teaspoonful of common salt. This mixture is placed on a banana leaf and fed to the cattle to stop diarrhoea. Another practice to stop diarrhoea is the use of jackfruit (Atrocarpus heterophyllus) leaves instead of sapota leaves. For four doses, the cost of sapota is Rs 4 and salt is Rs 1. **Keywords:** sapota, diarrhoea control, jackfruit	Shri Saroja Bala Manna, C/o Shri S.N. Manna, Bahichard, Midnapore (West Bengal) 721 627
826	Feeding of safeda and bamboo leaves for treatment of diarrhoea and dysentry	Diarrhoea is treated by feeding of safeda and bamboo leaves. To treat diarrhoea and dysentery batavua in maize husk is feed. This practice of curing animals is followed by Baldhar villages of Nagrota Bagwan block in Kangra district of Himachal Pradesh and is being practised for a long period. **Keywords:** diarrhoea and dysentery, feeding of safeda and bamboo leaves, batavua in maize husk, cure	Shri Rajeev Kumar, Room No. 32 D, NBn II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh) 834 006
852	Use of isabagol for control of diarhhoea and hookworm	For curing diarrhoea and hookworm infestation in animals, farmers feed isabgol @ 5 g per young animal, which has an efficacy of 80%. This is followed by 5% of farmers in Drang, Balh, Sunder Nagar and Gopalpur and development blocks of Mandi district in Himachal Pradesh, and is being followed for last 25 years. **Keywords:** isabagol, control diarhhoea, hookwarm infestation	Dr S. K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001

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1173	Feeding of sheesham leaves to control diarrohea in animals	To cure diarrhoea in animals, leaves of sheesham are fed to animals. This practice is used by the farmers of Naikani ka Purwa village of Raebareli district in Uttar Pradesh for the last several years. **Keywords:** diarrhoea, leaves of sheesham	Shri Ram Verma, Naikani ka Purwa, Amawa, Raebareli (Uttar Pradesh)
1196	Control of diarrhoea by use of bael / baked bael (stone fruit)	A solution of pulp of bael/baked bael (stone fruit) is prepared in boiled and cooled water, fed orally to the affected animals. This practice controls diarrhoea in animals with about 70–80% efficiency. This practice is followed by Pandri Halwa villagers of Bareilly district in Uttar Pardesh for many years. About 60–70% of the farmers are following it. **Keywords:** bael solution, diarrhoea cure	Shri Bandhu S/o Shri Rambhrose Lal, Pandri Halwa, Bhojipura, Bareilly (Uttar Pradesh)
1215	Control of diarrhoea by mustard oil	Mustard oil and edible soda have anti-diarrhoeal effect. These after dissolving in water are given to affected animal by the farmers of Dabra village in Hisar district of Haryana. This treatment costs Rs 10 per animal. **Keywords:** diarrhoea, mustard oil, edible soda	Dr B.P. Singh, Division of Extension Education, IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1235	Use of camphor in treatment of diarrhoea in cattle and buffaloes	For treatment of diarrhoea in cattle and buffalo, a few grams of camphor with jaggery is fed to the animal, 2–3 times a day, which costs Rs 10–20 per animal. This is practised in many villages of Badaun and Bareilly district of Uttar Pradesh. **Keywords:** diarrhoea, jaggery, camphor	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1263	Treatment of diarrhoea in animals by dhatura fruits	Dhatura fruits are poisonous but have medicinal value as explored by the farmers of many villages of Bulandshahr and Aligarh districts of Uttar Pradesh for controlling diarrhoea in animal. Dhatura fruits are fried in fire (till its upper part is brown). Two such fruits are mixed in wheat flour roti and given to the suffering animal. If diarrhoea still persists, second dose is given on the next day. This costs Rs 10–20 per animal. **Keywords:** diarrhoea, dhatura fruit, roti	Shri Amar Singh, Nayabas Kutabpur, Dibai, BulandShahr (Uttar Pradesh) 202 393
1280	Use of stone apple (bael) to check diarrhoea in animals	Stone apple (bael) might be having anti-diarrhoea ingredient. Juice of	Ms Husan Afzal, Primary School Teacher, C/o (late) Ilyas Fatima, Mohalla



Bael fruit to control diarrhoea

stone apple is mixed with water and is drenched to the animals suffering from diarrhoea, 2–3

vedon Tola, Buduan (Uttar Pradesh)

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		times a day. Treatment per animal costs Rs 15 to 20. The animal is cured in 2–3 days. This practice is in use in many villages of Budaun, Shahjahanpur and Bareilly of Uttar Pradesh. **Keywords:** cattle, diarrhoea, stone apple	
1282	Treatment of diarrhoea in animal by use of rice starch and barley flour	Diarrhoea is a common disease in animals, specially in young ones. It creates dehydration and even may cause death. and animal becomes very weak and it affects productivity of the animal. This ITK using the home-made material is very useful for the farmers in mild cases, which is practised in many villages of Shahajhanpur, Bulandshar and Barelly districts of Uttar Pradesh. Rice starch mixed with barley flour, which are available in the farmer's houses, is given in the form of bolus to the affected animal to control diarrhoea. It checks dehydration and the animal is cured in 3–4 days. It costs Rs 20 per animal. **Keywords:** diarrhoea, rice starch, barley flour	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education Extension, Jamia Milia Islamia University, Jamia Nagar (New Delhi) 110 025
1287	Treatment of diarrhoea in cattle and buffalo	Sheesham (Dulbergia sisoo) leaves might be having anti-diarrhoea medicinal value. This ITK is highly  Sheesham leaves to control diarrhoea compatible with the existing resources. About 500 g of sheesham leaves are ground into paste and are mixed with 1 litre water and drenched 2–3 times a day per adult cow or buffalo. It costs Rs 1–2 per animal. The animal is cured in 2–3 days. This is in vogue in many villages of Shahajhanpur, Bulandashahr and Bareilly districts of Uttar Pradesh. **Keywords:** diarrhoea, sheesham	Shri Syed Musawwir Ali, Mohalla Furshoori Tola, Bund Gali, Buduan, Bareilly (Uttar Pradesh)
1495	Treatment of diarrhoea in goat by linseed cake, wheat bran and paddy straw	Diarrhoea is very common in goat/sheep in the Bagraisai village of Saraikela district of Jharkhand. Diarrhoea is controlled by using linseed cake, wheat bran, chopped paddy straw and bamboo leaves. About 100 g linseed cake, 200 g wheat bran, 1 kg chopped paddy straw and 0.5 kg bamboo leaves are mixed together as a feed and given to the affected animals thrice a day for 2–3 days. Success rate of the practice is 95%. All the farmers use this age-old practice. bamboo (bans) - Bambusa arundinaceas, rice (dhan) - Oryza sativa, wheat (gahun) - Triticum aestivum	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikela- Kharsawan (Jharkhand) 831 002

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		Keywords: diarrhoea, goat, linseed cake, wheat bran, paddy straw, bamboo	
1497	Control of diarrhoea in cattle	In cattle, diarrhoea is also a common problem for cattle in the Bagraisai village of Saraikela district of Jharkhand. When it is observed that cattle passes watery stool, bamboo leaves and linseed cake are fed thrice a day for 1–2 days to check diarrhoea in cattle. The success rate of this method is 95%. All farmers of the village use this age-old practice. **Keywords:** diarrhoea, cattle, bamboo, linseed	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikela Kharsawan (Jharkhand) 831 002
1504	A spathe inflorescence of banana as an anti-diarrhoea	This is practised in the Bhorhan, Bhaturiyan and Patahin villagers of Sitamarhi district of Bihar. Spathe inflorescence of banana has good medicinal properties so that it is used to cure diarrhoea of animal. The roasted spathe inflorescence of banana is minced and given orally to the infected animals once a day for 5 days. This is in practice for last 100 years by maximum number of farmers in the above-mentioned villages. **Keywords:** spathe inflorescence, banana, diarrhoea, animals	Shri Vishwesh Kumar, C/o Satyendar Prasad Singh, Kataiyan village, Eostiyan, Sheohar, Sitamarhi (Bihar)
1517	Use of tamarind for treating diarrhoea in goat	In Bankarbani village of Saritola district of Jharkhand small-sized indigenous goats are reared and diarrhoea is common problem in the animals. In this practice, diarrhoea is treated by tamarind fruit, which has curative properties. This is age-old practice followed by 50% farmers in the village. **Keywords:** tamarind, diarrhoea, goat	Mohd. Aslam, C/o Dr Niva Bara, Department of Extension Education, RAU, Kanke, Ranchi (Jharkhand) 834006
1525	Treatment of diarrhoea in goat	Diarrhoea is a common problem in small-size indigenous goats in Bagraisai village of Sarikela district of Jharkhand. Tamnind fruit (old one) has curative property and is effective medicine for diarrhoea. Sometimes in place of tamarind fruit, bamboo leaves can be used as alternative. Diarrhoea is almost 60% checked by using tamarind fruit. This is age-old practice and adopted by 50% farmers in the village, which involves Rs 20 per animal per treatment. **Keywords:** diarrrhoea, goat, tamarind fruit and bamboo	Shri Sahyogi Mahila, C/o Dr N Bara, Department of Agricultural Extension, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006

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1529	Treatment of diarrohea in animal	To cure diarrhoea in animal, 250 g boiled fruit of dhumar is fed to animal for 2 days. This is a cheapest and non-hazardous practice and is being practised by 50% of farmers of Bihar for the last several years. It gives success by 70%. **Keywords:** diarrhoea, fruit of dhumar	Shri Veeresh Kumar, C/o Shri Sunil kumar, Kata, Muzaffarpur (Bihar)
1532	Treatment of diarrhoea in animals by flower of udhul	Paste prepared from 8–10 flowers of udhul and fed daily to animals suffering from diarrhoea in empty stomach for 4–5 days. Farmers of Karimpur village of Islampur block in Nalanda district of Bihar reported that this traditional practice has been followed by 80% of the villagers and success has been observed in 80% of the cases. **Keywords:** paste, flower of udhul, diarrhoea, empty stomach	Shri Ajit Kumar, S/o Shri S.N. Prasad, Karimpur, Dariapur, Nalanda (Bihar) 801 303
1533	Treatment of dysentery in animals through use of banana plant sap	Banana plant sap has medicinal property against dysentery. After heating banana sap and adding sufficient salt, it is given to animals for treatment of dysentery. This is administered to ailing animals twice a day for 1–2 days.The practice is followed in Kasimpur village of Islampur Block in Nalanda district (Bihar) and has potentiality for its further spread. This practice has been found effective in 80% of the cases. **Keywords:** banana, dysentery, sap	Shri Ajit Kumar, S/o Shri Shiv Nadan Prasad, Karimpur, Dariapur, Nalanda (Bihar) 801 303
1556	Control of diarrhoea in cattle, buffalo and goat  Patal kohra used for treatment of diarrhoea in animals	Farmers of Dumar village of Hazaribag district in Jharkhand are adopting this method for curing diarrhoea in cattle, buffalo and goat. Patal kohra (a wild climber, where leaves resemble cowpea leaves but are bigger size and tubers are formed under ground which is not root modification and the shape of the tuber is similar to pumpkin in appearance) and Van pyaz are ground and dissolved in water. Oral administration of this mixture controls diarrhoea in animals. This is in practice for several years. **Keywords:** patal kohra, van pyaz, water	Shri Kiran Hembrom, S/o Late William Hembrom, Dumar, Churchu, Hazaribag (Jharkhand) 825 411  Van pyaj used for treatment of diarrhoea in animals

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1558	Treatment of diarrhoea in cattle and buffaloes	Outbreak of diarrhoea in small size cattle and buffaloes is common problem. Villagers of Khijuria village of Dumka district in Jharkhand use dhania, jeera and bhang for treating diarrhoea. In this age-old practice, 10 g dhania, 10 g jeera and 20 g bhang are ground and mixed with water and fed to the animals twice in a day for 2–3 days. The cost of the treatment is Rs 30 per animal having 90% success rate. Cumin seed (jeera- Cuminum cymimum) coriander (dhania- Coriandrum sativum) hemp (bhang- Avena sativa) **Keywords:** diarrhoea, cattle, buffaloes, jeera, dhania, bhang	Ms Seemavati Singh, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1562	Treatment of khurha (FMD) disease in cattle and buffalo through use of bark of gulaychi plant	Gulaychi plant bark acts as medicine against FMD disease. It is cured by the application of bark of gulayachi plant in the Kanke block in Ranchi district (Jharkhand). The bark of flower plant gulayachi is collected, minced and paste is prepared. This paste is applied on the affected part of foot. Success has been observed in more than 75% of the cases. Cost: benefit ratio of this practice approximately works out to be 1 : 4. **Keywords:** gulaychi plant, bark, FMD, buffalo	Shri Ranjay Kumar Singh, Deparment of Extension Education, BAU, Kanke, Ranchi (Jharkhand) 834 006
1571	Indigenous treatment of arrahea in cattle and buffalo	Arrahea is common disease in small size indigenous cattle and buffalo in the Bikhampur village of Dhumka district of Jharkhand and it is cured with the help of bhelwa fruits. In the treatment of arrahea, its raw fruit is rubbed on the body of diseased animal. This low-cost practice is being adopted by 60% farmers in the village. **Keywords:** arrahea, cattle, buffalo, bhelwa	Shri Debasis Murmu, Shri Mohan Hansda, Agrarian Assistance Association, Bunder Jori, Dumka (Jharkhand)
1578	Geru an antidiarrhoea agent in animals	Plant of geru is used as an antidiarrhoea agent in the Sambha village of Muzaffarpur district of Bihar. In this 50 years old practice, geru is dissolved in water and given orally to the animal infected from diarrhoea once a day for 2–3 days. Maximum number of farmers use this practice for cattle and buffalo. **Keywords:** geru, antidiarrhoea, water, animal	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006
1585	Treatment of diarrhoea in goat by juice of urhul flower (Hibisrosa sinensis)	Diarrhoea is a common disease in the small size indigenous goats in the Samtoli village of Simdega district in Jharkhand. Diarrhoea in goats is controlled by urhul flower. Juice of urhul (Hibisrosa sinensis) flower (2–3 flowers) is orally administered twice a	Shri Babulal Horo, Pathalkudwa, Church Lane, Ranchi (Jharkhand) 834 001

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		day for 3 days. The cost of the treatment is Rs 30 per animal. Maximum number of farmers use this age-old practice. **Keywords:** diarrrhoea, urhul flower, small-size goat, juice of urhul flower	
1589	Treatment of diarrhoea in animals (goat and sheep)	Goat and sheep which are suffering from the diarrhoea are treated by pojo plant. Paste is prepared by crushing the pojo plant it is fed to animal @ ½ cup of pojo paste daily for 3 days. Villagers believe that pojo plant has medicinal value, controls diarrhoea and prevents dehydration. This wisdom is being in used for the ancient time without modification. **Keywords:** diarrhoea, paste of pojo plant, fed to animal, prevent dehydration	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke Ranchi (Jharkhand) 834 006
1900	Control of diarrhoea in animals by mixture of leaves	Five hundred gram leaves each of pipal (Ficus religeosa), babool (Acacia spp) and guava (Psydium guajava); 1 kg fingermillet flour and 100 g salt are ground well and mixed with 1.5 to 2 litres water. This solution is drenched to the animals suffering from diarrhoea for 3 times a day for 4–5 days.. It is practised since 70–80 years by 60% of farmers in Sonapur village of Jahanaganj block of Azamgarh district of Uttar Pradesh. **Keywords:** diarrhoea in animal, pipal, babool, guava, drenched	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1946	Control of diarrhoea in calves	Diarrhoea in calves due to overfeeding, excess intake of green tuber crops or indigestion causes heavy drain of body water and minerals from the body. Weakness and dehydration leads to heavy loss in health and lowering of resistance. Under these circumstances, diarrhoea in calves is controlled by feeding the animal ½ litre sweet oil (safflower and groundnut oil) mixed with 5 g camphor for 3–4 times.The cost of application is Rs 15–18. It is being adopted in western parts of Ahmednagar, Pune and Solapur districts of Maharashtra. **Keywords:** calves, diarrhoea, sweet oil, indigestion, dehydration	Shri B. B. Khutal, C/o Dr A.R. Bangar, ADR, NARP, 97, Raviwar Path, PO Box No. 207, Solapur (Maharastra) 413 002
1963	Sapota Juice & banana stem extract for diarrhoea control in animals	Extract of sapota fruit and banana stem are mixed in equal proportion in 500 ml. water. The mixture is given three times a day. More than 80% of people use this practice for diarrhoae control in animals	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture,

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		Keywords: Juice of sapota, Banana stem, Diarrhoea.	C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1964	Mixture of pulp of palm tree and banana stem for diarrhoea control in animals.	Palm tree pulp is prepared by crushing and mixed with banana stem extract. The mixture is given by adding 500 ml of water. When animals of Dindori (Madhya Pradesh) suffer from diarrhoea the rural people give this mixture thrice daily for 3–4 days. The highly cooling property of the mixture cure the problem to a considerable extent. **Keywords:** Palm pulp, Banana stem, Diarrhoea	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1965	Control of diarrhoea in goat	Kid mortality is one of the problems of goat rearing farmers. Diarrhoea plays a major role in kids mortality. To control diarrhoea in goat, bamboo leaves are ground and the extracted juice is orally administered. Farmers of Solapur district of Maharastra are adopting this practice since several years. **Keywords:** bamboo leaves, juice	Shri B.B.Khutal Solapur (Maharastra)
1967	Curing of diarrhoea in goats by using takala flower	Diarrhoea is a commonly observed health disorder in goats. The reason may be eating of tender grasses in rainy season, excess feeding intake of tubers, grains causes diarrhoea. To control diarrhoea, takala flower juice and ½ cup of tea is orally administered to the goat for 2–3 days. Farmers of Solapur district in Maharastra are adopting this practice since several years. **Keywords:** takala flower juice, diarrhoea, health disorder	Shri B.B.Khutal Solapur (Maharastra)
2187	eParudu mandu as a diarrhoea medicine	Diarrhoea in animal is controlled by taking 150 g parudu (Phyllanthus reticulatus) and 150 g banana leaves ground by adding 150 g ragi floor and this is administered to the animal thrice a day. Parudu leaves act as astringent and thus arrest the diarrhoea. **Keywords:** parudu mandu, diarrhoea	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2194	Use of gorinta (Lawsonia alba) in controlling diarrhoea in animals	About 100 g gorinta (Lawsonia alba) seed are soaked in water over night. Then the seed is ground and made liquid. This juice is fed to the cattle three times per day for about three days to control the diarrhoea in animals. The seed may have the anti diarrhoeal properties. These are fed to the cattle during	Shri Mudam Rajaiah, C/o Prakasam Krishi Vigyan Kendra, Gram Nava Nirman Samithi, Jamai Kunta, Karimnagar 505 122

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		September and October by the farming families. **Keywords:** gorinta, diarrhoea, animals	
415	Treatment for dysentery in goats	Banjam (Aridisa solanaceasyn) bark is ground well and mixed in juice obtained from bonkurchi (Holarrhena antidysenterica). The mixture is boiled and made into a thick substance and is orally administered to the goats. This practice controls dysentery in goat very effectively. This is due to the active ingredients present in plants that have anti-dysenteric properties. All farmers of Kalajharia village in Midnapore district of West Bengal are adopting this practice since 60 years. **Keywords:** Banjam (Aridisa solanaceasyn), bonkurchi (Holarrhena antidysenterica), anti-dysenteric properties	Dr S.S. Dana, Reader and Head, Dept of Extension Education, Fishery Sciences, Mohanpur Campus, Krishi Viswavidyalaya, Nadia (West Bengal) 741 252
796	Treatment for dysentery in animals	Locally developed treatment of animals for dysentery is claimed to be highly effective. Treatment of nostrils of domestic animals with red hot iron is the traditional method for dysentery control. This ITK practice is used throughout the north Himalayan region since time immemorial. **Keywords:** dysentery, hot iron rod, nostril	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
798	Treatment of dysentery in animals	For treating dysentery in animals, a red hot iron is brought near the nose of the animal, which is claimed to be very effective. The practice is specific to Lahaul valley and is also operational in other regions of Himachal Pradesh. This is a traditional practice but very few farmers practise this technique; a majority are using modern method of treatment. **Keywords:** hot iron, treating dysentery, nose	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
813	Treatment of dysentery problem due to overgrazing	Domestic animals like buffalo, cow, sheep, goat etc. suffer from stomach problem and dysentery due to over-eating of chara, grass with high moisture or properly ground meal (aata). To protect from this conditions, the farmers of Rayada village of Theong tehsil in Mandi district of Himachal Pradesh feed boiled gur (sugar) with thymol, ali ki fali, rock salt, herb, baheda, amla. The treatment is effective and many farmers of hilly regions use this technique but these days use of veterinary medicines from market is increasing.	Shri Narayan Singh, Rayada, Sulgwara, Thunag (Himachal Pradesh)

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		Keywords: overgrazing, overeating, dysentery, feeding of boiled gur with thymol, ali ki fali, rock salt, herb, baheda, amla, cure the disease	
828	Treatment for timber (bleeding problem) in cattle	Some farmers in Lahaul and Spiti district of Himachal Pradesh practise the method of pricking the nose of animals like yak, cow, choru etc. in order to get cured from diseases due to overeating of fodder and feed. Sharp needle is injected in the nose so that there is persistent bleeding for some time. After this, hot shocks with fat iron rod are applied on the nose for wound healing. This is an age-old practice, but nowadays veterinary medicines are mainly used due to easy availability. **Keywords:** timber, pricking of nose, needle, overeating, bleeding, healing	Shri Chaman Rao, Research Scholar, Department of Bio Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1914	Controlling gas trouble and dysentery in animals by drenching with sirka	Animals suffering from gas trouble and dysentery during the monsoon are cured by feeding the animals with well fermented filtered sugarcane juice called sirka (sugarcane juice collected in March-April, kept up to June for fermentation and filtered into pottery, which turns to wine colour). About 100–150 ml is fed for 3 times in an interval of 1–2 hours for 1 day. It is practised since 70–80 years by about with 35% farmers and about 50–60% problem is controlled by this practice. **Keywords:** dysentery, gas trouble, sirka	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1917	Use of andhoul, sesso, belpatra and guava to control of dysentery in animals	The problem of severe dysentery during summer in animals is cured by feeding the animals with 1–1.5 litres solution which is prepared from crushed leaves of andhoul, sesso, belpatra and guava in 1–1.5 litres water. About 100 g common salt is aded to it. It is fed to the animals in two times a day (morning and evening) for 3–4 days. This is being practised by the farmers of Sonapur village of Jahanaganj block of Azamgarh district of Uttar Pradesh since 70–80 years and controlls about 60–70% of problem. **Keywords:** andhoul, sesso, belpatra, guava, common salt	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1940	Control of blood dysentery in animal	A mixture is prepared by mixing 50–60 g crushed mustard seed with 250–300 g curd and fed to animals suffering from dysentery. About 250 g of the mixture is given orally with the help of bamboo stick, three	Shri Ranjay Kumar Singh, Ph.D. Scholar (Agriculture Extension), C/o Dr C. B. Singh, Dean,

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		times a day till complete cure is achieved. The practice is in use by 700–750 farm families out of 300 farmers and no other alternative is followed.This is practised by farmers of Ghanaghat village, Dindori block in Dindoori district of Madhya Pradesh with an efficacy of 30–90%. **Keywords:** crushed mustard seed, curd	College of Agriculture, C2 Krishi Nagar Colony, Adhartal (Jabalpur) 482 004
1941	Use of lemon extract to control heavy blood dysentery	To cure the animals suffering from blood dysentery, the farmers of Ghanaghat village in Dindori district of Madhya Pradesh use extract of lemon leaves. About 200–250 g lemon leaves (Citrus spp.) are crushed with a little quantity of water. Again it is mixed with 200–250 ml water and 10–15 g of common salt. This extract is fed to the animals three times a day till complete recovery is achieved. This practice has an efficacy of 80–90% and is followed by 700–750 farmers out of 800 farmers. Alternatively, boiled rice water is used by the farmers. **Keywords:** lemon leaves, salt, boiled rice water	Shri Ranjay Kumar Singh, Ph.D. Scholar (Agriculture Extension), C/o Dr C.B. Singh, Dean, College of Agriculture, C2 Krishi Nagar Colony, Adhartal (Jabalpur) 482 004
411	Control of loose motion in cattle	Begunia (Vitex negundo) leaves (75 gm) with spider thread and common salt is ground and made into a paste, which is fed to the cattle thrice a day for 3 to 4 days. The cost involved per application is Rs 10 per animal with control of 60% cases. It is being followed by 50% farm families in Mangalpur village of Sambalpur district in Orissa. **Keywords:** begunia leaves, veterinary medicine	Ms Padmini Mallick, Mangalpur, Rengli Block, Sambalpur (Orissa)
789	Treatment for stomach problem of animals	Animals suffer from fever and gaseous problem due to excess eating of grass and indigestion of excess food (grass). Application of nag chhatri (Euphorbia sp.) is made to protect the animals from stomach problem. The powder of nag chhatri's root is mixed with fodder and given to the animal twice a day. This treatment takes few days for effectiveness. The practice is being followed for last 30 years by all the farmers in the village. **Keywords:** stomach, nag chhatri, fodder	Shri Surat Ram, Karyali, Majhar, Theog, Shimla (Himachal Pradesh)
809	Use of hing (asafoetida) and turpentine oil for curing indigestion	Hing (Ferula asafoetida) is first heated and then fed to the animal @ 3 g per animal. This cures indigestion of animal. Also turpentine oil @ 100 ml per adult animal and 50 ml per young animal is fed for the same purpose for immediate relief. This is practiced	Dr S.K. Sharma, Professor, Training, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya,

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		i n Chatter, Galu, Nalini, Halyatar, Janalag villages of Sadar, Sunder Nagar and Balh blocks in Mandi of Himachal Pradesh, which has proved to be 65% effective and is practised for the last 40 years. **Keywords:** hing, turpentine oil, indigestion	Mandi (Himachal Pradesh) 175 001
811	Treatment of digestive ailment (patrrara) in livestock	This disease is common in cattle and buffaloes. Insect infested fodders cause this disease. Many of these insects are harmful when consumed by the animals. The main symptoms of the disease are gastric problems, loosening of teeth, fever and the animals are unable to masticate the food and get paraled. This ailment is cured by two methods: 1. By feeding ½ litre boiled butter in the morning to the infected cattle. 2. By drenching a mixture prepared by boiling black massur (Lens esculenta), wild aakhi (Colocassia antiquorum) and juice extracted from leaves of sarek plant (Melia azadirachta), bana (Vitex negundo), keinth (Albizzia lebbek). They contain certain insecticidal substances, which help in curing the gastric ailments in cattle. Butter provides energy to the cattle. The practices are in use in most of the villages of Mandi district of Himachal pradesh. 3. **Keywords:** digestion problem, insect infected fodder, boiled butter, boiled black massur, wild aakhi, darek leaf extract, bana, keinth	Shri Yesh Paul, Gopalpur, Sarkaghat, Mandi (Himachal Pradesh)
833	Treatment for stomach problem in ruminants	Trifala, i.e. harad (Terminalio chebula), beheda (Terminalio velerica) and amla (Emblica officinalis) (50 g each) is ground and mixed properly. Another mixture of long (Syzygium aromaticum), garlic (Allium cativum), ajwain (Hyoscyamus niger) and methi (Medicago fulcata) 20 g each is prepared by grinding properly. The two mixtures are mixed and about 400 ml water is added to it. This preparation is then fed to the animals having stomach problem twice a day. A mixture of jaggery and finely ground powder of tobacco in the ratio of 2: 1 is also given orally to treat stomach problem in cattle. Another method applied is sharp incision on tail or ear of the affected animal with sharp scissor to let blood ooze out. The methods are used by most of the villagers in Karsoy block of Mandi district in Himachal Pradesh. This is a practice of ancestors which is still in use by many	Shri Gireeja Ram, Kao, Karsog, Mandi (Himachal Pradesh)

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		farmers due to its effectiveness and low cost. **Keywords:** trifala, harad, beheda, amla, long, garlic, ajwaian, methi	
1203	Herbal preparation with sheesham to control loose motion	Farmers of Tulsa Sherpur village in Uttar Pradesh use to prepare this herbal solution to control loose motion in animals. About 250 g fresh leaves of sheesham (Dalbergia sissoo) is ground and administered orally to the animal to stop loose motion. They are practising this method for several decades. **Keywords:** loose motion, Dalbergia sissoo	Dr. Jawaharlal, Principal Scientist, Division of Pharmacology and Toxicology, IVRI, Izatnagar (Uttar Pradesh) 243 122
1241	Use of mustard oil and salt in indigestion in goats	Mustard oil is laxative. It is given to goats @ 25 g with 5 g salt per adult goat once or twice a day to recover from indigestion. This treatment costs Rs 5–10 per animal. This ITK is practised in many villages of Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** goat, indigestion, mustard oil	Shri Syed Musawwir Ali, Mohalla Furshori Tola, Bund Gali, Budaun (Uttar Pradesh) 243 601
1248	Herbal preparation with kasondi to stop loose motion in animal	Kasondi and black pepper have medicinal value. Paste of 250 g leaves of kasondi mixed with 50 g black pepper is given orally twice to stop loose motion. It costs Rs 5 per animal. This is practised in Tulaserpur village in Bareilly district of Uttar Pradesh. **Keywords:** loose motion, kasondi, black pepper	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1277	Use of the mixture made from the aundhaul flower and mahua	Usually calf suffers from loose motion due to overdrinking. Most of the leaves and flower of the plant have an ability to check loose motion. The farmers of Sonapur village in Azamgarh district of Uttar Pradesh use a mixture made from the aundhaul flower, mahua flower, leaf of the babool and guava to control the problem of loose motion of new calving animal. **Keywords:** loose motion, calf, flowers of aundhaul and mahua	Shri Ranjay Kumar Singh and Shri B.S. Dwivedi, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1479	To protect cattle and goat from loose motion	This is in practice in the Tikodih village of Nawada district of Bihar to check the loose motion in cattle. The loose motion in cattle and goats can be controlled by using Indian hemp. In this practice the leaves of Indian hemp (Cannabis sativa) is ground to paste and then mixed with water. This mixture is given to the cattle and goat twice in a day to prevent loose motion.	Md Mahmood Alam, Tikodih, Pahadpur, Nawada (Bihar)

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		This practice stops loose motion in cattle and especially in the goat. This is in practice for last 10–12 years by all the families who keeps cattle and goat. **Keywords:** cattle/goats, loose motion, Indian hemp (*Cannabis sativa L.*), water	
1939	Control of loose motion in animals	A mixture is prepared by crushing leaves of chherhutta with chhachh (whey) with addition of water. Common salt of 15–20 g is also added. After properly mixing, water is added and this preparation is fed to the animals at the dose of 300–400 ml for 2–3 times in a day. This cures loose motion to the extent of 80–90% and is practised by 700–750 farmers out of 800 farmers of Ghanaghat village in Dindori district of Madhya Pradesh. Use of bamboo leaves and sugar is an alternative one. **Keywords:** chherhutta leaves, chhachh (whey), salt, loose motion, bamboo leaves, sugar	Shri Ranjay Kumar Singh, Ph.D. Scholar (Agri. Extn.), C/o Dr C B Singh, Dean, College of Agriculture, C2 Krishan Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
51	Use of til oil and milk for constipation in dairy animals	Constipation in dairy animals is considered by feeding the animal orally with 500 ml milk along with 250 ml til oil and 500 g gudia shaker solution once a day for 2 days. This solution helps in removing the accumulated faecus from the intestine and animal feels relief. It is being followed in the Malera village of Chomu block in Jaipur district in Rajasthan. The cost involved per application is Rs 20–25 only. **Keywords:** animal constipation. til oil, milk	Shri Ishwar Lal, Shri Shyam Lal, Shri Ram Babu, Malera, Jatawali, Jaipur (Rajasthan)
784	Control of constipation/bloat in animals	Three types of preparations used for treating animals from bloat or constipation are indicated here. 1. *Ajawain* (*Severtia chirata*), hing (asafoetida) and black salt are ground well and water is added in the extract. Oral administration of the extract controls constipation of the animals. 2. *Amla* (Emblica officinalis), harad (*Terminalia chebula*) and bahera (Terminalia ballerica) are ground thoroughly and mixed. This mixture is known as triphala, oral administration of the mixture controls constipatipn in animals. 3. Mature seeds (20 g) of amaltash (*Acacia fistula*) are boiled with water and orally administered to control constipation. Sometimes amaltash seeds cause diarrhoea, which perhaps flushes out undigested or partially digested food material. Lukeworm juice of amaltash is given	Shri Thakur, I/C KVK, Hamirpur (Himachal Pradesh)

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		to the ailing animals. Farmers of Hamirpur and Oliaspur in Himachal Pradesh arer practising this method. **Keywords:** constipation, *Severtia chirata, asafoetida, black salt, amla, Terminallia chebula, Terminalia ballerica, Acacia fistula, triphala*	
836	Treatment for gastric problem in ruminants	Gastric problems in ruminants (cow, sheep, goat etc.) having foul excreta are treated by leaves of patish plant by the farmers of Pooh village in Kinnaur district of Himachal Pradesh. Patish plant leaves (about 1 kg) are collected and sun dried, and crushed with muller. This is given orally with feed or whey (1 kg). Whey and leaves are mixed and about 500 ml of the mixture is given 2–3 times in a day. The treatment is quite helpful, which has been in use since long. The better medicines from market have reduced it's use. **Keywords:** *patish leaves, whey, cure*	Shri Suresh Negi, Tussi, Pooh, Kinnaur (Himachal Pradesh)
846	Treatment for afara	*Afara* is very common in animals; it is due to excess green fodder eaten by animals. When animals are suffering by afara, the stomach of animal looks like a drum. Due to afara animals suffer from acidity and gaseous problem. For treatment, use 500 g onion and 100 g turmeric mixed with sufficient amount of lassi. This mixture is given to the animal and they get relief from afara. This application is being used for cow, buffalo, ox and bull. This practice is being followed for last several years by maximum number of farmers in the village. It is easy to practice and all materials are locally available and involves little cost. **Keywords:** veterinary science, afara, stomach, onion, turmeric, cow, buffalo, ox and bull	Shri Deep Ram Verma Village Jhogeri, Tehsil Theog, Shimla (Himachal Pradesh) 171201
1189	Treatment of stomach pain by mandar leaves	For the stomach pain in animal, farmers of Banda district of Uttar Pradesh give leaves of mandar with garlic and turmeric.About 3–4 leaves of mandar, 40–50 g garlic and 40–50 g turmeric are crushed and boiled in 1 litre water. After cooling, this mixture is given to the suffering animals. About 35–40 g mixture is given in one dose with the help of bamboo stick. **Keywords:** stomach pain, mandar leaves, garlic, turmeric	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1236	Use of desi ghee in constipation of animals	Consumption of ghee help the animals in passing stool during constipation. Desi Ghee @ 250 grams per adult animal is given and through drenching 2–3 times, costing Rs 50–100 per animal. This ITK is practised in many villages and blocks of Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** constipation, ghee	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1245	Herbal preparation for gastric disorder	Buch roots have the medicinal value as stomachic and astringent. About 500 g of powder of buch roots is added to 5 litres water and infused for 6 hr and strained. Strained liquid is bitter tonic, stomachic and astringent, which is used by the farmers of DehraDun in Uttaranchal for gastric disorders in animals. This treatment costs Rs 10 per animal. **Keywords:** gastric disorder, buch root	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1256	Use of kasaundi leaves in the treatment of indigestion and constipation of animal	The extract of kasaundi herb leaves might have digestive and laxative properties. The extract of 50 g kasaundi leaves and 2 g salt is boiled in water and filtered. The extract is drenched to animals thrice a day. This treatment costs Rs 1–2 per animal, which is practised by many farmers in the villages of Shahjahanpur, Bulandsahar and Bareilly districts of Uttar Pradesh. **Keywords:** kasaundi, indigestion, constipation	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1488	Treatment of afra in cattle by use of smoke of coriander	The whole coriander plants are collected and are burnt in the room where the animal resides. The fumigation of smoke in that room cures afra in animals. The success rate of the ITK is almost 20–25%. This is in practice for last 25–30 years by maximum number of farmers in Bihita village of Nawada district in Bihar. **Keywords:** afra, smoke of coriander, fumigation of smoke	Shri Naresh Ravidas, S/o late Shri Mishri Ravidas, Bihita, Samarigaarh, Pakribarawan, Nawada (Bihar)
1575	Cure from stomach pain in animals by bengsag	When animals are suffering from stomach pain, they will show uneasiness and would not take any food. Stomach pain is controlled with the help of bengsag (mandukparni). Whole plant of bengsag is minced; then a drop of mustard oil is put along with crushed bone, mixed together and given orally to the suffering animal twice a day for 2 days. This is 100 years old practice adopted by maximum number of farmers in the Chandwe village of Ranchi district in Jharkhand. (Sautala asiatica)	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: stomach pain, bengsag (mandukparni), mustard oil, bone, animal	Malyal, Warangal (Andhra Pradesh) 506 101
2173	Taking jeera (cumin seeds) water thrice a day against indigestion	One spoon of *jeera* (cumin seeds) boiled in one glass of water and strain it and taken three doses thrice a day eliminates indigestion. The jeera has carminative property and helps in eliminating indigestion. It is compatible with the available resources. **Keywords:** *jeera*, indigestion	Shri B.Kamli, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2174	Asafoetida relieves stomach and back aches	Swallowing of small pices of asafoetida relieves from stomachache. As asofoetida is a stimulant and powerful plasmodic, has germicidal properties and helps in relieving stomach ache and backache. **Keywords:** asafoetida, stomach ache, relief	Ms Narasamma, Krishi Vigyan Kendra, Malyal, Warangal, (Andhra Pradesh) 506 101
2176	Dhania (coriander seed) sharbat relieves stomachache	Two spoons of dhania sharbat or two spoonfuls of dhania boiled in one cup of water and taken for 2–3 times relieves stomachache. The dhania seed has germicidal properties which help in relieving from stomachache and gripping pain.	Shri B.Bujji, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2180	Feeding the tea decoction without sugar to control stomach swelling	Swollen stomach problem in cattle due to eating of plant, locally called uppu baddu (in Telugu) is controlled by feeding the cattle with tea decoction without sugar. **Keywords:** cattle, swollen stomach, tea decoction	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626. NagarJuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
2181	Control of feeding deterioration and excess salivation by smoke of sambarani	The feeding deterioration and excess salivation in cattle is controlled by exposing the cattle to the smoke of sambarani. **Keywords:** sambarani smoke, feeding deterioration, excess salivation in cattle	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626, Nagar Juna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
2197	Control of indigestion in cattle	The following condiments are mixed with jaggery and fed to the cattle around 3 to 5 times a day. Carawai 20 g, turmeric 10 g, dried ginger 10 g, asafoetida 5 g, coriander seed 15 g, ginger 15 g, black pepper 5 g, garlic 5 g, sodium bicorbonate 15 g, jaggery proportionately. It control indigestion and is being practised for last 50 years by most of farmers. **Keywords:** cattle indigestion	Training Organiser, Prof. N.G. Ranga Krishi Vigyan Kendra, Vinayashram, Guntur (Andhra Pradesh) 522 309

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
52	Control of bloat in animals	The bloat in the animals is cured by feeding the animal with mixture of 1 litre of whey (chhachh), 100 g salt and 100 g kachri. In addition, the farmers feed the animal 1 litre water after adding 100 ml boiled mustard oil. This practice is being adopted by 50–70% farmers, at a cost of Rs 5–7 only, in the Malera village of Chomu block in Jaipur district of Rajasthan. **Keywords:** chhachh, mustard oil, salt, animal bloat control	Shri R K Yadav, Shri M Yadav, Shri S Lal, Shri Prahalad, Shri B Nitharwal Mulera, Jatawali, Chomu, Jaipur (Rajasthan)
58	Use of kachri and whey to control aphra	Tympany (aphra) is a serious disease of domestic animals. This disease is caused by eating green fodder and fermented silage. Due to aphra, animals feel trouble in rumen. Due to severity of the problem the animal may die. Shri Bajrang Lal of village Gambhira in Rajasthan fed kachri (Cucumis callosus) 100 g to 150 g with 2 kg whey and 1 g salt to the animal, who was cured of the aphra disease. **Keywords:** aphra disease, feeding with mixture of kachri, whey and salt	Shri Bajarang Lal, S/o Shri Nehnu Ram Meena, Gambhira, Sawai Madhopur (Rajasthan) 322 001
269	Treatment of bloat with groundnut oil	Cattle, buffalo and other animals are fed 50–500 ml (depending on the size of the animal) groundnut oil and hot water in equal proposition to control bloat. About 120 cattle owners of Thekkampatti village of Coimbatore district in Tamil Nadu are using this method for several years. **Keywords:** bloat control, groundnut oil, hot water	Shri D Rajasekar, Thekkampatti, Seeliyar, Coimbatore (Tamil Nadu) 641 113
271	Treatment of bloat with plant ingredients	The animals affected with bloat are fed black pepper, asafoetida and banana. This is practised in Thekkampatti village of Tamil Nadu for several years. **Keywords:** bloat, black pepper, asafoetida, banana	Ms Rajammal, W/o Shri M. Rangasamy, Thekkampatti, Seeliyur, Mettapalayam, Coimbatore (Tamil Nadu) 641 113
558	Method to control tympany in animals	Tympany in animals is an indigestion problem. A mixture of ajvayan (Carum capsicum), black salt and baking soda acts as a very good digestive agent. When the problem is observed, the seeds of Carum capsicum are mixed with black salt and baking soda and fed to the animals @ 200 g/day. This mixture effectively cures tympani of animals. **Keywords:** Carum capsicum, black salt, baking soda	Shri Mohan Singh, Sakar, Hawalbag, Almora (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
823	Treatment of abdominal colic and tumour formation in neck region of bullocks	In this practice, the bullocks are not allowed to drink water after heavy work in the field. This is done by covering their mouths with a mesh made of rope or bamboo sticks.The farmers claim that immediate intake of water after heavy exercise leads to the formation of tumour in the neck region of cattle. The intake of cold water after heavy exercise results in the alteration of body temperature, which causes abdominal colic. Subsequent covering of mouth after heavy work allows the attainment of normal physiological condition within a few minutes. After a short period when homeostasis is achieved, only then, bullocks are allowed to take water by removing the mesh from the mouth.This is very effective and has been practised in various villages of Himachal Pradesh for the treatment of abdominal colic and tumour formation in neck region of bullocks, since time immemorial. **Keywords:** bullock, heavy work, water not offered, tumour of neck, colic, homoeostasis, covering of mouth	Shri Rajeev Kumar, Room No. 32 D, NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175001
1205	Treatment of bloat in cattle and buffalo	To cure the bloat-affected cattle and buffalo, 100 g onion (bulb) is crushed, mixed with 250 g mustard oil and is given orally 2–3 times a day. Bloat is cured by 70–80% with this treatment. It costs Rs 10–15 to cure the animals. This practice is in vogue in many villages of Bareilly and Badaun districts of Uttar Pradesh for last 50–60 years. **Keywords:** bloat, onion, mustard oil	Shri Syed Moamber Ali, Furshori Tola, Bund Gali, Badaun (Uttar Pradesh) 243 601
1259	Treatment of bloat in animals by use of bhilara seeds mixed with wheat flour	Bhilara seeds (herb) have antacid effect. About 50 grams bhilara seeds are roasted and mixed with 250 grams wheat flour and are fed twice a day to cattle and buffalo suffering from bloat.This ITK is practised in many villages and blocks of Bareilly, Badaun and Shahjahanpur districts of Uttar Pradesh. It costs Rs 5–10 per adult cattle or buffalo. **Keywords:** bloat, bhilara seed, wheat flour	Dr (Miss) Shagufta Jamal, Department of Adult & Continuing Education & Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1264	Treatment of bloat in animals	Oak flowers, hing, nausadar, meetha soda and tobacco are used for treatment of boat in animals. About 10 g oak flowers without petals + 5 g hing + 5 g nausadar and 5 g meetha soda are ground in water of hukka (smoking vessel). This is diluted in hukka water to make it 250 g and then given to the suffering	Shri Amar Singh, Nayabas Kutabpur, Dibai, Bulandshahr (Uttar Pradesh) 202 393

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		animal. Bloat is cured within 15 minutes. This treatment costs Rs 20–30 per animal. This is in practice in many villages in Bulandshahr and Aligarh districts in Uttar Pradesh. **Keywords:** bloat, oak, flower, hing, (asafoetida), nausadar, meetha soda, hukka water	
1271	Treatment for bloating of stomach in animals	Tobacco and oak flower might have an acidic effect. About 10–12 tips of flowers of oak are made into a paste with hing, nausader and edible soda using tobacco water (residual water of hukka). This paste is given to the animal to cure bloat. If hukka water is not available, molasses are used by the farmers of Nayabas Kutubpur village in Bulandshahr district of Uttar Prasdesh. **Keywords:** bloating, oak flower, tobacoo water, hing, nausader, soda	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1507	Cure of bloat disease in animals by traditional method	Animals of Sukurhuttu village of Ranchi district in Jharkhand are commonly suffering from bloat disease in which the belly of the animal gets swollen. In this practice, 250 g of adrakh (ginger) and 50–100 g black mangrail are taken, mixed together and given orally to the suffering animal twice a day for 2–3 days. This is in practice for last 50 years by maximum number of farmers in the village and it involves little cost. **Keywords:** bloat, adrakh (ginger), black mangrail, animal	Shri Ranjay Kumar Singh, Research Associate, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
2185	Kadupu pongu mandu as a bloat reliever	The bloat condition in cattle and buffalo is relieved by feeding the animal with dry ginger about 50 g + 10 g pepper, ground into powder, and water as a drench. **Keywords:** kadupu pongu mandu, bloat reliever	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
53	Use of caraway (ajawain) to control pneumonia in dairy animals	The pneumonia in dairy animals in Anoppura and Gudasurjan villages of Amber block in Jaipur (Rajasthan) is cured as follows. Dairymen take a few burning coal into a baked earthen pot and add 20–30 g of ajawain which creates smoke. The animal is smoked for half an hour daily for about 3 days. It controls pneumonia. The cost involved per animal is Rs 8–10 and is being adopted by 70% of the farmers. **Keywords:** ajawain, pneumonia, dairy animals	Shri K. Singh, Gopal, R. Ram, Sanwar Lal Siyawa, Chomu, Jaipur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
830	Pneumonia treatment in cattle	Domesticated animals like sheep, goat, cow, donkey etc. having symptoms of salivation, off-fed, and restlessness are treated with hot juice extracted from boiled guchhi (jhangmuch or mushroom). About 100 g mushroom is boiled in 1 litre of water for about 30 min. and the juice is in cotton cloth. This juice of about 200 ml is fed orally to the affected animal at a time for 2–3 days. the treatment is found to be effective. This practice is adopted in Ribha village of Murang block in Kinnaus district of Himachal Pradesh. This is a traditional method which is passed on from ancestors but now a days farmers prefer for synthetic medicines which are easily available in the market. **Keywords:** guchhi extract, pneumonia, orally fed, disease cures	Shri Rattan Negi, Ribha, Murang, Kinnour (Himachal Pradesh)
851	Treatment of cattle suffering from saruka (pneumonia)	Pneumonia is very common in cattle. In the Nagrota block in Himachal Pradesh it is commonly known as saruka. Symptoms of disease are: whole body hairs become erect, ear lobes become cool and cattle shows shivering. This disease is treated by seeds of sarua and is in practice for last two years by the maximum number of farmers in the villages. **Keywords:** saruka, pneumonia, sarua, sarus's seeds, cattle	Shri Rajeev Kumar, Room No. 32 D NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175 001
1553	Use of eucalyputus leaves in controlling pneumonia in cattle	Animal husbandry particularly the rearing of cattle is the main subsidiary occupation of the rural folks of Banka district. But there is higher rate of mortality in cattle due to pneumonia disease. People of this district are using very good practice in curing this disease. Eucalyptus leaves are boiled in water and its vapour is inhaled by the diseased animal, which gives much relief to them. **Keywords:** eucalyptus, pneumonia, inhaling, animal	Shri Basudev Marik, C/o Training Organiser, Banka, Jagatpur, Banka (Bihar) 813 102
275	Curing of ephimeral fever in cattle	Ephimeral fever is cured when egg white and vadagam are administered orally. Vadagam is mixed with egg, which is then fed to the cattle. The practice has been in vogue for 10 years. This is in practice in Thondamuthur village of Coimbatore district in Tamil Nadu. **Keywords:** egg white, vadagam, ephimeral fever, cattle	Shri R. Kalliappan, Perur, Thondamuthur Coimbatore (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
277	Control of animal fever	Fever in livestock is controlled by applying notchi plant leaf paste on body surface of the animal and massaging it. In addition, an oral dose may be given. Leaves and tender twigs of Chinese chaste shrub (Vitex negundo) are used to control animal fever. About 150–200 gms of fresh leaves and tender twigs are ground in 50 ml water and juice is extracted from crushed material. About 100 ml of this extract is fed to the animal orally and massaged on the body with left over of the crushed materials. The animal is treated twice daily, morning and evening for 3 days. Fever gets reduced within 24 hours after intake of this oral dose. **Keywords:** chinese chaste plant (Vitex negundo), animal fever	Shri Malagouda Patil Halloli, Hukkeri, Belgaum (Karnataka)
555	Treatment of fever by kamer soil in animals	When any animal suffers from fever, the villagers make a paste of kamer soil and a thick layer of this paste is applied on the head of the animal. The soil is supposed to absorb heat, giving relief to the suffering animal. This is an easy and simple treatment for fever. **Keywords:** fever, kamer soil, heat absorption	Shri Mohan Singh, Danrati,Ranti Munsyari-Pithoragarh (Uttaranchal)
561	Use of millipede as antifever remedy for cattle	Millipede, an insect commonly seen in abundance during rainy season, is collected and put inside the kneaded flour. It is then fed to the bullocks, cows, buffaloes, goats etc. The cattle get immunized against fever at least for 1 year. This technique is used by 90% of the farmers since generations in Barakute village of Champavat district in Uttaranchal. **Keywords:** immunization, fever	Shri P. S. Mehta and Dr I. S. Bisht, NBPGR, Pusa Campus, (New Delhi) 110 012
832	Treatment for basawn (fever) in cattle	Basawn, local name for fever, is of two types: one occurring in winter and the other dhyosha in summer. It's treatment is done with a mixture prepared from 10 g dalu, 20 g banah leaves (Vitex negundo), 10 g timber leaves (Xanthozylum alation), 10 g mashna roots and 10 g kali mirch. Dalu, banah leaves, timber leaves and mashma roots are dried properly and ground kali mirch is added. Water 300 ml is added to the mixture and fed orally to the affected animal twice daily for 2–3 days. Freshly prepared mixture is used and this has a very effective result for controlling fever and blood purification as well. The practice is a traditional one for the people of most villages of Karsug block in Mandi district of Himachal Pradesh	Shri Gireeja Rao, P.O. Kaa, Tehsil Karsug, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: basawn, fever, dalu, banah leaves, timber leaves, mashna roots, kali mirch, treatment for fever	
853	Control of parawa problem in animals	The problem of parawa is very common in cattle. The main symptoms of this disease are salivation and animal stops feeding. This disease is caused by eating the insects in grasses. Treatment for this disease is done with garlic (50 g) and timbru leaves (100 g). These two ingredients are ground properly with muller separately and then mixed. About 150 ml water is added and fed to the animals with the help of bamboo stick, called nalu (200 ml capacity). The practice is found to be effective for parawa disease. This is practised in Kao village of Kinnaur district in Himachal Pradesh. **Keywords:** parawa, insects in grass, garlic, timbru	Shri Tanjeen, Kao, Yanthan, Kinnaur (Himachal Pradesh)
859	Treatment for fever in cattle	For treating fever in cattle, farmers of Pangi village of Kinnaur district in Himachal Pradesh are adopting some practices, which are mentioned here. The main symptoms of cattle infected with fever are animal stops feeding, has temperature and become lethargic. Oral administration of snake skin powder (50 g) in 100 ml boiled water is given to control fever in animals. Witchcraft is also applied for treating fever in cattle. **Keywords:** snake, skin, witchcraft	Shri Bhadar Singh, Pangi, Kalpa, Kinnaur (Himachal Pradesh)
1169	Feeding of gur (jaggery) for protecting cattles from cold	Farmers of Ujawa village are practising this method to protect cattles from cold. About 250–350 g jaggery is fed on alternate days at the night time to the pregnant animals. Then 250 g methi seeds (awti) and 1½ litres water are boiled for 30–45 minutes and 1 kg of jaggery is added and cooled, and orally administered at night to the non-pregnant animals. This practice protects the cattle from cold. **Keywords:** jaggery, methi, cold	Ms Geeta Devi, W/o Shri Ishwar Singh, 1173, Ujawa (New Delhi) 110 073
1171	Feeding of mustard oil and dried mahua to protect the goat from cold	To protect or cure the cold, mustard oil and dried mahua are fed to goats. This indigenous wisdom is being practised by the farmers of Raebareli district in Uttar Pradesh for the last several years. **Keywords:** protect from cold, mustard oil, dried mahua	Shri Ramlakhan, Ruredalsingh, Rahi, Raebareli (Uttar Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1207	Protection of animals from cold during winter by feeding boiled bajra (pearl millet)	About 1–2 kg bajra (pearl millet) is boiled and given to animals daily as concentrate. This protects animals from cold during winter. The practice is effective and fat content of milk is also increased by 2–3%. The cost involved is only Rs 10–15 per day and the practice is in use for more than 100 years with 200 to 250 farmers in each village adopting it. Others who lack knowledge about this practice or lack of availability of the materials do not practice it. **Keywords:** pearlmillet, fed to animals, protect from cold, increased fat content	Shri Satyendra Singh, Delhi Electric Co., Kodesia Building, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1225	Use of neem juice for treatment of fever of calves	Neem has immense medicinal value. When a calf suffers from fever, farmers of Sonapur village in Azamgarh district of Uttar Pradesh feed extract of neem bark to overcome the problem. Keywords: calve, fever, neem bark extract	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1229	Feeding of mahua (Madhuca indica) flower to bullocks to protect from fever and for body maintenance	Mahua flowers have cooling effect. Farmers of Sonapur village in Azamgarh district of Uttar Pradesh feed mahua flowers to the animals in rainy and winter seasons to avoid fever and maintain body heat. **Keywords:** bullocks, fever, body heat, mahua flower	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004.
1244	Herbal expectorant	Vasaka and ginger have medicinal value for the treatment of cough and bronchitis. Fresh juice of vasaka leaves (500 ml) is added to 250 ml fresh juice of ginger and 500 g honey. Preparation is useful in chronic cough and bronchitis. Dose for cattle is 50 ml twice daily which costs Rs 10 per animal for cure. It is practised in DehraDun district of Uttar Pradesh. **Keywords:** cough, bronchitis, vasaka, ginger	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology, IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1246	Herbal antipyretic	Chiraita stems (300 g) are chopped and added to 5 litres water. Preparation is bitter tonic and gastric stimulant dose for cattle is 40 ml, twice daily. It costs Rs 10 per animal. **Keywords:** chiraita, gastric stimulant, antipyretic	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1253	Herbal preparation for cough and cold	Apamarg has the medicinal value of curing cough and cold. Whole plant of apamarg (Achyranthes aspera) is ground on stone slab and 50 ml of paste is given orally for three days to animal suffering from cough and cold.This is in practise in Ganeshpur villlage of Etah district in Uttar Pradesh. **Keywords:** cough and cold, apamarg	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1255	Use of gumma (weed) to reduce fever in cattle and buffalo	Farmers in many villages of Badaun and Bareilly district of Uttar Pradesh feed the fever-affected cattle and buffalo with a mixture prepared with extract of 100 g gumma (weed) and 250 g skimmed milk 2–3 times a day. This treatment cost Rs 25–50 per adult animal. **Keywords:** cattle, buffalo, fever, gumma weed, skimmed milk	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1483	Control of ephemeral fever of cattle and buffalo	This is practised in Karge and Reptin villages of Ranchi district of Jharkhand. Occurrence of ephemeral fever in small-sized indigenous cattle and buffalo breed is a common problem. To solve this, decoction of bamboo (Bambosa arundinacea), sindwar (Vitex negundo) and neem (Azadirachta indica) is orally administered, one cup twice daily for 3 days. It is an age-old practice and adopted by 40% farmers. **Keywords:** ephemeral fever, cattle/buffalo, bamboo, sindwar, neem	Shri Md Aslam Department of Extention Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) - 834 006
1515	Treatment of cold and cough in animals by use of mustard oil and akwan plant milk	Head massaging by mustard oil mixed with 3–4 drops of akwan plant milk is done twice daily (morning and evening) for three days in the animals ailing with cold and cough. **Keywords:** akwan, mustard oil, cold and cough	Shri Varun Lal, C/o Lok Jagriti Kendra, Madhupur, Deoghar (Jharkhand)
1519	Administration of mahua fruit to cure fever in animals	People of Okhargarha village of Ranchi district in Jharkhand use mahua fruits in livestock fever. In this practice, mahua fruit is first boiled and the fleshy part is taken and coated all over the body of animals. The fever goes down. This is more than 100 years old practice adopted by majority of the farmers in the village. **Keywords:** mahua fruit, fever, animal	Shri R.K. Jha, Department of Fisheries, Ranchi Veterinary College, Kanke, Ranchi (Jharkhand) 834 007

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1523	Treatment of fever in cattle and buffalo	Fever is most common problem in small-size indigenous cattle and buffalo, which are reared in Jharkhand. To control this 250 g ole, 250 g kadibau, chiraita and madhuras are mixed and fed to the animals thrice daily. It checks the problem by almost 50–60%. This practice is highly compatible with the existing farming systems and internal resource of the household. This is age-old practice and about 50% farmers in the village use it. **Keywords:** fever, cattle, buffalo, ole, kadibau, chiraita, madhuras	ITK Project Staff, Department of Agricultural Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1535	Treatment of cold, cough and fever in animals through use of aniseed garlic and onion	The ingredients act against cold, cough and fever. About 5 g aniseed, one bulb of garlic, one onion, two tablespoon ful salt are ground and mixed in mustard oil and then it is fed to ailing animals twice a day, i.e., in morning and evening. The practice is followed in Kashimpur village of Islampur Block in Nalanda district (Bihar). This practice is very effective and about 80% cases have been successfully treated. Cost: benefit is 1 : 8 approx. **Keywords:** cold, cough, fever, garlic, aniseed	Shri Ajit Kumar, S/o Shivnandan Prasad, Kasimpur, Dariapur, Nalanda (Bihar)
1541	Cure of cough in animals	Cough is common in winter season and it is controlled by using ingredients found in home of the farmers. Urd, ajwain and burnt turmeric powder is mixed together and given orally with hot water to the suffering animal. Practice is used in cattle, buffalo, goat and pig. This is age-old practice adopted by maximum number of farmers in the Chandwe village of Ranchi district of Jharkhand. **Keywords:** cough, ingredient, cattles/buffalo	Shri R. K. Jha, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006
1548	Cure of chilling in animal by indigenous method	Chilling of legs and animal becoming cold are common in Sukurchuttu village in Ranchi district. If an animal is suffering from chilling, the mixture of jaifal (50 g), chandrasur (50 g) and 1 egg is given orally to the animal for its cure. It is in practice for last 50 years by 50 families in the village. **Keywords:** chilling, animal, chandrasur, jaifal, egg	Shri Antoni Kongri, Sukurlluttu, Ranchi (Jharkhand)
1577	Use of garlic as anticold in poultry	People of Okhargarha village of Ranchi district in Jharkhand use garlic as an anti cold for the poultries suffering from cold. In this 30 years old practice, garlic is minced properly and given orally to the suffering poultry. The farmers think that garlic is very	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		hot and it can be applied as an anti cold. Only 5 families out of 50 use this practice. **Keywords:** garlic, anti cold, poultry	University, Kanke, Ranchi, (Jharkhand) 834 006
1907	Control of cold fever in animals	Animals suffering with cold fever is treated by smearing the animals with a solution of 100 g ginger, 50 g ajwain (Trachipermum ammi), 50 g neem (Azadirachta indica) bark in mustard oil, which is boiled till colour turns reddish. Cooled mixture is smeared on backbone of animal for 3 times in a day @ 100 ml. It is being practised for last 50–60 years in Sonapur village in Azamgarh district of Uttar Pradesh. **Keywords:** cold fever, dry ginger, ajwain, mustard oil, neem bark, backbone	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1918	Use of fried mandar leaves for control of cold fever in animals	Cold fever in winter season after calving in animals is cured by using mandar leaves. 300–400 g mandar leaves are fried in 100 ml mustard oil. It is then pasted  Mandar plant used in treatment of severe cold and fever in animals on the back bone of the animal for two times in a day for about 3–4 days. About 70–80% of the disease is cured. It has been practised since last 70–80 years by the people in Sonapur village of Jahanganj in Azamgarh. **Keywords:** animal, cold fever, mandar leaves, mustard oil, calving	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1948	Application of fried beladona leaf and mustard oil paste to control high fever in animals.	 Plant of beladona About 200–250 gms. of green leaves of beladona leaves are collected and fried in 100–150 ml of mustard oil to make it a paste. When the animal suffers from high fever, the mixture paste is applied on the backbone twice daily. This is a common practice in Azamgarh. **Keywords:** Beladona leaf, Mustard oil, High fever, Backbone.	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1958	Use of Kanjee for treatment of fever in animals	Kanjee is prepared by keeping rice water in pots for 2 months. The material is allowed for fermentation. Then the fermented material is given to the animals suffering from fever at a dose of 200–250 ml per day till recovery. The material is available abundantly and act as an effective antifever element. **Keywords:** Kanjee, rice water, fermentation	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1959	Treatment of fever in animals by using extract made from mixture of Ghamira, Gurbel & Tulsi	Tribal farmers of Dindori block of Madhya Pradesh collect Ghamira, Gurbel and Tulsi and mix them in 5 : 3 : 2 ratio and crush with little water to prepare the extract. When the animal suffers from severe fever, the same extract is given at a dose of 50–100 ml. with help of a bamboo stick **Keywords:** Severe fever, Ghamira, Gurbel and Tulsi	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
787	Animals having red urine due to worm	Animals discharge red urine due to worm by eating excess grass. Application of golaje (Tinospora sp.) helps in protecting the animal having red urine. Powder of dry golaje is wetted with water for 12 hours and given to the affected animal. This practice is very useful and is followed for last several years by maximum number of farmers. The plant is available at rainy season and is free of cost **Keywords:** red urine, golaje, rainy season	Shri Chandra Singh Jogi, President, Jogi Sports Club, Near Civil Hospital Theog, Theog, Shimla (Himachal Pradesh)
1901	Control of bleeding problem in urinal tract of animal by gurhal flower and banana root pulp	Gurhal (Rosa sinensis) flower (500 gm) and 20–30 kg banana root pulp are made into a paste and 1.5–2.0 litres water ia added. It is drenched to the affected animals @ 200–250 ml per dose twice daily for 4–5 days. About 60–70% farmers of Sonapur village of Azamgarh district of Uttar Pradesh drench their animals, suffering from bleeding problem in the urinal	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator



Gurhal flower used in treatment of urinary tract ailments in animals

tract, with this mixture since 80–85 years.

Keywords: urinal bleeding in animals, gurhal, banana

2277 Haemeturia and retention of urine

Farmers in the different areas of Rajasthan are following different practices for anestrus.

Jodhpur-Nagore

1. 100 g sugar for goat and 500 g sugar for cattle is taken and mixed with 100 ml sesame oil for goat and 500 ml for cattle. It is fed to animals.
2. 50 g sodium bicarbonate is dissolved and it is fed upto 3 days.

Jaisalmer

1. Murat grass is burnt and ash is fed to animal.
2. Buiroot is ground and boiled in water. It is given to animal.

Barmer

1. Pearlmillet is given to animal

Ajmer-Nagore

1. 500 g flower of flame of the forest (Khakhra) are ground and boiled in 2.5 litres water and fed to animal.

Keywords: haematuria, urine retention, buiroot, pearlmillet grain, khakhara flower

Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

814	Treatment of liver ailments in cattle	The infected animals are cattle. The main symptoms are restlessness, loss of appetite, swelling of mouth and excess salivation; the animal stops feeding and is unable to masticate the fodder or even unable to ingest the feed. Death is the outcome in most of the cases. This disease is locally treated by giving the juice extracted from leaves of gadoosh (Callicarpa macrophylla) and banah (Vitex negundo). About 5 ml, extracted juice is given orally after diluting it with 500 ml water. The course of the disease varies from	Shri Sunder Singh, Village Nour, P.O. Sunglawara, Jangelhi, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		3 to 4 days for self-recovery. Young cattle appear to be more susceptible than the older ones and death rate is high among them. This is very effective and has been practised in most of the villages in the Sarkaghat and Jangehli tehsil of district Mandi. **Keywords:** liver ailment, extract of gaddosh and banah leaves, feeding orally	
799	Treatment of cattle against eye sores with human saliva	Human saliva is believed to be effective against eye sores in cattle. Human saliva may contain certain healing properties against eye-sore. Human saliva is collected after spitting it on hand (hand should be clean) of any person and is then put in the suffering eyes. This treatment is very effective for treating the eye sores in cattle. This ITK is practised in some parts of north-west Himalayas since time immemorial. **Keywords:** human saliva	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
820	Eye problems in animals	Eye disease in buffalo, cow, sheep, goat, horse, donkey etc. is treated by juice extracted from leaves of gadoosh plant which is very effective. Alum with gadoosh juice is also used. Farmer in Ghad village of Thunag Tehsil in Mandi district of Himachal Pradesh still use this method, which they learnt from ancestors. But due to easy availability of effective drugs, the users are declining. **Keywords:** eye disease, buffalo, cow, sheep, goat, horse, donkey etc., gadoosh and leaves, eye disease	Mr Suresh, Village Ghad, P.O. Sulghada, Tehsil Thunag, Mandi (Himachal Pradesh)
1904	Use of banyan tree sap and cow ghee to remove blood clotting in animal eyes	When an animal is suffering with blood clotting in eyeball, the animal does not open the eye. The farmers apply 1 teaspoon of banyan (Ficus bengalinsis) tree sap mixed with 0.5 to 1 teaspoon of cow ghee daily two times (morning and evening) for 7–8 days. About 70% of the farmers are following this practice in Sonapur village of Azamgarh district in Uttar Pradesh from last 80–90 years. **Keywords:** blood clotting, animal eyes, banyan sap	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1951	Use of 1% salt solution for flushing of eyes in animals for corneal opacity.	Corneal opacity is an eye disorder caused due to bacterial infection. Rural people of Nanded use 1% common salt solution for flushing the affected eyes. This is done 10–12 times. Common salt solution causes lymphatic drainage and stimulate regeneration leading to recovery. The cost of application per animal is about Rs 8. **Keywords:** Corneal opacity, Salt solution.	Dr.S.P. Deshmukh Trg. Assoc. Pokherni Nanded

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2198	Use of fresh bitter gourd leaves to control pus formation and watery eye problem in cattle	Fresh bitter gourd leaves @ 10 g are ground and mixed with salt and applied to eyes of cattle for 3 days or alternate days to control pus formation and watery eye problem. **Keywords:** pus formation in cattle, bitter gourd leaf	Shri Chandra Sekhar, Progress, 12–13–626 Nagarjuna Nagar, Tarraka, Hyderabad (Andhra Pradesh)
2271	Opacity of cornea	Farmers in the different areas of Rajasthan are following different practices for the opacity of cornea *Jodhpur:* In morning saliva is collected by spitting on palm. Fine powder of ginger is applied in the eye for 3 days. Fine powder of sugar is applied in eye for 7–8 days *Jaisalmer:* Ground alum, dried excreta of quail and powder of half burnt bread of pearlmillet is applied in the eye. *Barmer:* Eye is washed with butter milk and sugar is applied in the eye. *Ajmer-Nagore:* Dry ginger and sugar is mixed. Then mixture is applied in eye for 3–4 days. The dust between the abdomen and hind legs of sheep is collected and saliva is added to it and it is applied in the eye. **Keywords:** opacity, cornea, ginger, sugar, pearlmillet	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
241	Control of respiratory tract infection in poultry birds	Tulsi (Ocimum sanctum) leaf extract is administed orally to the birds for respiratory tract infection. About 100 g tulsi leaf is sufficient to treat 1000 birds. **Keywords:** poultry birds, tulsi leaf, respiratory tract infection	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agrilcultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
242	Control of respiratory disease in poultry birds	To control the chronic respiratory disease, the root of senthatti is dried, powdered and administered along with the regular feed for 2 day. The required quantity is 500 g for 1000 birds. **Keywords:** poultry bird, respiratory disease, senthatti	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agrilcultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
849	Traditional method of treatment of cattle suffering from minkedi (swelling of larynx)	Swelling of larynx is commonly known as minkedi in the Baldhan village in Kangra district of Himachal Pradesh. The symptoms of minkedi are: swelling of tongue and cattle do not take its fodder easily. It is treated by wild corriander mixed with wheat flour and given to the cattle. This is in practice for last several years by maximum number of farmers of the village and no modification has taken place. **Keywords:** minkedi, swelling, tongue, wheat flour, corriander	Shri Rajeev Kumar, Room No. 32 D NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175 001
1949	Crushed kush and milk for control of Asthma of animals	Roots of kush weed is collected and crushed. About 100–200 gms of crushed root is mixed to 200–250 ml of cow milk and then drench to affected animal twice daily for 6–7 days. Cost of application is only Rs 6–8 per animal. **Keywords:** Kush weed, cow milk, Drenching	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1182	Treatment of flatulence by madar and amaltas fruits with garlic, ajwain, black pepper and mustard oil	Flatulence is a dangerous disease of the animals occurring during rainy season, generally by heavy grazing and overeating of grasses. To control the disease the farmers of Uttar Pradesh prepare a mixture of madar and amaltas fruits with garlic, ajwain, black pepper and mustard oil and give this mixture to the suffering animal. To prepare the mixture, madar and amaltas fruits, garlic, ajwain and black pepper are crushed and then fried in the mustard oil. After cooling, 200 ml per dose is given to the suffering animal. The dose is repeated thrice a day as per the need. **Keywords:** flatulence, madar and amaltas fruits, garlic, ajwain, black pepper, mustard oil, heavy grazing, rainy season	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1276	Use of amaltas fruits for treating flatulence  Amaltas fruits for treatment of flatulence	Flatulence is a dangerous disease occurring generally during the rainy season, mostly due to the heavy grazing of the animal. Amaltas pods have an ability to cope with gas trouble and other stomach problem and can solve flatulence problem. To control the disease, the farmers apply the fruit of amaltas (¼ part of the pod) mixed with the black pepper (10 g), and mustard oil. The crushed material of amaltas and black pepper is fried in the mustard oil, then after cooling it is given to the animal @200 ml/dose. **Keywords:** flatulence, amaltas pods, black pepper	Shri Ranjay Kumar Singh, Shri B.S. Dwivedi, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004.

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1587	Remedy for flatulence in cattle	Bloating in cattle is treated by dry sponge of tori (Laffa cylindrica) and ghia tori (Luffa acutangula). Dried sponge of tori or ghia tori is burnt and cattle are made to inhale its fumes. Fumes of their burnt dry sponge helps in releiving the animals from gas within the body by passing the wind. Farmers of Bagraisai village of Saraikela district in Jharkhand use this age-old practice, which is effective to an extent of 95%. **Keywords:** flatulence in cattle, tori/ghia tori, sponge, cattle	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikala, Kharsawan (Jharkhand) 831 002
1908	Use of tamarind pulp, mustard oil, cowdung ash and common salt to control flatulence disease in cattle	The animals suffering from flatulence in monsoon season is controlled by using 500 g tamarind, boiled in 1.5 litres water till seeds are separated. It is filtered and mixed with 50–100 g common salt, 50 g cow dung ash and mustard oil. The mixture is drenched to the affected animal @ 400–500 ml for 2–3 times a day. **Keywords:** flatulence in animals, tamarind, mustard oil, cowdung ash	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
786	Galghotu (swelling of tongue and tumour in neck) treated by majru grass	Animals stop feeding due to swelling of tongue or tumour in neck. Water is discharged in this disease. For remedy of galghotu, majru grass (leaf) is rubbed on the tongue/or it is fed 2–3 times a day till cure. Majru grass is a perennial climber available every where free of cost and is eco-friendly. Majority of the farmers are using this practice for the last several years. **Keywords**: golghotu, swelling of tongue, tumour in neck, majru grass, rub, feed	Shri Chandan Singh Jogi, President Jogi Sports Club, Near Civil Hospital, Theog, Shimla (Himachal Pradesh) 171 201
1179	Treatment of H.S. (galaghontu) by eloran fruit	Galaghontu is a deadly disease of animals. To treat this disease, the resource-poor farmers of Sonarhi and Terhi villages of Banda district (Uttar Pradesh) use eloran fruit. The farmers collect about 250–300 g eloran fruit, crush them and give them to the affected animal by bamboo stick. Eloran plant is wildly grown in the marwa soil and is a perennial creeper. The dose is repeated thrice in the day at an interval of 3 hours. **Keywords:** galaghontu, eloran fruit, marwa soil, perennial creeper, bamboo stick	Shri Ranjay K. Singh, Ph.D. Scholar, C/o- C.B. Singh, Dean College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1239	Treatment of haemarrhagic septicaemia (H.S.) by alcohol drug	Wine (alcohol) has medicinal value. It is applied in the throat of the HS-affected animal and the throat is cleaned with the help of hand. The cough-type material is taken out. Then the animal is drenched with one litre wine. If the treatment is given at the initial stage, the animal is sure to be cured.The	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		treatment costs Rs 100–200 per animal. This practice is followed by the farmers of many villages in Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** Haemarrhagic Septicaemia, wine	
1265	Treatment of haemarhagic septicaemia (H.S.) in animals	About 30 g geru soil + 10 g sipi (snail skull) + 10 g kundru or sahjan gum are ground and mixed in 150 g of castor oil. This is boiled to make it a paste. This paste is applied on the affected neck of the animal. It kills the bacteria of H.S. Water comes out from nose and mouth of the animal and the killed bacteria come out with it. Animal is cured in 2–3 days. It costs Rs 50 to 100 per animal. **Keywords:** H.S., geru, sipi, saahjan, kundru, castor oil,bacteria	Shri Amar Singh, Nayabas Kutabpur, Dibai, Bulandshahr (Uttar Pradesh) 202 393
822	Treatment of sarka or biddi in animals (stomach and respiratory problem)	Animals having stomach and respiratory problems like stomach swelling and lethargy are treated by giving black pepper in mustard oil or black beny plus laddu (peach) and also hot shock treatment. This is practised by Sanglawara villages of Jangehli Tehsil in Mandi district in Himachal Pradesh. This is an age old practice which is still in use but not very popular due to availability of modern drugs. **Keywords:** sarka/biddi, stomach problem, respiratory problem, black pepper in mustard oil, black berry with peach, hot shock	Karan Singh Thakur Village P.O. Sanglawara Tehsil Jangehli, Mandi (Himachal Pradesh)
1272	Treatment for galghontu	Shoulders of bullocks are swollen, due to which they become unable to do work. Mixture of geru (30 g) and snail shell or sipi (50 g) is boiled in caster oil. Alua (20 g) and kudru/sahjan gum (50 g) are mixed to it. This paste under warm condition is applied on the affected neck of the animal where there is swelling. This is practised by the villagers of Nayabas Kutubpur in Bulandshahr district of Uttar Pradesh. **Keywords:** galghontu, paste made of geru, sipi, alua, kudru, sahjan, castor oil	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No.38, Purva Ahiran,Indra Chowk, Meerut (Uttar Pradesh)
1285	Treatment of haemarrhagic septicaemia (HS) disease by kala jeera	This method which is practiced in many villages of Badaun and Bareilly districts of uttar Pradesh is very effective to cure the disease, if the treatment is done at the initial stage of disease. Paste of kala jeera is applied on the throat of HS affected animal. **Keywords:** HS, kala jeera, throat	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1554	Use of elephant foot yam in controlling the haemorrhagic septicaemia (galghotu) disease in milch animal/cow	Haemorrhagic septicaemia is a very serious disease of cattle/cow. Farmers of Khambhari and Maisadih villages of Banka district of Bihar are using very good practice in controlling this disease. The tubers of elephant foot yam are crushed, salt and water is added, and then this mixture is fed to the diseased cattle. **Keywords:** elephant foot yam, haemorrhagic septicaemia (galghotu), tuber, cattle/cow	Shri Basudev Marik, C/o Training Organiser, Banka, Jagatpur, Banka (Bihar) 813 102
1572	Indigenous treatment of gola-kantha (galaghotu) in pigs	Gola-kantha (galaghotu) disease in small size indigenous pigs is treated with the help of vasak and bhelwa. It is cured by the mixture of four leaves of vasak and two seeds of bhelwa, orally fed twice a day for 2–3 days. This low cost treatment takes ½ hour in practice. About 60% farmers of Bhikhampur village of Dumka district in Jharkhand use this age-old practice. **Keywords:** gola-kantha, galaghotu, vasak, bhelwa, pig	Shri Dewashis Murmu, Mohan Hansda and Lakhiram Marandi, C/o Agrarian Assistance Association, Bunderjori, Dunka (Jharkhand)
1936	Use of gimta fish for treatment of galaghontoo	Galaghontoo is a serious disease, which occurs mostly during rainy season and especially to the calf. To overcome the problem the farmers use fresh gimta fish which is collected from pond. This has an efficacy of 40–50%. The practice is followed by the villagers of Ghanaghat in Dindori district of Madhya Pradesh. A total of 650–750 farmers use this practice out of 800 farmers. **Keywords;** galaghontoo disease, gimta fish, cures, pond	Shri Ranjay K. Singh, Shri B. S. Dwivedi, C/o Dr C. B. Singh, Dean, College of Agriculture. JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1957	Use of fried ram banse plant extract to treat the severe Galaghontoo disease.	The tribal farmers of Dindori collect ram banse herb and crushed i t for separation of extract. The same is applied to the animals suffering from Galaghontoo disease **Keywords:** Galaghontoo disease, ram banse disease	Shri Ranjay Kumar Singh, Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh)482 004
1528	Treatment of black quarter in cattle and buffalo	Farmers of Patratoli village in Ranchi district of Jharkhand use roots of harish and dhela for treating the black quarter. Roots of harish and dhela have curative property, therefore it is considered effective medicine for black quarter. These roots are mixed and fed to the animals. This treatment takes 1 hour and involves cost of Rs 30 per animal per treatment.	ITK Project Staff, Department of Agricultural Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 434 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		This is an age-old practice followed by 60% farmers in the Patratali village. **Keywords:** black quarter, cattle/buffalo, harish, dhela	
1569	Treatment of black quarter in cattle and buffalo	Kata sakhe leaves are ground and 250 g of the extract is fed twice daily to control black quarter in cattle and buffalo. About 50–60% problem is solved by this method. The cost per treatment is Rs 30. About 50% farmers in Patratoli village of Ranchi district in Jharkhand are adopting this treatment since several years. **Keywords:** kata sakhe leaves, black quarter	ITK Project Staff, Department of Agriculture Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
841	Treatment of throat infection	Animals suffer from throat infection due to infected plant or grass. Application of greengram or basutee/ adosa/basak (Adathoda vasica) uana/nirgadhee (Vitex negundo) or black pepper and desi ghee helps protect the animal against throat infection. Greengram (500 g) is boiled with water for half an hour and applied to the throat of infected animal thrice a day for 2 days. In the second method, 50 g of basutee/ adosa/ basak leaves and 50 g uana/ nirgadhu leaves are boiled with water for 10 min and the syrup is applied to the throat of the infected animal. This practice is being followed for last several years by all the farmers in the village. It is easy to practice and involves little cost. **Keywords:** greengram, Adhaloda vasica, Vitex negundo	Shri Chandra Singh Jogi, President, Jogi Sports Club, Near Civil Hospital Theog, Theog, Shimla, (Himachal Pradesh) 171 201
855	Use of hot iron for treatment of tonsil (gindia) in cattle	Infected animals are yak, cow, sheep, goat, donkey etc. Main symptoms of this infection are swelling around neck region of the cattle, unconsciousness and excess salivation. Death usually follows in many affected animals, sometimes in a few hours after the appearance of the first noticeable symptoms. Treatment is done by giving hot shocks with the flat iron rod heated up to a temperature of about 50–60°C in the neck and mouth of infected animals.This is a traditional practice for treating the tonsil ailments in cattle in Kinnaur district of Himachal Pradesh. **Keywords:** infection of tonsil, swelling in neck, cattle, hot iron shock	Shri Sherav Dolama, Nako, Yanthang, Kinnaur (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1909	Use of tamarind, chillies and palm oil to control throat infection in cattle	The throat infection in cattle is cured by drenching the animal with a mixture made from 200–300 g tamarind fruit pulp, 20–25 g chilli powder and 150–200 ml palm oil. It is fed two times a day for about 4–5 days. The cost involved per application is Rs 10–15. It is totally compatible with farming system and is being practised since 90–80 years in Sonapur village of Azamgarh district of Uttar Pradesh by 60–70% of farmers **Keywords:** throat infection, cattle, tamarind, chillies, palm oil	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1911	Control of jaharbad disease in cattle and buffalo	The farmers of Sonapur village of Jahanaganj block in Azamgarh district of Uttar Pradesh drench the jaharbad disease affected animal with a solution prepared by boiling 1 litre cow milk, 1 litre water, 50 g ainjad bark and 50 g black pepper till the solution comes to 1 litre and turns brown in colour. It is given to the animals for 2 times a day for 8–9 days. Cost involved for one treatment is Rs 5–6. About 60–70% of disease can be controlled by this practice and is being used since 60–70 years by 50% farmers of the village. **Keywords:** jaharbad disease, ainjad bark, black pepper, cow milk	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128  Ainjad plant used in treatment of jaharbad disease in animals
1962	Use of tamarind, chillies and turmeric for cure of throat infection in animals	The animals suffering from throat infection are given a mixture of 100 g tamarind, 3–4 g dry chilli and 50 g of turmeric with 500 ml, of water. The mixture is given three times a day for 3 days. **Keywords:** Throat infection, Mixture paste.	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
45	Technique of removing placenta in animals	The placenta remaining in the body of animals after calving in the desert districts of Jodhpur, Bikaner, Jaislmer and Nagour is removed by the methods as given below: 1. Feeding of animal with lathia gur (jaggery slurry) extract, which is obtained by boiling, cooling and filtering 250 g of gur along with 100 g sinia root along with 100 g of bamboo sticks. 2. Mix ½ kg ajawain in water, boil it and add ½ kg ajawaine drench to the cattle with 2 litres of water for 2 to 3 days.	Shri Z.D. Kavia, Dr Kaushish and Dr B.K Mathur, Div of Extension Education & Training. Head and P. S., Div. of Animal Sciences Senior Scientist, Div of Animal Sciences (CAZRI), Jodhpur (Rajasthan) and Shri Hari Ram Ghala, Balaya, Mundva, Nagaur (Rajasthan) 342 003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		3. Boil 250–500 g kneep (*Lyptodenia pyro-technica*) in 250 g of jaggery filter it and feed to the animal after cooling. 4. Boil 10 g bark of arjan (*Ailanthis excelsa*), filter and cool it and give 2 doses in 1 day to the animal. After calving, usually placenta drops naturally. In some cases placenta is retained in the body of the animal, which may cause poisoning. Villagers use chickpea (Cicer arietinum) for removal of placenta. Husk is removed and chickpea is boiled in the desired quantity of milk. It is mixed well and given as oral dose in morning and evening for 2 days.The cost of the treatment is about Rs 150. **Keywords:** *animals,placenta* removal, lathia gur, *ajawine,* milk, chickpea	
61	Placenta removal in animals by use of chickpea and milk	If placenta is removed late in the animals, this indigenous medicine (chickpea) is fried, and after *decortication* it is ground and boiled in milk. It is fed twice daily for 2 days. **Keywords:** chickpea, milk, placenta	Shri Hari Ram Kala, C/o KVK, Nagour, Balaya, Mundwa, Nagour (Rajasthan)
247	Dropping of placenta in cattle	To hasten the dropping of placenta, 1 kg paddy is smeared with groundnut (*Arachis hypogaea)* oil and is fed to the cattle. It is done 3 to 4 times after calving. **Keywords:** placenta, paddy, groundnut, cattle	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
253	Treatment for expulsion of placenta in cattle	For expulsion of retained placenta in cattle, oral administration of powdered sesame with palm jaggery is used. This practice is being followed for the last 5 years by the farmers in Thanjavur district in Tamil Nadu. **Keywords:** sesame, palm jaggery, expulsion of plancenta, cattle	Shri R.Prakash 26, Palaniappa Nagar N. K. Road, Thanjavur (Tamil Nadu) 613 006
816	Use of fig and gur for expulsion of placenta (jer ka rukna) in cattle	This problem is very common in animals like buffaloes, cows, goats, sheeps etc. The main cause of the disease is the blockage of placenta with digestive system at the time of pasturation. This ailment is also very likely to cause other diseases.	Shri Bhupinder Singh, Tadi, Thunag, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		About 0.5 kg ripe fruits of fig are boiled in 0.5 kg gur (*Saccharum officinarum*) and then it is given orally to the affected cattle. This treatment is very useful in easy expulsion of blocked placenta, because fig fruits contain certain coolant substances which also have antiseptic property. This is very effective and has been practised in most of the villages in hilly areas of Mandi district in Himachal Pradesh since time immemorial. **Keywords:** expulsion of placenta, fig fruit and gur mixture, oral feeding	
825	Treatment of cow for expulsion of placenta	For expulsion of placenta, the farmers of Sunehar of Nagrota Bagwan in Kangra district of Himachal Pradesh follow the practice of feeding their animals with bamboo leaves and bark boiled with paddy husk. This preparation is fed to the cow just after birth to expel the placenta. The practice is in use for many years without any modification, but veterinary medicines are also used. **Keywords:** expulsion of placenta, cow, bamboo leaves, bark, paddy husk	Shri Rajeev Kumar, Room No. 32 D, NBn II Hostel, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
854	Treatment for eating of placenta in cattle	Milk production reduces when cow happen to eat her own placenta. To treat this condition, about 2 kg bark of sembal (*Bombax ciba*) plant is fed with feed or boiled in jaggery and fed. The treatment is continued for 2–3 days to improve milk production. The practice is effective, which is in practice for many years in most villages of Mandi district in Himachal Pradesh. **Keywords:** eating of placenta, cow, decreased milk production, sembal (*Bombax ceiba)*	Shri Gireeja Ram, Kao, Kassog, Mandi (Himachal Pradesh)
863	Treatment for removal of placenta in cattle	Farmers of *Mendi* village of Mandi district in Himachal Pradesh are adopting this practice for removal of placenta in cattle. Banana inflorescence is cut into small pieces and 0.5 kg is orally administered to the cattle effected by this problem. *Bayuhal* twigs (10–20) are ground and 200 ml of the extract is orally administered to the affected cattle, which helps release the placenta safely within 30 minutes. **Keywords:** removal of placenta, banana inflorescence, *bayuhal* twigs	Shri Sita Ram, Mendi, Karsog, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1164	Removal of placenta by feeding railway ticket to animals	For removal of placenta in cows, 12–15 railway tickets (pulpy) are fed to cows with flour paste. Farmers of Chandaus block in Aligarh district of Uttar Pradesh assume that chemical or element presented in railway ticket acts as medicine, which removes the placenta. This practice is in use for the last 2–3 years. **Keywords:** removal of placenta, railway tickets, flour paste, medicine	Shri Niranjan Lal, 5-A, Labour Street, IVRI Road, Izatnagar, Bareily (Uttar Pradesh) 243 122
1210	Indigenous method of placenta extraction after calving in cow and she-buffalo	When cow or she-buffalo are unable to discharge the placenta, they are given 2 kg lukewarm milk with 250 g desi ghee and 100 g sugar after calving. It encourages the placenta extraction activity in the body. This practice has been followed by the people of Nayabs Kutubpur village of Bulandashahr district in Uttar Predesh for the last several years without any modification. **Keywords:** placenta, lukewarm milk, desi ghee, sugar, after calving	Shri Prem Pal Singh Arya, C/o Daal Chand H. No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1216	Expulsion of retained placenta	If placenta is retained, the animal is fed barley (2 kg) and molasses (1.5 kg) for its removal. This costs Rs 25 per animal. This is practised in many villages of Almora district of Uttaranchal. **Keywords:** placenta, barley, molasses	Shri Niranjan Lal, 5A Backer Street, IVRI Road, Izatnagar (Uttar Pradesh) 243 122
1233	Expulsion of retained placenta	Syrup containing jaggery, ajwaine, shatawar, and bamboo leaves, mango leaves and paddy straw which when fed to the freshly calved animal help in expulsion of retained placenta. This is practised in Champatpur village of Allahabad district in Uttar Pradesh. **Keywords:** placenta, jaggery, ajawaine, shatawar, bamboo and mango leaves	Shri Ajay Kumar, Training Associate (Extension) Krishi Vigyan Kendra, Allahabad Agriculture Institute (Deemed University), Allahabad (Uttar Pradesh)
1266	Treatment of retention of placenta	Ghee mixed with milk has medicinal value. One or 1½ kg cow milk mixed with 200 g sugar is boiled. About 150 g pure ghee is mixed with it and is given to the suffering animal after 4–5 hours of calving. Warm water is given for drinking. Placenta will be removed easily. It costs Rs 40–50 per animal. This practice is in use in many villages of Bulandshahr and Aligarh districts of Uttar Pradesh. **Keywords:** placenta, cow milk, sugar, ghee	Shri Suraj Pal Singh, Nayabas Kutabpur, Dibai, Bulandshahra (Uttar Pradesh) 202 393

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1274	Use of leaves of jaiphal and kaiphal for removing placenta from animal	Retention of placenta after calving is a common problem in cattle and buffaloes in the rural areas. It becomes very essential to cure this problem within a time limit to check animal mortality and morbidity.The mango leaves, jaiphal and kaiphal are ground and made up to a paste. After warming it is applied around the vagina. After some time the retained placenta is removed from animal. This ITK is prtactised in Dabra village of Hisar district, Haryana. **Keywords:** removal of retained placenta, jaiphal, kaiphal, mango leaves	
1913	Use of turmeric powder with mustard oil to prevent infection in cut portion of placenta	In some cases after calving the placenta is not dropped due to some factors. This problem can be solved by feeding the animals with 200–250 g ghongichi crushed seed by mixing with 200–300 ml mustard oil for 2 times with an interval of 3–4 hours. About 80 to 90% of results are obtained by this practice. This is in practice since 70–80 years by 40–50% of farmers in Sonapur village of Jahanaganj block in Azamgarh district in Uttar Pradesh.  Ghongichi plant used in quick and easy removal of placenta Keywords: ghongichi seed, mustard oil	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1921	Use of turmeric powder with mustard oil to prevent infection in cut portion of placenta	Infection on the cut end of placenta of the calving animals is avoided by smearing 5–10 turmeric powder, mixed with mustard oil for two times at an interval of one day. The turmeric has antiseptic property and controls the infection.It has been in practice since 70–80 years with 80–90% efficiency in Sonapur of Azamgarh district in Uttar Pradesh. **Keywords:** turmeric powder, mustard oil, placenta	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1937	Removal of plancenta	The mixture prepared from mahua flower (Madhuca latifolia), sugar, wheat bran, small pieces of the pulses is used for quick dropping of placenta. This preparation of about 500 g to 1 kg is given as single dose but if needed the same dose can be repeated. Mahua flower is collected during March and April for this purpose. This is practised by the farmers of	Shri Ranjay Kumar Singh, Ph.D. Scholar (Agri. Extn.), C/o Dr C B Singh, Dean, College of Agriculture, C2 Krishan Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Ghanaghat village in Dindori district of Madhya Pradesh since time immemorial with result of 80–90%. Alternatively leaves of bamboo and sugar are also used. About 600–700 farmers out of 800 farmers are following the practice. **Keywords:** *mahua* flower, sugar, wheat bran, pulse, placenta dropping, bamboo, sugar.	
2273	Retention of placenta	Farmers in the different areas of Rajasthan are following different practices for the retention of placenta in animals. *Jodhpur-Nagore* Kheep is ground and boiled in 500 ml water, and fed to animals @ 250 ml twice. lokimula is boiled in 500 ml water and 200 ml of boiled water and given to the animal. *Jaisalmer* Kheep boiled in 100 ml water, juice is extracted and jaggery is added. 50 ml mixture is fed twice daily. *Barmer* Half red chilli having black mouth is ground with 500 g wheat and fed to the animal. *Ajmer-Nagore* 500 g of pipal bark is boiled in 2.5 litres water, fed to the animal twice. Animal is fed with kheep extract. Keywords: placenta retention, *lokimula*, kheep, *pipal*, red chilli	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313001
46	Treatment of prolapse of uterus by saline water	Uterus comes out from vagina of the animals. For its treatment, water mixed with salt is sprinkled slowly on the part of the uterus, that is outside the body. By this uterus takes the normal position. **Keywords:** uterus, prolapse, salt water	Shri Dayal Ram, S/o Shri Aaidan Ram, Balaya, Mundwa, Nagaur (Rajasthan)
49	Treatment of uterus outings in animals	Ousted uterus is treated by applying a mixture of 100 g ghee, 50 g methi, 50 g haldi and 1 g opium (*aphim*) made up in mild, and the uterus is turned back by mechanical method in the animal's body. **Keywords:** *ghee, methi, haldi, aphim, milk, uterus*	Shri Khet Singh, S/o Shri Dhokal Singh, Chandan, Jaisalmer (Rajasthan)
57	Treatment of prolapse of uterus in cattle	Uterus comes out in cattle at calving. It may be due to many reasons such as weakness of the animal, injury or some changes and large size of calf. Farmers have reported indigenous treatment to overcome this problem. They wash the uterus with cold water and	Shri Jethpal Singh, S/o Shri Padam Singh, Jasai, Badmer, Badmer (Rajasthan) 344 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		apply vegetable oil (either mustard or sesame). A solution of doda (a paste of opium plant) is prepared in fresh water and filtered. This filtered solution is applied to uterus and then it is pushed inside the body. A local fibre plant is used to prepare ring of 2–3" radius for binding the uterus tightly to inhibit uterus to come out. The sick animal is given 500 ml of camel milk twice a day. Thus the animal get relief from this problem. The cost of the treatment is about Rs 100. **Keywords:** uterus, opium paste, camel milk, prolapse	
847	Cleaning of uterus of animals	Cleaning of uterus of animals (cow and buffalo) after pregnancy is essential for the health of animal as well as for milk production. In this application farmers use mixture of 50 g turmeric, 200 g uncooked rice and 200 g mallosis of oil palm. This mixture is given to the animals. After a few hours the uterus is cleaned. If above-mentioned mixture is not effective, give small pieces of cuerbit fruit to the animals and by this the uterus is cleaned completely. This application is being followed for last several years by maximum number of farmers. The result of this technique is almost 100%. It is easy to practice and all materials are locally available and it involves little cost. **Keywords:** veterinary science, pregnancy, uterus, cow and buffalo	Shri Dev Kant Prakash Village Bhejheog, Tehsil Theog, Shimla (Himachal Pradesh) 171 201
1208	Treatment of prolapse in she-buffalo after parturition by gul kankari	For treatment of prolapse in she buffalo after parturition, decoction made by boiling gul kankari (a creeper) in 1.5 kg water is given to animal twice a day for 2–3 days. This practice is being followed by the villagers of Nayabas Kutubpur village of Bulandshahr district in Uttar Pradesh. They reported that this is easiest and cheapest method, which strengthens the uterus. **Keywords:** prolapse, she-buffalo, parturition, decoction, gul kankari	Shri Prem Pal Singh Arya, C/o Daal Chand H. No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1219	Mastitis control in animals	The clinical mastitis control is being practised by many farmers in different villages of Ambala district of Haryana. Use of sodium bicarbonate has been found effective for its treatment for last many years. Sodium bicarbonate (50 g) with drinking water or mixed in wheat floor is given to the affected animals for 4–5 days. This treatment costs Rs 10 per animal. **Keywords:** mastitis, sodium bicarbonate, wheat flour, drinking water	Shri Keshav Rana, Samalkha, Barara, Bihta, Ambala (Haryana) 133 101

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1228	Feeding of black ink with bread to she animal for controlling the bhandar aana	Sometimes in cows and buffaloes, the (ovary with the coming calf) is problem of bhandar excuted before 3–4 month of calving the animals. This disease is very dangerous and may cause death of the animal if properly, not cared. Black Ink with bread is fed to she animal for controlling the problem of bhandar aana In addition, farmers smear desi wine on the croup and lower portion of the croup. **Keywords:** bhandar aand, black ink with bread, ovary coming out	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1232	Control of mastitis	Oral feeding of 200 g lemon juice reduces the mastitis infection o f the animal. This is practised in Bhujia village of Bareilly district of Uttar Pradesh. **Keywords:** mastitis, lemon juice	Shri Laxbir, Bhujia Bhojipura, Bareilly (Uttar Pradesh)
1234	Curing of mastitis by using flat thohar (Opuntia tune) as a drug	Opuntia tuna (flat thohar or chhittar thohar) is known as rich sources, of vitamin C (which is immuno-stimulent) and it also has a good antibiotic activity that helps to strengthen immune system and controls the growth of bacteria. Farmers of village Padrana in Hoshiarpur district of Punjab cure mastitis in dairy animal by using chittar thohar or thohar (Opuntia tuna). They keep few branchs of flat thohar in burning cowdung cakes overnight, then extract the pulp of roasted branches, and mix it with common salt and feed this to the animals as a drug or drench it. The practice cure mastitis, which costs Rs 25 per animal **Keywords:** mastitis, flat thohar, drug	Shri Paramjit Singh, Padnana, Garshnker, Hoshiarpur (Punjab) 144 528
1250	Herbal preparation for prolapsed uterus in animals	Prolapse of uterus is very common problem in dairy animals. Whole plant of bhring raj (Eclipta alba) is ground on stone slab and juice is extracted. About 100 g juice is applied to prolapsed uterus and with the help of hand, the uterus is pushed inside. This is practised in Ganeshpur vilage of Etah district in Uttar Pradesh. **Keywords:** prolapsed uterus, Eclipta alba	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1260	Feeding lajwanti herb in prolapse of uterus in animals	Lajwanti herb has the medicinal value. Leaves of lajwanti herb are fed to the animals to treat the prolapse of uterus. This is practised by the farmers of many villages of Badaun, Shahjahanpur and Bareilly districts of Uttar Pradesh. **Keywords:** prolapse, leaves of lajwanti herb	Shri Syed Moamber Ali, Mohalla Furshori Tola, Bund Gali, Budaun (Uttar Pradesh) 243 601

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1267	Treatment of prolapse before calving in buffalo	Farmers of many villages in Bulandshahr and Aligarh districts of Uttar Pradesh treat the buffaloes with ral, against prolapse. In this practice ral is heated to become liquid. This is pasted on one side of a new white cloth. The cloth is tied in the back of the animal from the root of the tail. With this uterus comes out till calving. This practice is in use since more than 100 years. **Keywords:** *ral, white cloth, tail root*	Shri Suraj pal Singh, Nayabus, Kutabpur, Dinbai, Bulandshahr (Uttar Pradesh) 202 393
1268	Treatment of prolapse in animals with parturition by gul kankari	Gul kankari has some medicinal value. About 250 g root or stem of gul kankari creepar is crushed and boiled in 1½ kg water. The syrup is given to the animal, 2–3 times daily for 3 days. Animal is cured in 2–3 days. It costs Rs 50–100 per animal. This is in practice in many villages of Bulandshahr, Aligarh, Etah and Hathras districts of Uttar Pradesh. **Keywords:** *prolapse, gul kankari*	Shri Suraj Pal Singh, Nayabas Kutabpur, Dibai, Bulandshahra (Uttar Pradesh) 202 393
1273	Treatment of prolapse of uterus	Barley is highly nutritive. About 0.5 kg barley flour is soaked i n water in the morning and is given, in the evening to the suffering animal with prolaspe of uterus. This is repeated every day for 8–10 days to treat the animals by the farmers of Danpur and nearby villages of Bulandshahr districts of Uttar Pradesh. **Keywords:** *prolapse, uterus, barley*	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No.38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1496	Control of epilepsy in goats and sheep	If goats are fed the leaves of Ipomoea reptens/Ipomoea fistulosa or ambari plants they suffer from convulsive fits, i.e., epilepsy. Epilepsy is protected with the help of roots of Ipomoea reptens and garlic (both used in equal proportion), which are ground to paste and added along with some salt with fresh concentrated rice beer, and given twice a day till the goat recovers. All farmers of the Sikudsai village of West Singhbhum district in Jharkhand use this age-old practice. **Keywords:** *epilepsy, goat, sheep, ambari (Ipomoea reptens), garlic, salt, rice beer*	Shri Shiv Charan Pandya, Sikudasai, Chaibasa, West Singhbhum (Jharkhand) 833 201
1573	Cleaning of uterus after delivery in animals by porosag	Porosag clears the uterus after delivery. About ½ kg poro sag is given to clean the uterus for one week in the morning. This practice is common in Kashimpur village of Islampur Block in Nalanda district (Bihar) and has potential for its spread where porosag is grown. Success has been observed in more than 75%	Shri Ajit Kumar S/o Shivnandan Prasad, Kasimpur, Dariapur, Nalanda (Bihar)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		of cases. Cost: benefit is 1 : 3 approx. **Keywords:** delivery, porosag	
1579	Traditional method to avoid abortion in cattle	Fruits of gular are used by the villagers of Kata village of Gayghat block in Muzaffarpur district (Bihar) to avoid or prevent abortion in cattle. About 10 fruits of gular are fed to cattle for 7 days over empty stomach. This is very economic (Rs 25 per animal) and traditional treatment and is being in use for the last several years. **Keywords:** fruit of gular, avoid or prevent abortion, cattle, empty stomach	Dr Sunil Kumar, Kayn, Muzafferpur (Bihar) 842 001
2272	Prolapse of vaginal uterus	Farmers in the different areas of Rajasthan are following different practices for the prolapse of vaginal uterus. *Jodhpur-Nagore* 1 kg rice and 1 kg desi sugar is mixed, soaked in water and fed to animal for 3 days. Wine is applied on uterus/ vagina and is allowed to go slowly inside. *Jaisalmer* Fenugreek is ground and mustard oil is added and applied on the uterus and slowly set inside. Dry fenugreek and milk of opium is mixed and the vagina is washed with water and apply mixture on it. *Barmer* Dry fenugreek and opium are mixed and uterus is washed and it is applied on uterus. 2 litres camel milk to cow or 2 litres cow milk to a camel is given, if it is camel for 5–6 days *Ajmer-Nagore* 1 or 1.5 kg tea is given with cold water or 2 to 3 kg desi ghee is given. **Keywords:** vaginal prolapse, sugar, mustard oil, fenugreek	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
2274	Preventing the abortion	Farmers in the different areas of Rajasthan are following different practices for the cure of abortion in animals. *Jodhpur-Nagore* 1. 500 g of desi ghee is mixed in cold water and fed to the animal bimonthly during pregnancy period	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		2. 500 g turmeric powder is mixed in 500 g of desi ghee and given to the animal for 3 days *Jaisalmer* 1. 500 g desi ghee is mixed in cold water and given to animals at bimonthly intervals during pregnancy period 2. 500 g rice is ground, soaked in water, desi ghee is added, and given three times a day at an interval of 20 days during pregnancy period. *Barmer* 50 g turmeric powder is mixed with desi ghee for 3 days at an interval of 1 month. *Ajmer-Nagore* 1. Jamun powder dissolved in cold water is given to the animal. 2. Alum powder dissolved in water is given to the animal on alternate days. **Keywords:** abortion, desi ghee, alum, jamun	
282	Energy stimulant for young calf	Black pepper (Piper nigrum) powder, if blown from the mouth of a person nursing the birth of a calf, acts as an instant energy provider to the calf. For 1 day old calf, dysentery is prevented by giving turmeric (Curcuma longa) juice (1 spoonful). After birth the calf, lies on the mud. The person nursing the animal takes some black pepper in the mouth and crushes it there and then introduces the crushed substances into the nose of the calf by blowing from the mouth. This activates the calf immediately, and after some time it stands and starts running. Thus black pepper acts as an instant energy provider to the calf. Pepper costs Rs 5 and turmeric costs Rs 4. This is in practice in Midnapore village in West Bengal **Keywords:** black pepper, turmeric, new-born calf, dysentery, energy stimulant	Ms Saroja Bala Manna, C/o Shri S.N. Manna, Bahichard, Midnapore (West Bengal) 721 627
1167	Treatment for teat obstruction	Farmers of Bakhtawarpur are adopting this practice for treating teat obstruction in cattle. About 250 g mustard oil, 250 g sugar and 250 g lemon juice are mixed together and boiled, and kept for cooling. Then the extract is administered orally for 6 days to the cattle. This is in practice for several years. **Keywords:** *teat obstruction, mustard oil, sugar, lemon juice*	Shri Ramesh, C/o Krishi Vigyan Kendra, 47, Pankha Road, D-Block, Janakpuri, (Delhi) 110 058

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1187	Treatment of udder wound by ghamira plant paste	Paste of crushed ghamira plants (25–30 g) is tied at wound of udder with the help of cotton cloth. This is repeated till the wound is cured. Ghamira plant is available in the agricultural field. This practice is found in the villages of Banda district of Uttar Pradesh. **Keywords:** udder wound, ghamira plant paste	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1281	Use of Chenopodium album to control mastitis in cattle and buffalo	Mastitis is a common ailment especially in high-yielding cattle and buffaloes. It is not only injurious to the animal but also spoils the milk produced by  Chenopodium album (Bathua) to control mastitis the diseased animal. To control mastitis a few grams of green Chenopodium album is boiled in one litre water and the fermentation is used to wash the teats and udder of diseased cattle and buffalo 1–2 times a day. The animal gets relief by this practice, which involves almost no cost. This treatment is followed by the farmers of many villages of Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** mastitis, wash of teats and udder, Chenopodium album	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1518	Cure of mastitis in cow and buffaloes by using ghee, jaggery and black salt	Mastitis, which is commonly known as thanai, is a common problem for lactating animals like cow, buffalo etc. It is cured traditionally by using cows' ghee, jaggery and black salt in some proportions. First cow ghee (250 g), jaggery (150 g) and black salt (250 g) are mixed together and given orally to the	Shri Rajeev Kumar Jha, Research Associate, Deparment of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		suffering animal. The practice is followed by farmers in Sukurhuttu village of Kanke Block of Ranchi district of Jharkhand state. Success in more than 50% of the cases was noticed in this village. **Keywords:** mastitis, cow ghee, black salt, jaggery, thanai	
1542	Traditional treatment of mastitis in animals	Mastitis, locally called thanail/thanora, is very much common in lactating animals and animal stops lactating during this period. Babuna, turmeric, surdshekh and dub grass are mixed in equal proportions and then applied on the swollen part of the udder of the affected animal. This is in practice for last 50 years by maximum number of farmers in the Madhesara village of Sitamarhi district of Bihar. **Keywords:** mastitis, thanail/thanora, babuna, turmeric, surdshekh, dub grass	Shri R. K. Jha, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006
1931	Treatment of mastitis in cattle and buffaloes	Juice from Tocea aspera roots (dukkarkand), Colocasia antiquorum (allu), Leea macrophyla root (dinda), Tectona grandis infloresence (sagavan) is extracted and mixed with flour of Eleusine coracana seed (nachani). Then the mixture is blended with honey and applied to the affected teats. The preparation has found to be very effective but only 30% of Kirlos villagers of Malvan taluk in Sindhudurg of Maharashtra are using this practice for about 50 years. **Keywords:** aspera roots, Colocasia antiquorum, Leea macrophyla root, Tectona grandis inflorescence, Eleusine seed, honey, mastitis, topical application	Shri Lawoo Rama Ghadigaonkar, Kirlos, Gavathanwadi, Sindhudurg (Maharashtra) 416 616
2264	Control of mastitis	Farmers in the different areas of Rajasthan are following different practices for the control of mastitis *Jodhpur-Nagore* 1. Animal is fed 125 g jaggery for 3 days. *Jaisalmer* 1. Tip of the horn is burnt on the opposite side. 2. Animal is drenched with jaggery, dissolved in 125 g water. *Barmer* 1. Salt is added in mustard oil and applied on the teats of animals. 2. 500 g fenugreek is soaked in water, ground and given to the animals for 3 days.	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Ajmer-Nagore 1. Cut is placed in left ear for right teat and on right ear for left teat (for goats only). 2. Hot iron treatment on tail is performed. **Keywords:** mastitis animals, fenugreek, mustard oil, jaggery	
55	Control of internal parasites in animals	Grazing animals in the tribal villages of Dungarpur are suffering from internal worms. They are cured by feeding amaltas pods mixed with water. Whenever worms are noticed in the dung of animals, tribal people apply some curative measures. It is being practiced from a long time. **Keywords:** internal parasite, amaltas, animals	Shri Goutam Lal Pargi, S/o Jagnath ji Pargi, Bamasa, via Sabla. Sagwada, Dungarpur (Rajasthan)
276	Deworming in animals	Deworming in animals by the application of syrup containing Melia azadiracta and curd acts as an effective deworming agentl. About 200 g of fresh bark of Melia azadiracta is ground nicely with curd. The material is then mixed with 250 ml curd and fed to the animals. This syrup is best suited for cattle and buffaloes. It is easy to prepare. About 30% of the population uses this method to control worms. For the last 40 years, 350 farmers are using this method in Belgaum district in Karnataka. It gives 100% control over the cattle worms and costs Rs 10 to prepare this remedy. **Keywords:** Melia azadiracta, curd, deworming	Shri B Sannappa, Mallapure, Tukkanatti, Gokak, Belgaum (Karnataka)
410	Deworming in calf	About 10–15 g pods (epicarp of fruit) of cow hage (Mucuna prurita) are taken and mixed with 10–15 ml tamarind-fruit juice and water. This mixture is then fed to calf twice daily for 2 to 3 days. It helps in killing the endoparasites /worms in the gastro-intestinal tract of the calves. It is being followed by 50 to 60% farmers for	Shri Purna Ch. Naik, Sundhiput, Scmiliguda, Koraput (Orissa)



Baidanka plant used as dewormer

the last 15 years in the Sundhiput village of Semiliguda in Koraput district of Orissa.

Keywords: deworming in cattle, Mucuna prurita

498	Use of molases for treatment of ascaris in calves	In order to get rid of ascaris infestation in calves, about 150 g of molases (gur) is administered to calves in empty stomach. This practice is followed by farmers of Serfarguri village under Gossaigaon block	Shri Ray Bahadur Chetri, Serfarguri Village, Gossaigaon Block, Kokrajhar (Assam)

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		in Kokrajhar district of Assam, mostly by Nepali farmers. The cost of treating per animal is about Rs 3 and almost all the farmers follow this with some exception as sometimes this practice fails to expel the worm. Since long time this practice is in use. Alternatively, veterinary medicine is used. **Keywords:** molasses, ascaris, calves	
554	Control of intestinal worms by tora soil	The soil, fed to the animals detaches the worms from intestine and passes them through stool. An animal suffering from worms infestation is fed with tora soil. Ten gram soil is fed to the animals per day for 3–4 days. The treatment is location specific because the type of soil used in treatment is not easily available. It is claimed that the soil can effectively treat the intestinal worms of the animals. The technique is cheap which costs Rs 10 to treat the animals. **Keywords:** intestinal worms, tora soil, wormicide	Shri Mohan Singh, Daranti, Ranti, Pithoragarh (Uttaranchal)
560	Control of intestinal worms through mamira (Thalictrum foliolosum) roots	Roots of the plant possess worm killing property. Paste is prepared from roots of mamira and fed to the animals. The paste controls the worms effectively and does not have any adverse effect on animals. This technique is also used to treat human beings. The mamira plant is easily available in the vicinity of village and the cost of the treatment is almost nil. **Keywords:** mamira, deworming	Shri Jeevan Chandra Pandey, Patiya, Hawalbag, Almora (Uttaranchal)
687	Deworming in cattle with kamal (Mallotus phillippmensis) seed powder	Kamal-seed powder along with some other ingredients (mentioned below) act as deworming drug. It causes diarrhoea, which flushes out the dead worms. Seeds of widely grown kamal are used for the treatment of worm infestation of the animals. About 25 g kamal seed powder, 100 g raya (ground) and 1.5 litres lassi are mixed together thoroughly and then given orally to ailing animals. This ITK is practised in most of the villages of Hamirpur district in Himachal Pradesh since time immemorial. **Keywords:** worm infestation, seed powder, raya, lassi	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1168	Oral administration of neem extract with salt to control worms	Green neem leaves are boiled and 10 g salt is added in the boiled extract and orally administered to the cattle. This treatment is given for 2–3 days. Farmers of Ladpur village in Delhi are practising this method	Ms Phoolwati, W/o Shri Jwala Singh, Ladpur, Kanjhawla, (Delhi)

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		to control worms for several years. **Keywords:** neem leaves, salt, worms	
1204	Control of rinderpest in cattle and buffalo	Farmers of Badaun and Bareilly districts in Uttar Pradesh are practising this method to control rinder pest. Leaf extract of shisham (100 g leaves are ground) and 250 g barley flour are mixed and admininstered orally for 2–3 times in a day. This method is in practice for 30–40 years by many farmers. **Keywords:** rinderpest, cattle, buffalo, barley flour, *shisham*	Ms Shagufta Jamal, Department of Adult and Continuing Education and Extention, Jamia Millia Islamia University, Jamia Nagar, (New Delhi) 110 025
1211	Method to kill intestinal worms in animals	Immature fruit of *dhatura* (thorn apple) is fried in fire and given to animals with *chapati/roti* to kill the intestinal worms. Dhatura has some toxic property which kills worms. This practice is being followed by the villagers of Ratanpur village of Bulandshahr district in Uttar Pradesh for last several years without any modification. **Keywords:** *unmatured fruit of dhatura* (thorn apple), *fried in fire, chapati/roti*	Shri Prem Pal Singh Arya, C/o Daal Chand H. No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1231	Deworming in animals	For deworming of animals, farmers of Pandri Halwa, Bareilly district of Uttar Pradesh feed the animals with 500 g whey *(chhachh*) in which 100 g mustard oil and 50 g salt are mixed. **Keywords:** deworming, *chhachh*, mustard oil, salt	Shri Chet Ram, Pandri, Halwa Bhojipura, Bareilly (Uttar Pradesh)
1243	Bindi as an anthelmintic	Barley (100 g) is roasted till it becomes brown and it is powdered. Bindi root (1 g) is added to it and again ground. Two spoonful of this powder is given once daily for three days. This is practised in Mukteswar of Naini Tal district of Uttar Pradesh **Keywords:** anthelmintic, barley powder, bindi root	Dr Jawahar Lal, Principal Scientist Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1247	Herbal anthelmintic	*Baibirrang, palas* and anar have good medicinal value. Baibirrang (120 g), 60 g palas seeds and 60 g anar root bark are added, powdered and made into a ball with honey to be used as purgative, a good anthelmintic. Dose for cattle is 100 g.This costs Rs 10 per animal. This is practised in Dehradun district of Uttar Pradesh. **Keywords:** baibirrang, palas, anar, purgative, anthelmintic	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122.

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
1258	Use of paste of neem leaves and mustard oil to control worm infestation in animals	Neem has wormicidal effect. Paste of 50 g neem leaves is prepared and is mixed with 250 g mustard oil. This is given to cattle and buffalo 1–2 times a day, which costs Rs 5–10 per animal. This practice is adopted by the farmers of many villages of Bareilly, Badaun and Shanjahanpur districts in Uttar Pradesh. **Keywords:** worm in animal, neem leaf and mustard oil	Dr (Miss) Shagufta Jamal, Department of Adult & Continuing Education & Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1261	Control of worm infestation in cattle and buffalo	Papaya seeds have wormicidal effect. Paste of 250 g papaya seed is mixed with 250 g mustard oil, and given to cattle and buffalo, 1–2 times a day. Farmers of many villages in Badaun district of Uttar Pradesh use papaya seeds to control worm infestation in cattle and buffalo. **Keywords:** worm, papaya seed, mustard oil	Shri Syed Moamber Ali, Mohalla Furshori Tola, Bund Gali, Budaun (Uttar Pradesh) 243 601
1484	Use of leaves of bhant (Glycine max) for checking worms in animals	Problem of worms (roundworm, tapeworm and neamatodes) in gastro-intestinal tract is common problem in small size cattle and buffaloes in Jharkhand. For control of worms, 30 to 50 g leaves of bhant (Glycine max) given to animals orally for 2 or 3 days. Leaves of bhant are anthelmintic. This practice is highly compatible with existing farming system and internal resources of the household. This is in practice for last several years by 50% of the population in the Jharkhand. **Keywords:** bhant, Glycine max, roundworm, tapeworm, nematodes, anthelmintic, cattle	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1564	Deworming of animals by neem leaves and palash seed	The farmers of Okhargarha village of Ranchi district in Jharkhand observed that when animals of their herd used reduced levels for eating, they were infected from worms. In this 20 years old practice, green leaves of neem and seeds of palash are mixed together thoroughly and given orally to the animals once or twice a day, the worms come out with stool. **Keywords:** deworming, neem leaves, palash seed, animal	Shri Ranjay Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1582	Control of worms (round worm, tape worm and nematodes) in animals through leaves of bhant	Worms in gastro-intestinal tract create very serious problems in digestion in animals. Gastro-intestinal worms like roundworm, tapeworm and treamatodes are controlled by using leaves of bhant in the area of Chandpura village of Dumka district in Jharkhand. Its leaves are anthelminitic. About 30 to 50 g leaves	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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	(Clerodendron infurtanatum)	of bhant are fed to animals for 2–3 days empty stomach early in the morning. It controls 70% of gastro-intestinal worms. This is in practice for last 15 years. **Keywords:** gastro-intestinal worms, leaves of bhant, anthelminetic, animal	
1592	Use of neem leaves and mustard oil paste to control worm infestation in animals	Worm infestation in animals is controlled by using neem leaves and mustard oil. In this practice, 50 g neem leaves and 300 ml mustard oil are mixed together thoroughly and given to the animal twice or thrice a day for 2–3 days. This is in practice for last 50 years by maximum number of farmers in many villages of Madhubani district of Bihar. **Keywords:** neem leaves, mustard oil, worm infestation, animals	Ms Rekha Karn C/o Akhileshwar Lal Das Village Betauna, P.O. Benipatti, Madhubani (Bihar)
1596	Root of daydhapara as an anthelmintic agent	Roots of daydhapara are used as anthelmintic agent to cure the animals from disease. In this practice, the roots of daydhapara are dug out from earth and washed. It is then pressed and minced and given to the animals after mixing with salt and water orally twice a day for 2–3 days. This is 100 years old practice which is having 70% success rate, and is adopted by maximum number of farmers in the Banpur village of Lohardage district of Jharkhand. **Keywords:** daydhapara, disease, anthelmintic agent, animal	Shri R.K.Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1919	Control of tapeworm infection in new calving animals	The tapeworm infection in calving animals is controlled by drenching the animal with 100–150 ml of akolh decoction (200–250 g akolh bark, boiled in 750 ml water till the solution remains 500 ml and turns dark brown in colour) daily three times for 2–3 days by mixing with common salt. It has been in practice since 70–80 years in Sonapur village of Azamgarh district in Uttar Pradesh. About 70–80% of infection can be controlled by this practice.  Akolh plant– bark used in control of tapeworm infection in animals **Keywords:** akolh bark, tapeworm infection	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1933	Use of different plants as antihelminthic drug	The juice extracted from the bark of Alstonia scholaris (locally called satvin) and hairs on the pods of Macuna pruriens (khazkuvali) and Curcuma longa (haldi) are mixed and blended with butter milk to be used as anthelmintic in animals. Turmeric is also added to the mixture. The practice is effective, which is widely used by 70% of Kirlos farmers of Malvan taluk in Sindhudurg district of Maharashtra for last 50 years. **Keywords:** mixture of Alstonia scholaris, Macuna pruriens, Curcurma longa, butter milk and turmeric, anthelmintic	Shri L.R. Ghadigaonkar Kirlos, Gavathanwadi, Sindhudurg (Maharashtra) 416616
1938	Control of tape worm in calf	A mixture of nai and damdari plants is prepared in the ratio of 5 : 2 by crushing and about 150–200 ml water is added. This preparation in the dose of 100–150 ml is fed to the young calves for three consecutive days to overcome the problem of tapeworm infestation. This practice is followed by 600–700 farmers out of 800 by Ghanaghat village in Dindori district of Madhya Pradesh with 80–90% efficacy. Alternatively mixture of chhach (whey) with Nila thhotha is used for the same purpose. **Keywords:** nai, damdari, tapeworm infestation, Neela thhotha, whey	Shri Ranjay Kumar Singh, Ph.D Scholar, (Agril. Extn), C/o Dr C B Singh, Dean College of Agriculture, C2 Krishan Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
2186	Deworming medicine	The deworming medicine is prepared by taking 50 g gadida gadapa leaves ground into paste and applied on the navel once to avoid the entry of worms into the navel. It is best for calves of cows and buffaloes. **Keywords:** deworming, cattle	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2262	Worm-infection control	Farmers in the different areas of Rajasthan are following different practices for worm-infection control: *Jodhpur-Nagore* 1. First 500 g of jaggery is fed to the animal, and later one teaspoonful chilli powder is fed daily for 3 days 2. 20 g red chilli powder is mixed with 3 g asafoetida and water drench to the animal for 3 days *Jaisalmer* 1. 250 g jaggery and 100 g red chilli is fed to animal with 1 hour break for 3 days 2. 250 g of jaggery and 2 teaspoonfuls of jumba oil is given at 1 hour interval.	Shri K.S. Hooda, Vidya Bhawan, Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

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		Ajmer-Nagore 1. Ground red chilli and jaggery is added and heat and drench it to the animal. 2. The filtrate obtained by grinding leaves boiled in water is drenched to the animals. 3. Grain of bukan boiled in water is drenched to the animal *Barmer* 1. First 250 g jaggery is fed to the animal during night and 100 g red chilli powder given in the morning. 2. Tobacco soaked in water over-night is drenched to the animal. **Keywords:** worm infection, jaggery, red chilli	
272	Control of tick in cattle	To minimize the infestation of cattle by ticks, cattle owners apply juice of agave plant. This is being followed by the villagers in Nagercoil for the last 4 years. **Keywords:** cattle, tick control, agave	Shri Meenashi Sandaram, Erumbukaddu, Rajakamangalam Road, Nagercoil, Anandanadargudi, Kanyakumari (Tamil Nadu)
408	Use of root of vaira tree to control ticks and lice in buffalo	The ectoparasites like ticks and lice on the body of the animals are removed by application of vaira (Heterodragma roxburgii) root extract, which is obtained by soaking 0.5 kg root per litre water over-night and adding a pinch of salt. After 2 to 3 hours of application, the animal body is washed with water. The chemicals present in the vaira root kill the ectoparasites. About 70 to 80% farmers are practicing this method. **Keywords:** vaira root, ticks, lice, buffalo	Shri Harihara Naik, Pakjhola, Karaput (Orissa)
556	Control of ecto-parasites in animals by a mixture of pati (Artimisia nilgirica) leaves and common salt in animals	The leaves of pati (Artemisia nilgirica L.) possess some insecticidal property. Higher concentration of salt can destroy the eggs of parasite. The paste of pati leaves is prepared and mixed with common salt. The paste is applied on the affected part of the body of the animal. The technique is found very effective to control the ecto-parasites of the animal. **Keywords:** pati, Artemisia nilgirica, ectoparasites, insecticide	Ms Prema Devi Bhagtola, Almora (Uttaranchal)
818	Treatment of skin disease in animals	Skin problems like loss of hair, dry skin and itching in animals are treated with neem leaves (Azadirachta sp.) solution of by black smoke. This is followed in	Parvan Kumar, Village Nour, P.O. Sulghada,

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		four villages of Sulghara Tehsil in Mandi district of of Himachal Pradesh by majority of the farmers. This is very popular but farmers also use veterinary medicines available in market. **Keywords:** skin disease, neem-leaf solution, black smoke, refection cure	Tehsil Thunag, Mandi (Himachal Pradesh)
837	Treatment for wool and hair loss in sheep, goat and cattle	The problem of hair and wool loss in sheep, goat and cattle is cured by use of juice extracted from roots of pipjul plant. Roots of this plant washed and crushed with muller. About 20 ml juice is mixed in 50 ml mustard oil or chulli oil for use on the affected area of the body. The treatment is given for 2–3 days after giving a bath to these animals with clean water. This treatment is very effective and is in use by many farmers in Nako village in Lahaul and Spiti district of Himachal Pradesh. Due to availability of special oil for the disease in the market, its users are declining. **Keywords:** wool and hair loss, pipjul root extract, mustard oil, chulli oil, topical application	Chhering Orje, Nako, Yanthang, Kinnour (Himachal Pradesh)
1237	Use of sitaphal (custard apple) seeds for control of ticks on animals	Paste of sitaphal (Anonna squamosa) seeds might have insecticidal effect. Ticks are killed and removed by the use of a paste made of sitaphal seeds, applied on the affected parts of the animal and kept for 5–6 hours. Ticks are removed by washing the animal with water. This treatment costs Rs 2–3 per animal. This ITK is practised in many villages of Badaun and Bareilly districts of Uttar Pradesh. **Keywords:** sitaphal seed, paste, tick	D r (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1238	Use of babool and neem with turmeric to cure skin disease in animals	A paste made from bark of babool (Acacia nilotica) and neem (Azadirchta indica) and turmeric powder cures skin disease in animals. Cost of this treatment is Rs 20–50 per animal. **Keywords:** skin disease, babool, neem, turmeric, animal	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1249	Herbal preparation for ticks, mites and lice in animal	Turpentine oil (15%) in castor oil base is applied once daily to the animals infected with mites, ticks and lice. The preparation is applied for seven days to get rid of the mites, ticks and lice. This is practised in Tulaserpur village in Bareily district of Uttar Pradesh. **Keywords:** turpentine oil, castor oil	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
1500	Control of skin disease in animal by neem leaves	Skin diseases like bodylice and fleas are common problem in animal. Hair falling in patches and scratching of the affected portion are symptoms of skin disease. To controls it, leaves or seeds of neem are ground into fine paste and applied on the body of animals suffering from skin disease. It is more than 96% effective. Almost all the farmers of Buribora village of West Singhbhum district in Jharkhand use this age-old practice. **Keywords:** skin disease, body lice/fleas, neem, hair falling in patches, scratching	Shri Vishwajit Doraiburu and Shri Haricharan Badra ASRA Building, Tombo, Chaibasa, West Singhbhum (Jharkhand) 833 201
1549	Leaves of custard apple used as antiscabies in animals	The villagers of Banpur collect leaves of custard apple (sitaphal), which has poisonous properties, and is applied on the body surface where scabies/ticks and mites are available. It kills these as soon as it is applied. It is in practice for last several years by all the villagers. **Keywords:** custard apple, sitaphal, scabies, ticks, mites, poison	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1560	Application of pest of sharifa leaf for control of lice, tick etc. and livestock	Lice and tick infestation are common problems in small-size cattle and buffaloes in the area of Sutiambe and Pethaoria village of Ranchi district in Jharkhand. These are controlled with the help of sharifa (Annona squamosa) leaves paste is applied on infested skin of animals. The leaves of sharifa have insecticidal properties. It kills and eliminates external parasites of animals. After 2nd or 3rd application, the problem is checked by 60% to 70%. About 75% farmers use this age-old practice. **Keywords:** lice/tick, sharifa (Anona squamosa), external parasites, animals	Shri Ranjeet Bara, Pathlkudwa, Church Lane, Ranchi (Jharkhand)
1574	Sindur (vermilion), an antiscabies agent	Scabies (skin disease) is controlled with the help of sindur (vermilion). Vermilion has such a characteris-tic with some chemical agent which is used as antiscabies agent to cure scabies disease in animals. The powdered vermilion or its emulsion in any bland oil is applied over the scabic area of infected animals once a day and repeated after 3–4 days. All farmers of Sambha village of Muzafferpur district in Bihar use this 100 year old practice. **Keywords:** sindur (vermilion), antiscabic, scabic, skin disease, animal	Shri R.K.Jha, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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1586	Control of skin disease in animals	Custard apple sharifa; (Annona squaqmosa) is used for treatment of the skin disease. Seeds or leaves of custard apple are ground into paste and applied on the body of animals infected with skin disease. It is repeated according to the severity of disease and is very effective to an extent of 98%. Farmers of Burebora village of West Singhbhum district in Jharkhand use this age-old practice. **Keywords:** skin disease, custard apple (sharifa seeds and leaves, animal	Shri Vishwajit Doraibru & Shri Haricharan Bodra, ASRA Building, Tombo, Chaibasa, West Singhbhum (Jharkhand) 833 201
1593	Use of decoction of sharifa leaf and seed for remedy of lice and ticks in cattle	Decoction of sharifa leaves and seed powder works as an insecticidal and ectoparasiticidal agent. People of Karge village of Ranchi district in Jharkhand use these for lice and tick control. Fresh leaves of sharifa are boiled for half an hour on fire and after cooling the water is applied twice or thrice a week on the cattles and buffalo's body for remedy of lice and tick. In this practice all ticks die and are separated from the body. It has 100% success rate and 80% farm families use this 50 years old practice. **Keywords:** decoction of sharifa leaf and seed, insecticideal, ectoparasiticidal, cattle/animals	Dr B.K. Roy, Associate Professor, Birsa Agricultural University, Ranchi (Jharkhand) 834 006
1905	Control of body lice of animal by using vanaspati (dalda) ghee `	If animals suffer with too much infection of lice, the farmers of Sonapur village of Azamgarh district of Uttar Pradesh smear about 100–200 ml of lukewarm vanaspati ghee on the skin for 2–3 times for 4–5 days. It is being practised from last 80–90 years by 60–70% of farmers. **Keywords:** animal, body lice, vanaspati ghee	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1920	Use of papaya milk for treatment of skin diseases in animals	Skin diseases of animals in which blain and blister are developed and in some cases the boll of tail is destroyed by infection are cured by application of papaya milk. About 100–200 ml milk, trapped from the plants and applied on the affected part of the animals. It is repeated for 2 times a day and is continued for 4–5 days. This practice has an efficiency of 70–80% which is in use in Sonapur village of Azamgarh district in Uttar Pradesh for 70–80 years by about 35% farmers. **Keywords:** papaya milk, smearing	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

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1924	Treating of dermatological problems in animals	Farmers of Waghi village in Maharastra using adopted this method for curing dermatological problems. Two parts sulphur powder and eight parts coconut oil are mixed together. The extract is applied on the affected animal to control skin problems (itching, alopesia, dermatitis). Sulphur powder acts as anti-fungal and coconut oil acts as soothening agents. **Keywords:** sulphur powder, coconut oil, skin diseases, dermatological problems	Dr S.P. Deshmukh, Training Associate, Krishi Vigyan Kendra, Pokharni, Limbgaon, Nanded (Maharastra) 431 602
1932	Use of Xanthoxylum rhetsa as ecto-parasiticide for ticks in cattle and buffaloes	The fruits of Xanhoxylum rhetsa (tiraphal) are boiled in airtight container and the decoction is used once a week. Animal is washed with water after half an hour of the treatment. It has found to be very effective to counteract tick infestation. The practice is in use for the past 50 years by 50% of Kirlos villagers of Malvan block in Sindhudurg district of Maharashtra. **Keywords:** decoction of fruits of Xanthoxylum rhetsa, boiled in airtight container, tick infestation	Shri L.R. Ghadigaonkar, Kirlos, Gavathanwadi, Sindhudurg (Maharashtra) 416 616
1942	Use of custard apple extract to control lice and ticks in animals	For controlling the infestation of lice and ticks in animals, the farmers of Ghanaghat village, Dindori block in Dindori district of Madhya Pradesh use the extract of sitaphal leaves with an efficacy of 80–90%. The leaves of sitaphal (custard apple) are crushed and mixed with water. It is then applied to the body of the animal (any species) infested with lice and ticks. About 200–300 ml of the extract is used for treatment. This practice is followed by about 700–750 farmers out of a total of 800 farmers. **Keywords:** lice, tick, sitaphal (custard apple) leaf extract	Shri Ranjay Kumar Singh, Ph.D. Scholar (Agriculture Extension), C/o Dr C.B. Singh, Dean, College of Agriculture, C2 Krishi Nagar Colony, Ahartal (Jabalpur) 482 004
2184	Control of lice infestation by bodasaram leaves	For the cattle infested with lice, the leaves of bodasaram are rubbed on the affected parts of the animals. This reduces the lice infestation and is being practised in Amadalavalasa of Srikakulam district in Andhra Pradesh. **Keywords:** lice infestation, cattle, bodasaram leaves	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626. Nagarjuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
2202	Using Annona (custard apple) leaves for control of ectoparasites, exemia and dandruff	Annona leaves mixed with water ground into fine paste and applied once daily for 3 days control the ecto parasites exemia and dandruff in the rainy months as annona leaves work as anti allergent and anti dandruff agent. **Keywords:** cattle, annona, ecto parasites	Shri Konda Reddy, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
2266	Eczema control	The essence of the bark of rohida, sesame oil and waterist applied on the whole body of animal. The grinded bark of rohida with sesame oil is mixed with sulphur and butter milk and applied on whole body. *Jaisalmer* Massage is done with mustard oil. Poison added mustard oil is applied on the body of animal. Salt-added mustard oil is applied on the body. *Barmer* Ash of the jall wood and application of jambo oil on body. *Ajmer-Nagore* Mix 50 g sulphur, 50 g copper sulphate and 50 g chop with sesame oil, apply on the entire body. It may be applied without chop also. **Keywords:** eczema, animal, rochida, sulphur, sesame	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
245	Healing of cuts and wounds in animals	A handful of neem (Azadirachta indica), a few pods of garlic (Allium sativum), 3–4 naphthalene balls and carbon powder (from waste battery) are mixed and made into a paste and applied on the cuts and wounds of the animals. **Keywords:** wound, animal, neem, garlic	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
246	Curing yoke galls in bullocks	To cure yoke galls in bullocks, onion roots are burnt and the ash is mixed with butter and made into a paste, which is applied on the yoke gall. **Keywords:** bullock, yoke gall, onion	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
249	Use of droppings of goat for control of wounds	About 3–4 droppings of goat and 1–2 leaves of aval are pound together. This mixture is applied daily on the wound of animals. **Keywords:** goat droppings, wound	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
268	Control of maggot in animals with camphor and neem oil	Maggot wounds of animals are treated with a mixture of neem oil and camphor in equal proportion. The mixture is applied to the affected area of the animals. Camphor helps control the maggot in the wound and neem oil prevents maggot fly sitting on the wound. About 50% of the animal owners of Tholompalayam village use this prescription to control maggot in animals for the last 10 years. **Keywords:** camphor, neem oil, maggot control	Shri C. Manikaraj Kurrai Thottam, Tholampalayam, Mettupalayam, Coimbatore (Tamil Nadu) 641 113
270	Maggot infection in wound	The leaves of kalyana muringai (Erythrina indica) are crushed and mixed with eucalyptus oil. The mixture is applied on wounds. The wounds are later pressed for removal of maggots. **Keywords:** maggot control, kalyana muringai, eucalyptus oil	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
279	Wound management in cattle	Kumatti (Citrullus colocynthis) fruit pulp mixed with neem oil is used to control maggot wound in cattle. Magggots are killed by the toxic action of fruit pulp and neem oil acts as repellent for the flies. This technology is in practice for the last five years, adopted by the farmers of Kovillor village of Pudukottai district in Tamil Nadu. **Keywords:** maggot, neem oil, wound control	Shri K. Ganesan, Melakkarai, Kovillor, Alangudi, Pudukottai (Tamil Nadu) 622 301
404	Wound treatment in cattle or buffalo  Katha champa plant used for wound healing in animals	A paste prepared from bark of karanj trees (Pongamia pinnata), bark of kathachampa and tamarind (Tamarindus indica) fruit in equal proportions, is applied on the affected portion or wound of the animal for 2 to 3 times daily in the morning to heal the wound. The chemicals present in these plant materials kill the germs. About 60 to 70% of the farmers are	Shri Parahallad Nak, Semiliguda, Koraput (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		practicing this for the last 20 years. **Keywords:** wound, cattle, buffalo, karanj, katha, champa, tamarind fruit	
407	Use of milk of weed for healing of wound in cattle or buffalo	Giant weed's (Calotropis gigantia) milk (juice), which is obtained by cutting twigs, is applied on the wounds of the affected animals 2 to 3 times on  Arakha–its milk is used for wound healing in animals alternate days for healing the wounds. The chemicals present in the juice act as killing agent of germs. About 30 to 40% of villagers are using this method for the last 15 to 20 years. **Keywords:** milk weed, wound healing, cattle	Ms Madhu Burundi, Gopalput karaput, Koraput (Orissa)
414	Healing of wounds in goats and sheep by termite soil	Soil collected from termite hill is made into a paste with warm water and applied to the wounds of sheep and goats for 2 to 3 days for healing of the wounds. It is being 3 used by 60 to 70% farm families with 50 to 60% effectiveness in Makarbilli village of Nawapada district in Orissa. **Keywords:** termite soil, wounds, sheep, goat	Bhanumati Behera Plot No 64, Surya Nagar Unit 7, Bhubaneswar (Orissa)
542	Use of beladona (dolu) for external application on wounds	100 g beladona (Rheum emodi) bark is boiled with 200 ml water. The treatment is given at the affected part of the patient with the help of a piece of cloth soaked in the hot beladona extract. It gives relief to the patient in case of hidden injury. **Keywords:** hot extract, beladona, hidden injury	Dr Nirmal Chand, Senior Scientist (Agric. Extn), VPRAS, Almora (Uttaranchal) 263 601

Treatment of worm-infested wounds in animals by bajar-bhang (Physochlaina praealta)	The juice of bajar-bhang leaves are supposed to possess insecticidal property, which kills and controls worms. An extract is made from bajar bhang leaves and applied on the affected part of the animal. The worm-infested wounds are cured effectively by this treatment without causing any harm to the animal. The plant used in this treatment is available in abundance. The method is simple and the farmers can	Shri Chandra Singh Pangati, Kainthi, Sebla, Munsyari-Pithoragarh (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		easily treat their animals. The cost of treatment is almost nil. **Keywords:** worm infested wounds, Physochlaina praealta, bajar-bhang	
815	Wound healing in animals	The itching of wounds in animals is being treated by juice extracted from the leaves of ramban, plant locally called dawarya. Some farmers also use petrol or phenyl for this purpose to kill the germs. After this, turmeric powder and alum mixture is used to fill up the wound. Juice extracted from gaddosh plant is also being used for wound healing. The practice is in use by most of the farmers of villages in Mandi district of Himachal Pradesh. Veterinary medicines are also used by the farmers. **Keywords:** wound itching, ramban leaf extract, petrol, alum, phenyl, turmeric, gaddosh bark extract, cure wound	Shri Kasav Ram, Village Bhalwad, P.O. Jangehli, Mandi (Himachal Pradesh)
834	Wood ash for wound healing in cattle	Wood ash contains certain antiseptic substances, which help kill the microbes and lead to easy recovery of wounds in cattle. Wound area is covered properly with wood ash. This helps in healing wound within a week. This treatment is done twice daily for about 3–4 days. This is practised in most of the villages in hilly areas of Kinnour. **Keywords:** wood ash, wound, cattle	Shri M.C. Negi, Nangyoh, Pooh, Kinnour (Himachal Pradesh)
835	Treatment for wounds in animals with doshkar root	Any infection or wound in the body of animal is treated by using root extract of doshkar plant. Doshkar plant roots are collected and washed in clean water. It is then crushed with miller on flat stone. The paste is then taken in a cotton cloth and juice is extracted by squeezing. About 20 ml of this juice is poured over the wounded area, which gives effective healing. The practice is followed by farmers of Pangi village in Kinnour district of Himachal Pradesh. This practice is an age old one, which is considered as first aid but availability of better drugs in the market has made its use less popular, though it is effective. **Keywords:** wound, doshkar root extract	Shri Kashi Dhannuk, Kanan, Pooh, Kinnaur (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
840	Treatment of wounds in the neck of bull	During ploughing, bulls are engaged for whole day for 4–5 days causing wound in neck. Cowdung ash mixed with kerosene oil is applied on the neck of the affected animal. Wound is healed within 4–5 days. This is in practice for last several years, followed by maximum number of farmers in the villages of Theog tehsil of Himachal Pradesh. **Keywords:** wound, bull, kerosene oil, plough, cowdung ash	Shri Chandan Singh Jogi, Near Civil Hospital, Theog, Shimla, (Himachal Pradesh) 171 201
1183	Treatment of wounds/cut from plough shear by decoction of babool bark	During the ploughing, bullock feet are cut by plough shear, which makes wounds. Farmers of Banda district of Uttar Pradesh apply bark of babool tree and geru (red soil). Babool bark act as disinfectant and also as pain killer. About 500 g babool bark and 50–100 g geru are boiled with 500 litres water till solution remains 400 ml. After filteration, it is dropped on the wounds and tied with the cotton cloth. The left over decoction is used again for 7–8 days. Kaitha leaves are also used as alternative. **Keywords:** wound made from cut by plough shear, babool bark, geru, decoction, kaitha leaves, disinfectant and pain-killer	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1186	Treatment of wound and sores by ghamira paste	The farmers of Banda district (Uttar Pradesh) apply paste of ghamira plant on the wounds and sores of animals. It provides relief to the animals. About 50 g ghamira plant is collected from the field and crushed. The paste of about 25–30 g is tied at wound with the help of cotton cloth. This is changed every day. Ghamira is a perennial herb and is found in agricultural fields. **Keywords:** ghamira plant, wound and sores, perennial herb	Shri Ranjay K. Singh, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1482	Treatment of wounds and maggots	Xerophytic plants are used for treatment of wounds and maggots by the villagers of Khorahar, Rolo, Lathia and Kundwa of Hazaribag district in Jharkhand. The semi-solid mixture of dudhee grass, chiniya grass and bark of teet wood is applied on the wounds and maggots, and also use the leaves of these grasses to smell to the animals. This is in practice for last 5 years. **Keywords:** wound, maggot, dudhee, chiniya, teet	Shri Yodu Saw, Shri Baso Gope and Shri Deglal Mahto, Kundwa, Kewal, Hazaribag (Jharkhand) 825 405



Dudhee grass used in treatment of wounds in animals



Chiniya grass used in treatment of wounds in animals

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
1486	Use of indigenous practice for treating wound in animals	This is in practice in Chatwal, Hatma and Karge villages of Ranchi district of Jharkhand. Wounds/surgical diseases are common in these areas. It is controlled by the following way. Wounds are washed with neem and after that mixture of haldi (turmeric powder), desi ghee and lime is placed on the wounds twice a day for 4–5 days. **Keywords:** wound, neem, haldi, turmeric, desi ghee, lime	Shri Veeresh Kumar, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1501	Control of worms in external wounds of cattle and other animals	Wounds in animals are infested with worms and eradication of worms is necessary for healing of wounds. This is practised in the Angadia village of West Singhbhum of Jharkhand, in which kusum (safflower) seeds are used for treatment. About 4 to 5 seeds of kusum are ground into powder and fed to the animals having external wounds, twice a day for 2–3 days. All the farmers of the village use this age-old, low-cost practice. **Keywords:** external wounds, kusum, worm	Shri Lenga Purty, Angadia, Khetiatangar, Chaibasa, West Singhbhum (Jharkhand) 833201
1509	Wound healing in animals through extract of brinjal leaf mixed with lime	The leaf extract of brinjal (Solanum melongena) has some medicinal value against wound. When its leaf is mixed with lime and applied on wounds, the animal gets cured. The leaf of brinjal is macerated between palms and its extract is collected and mixed with lime. This mixture is applied over wounds. The process is repeated twice a day for 4–5 days to heal the wounds in cattle, buffalo, pig and goat. The practice is being followed in Khalisha village of Udwantnagar Block of Bhojpur district (Bihar) and has potential for its further spread. The success has been observed in more than 75% of the cases. Cost: benefit is 1 : 6 approx.	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Eostiyan, Sheohar, Sitamarhi (Bihar)
1514	Treatment of wound in animals	Wounds are very common in animals in the Bagaha village of Betuya district in Bihar. Turmeric (curcuma longa) has some medicinal properties and used for protecting wounds. In this practice, powder of turmeric is mixed with coconut oil and this mixture is applied on the wounds twice a day for 4–5 days. The success rate of the practice is 60%. It is age-old practice and adopted by 75% of farmers in the village and involves little cost. **Keywords:** wound, turmeric (*curcuma longa*), coconut oil, animals	Shri Sunil kumar, Kanti, Muzafarpur (Bihar)

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
1520	Treatment of wounds on the shoulders in cattle and buffalo through use of kesharia grass	Kesharia grass contains medicinal value to cure wounds. About 100 g paste is pepared by grinding kesharia grass with water and this paste is applied twice a day for 3–4 days. The practice is followed in the villages of Madhupur in Deoghar district (Jharkhand),which can be replicated in the areas where kesharia grass is available.Success has been reported in 75% of the cases. **Keywords:** kesharia, wound treatment	Shri Varun Lal C/o Lok Jagriti Kendra, 52 Bigha, Madhupur, Deoghar
1522	Treatment of stomach wound in cattle and buffalo through use of harad and bahera	Harad and behera have curative property; therefore these are considered effective medicine for treatment of stomach wound. To control stomach problem, juice of harad and bahera is mixed with honey and fed to the animal thrice daily for 3–4 days. The practice is prevalent in the villages of Kanke. Block in Ranchi district (Jharkhand) and has potentiality for further spread in other areas. About 50–60% problem has been reported to be checked. Cost: benefit in treatment is 1 : 7 approx. **Keywords:** harad, bahera, stomach wound	Project Staff ITK, Department of Agril Extension, BAU, Kanke, Ranchi (Jharkhand) 834 006
1527	Treatment of wound in cattle and buffalo	Small-sized indigenous cattle and buffalo are reared in Jharkhand. It suffers from wound. To cure wound, honeycomb is considered an effective medicine. This is age-old practice and adopted by 50% farmers in the Patratali village of Ranchi district of Jharkhand. **Keywords:** wound, callus, buffalo, honeycomb, medicine	ITK Project Staff, Department of Agricultural Extension, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1534	Treating wounds in animals by chidechidi	Root of chidechidi is crushed to make paste and applied on the wound in animal daily at once for 3–4 days for its cure. About 80% of the farmers of Karimpur village of Islamapur block in Nalanda district (Bihar) have been practising this traditional wisdom for the last several years without any modification. Success has been observed in 80% of the cases. **Keywords:** root of chidechidi, wound cure	Shri Ajit Kumar, S/o Shri Shiv Nadan Prasad, Karimpur, Dariapur, Nalanda (Bihar) 801 303
1537	Indigenous treatment of wound in animals through use of kujri oil	Kujri has medicinal property. Users believe that kujri oil is useful in treatment of wounds and it is used as pain killer. To cure wound and swelling kujri oil is used. It is applied twice a day for 4–5 days. The practice is followed by livestock farmers of Getalsud village in Ranchi district (Jharkhand). It has been	Shri A.Y. Khan, Maheshpur, Getelsud, Ranchi (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		found successful in more than 60% of the cases. Cost: benefit is Rs 10 per cattle (1 : 10 approx). **Keywords:** kujri, wound, animals, pain killer	
1566	Treatment of animal wounds specially for cattle and buffalo by bhelwa oil	Wound-curing element is present in bhelwa oil; therefore it is used for wound treatment. For treatment of animal wounds of cattle and buffalo, warm bhelwa oil is used thrice a day for 6–7 days The practice is followed in Madhupur village of Madhupur Block in Deoghar district (Jahrkhand). Success has been observed in 70% of the cases. Cost: benefit is 1 : 6 approx. **Keywords:** bhelwa oil, animal wound	Shri Varun Lal C/o Lok Jagriti Kendra, Madhupur, Deoghar
1902	Use of bamboo bark and kunkroundha (Blumia spp) extract to control heavy bleeding due to bullock drawn equipment during field operations	Bleeding due to equipment injury in animals is controlled by application of an extract obtained by crushing 50–60 g bamboo green bark and 10–15 g kunkroundha green leaves for two times in an interval of 2 days. It is being followed from last 80–90 years by 40–50% of farmers in Sonapur village in Azamgarh district in Uttar Pradesh  Kunkroundha plant and leaf extract used for checking bleeding due to cut in animals **Keywords:** bleeding in bullocks, bamboo, kunkroundha, extract	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1903	Use of cow ghee and camphor to treat infection on wounds of bullock made by plough share	The infection on wounds of bullocks feet caused due to equipment is cured by applying a paste made of 2–3 tea spoons of cow ghee and one teaspoon of camphor powder. This is applied on the wound and bandaged two times at 3 days interval. The cost involved for this is Rs 2–3. About 80–90% farmers are following this practice from last years. **Keywords:** wound infection in cattle, cow ghee, camphor	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1906	Drenching of animal with castor oil for control of ascaris	When an animal suffers from ascaris in the intestine, farmers drench the animal with 100–200 ml of castor oil according to body weight for about 2 to 3 times for 4–5 days. The cost of application is Rs 10–15. The farmers in Sonapur village of Azamgarh district in Uttar Pradesh obtain 60–70% success with this treatment. **Keywords:** castor oil, ascaris control in animals	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1947	Treatment of swelling muscles by application of mixture of Paras bark decoction and salt.	About 1.5–2.0 kg of green bark of paras stem is collected and boiled in 2 litres of water to which 100–150 g salt is mixed. The light warm decoction is used to smear to the swellings in muscles caused due to any reason. This practice is continued for 7–8 days **Keywords:** paras bark, Decoction, Smear, Swelling muscle.	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1953	Use of bhojraj extract to treat the wound made from plough share.	Green leaves of bhojraj is collected and crushed. When the bullock is suffering from wound caused by plough share, 4–6 drops of extract solution is applied on the wound thrice daily till complete cure of wound. **Keywords:** bhojraj leaf, plough share, wound	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1968	Wound management in animal	This practice is followed by the farmers of semi-arid tract of Western Maharastra specially parts of Pune, Satara, Solapur and Ahmednagar districts. Ridge gourd/ekdandi leaves are ground and the juice is extracted. The extracted juice is smeared over the wounds of the animal. This practice effectively controls wound in animal due to antiseptic lotion present in ridge gourd/ ekdandi leaves. **Keywords:** ridge gourd, ekdandi leaves, antiseptic lotion, juice smeared.	Shri B.B.Khutal Solapur (Maharastra)
2188	Wound healing using uttareni leaf	Collect adequate Achyranthes aspera (uttareni) leaves take the extract of the leaves, and apply on the wound region once daily for 3–4 days. This practice helps in early healing of wounds. Adding neem leaves to the above ingradients may hasten the wound healing process. **Keywords:** wound healing, uttareni leaf	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2189	Wound healing using kakidonda and uterine	The extract of the leaves of kakidonda (Coccinia indica) and uttarani (Achyranthes aspera) are applied between the two horns and the rest at the base of horns. The remnant leaves are to be applied on the wound. **Keywords:** wound healing, kakidonda uttarani	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
2196	Use of bandi gurijee leaf for control of yolk gall	The leaves of bandi gurijea are ground into paste and applied on the affected part twice a day for three days. This practice controls the yolk gall. As bandi gurije is locally available and all the farm families are following the practice in the Huzurabad mandal of Karimnagar district in Andhra Pradesh. **Keywords:** bandi gurijee, yolk gall, control	K.Sanjeeva Reddy, C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirman Samithi, Jamai Kunta Karim Nagar, (Andhra Pradesh) 505 122
2265	Wound control	F o r controlling wound in animals, the practices followed in different regions of Rajasthan are as follows: *Jodhpur-Nagore* 1. Sesame oil and asafoetida is applied. 2. Sesame oil is applied on wound and spread ground alum in it. 3. Sesame oil is mixed with water and opium and applied it on wounds. *Jaisalmer* 1. Alum is ground and spread it onward. 2. Asafoetida is mixed with jall tree and human urine and it is applied on wound. *Barmer* 1. Hot-iron treatment on wounds. 2. Ash of jall tree is mixed with human urine and applied on wound. *Ajmer-Nagore* 1. Fat of fig is heated and applied on wound. 2. Desi ghee and turmeric powder is mixed and applied on wound. **Keywords:** wound control, animals,jall tree, ghee, turmeric powder	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

2267	M a g g o t wound control	Farmers in the different areas of Rajasthan are following different practices for maggot wound control. *Jodhpur-Nagore* Grained camphor is applied on the wound. Kerosene is also applied on wound. *Jaisalmer* Grained camphor or kerosene is applied on the wound. *Barmer* Jall ash mixed with human urine or ground camphor is applied on wounds. *Ajmer-Nagore* Ground camphor or desi ghee is applied on wounds **Keywords:** maggot wound, camphor, kerosene	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001

Code No.	Title of ITK	Description of the ITK	Name and address of No. discloser/facilitator
2268	Injury or haematoma control	Farmers in the different areas of Rajasthan are following different practices for the injury or haematoma control *Jodhpur-Nagore* A mixture of 100 g alum and 100 g pearlmillet is applied on injured area, and it is bandaged. Turmeric dissolved in 100 ml sesame oil is given to the animal for 30 days. *Jaisalmer* Turmeric with ghee or milk is applied. Hot air treatment with goat hair *Barmer* Alum powder and pearlmillet flour are given to the animal. A mixture of 250 g jaggary and 100 g asalia is applied and the affected area is bandaged *Ajmer-Nagore* 1 kg gangadi is ground and fed to the animal. A mixture of 2–3 litres milk with turmeric powder and desi egg is fed for 4–5 days. **Keywords:** haematoma, alum, turmeric, jaggery	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
48	Control of tympany in cattle	The fatal disease tympany in cattle is controlled by feeding cattle with a mixture of 1 kg edible oil and 250 g of asafoetida powder once or twice. Asafoetida is a condiment can control the gastric problem. It is widely accepted by the farmers in emergency in Kahoda village of Unjha Taluka of Mehasana in Gujarat **Keywords:** cattle tympony, asafoietida	Shri Patel Natubhai Ranchhoddas, Opp. High School, Kahoda, Unjah, Mehasana (Gujarat)
1214	Management of afara (tympany) in cattle, buffaloes and goat	Tympany is a common fatal problem in cattle, buffaloes and goats. A traditional practice is in vogue in village Chalaniyan of Etawah district of Uttar Pradesh to manage this disease by drenching mustard oil with black salt, cumin and asafoetida. This treatment is being practised since generations and is very effective for tympany, if treatment is rendered in time. The animal is drenched with 500 ml to 1.5 litres mustard oil with 50–100 g black salt, 25–50 g cumin and 10–20 g asafoetida. Black salt, cumin and asafoetida are finely ground and then mixed with mustard oil to prepare the drench for cattle and buffaloes. The treatment is repeated after 2–3 hours, if the animal does not respond. The dose is given for one fourth or less in case of goat. This costs Rs 50–	Dr Ram Naresh, Scientist, Division of Medicine, IVRI, Izatnagar (Uttar pradesh) 243 122

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		70 per cattle and buffalo. **Keywords:** tympany,mustard oil, black salt, cumin, asafoetida,drenching	
1230	Control of tympany	Mixture of soda-bicarb (20 g), ajwain (30 g), asafoetida (2 g) and black salt (30 g) in powder form is given orally to the animal to control tympany. It provides immediate relief to the ailing animal. The ingredients in the mixture stimulate digestion and act as antacid. This is practised in Dalpatpur Bhojipura village in Bareilly district in Uttar Pradesh. **Keywords:** tympany, soda-bicarb, ajwain, asafoetida, black salt	Shri Mul Chand, Dalpatpur, Bhojipura, Bareilly (Uttar Pradesh)
1251	Controlling of tympany	Black pepper and ghee are antacid. About 50 g powdered black pepper is mixed in 200 g pure desi ghee and given orally to animal for treating tympany. This ITK is practised in Tula Sherpur in Bareilly district in Uttar Pradesh. **Keywords:** tympany, black pepper, ghee	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1945	Use of sweet oil as remedy for tympany	The tympany in animals is controlled by feeding the animal 400 g sweet oil (edible oil of sunflower/groundnut). The sweet oil helps in expulsion of gases formed in the stomach, helping in normal functioning of digestive tract. The cost involved in the application is Rs 15–16 per drenching.This practice is in use in Solapur, Pune, Ahmednagar and Sangli district of Maharastra. **Keywords:** tympany, sweet oil, expulsion of gases, digestive tract	Shri B.B. Khutal, C/o Dr A.R. Bangar, ADR, NARP, 97, Raviwar Path, Pox Box No. 207, Solapur (Maharastra) 413 002
45	Treatment of FMD by cream of fresh milk	Cream of fresh milk is given to the diseased animal daily in the morning for 7 days. The animal is cured. **Keywords:** cream of fresh milk, foot and mouth disease (FMD)	Shri Ram Swarup, S/o Shri Hari Ram, Balaya, Mandwa, Nagaur (Rajasthan)
59	Mud therapy for promotion of wound healing in foot-and-mouth disease	Foot-and-mouth (FMD) disease is common in Gaurya village of Ahwa block of Dangs district of Gujarat. Working efficiency of bullocks is reduced due to wounds of foot-and-mouth disease. Many maggots may cause deep injury. Farmer or animal keepers keep the animal standing in mud area for 5–6 hr. Thus there is healing of wound in inter digital space. This reduces the chances of maggot wound. Due to mud, healing process becomes fast. Thus the animal keeper keeps	Ms Kusumben Rangubhai Dalvi, Gaurya, Ahwa, Chikartiya, Dangs (Gujarat)

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		their animal standing either in paddy field or in river banks. It is economical and wound is healed within a few weeks. **Keywords:** foot-and-mouth disease, mud treatment	
62	Control of mouth ulcer of animals	Sometimes the animal becomes sick due to mouth ulcer. The affected animals stop feeding and thus output of the animal is reduced. To cure the animals from mouth ulcer, the farmers feed moth (Vigna mungo) roti while keeping the unexposed portion of hot iron plate (tawa) to one side. It is fed twice a day for 2 days. This cures the animal. This treatment cost Rs 50 per animal. **Keywords:** mouth ulcer, baked on one side moth roti	Shri Bheeka Ram, S/o Shri Ganga Ram, Kharnal, Mundva, Nagaur (Rajasthan)
263	Control of foot- and-mouth disease in cattle and buffalo	Mouth of the affected animal is first washed with 0.1% potassium permanganate solution.Then extract of wild cashew nut (Semecarpus anacardium) is applied in the affected area. This is repeated for 2–3 days. Extract of wild cashew nut is prepared by taking 10 g seeds, broken into 4–5 pieces.The broken seeds are heated in a small vessel for 5 minutes. The extract coming out on heating is collected for use. Then 50 ml coaltar is applied in each leg. Phenyl or neem oil applied over it. These treatments are almost 100% effective in controlling foot-and-mouth diseases (FMD). About 27% of cattle owners at Hattaragi village in Belgaum district of Karnataka are following this practice for the last 50 years **Keywords:** FMD, cattle, buffalo, wild cashew, coal tar, neem oil	Shri Bassappa Mallappa Sarapure, Hattaragi, Hukkeri, Belgaum (Karnataka)
266	Treatment for foot and mouth disease and diarrhoea in cattle	The practices developed by Ms. Ponnumuthu for curing foot and mouth disease and diarrhoea are indicated here. Foot and mouth disease: 500 g tulsi (Ocimum sanctum) leaves is ground and the extract is administered to the cattle. The waste tulsi residue is used to smear over the foot and mouth disease affected animal. This practice is followed for 3 days. Mixture of hot water, common salt and neem tree bark are used to clean the foot and mouth disease affected animals. Diarrhoea: Two pieces turmeric, 100 g common salt, one piece asafoetida and banana flower are ground well and the mixture is administered for 3 days. During the treatment the animal is fed only dried paddy straw.	Ms. Ponnumuthu, Devanipatti, Idayanmelur, Sivaganga (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: common salt, neem tree bark, Ocimum sanctum, banana flower, turmeric, asafoetida, diarrhoea, foot and mouth disease	
280	Treatment for foot-and-mouth disease	Foot and mouth disease is controlled by the application of a mixture by both oral dose as well as external application on the wound. About 250 ml gingelly (Sesamum indicum) oil is mixed with 4 banana and 5–10 drops of pig fat, and the mixture given as a oral dose to the cattle. Then 250 ml kannu vali kelangu (Gloriosa superba) mixed with 250 ml neem oil and boiled well for half an hour. After boiling, this extract could be applied on the wound. Oral dose twice, for 3 days is best suited for animals suffering from foot-and-mouth disease. External application of the extract should be continued for 3 days each twice daily till recovery. This is in practice for more than 5 years. About 2000 farmers are practicing it. It costs Rs 100 per animal. **Keywords:** gingelly oil, pig fat, banana, Gloriosa superba, neem oil, foot-and-mouth disease	Dr M. Subramanian, Krishi Vigyan Kendra, Tamil Nadu Veterinary and Animal Science University, Kundrakudi, Sivaganga (Tamil Nadu) 636 206
409	Control of foot and mouth disease (FMD) in cattle by using bheru leaf	Phatua (FMD) disease, in which soft fleshly skin in the hoofs of cattle is affected due to penetration of pebbles or hard soil, is cured by application of 50 to 100 g bheru leaf (Chloroxylon swietenia) extract 2 to 3 times. **Keywords:** phatua disease, cattle, bheru leaf	Shri M. Mohanty, Senior Research Fellow, NATP (RRPS), Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
416	Treatment of foot-and-mouth disease (FMD) in cattle with harida and behada	FMD in cattle is controlled by washing of affected parts by using 500 g each of harida and behada powder mixed with 250 ml water, applied twice a day after boiling. It is being used extensively by the cattle-growing farmers in Makarbili village of Nawapada district in Orissa. **Keywords:** FMD, harida, behada	Ms Bhanumati Behera, Plot No 64, Surva Nagar, Unit 7, Bhubaneshwar (Orissa)
417	Treatment of foot and mouth disease in animals	For treating foot and mouth disease in animals, farmers of Dhieem village in Mandi district of Himachal Pradesh use mach (Phaseolus mungo). The finely ground powder of this pulse is rubbed on the mouth of the affected animal to prevent infection. Moisture containing grasses are also burnt to keep away houseflies. The practice is followed by a majority of the farmers for long period.	Seeva Nand Thakur, Village Dhieem, Tehsil-Janjehli, Mandi (Himachal Pradesh)

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		Keywords: foot and mouth disease, Phaseolus mungo, treatment of wounds	
831	Treatment for khareli (foot and mouth disease) in cattle	Most of the villagers of Karsog block in Mandi district of Himachal Pradesh use different methods for treating foot and mouth disease affected animals with effective results. Finely ground snake skin is applied to the affected part. Eggs of tatihari bird are also used by feeding orally. Fish pieces of about 200 g enclosed with kneaded wheat flour are given orally for 2–3 days to the affected cattle with kardi. Topical application with oil extracted from Cedrus deodara to the wound is also followed. Finely ground manu leaves about 100 g are also used topically. Seeds of Phaseolus aureus (200 g) are soaked in water overnight and ground properly the next morning. This is then mixed with kali mirch (black pepper) 20 g and 10 g salt. The prepared mixture is applied to the affected area, which has a good healing effect. The practice is an age old one and is still in use. Alternatively synthetic drugs are used. **Keywords:** foot and mouth disease, snake skin, tatihri egg, fish, Cedrus deodara oil, manu leaves, black pepper, topically applied, heal wounds	Shri Shukaru Rao, Kao, Karsug, Mandi (Himachal Pradesh)
839	Treatment of foot and mouth disease in ruminants	For treating foot and mouth disease in animals like yak, cow, sheep goat etc, 100 g of khal (residue of mustard oil extraction) is properly ground and mixed with 50 g turmeric powder and 50 g rock salt powder. Water (100 ml) is added to make it semi-solid mixture. This mixture is applied on the wounds for 2–3 times, which has a good healing effect. The practice is an age-old one for the farmers of Khurek, Tubo village Lahaul and Spiti district of Himachal Pradesh. The use of this method is limited these days, because veterinary medicine available in the market is found to be more effective. **Keywords:** foot and mouth disease, ruminants, khal, turmeric, rock salt powder	Shri Dorgi Padama Khurik, Rangrik, Kuzu, Lahaul and Spiti (Himachal Pradesh)
857	Treatment for foot and mouth disease	T h e main symptoms of foot-and-mouth disease in the infected animal is salivation, stoppage feedings, weakness and lameness. For curing this disease farmers of Yula village of Kinnaur district of Himachal Pradesh use chulli fruit. About 2 kg of chulli plant fruit is ground and the juice is extracted.	Shri Bhargat Das Negi, Yula, Nichar, Kinnaur (Himachal Pradesh) 172 107

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		About 200 ml of the juice is given orally with nalu (bamboo stick) at a time for 2–3 days. This practice is very effective for this disease. **Keywords:** salivation, stoppage feeding, weak, chulli fruit, juice, nalu	
860	Treatment for foot and mouth disease	Foot and mouth disease affected animals are treated with oral administration of properly ground powder of snake skin (10 g) mixed with sattu. Sattu is prepared from wheat/ barley, about 100 g it is mixed. The mixture is spread on mouth and hooves. This treatment is given 2–3 times in a day. This is an effective treatment followed in Kaza area of Lahaul and Spiti district of Himachal Pradesh. **Keywords:** foot and mouth disease, snake skin, sattu	Shri Prem Singh, Nudhang, Tubo, Kaza, Lahaul and Spiti (Himachal Pradesh)
1165	Treatment of FMD in cattle by water melon and musk melon	For the treatment of FMD, in animals (cattle/buffalo), they are made to walk on the heap of water melon or musk melon vine. Farmers of Bahedi block in Bareily district of Uttar Pradesh considered that latex secreted from the vine of water melon or muskmelon cures the FMD in animals. Vines are collected after the harvesting of their fruits. This practice is being in use for last 5–6 years and it is observed as a successful treatment. **Keywords:** FMD, walk on the heap of water melon/musk melon, vine latex, secretion	Shri Niranjan Lal, 5-A, Labour Street, IVRI Road, Izatnagar, Bareily (Uttar Pradesh) 243 122
1176	Treatment of foot disease in animals by giving milk	The farmers of Sonarhi and Terhi villages of Banda district of Uttar Pradesh give 1–2 litres milk per day (preferably cow milk) to the animals suffering from foot disease. They believe that the milk (specially cow milk) is of cool nature and helps in treatment of foot disease. The milk is given to the animals with the help of bamboo stick. **Keywords:** foot disease, bamboo stick, milk	Shri Ranjay K. Singh, Ph.D. Scholar, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1200	Foot and mouth disease management in cattle	Ms Shagufta Jamal indicated a practice for curing foot and mouth in cattle by using alum water, skimmed milk, bengal gram chapati and mustard oil. Hooves of the cattle are washed by alum water. Bengal gram chapati is mixed with mustard oil and administered along with skimmed milk to the animal. Many farmers in Badaun and Bareilly districts are practiing this method from 50–60 years.	Ms Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar, New Delhi 110 025

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
		Keywords: foot and mouth disease, alum water, skimmed milk, bengal gram, mustard oil	
1206	Treatment of FMD lesions on hooves of animals by babool bark	Babool bark is boiled in water and then it is strained. The affected hooves are washed with this water. Then mustard oil mixed with little camphor and applied on washed and dried hooves. The lesions get cured in 2–3 days. This is a very effective method which is followed in many villages of *Bulandhshahr* and Aligarh districts of Uttar Pradesh. This is a very cheap method costing only Rs 10–20 for each treatment but followed by only 5–20 in each village due to lack of knowledge, though the practice is used for about 100 years. **Keywords:** babool bark, treatment of FMD lesion, mustard oil, camphor	Shri Amar Singh, Nayabas Kutabpur, Dibai, *BulanShahar* (Uttar Pradesh) 202 393
1212	Curing lesions of mouth and hooves of FMD-affected animal	Paste of fig (*anjeer)* leaves might have medicinal and antiseptic value, which is applied on the lesions of mouth and hooves of FMD-affected animals. This is practised in many villages of Badaun, Shahjahanpur, Bareilly and *Moradabad* districts of Uttar Pradesh **Keywords:** FMD, fig leaf	Mrs Husan Afzal, Primary School Teacher, D/o (late) Ilyas Fatima, Mohala Vedon Tola, Bund Gali, Badaun (Uttar Pradesh) 243 601
1213	Management of FMD by using arjuna, babool and neem	Foot and mouth disease (FMD) is a devastating disease of farm animals in general and cattle and buffalo in particular. As a traditional practice to prevent the disease, farmers of *Chahaniyan* village of Etawah district of Uttar Pradesh use indigenous technology of tying the nuts of the *arjuna* (Terminalia *arjuna)* around the neck of the animals. At the time of out-break of the disease, severity is reduced effectively by keeping healthy cattle and buffaloes under the shed of *arjuna* tree. This practice is considerably effective in prevention and control of FMD. Further, during the out break of FMD, farmers boil bark of babool (Acacia) and leaves of neem (Azadirachta indica) in water. The decoction is applied on the affected hooves and mouth of the animals. Animals are cured, generally within a week. **Keywords:** FMD, *arjuna,* Acacia, neem, tree shade	Dr D. Swarup (Senior Scientist), Dr Ram Naresh (Scientist), Division of Medicine, IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1240	Control of skin and FMD lesions of animals by using *raang* powder	*Raang* (roots of *jhalberi*) might be having medicinal value to prevent skin diseases caused by any pathogenic organisms like bacteria, fungi, protozoa, and parasitic infection and FMD (for foot lesions). Root of wild *jhalberi* is collected and a fine powder is prepared and applied or sprayed on the skin lesions, and lesions caused by FMD in animals after applying mustard oil/desi ghee. This is practised by the farmers of *Nangli* village in *Rewari* district of Haryana. **Keywords:** skin disease, FMD, *raang* powder, mustard oil, ghee	Shri P*radeep Kumar, Nangli Godha, Rewari* (Haryana) 123 401
1254	Curing foot and mouth disease in animals with akoa and bitter gourd leaves	*Akoa,* a herb, has anti-bacterial property. Oral extract of 10 leaves of *akoa* + 10 leaves of bitter gourd is given to animals in FMD, which costs Rs 1–2 per animal. This ITK is practised by the farmers of many villages in *Sambhal* Shahjahanpur, Bareilly and Badaun districts of Uttar Pradesh. **Keywords:** FMD, *akoa* and bitter gourd leaves	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1262	FMD control by making the animals to stand in hot sand	Warm or hot sand is perhaps bacteria killer. The animal suffering from FMD are made to stand in the hot sand in the field during noon time in bright sunlight. The animals are made to stand in such hot sand for 30 to 40 minutes. Animals are cured in 4–5 days by repeating this practice daily for 30–40 minutes. **Keywords:** FMD, hot sand treatment	Dr *Tung Vir* Singh, D-37, Medical College Campus, Meerut (Uttar Pradesh) 250 004
1279	Curing lesions of FMD by applying extract of peach leaves mixed with fresh milk	To treat the lesions of mouth and hooves of the animals suffering from FMD, extract of peach leaves mixed with fresh milk is applied three times daily on the lesions of FMD-affected parts of the animals. This is followed in many villages of Budaun, Shahjahanpur and Bareilly districts of Uttar Pradesh. **Keywords:** FMD, lesions, peach leaf, fresh milk	Shri Syed Musawwir Ali, Mohalla Furshori Tola, Bund Gali, Budaun (Uttar Pradesh) 243 601
1286	Treating FMD with tobacco powder, molasses and red chillies	Paste of tobacco powder + molasses + red chilies might be having the medicinal value to control FMD, which is applied on the hooves of animal to cure the lesions. Fresh fish meal is also fed to the animal to control FMD. It cost Rs 5–10 per animal. By this method FMD is cured by 70–80%. **Keywords:** foot and mouth disease, tobacco, molasses, red chillies, lesions on hooves	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1288	Use of babool and jamun bark to cure FMD in animals	A paste of babool bark and black berry is applied on the hooves of the FMD-affected animal thrice daily, costing Rs 2–5 per animal. In this method the disease  (a) Babool bark to cure FMD lesions; (b) Jamun bark to cure FMD lesions is cured up to 70%. This is practised in many villages of *Baduan* and Bareilly districts of Uttar Pradesh. **Keywords:** FMD, bark, babool, black berry	Shri Syed Musawwir Ali, Mohalla Furshoori Tola, Bund Gali, Buduan, Bareilly (Uttar Pradesh)
1503	Control of FMD in cattle with kusum seed	This is in practice in Angadia village of West Singhbhum district of Jharkhand. In this practice, cattle are made to walk in sandy soil along the riverbed to clean the wounds. The hooves are washed with river water to remove sand. Mixture of dried kusum (safflower) seeds powder and neem oil is then applied on the wounds. The animals with thorny lesions on the tongue are scarped by *dumar* leaves. Paste of old tamarind, chilli, *shilwa* seeds, and fresh concentrate local rice bear mixed with salt is rubbed on the tongue of the cattle. This is age-old practice and adopted by all the farmers. **Keywords:** cattle, kusum, wound, hooves, neem, *dumar,* rice bear, thorny lesions	Shri Lenga Purty, Angadia, Khetiatangar, Chaibasa, West Singhbhum (Jharkhand) 833 201
1505	Cure of foot disease of cattle and buffaloes	Foot diseases are very common problem in the Chandwe village of Ranchi district of Jharkhand. These diseases are cured by application of bark of gulayachi flower plant. In this practice, the bark of gulayachi flower is collected, minced and the paste is applied on the affected part of foot twice a day for 5–6 days. This is in practice for last 100 years by maximum number of farmers in the Chandwe village. **Keywords:** foot disease, cattle/buffalo, gulayachi flower, bark	Shri Ranjay Kumar Singh, Research Associate, Department of Extension Education Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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1511	Use of bark of *dahu* to cure foot disease of cattle	The foot disease locally called khurha is very much prominent in the Sukurhuttu village of Ranchi district in *Jharkhan*. Khurha disease is cured indigenously when boiled bark of *dahu* is applied on the foot of infected animal. In this practice, collected stem barks of *dahu* are boiled with water and boiled soft barks are applied on the infected foot for 2–3 days or till the foot gets cured. This is in practice for last 150 years by maximum number of farmers in the village. **Keywords:** *dahu,* khurha, foot disease, bark, boil	Shri Vishwesh Kumar, C/o Satyendar Prasad Singh, Kataiyan, Eostiyan, Sheohar, Sitamarhi (Bihar)
1513	Indigenous medicine for treating khurah in animals	This practice is used for treating khurha in animals and human beings in Samtoli village of Gumla district of Jharkhand. Khurha is treated by kujri oil; it is medicinal oil which is very effective on bacteria causing skin disease and also used as pain killer in animals and human beings. In this practice, kujri oil is applied thrice a day in the affected portion. It is age-old practice and adopted by 40% of farmers in the Samtoli village, involving little cost. **Keywords:** *khurah,* kujri (*Alistus paniculata)*, oil, skin disease, bacteria	Ms Sushmita Khalkho, Income Tax Colony, Lalpur, Ranchi (Jharkhand)
1524	Indigenous treatment of khurha (FMD) in cattle and buffalo	This is practised by villagers of *Joipdih* in Deoghar district of Jharkhand. The practice is to cure khurha in cattle and buffalo. Khurha is treated by using oil of mahua seed, which has medicinal value. This practice is highly compatible with the existing farming systems and internal resource of the household. This is age-old practice, adopted by 50% farmers in the village and involves Rs 15 per cattle. **Keywords:** khurha, mahua, cattle, buffalo	Shri Satendra Singh, Agrarian Assistance Association, Bunder Jori, Dumka (Jharkhand)
1530	Making the animal walk in mud and hot sand for remedy from FMD	Mud and hot sand acts as a covering agent of wound. If animal is suffering from lesions, the villagers of *Umarpur* village of *Bustar* district in Bihar move their animals in hot sand during the summer season to get rid of FMD. Users are 100% satisfied with this practice. It is 80 years old practice and adopted by 75% of farmers in the village. **Keywords:** mud, hot sand, wound, lesions, pond, FMD, animals	Dr B.K. Roy, Associate Professor, RVC, Ranchi (Jharkhand)
1552	Control of foot and mouth disease in cattle	Foot and mouth disease in cattle is very common in the rainy season. People of the *Sokhodeora* and *Bijho* village of Nawada in Bihar use leaves of *ashoka* to	Shri *Sugriv Choudhary Sokhodeora*, Nawada (Bihar) 805 106

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		control foot-and-mouth disese of cattle. In this 25 years old practice, cattle are given to eat 20–25 ashoka leaves in the beginning of the rainy season and at the end of the rainy season per day. About 60–65% animals/cattles are cured of this disease. **Keywords:** foot and mouth disease, rainy season, ashoka leaves, cattle/animal	
1588	Control of FMD in cattle with camphor	Mouth wounds and *hoove* wounds are common disease in cattle/animals. Farmers of Bagraisai village of Saraikela Kharsawan district in Jharkhand use following practice for treatment of hooves and mouth wounds. 1. For hooves: Cattle are made to walk in sandy soils along the river bed. The coarse sand helps to clean the wound by friction. Hooves are washed with hot water; then 2 pieces of camphor and 10 ml coconut oil mixed together are applied on the wounds, which acts as an antiseptic. 2. For mouth: Paste of roasted brinjal and pure ghee is scrubbed on the tongue to clean as well as treat the lesions. The cost of above two treatments is very less, i.e., almost Rs 3 to Rs 5 per animal, which is successful in more than 95% of cases. All the farmers in the village use these age-old practices. Camphor (*kapoor*) - (*Cinnamonium camphora*) coconut (*nariyal*) - (*Cocos mecifera)* brinjal (*baingan*) - (Solanum melongena) **Keywords:** mouth wounds, hooves, camphor, coconut, brinjal, walk in sandy soil, cattle/animals	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikala Kharsawan (Jharkhand) 831 002
1595	Use of *vantulsi* for treatment of khurha (FMD) in cattle and buffalo	*Vantulsi* has medicinal properties against FMD. Paste of *vantulsi* leaves is prepared after grinding it along with water and the paste is applied on the infected foot of cattle and buffalo at least twice daily for 3–4 days.The practice is prevalent in *Barmasa* village of *Jarmundi* Block in Dumka district (Jharkhand) and has potentials for spread in the areas where *vantulsi* is available.Success has been reported in more than 75% of the cases. **Keywords:** *vantulsi*, khurha, cattle	Shri Varun Lal C/o Lok Jagriti Kendra, 52 Bigha, Madhupur, Deoghar (Jharkhand)

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1925	Use of soda, ghee and turmeric for treating foot and mouth disease (FMD)	Soda (baking powder) @ 4% solution is used due to its *viricidal* action for washing mouth cavity of the affected animal. Then ghee and turmeric powder paste are applied to oral lesions of the animal to heal the wounds early. Ghee gives soothening action and also it has a high vitamin-A content. Turmeric powder acts as an anti-bacterial agent. This is in practice for several year in *Wagi* village of Nanded district in Maharastra by 200 farm families. **Keywords:** baking soda, ghee, turmeric powder	Dr S.P. Deshmukh, Training Associate, Krishi Vigyan Kendra, Pokharni, Limbgaon, Nanded (Maharastra) 431 602
1927	Control of maggot fly by using coaltar in foot and mouth disease affected animals	Farmers of Waghi in Nanded district of Maharastra are adopting this traditional method to control maggot fly in foot and mouth disease affected animals. Coal tar solution (thick layer) is applied to foot lesions (hoofs) of the animal. About 2–4 applications on alternative days are required. **Keywords:** coal tar solution, foot lesions	Dr S.P. Deshmukh, Training Associate, Krishi Vigyan Kendra, Pokharni, Limbgaon, Nanded (Maharastra) 431 602
1930	*Curring* of foot and mouth disease in cattle	The foot and mouth disease in cattle is cured by feeding the animal with a mixture prepared from whole plant of *Agaricus ostveatus*, Dalbergia *volubilis* bark and small coconut fruit. Agaricus ostveatus cures the wounds and clots the blood, *Dalbengia volubilis* acts as coolant, mouth astringent, and curing of wounds whereas coconut acts as coolant. The cost of treatment per animal is Rs 10 and it has been in practice since 50 years in Kirlos village of Malvan t*aluka* of Sindhudurg district in Maharashtra. **Keywords:** foot and mouth disease, *Agaricus ostveatus,* Dalbergia *volubilis*, coconut fruit	Shrii Lawoo Rama Ghadigaonkar, Kirlos, Gavathanwadi, Malvan, Sindhudurg (Maharashtra)
1935	Use of bhelwa seed for treatment of foot disease in animals	Foot disease, which occurs mostly during rainy season, is being controlled by use of bhelwa seed. About 5–10 g of bhelwa seed is boiled with 150–200 ml mustard oil. After cooling it is applied in the desired quantity on the affected part, two times a day for 5–6 days to get complete recovery. This practice has been found to have 70–80% efficacy. This is practised by 650–750 farmers out of 800. The farmers of Ghanaghat village, under Dindori block in Dindori district of Madhya Pradesh. **Keywords:** bhelwa seed, mustard oil, foot disease, topical application	Shri Ranjay K. Singh, Shri B. S. Dwivedi, C/o Dr C. B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004

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1944	Control of foot and mouth disease	The foot and mouth disease in cattle is controlled by allowing the animal to walk in the mud and rubbing of mango pickle and common salt on the animal tongue. The wound formed due to FMD attack on fore and hind legs near the hooves are plastered by mud which prevents maggot formation. The mango pickle softens the wounds in a mouth. This practice is being followed over years in Satara, Solapur and Ahmednagar districts of Maharashtra. **Keywords:** foot and mouth disease, cattle	Dr A.R. Bangar, ADR, NARP, 97, Raviwar Path, PO Box No. 207, Solapur (Maharastra) 413002
1952	Control of FMD in cattle	The animals affected with FMD are made to walk in the mud followed by application of ash or walk in hot soil. The infected mouth is brushed with dehusked maize cob followed by honey and turmeric application. Some tribals of *Amarvati* district also sprinkle fish washed water in the cattle shed for cleaning and use cactus trunk to be hanged inside the shed. The cost involved per application is only Rs 20. The fumes and smell generated through cactus helps to control FMD. **Keywords:** FMD, mud/hot soil, dehusked maize cob, cactus (Opuntia sp.) trunk	Dr *O.P.Ingle* Head, Deptt. of Extn. Edn. *Dr.PDKV,* Akola 444 104
1960	Treatment of FMD in cattle	Cattle suffering from FMD is treated by keeping one fish on the *tounge* of animal. So also the fish water is added in the drinking water. The disease is cured within a week. **Keywords:** FMD, fish	Prof. *P.S.Patil,* Training Organiser, KVK, Dhule 424 004
2190	*Kalipundu* mandu (foot-lesion medicine)	Collect adequate *seetaphal* (Annona squamosa) leaves, *Strychnos noxvomica* leaves and *Jatropha* leaves. Take 25 g leaves of each of the above and add little tobacco grind into fine paste and apply to the foot *lessions.* This helps in promotion of foot wounds healing. **Keywords:** *kalipundu,* mandu	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2200	Feeding cattle with *nemili* nara against foot and mouth disease	The leaves of *nemili nara* crushed and kept in banana dipped in groundnut oil fed to the cattle suffering from foot and mouth disease. It is having advantage over the use of chemical as the disease being a viral. Keywords: foot and mouth disease, banana, groundnut	Shri Rami Reddy, *Athevelli,* Vikarabad, Rangareddy (Andhra Pradesh)  Nemili nara–leaf used for treatment of FMD

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator
2275	Foot and mouth disease	Farmers in different areas of Rajasthan are following different practices for foot and mouth diseases in animals as indicated below. *Jodhpur-Nagore* 1. Dew bean bread is prepared and sesamum oil is added and fed to the animals *Jaisalmer* 1. Herd is fumigated by burning camel bone 2. desi ghee is mixed with wheat flour and onion and fed to the animals *Barmer* 1. 250 ml sesamum oil is mixed with 250 g pearlmillet and fed to the animals. 2. The leaves of oak is warmed, squeezed on mustard oil and applied to the mouth of the animal for 3–4 days *Ajmer- Nagore* Herd is fumigated by animal zauia or by dog excreta **Keywords**: foot and mouth disease in animals, sesamum oil, burning camel bone, mustard oil, desi ghee, dog excreta	Shri K.S.Hooda, Vidya Bhavan KVK, Badgaon, Udaipur (Rajasthan) 313 001
248	Sesame oil for hairy tail	Animals lose hair on their tail due to excessive cold in winter. This is prevented by dipping the tail of the animal in sesame oil, which is heated till red colour. The tail is dipped when the oil is cool. It is applied 2–3 times a day for 1 week, until the animal regains its hair. **Keywords:** hair fall, animal tail, sesame oil	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)
1481	Control of tail gangrene	This practice is used for controlling tail gangrene in the cattle and buffalo with the help of van angoor root, which has some antibiotic and antiseptic action. Bark tuberous roots of van angoor is removed and the left-over roots are made into paste	Shri Kiran Hembrom, S/o Late Willaim Hembrom, Dumar, Churcha, Hazaribagh (Jharkhand) 825 411



Use of Van angour in treatment of tail gangrene in animals

after grinding. The paste is applied on the infected portion of the tail. Again 50 g ground root is dissolved in 250 ml water and given to the animal orally. About 65 families out of 68 of Dumar village of Hazaribagh district in Jharkhand use this age-old practice.

Keywords: tail gangrene, van angoor, cattle, buffalo, tuberous root and paste

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1487	Use of vasak (Adathoda vasica) leaves for treating gangrene of tails of cattle	Gangrene of tails in cattle is common problem in Jharkhand. Leaves of vasak (Adathoda vasica) is used for treating it. Vasak plant has medicinal property and is also used for cough, fever and T.B. The leaves of vasak check about 60 to 65% problem. It is age-old practice and adopted by 60% families of Tangar village in Ranchi district of Jharkhand. **Keywords:** vasak (*Adathoda vasica*), cattle, gangrene, cough, fever, T.B.	Shri Ranjeet Bara, Pathalkudwa, Church Lane, Ranchi (Jharkhand) 834 001
829	Termite nest material for poison treatment	Farmers of Yula village in Kinnaur district of Himachal Pradesh are adopting this method to control poison in cattle. To treat the poisonous effect in the cattle, oral administration of 50 g termite/ ant nesting material in 100 ml water and halu (200 ml) is given. This practice effectively controls the poisonous effect in cattle and it is in practice for several years. **Keywords:** termite/ ant nesting material, poison treatment, halu	Shri Bhargat Das Negi, Yula, Nichur, Kinnaur (Himachal Pradesh)
800	Drying and preservation of meat.	In some parts of Shimla, Kinnaur, Lahaul and *Chamba* districts, low temperature, humidity, salt and smoke are used for drying and preservation of meat. Exposure of meat to low temperature, humidity and its treatment with salt and smoke enhances its shelf-life. This ITK helps the mountain communities living in cold desert to tide over food scarcity period during winter months, when the area is cut-off from the other parts of the state. In some parts of Himachal Pradesh, the meat is preserved and dried for use during winter by hanging strips of meat on strings tied across the room. Due to heavy snow and the low temperature, spoilage of the product is delayed. At low temperature and very low humidity, the meat dried is preserved for longer period. In some places, salt is also sprinkled on the meat prior to drying, which also assists in preservation. In Nako and Milling areas of Kinnour district, the meat is hung in the kitchen; the smoke from the hearth serves to smoke the meat and hence preserves it. In some parts of Mandi, Kullu and *Chamba* area, smearing it with a mixture of mustard oil and turmeric powder preserves the meat. This method has been practised in most of the hilly areas of district Shimla, *Chamba*, Mandi, Kullu, Lahul and Spiti since time immemorial for meat preservation during winter season.	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: meat preservation, drying, winter, shelf-life	
2282	Post-harvest processing of animal and crop products	Animal husbandry in Rajasthan accounts for 15% of the total income. In addition to good breeds of livestock for milk production and drought, other products like wool, mutton, leather, horn etc. which need marketing and processing are operated with regards to crop products, traditional storage systems like for storing bajra grains in addition to *pachawa, thumpadu,* board systems which are owned by farmers. To meet the requirement of fodder during scarcity, fodder banks of the grasses, tree leaves, stalk were kept during rainy season. It is used to meet the livestock requirement till the next rainy season. It is used to meet the requirement during drought. **Keywords:** post-harvest processing, fodder grain, leather	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)
262	Animal shed at higher elevation  *Attu kodappa*– goat shed	A small shed is erected at a height of 1.0 to 1.5 meter above the ground surface, the basic structure of which is made from the stem portion of *Leucanea leucocephala* and Acacia nilotica. This is done to house the small animals such as sheep and goat so that they are protected from forest animals. The feed is provided to the animals inside the house. More than 5 farmers of *Maniyarpalayam* village of Tamil Nadu are protecting their animals in such houses for last 25 years. **Keywords:** elevated animal house, protection from forest animals	Shri K. Kuppan, S/o Shri *Kaliappan, Maniyarpalayam*, Kallakuruchi, Villupuram (Tamil Nadu) 606 207
42	Garbage sitting (baithak)	Most of the village farmers in Dausa district of Rajasthan during the rainy season allow the animals to stay in the fallow fields during night. As a result, the entire field is covered with dung and urine. This improves the soil fertility, helps in safe disposal of dung and urine, and the animals also get green fodder available in the nearby area, **Keywords:** animal sitting, garbage disposal	Training Organiser, Krishi Vigyan Kendra, Khedla Khurd, Dausa (Rajasthan) 303 303
56	Use of javersa creeper for removal of needle/nails from animal stomach	In the tribal areas of Dungarpur district the animals are allowed to graze in the open lands. They consume needle/nails during feeding, which are removed by feeding the animal 250 g ground powder obtained from dried twigs of *javarsa (Alhagi comelorum*)	Shri Goutam Lal Pargi, S/o Shri Jagnath ji Pargi, Bamasa, via Sabla, Sagwada, Dungarpur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		creeper for 1 or 2 days. The needle will come out. It is being practised from the last 30 years, as the plant is easily available. **Keywords:** javersa, animals removal of needles	
252	Ethno veterinary practices in cattle	Ethno veterinary practices developed by Shri. Palanivelu for curing fever, paralysis, snake bite, deep injuries, wound and skin diseases to cattle are indicated here. *Nochi* (Vitex *negunda*) and *adhathoda* leaves are placed in a cloth and heated brick are placed over the leaves and the cloth is rolled. The rolled cloth is used for massaging the neck region of animal. After this first aid treatment, leaf powder of *nilavembu (Andrographis* paniculata), *thrikadukam* (mixture of ginger, pepper, thippili and puliyarani (Oxalis *corniculata*) (tubers of *puliyarani mascerated* in butter milk and steamed) are taken at the rate of 35 g each and 150 g jaggery are added and all are mixed thoroughly. Small balls are made by using the mixture and administered to the animal at every half an hour or one hour depending upon the severity of disease. Cooled hot water is given for 3 days to the animal. During such time nutritious foods are avoided and animals are fed with paddy straw. For lactating animals the calves are not allowed for sucking the udder. For treating deep injuries a liquid herbal preparation called *mathan thailam* is used. Two litres *datura* leaf extract, 100 g copper sulphate and one litre coconut oil are mixed and stirred well. Mixture are boiled in mud pot. The boiling time is adjusted till the moisture in the mixture goes off completely. Usually it takes 2–3 hours for boiling. This liquid preparation can also be used for human for treating bad sore, cat bite, and rat bite. It also act as a pest repellent. For treating wounds and skin diseases in cattle *siratai thailam* is used. This is prepared by placing the coconut shells in the mud pot. This mud pot is heated by cow dung cake. Underneath the pot a small jar made up of china clay is kept. On the bottom surface of the mud pot three holes are made for passing the effluent to the bottom jar. Cloth is used to cover the lid of the mud pot and the whole mud pot is covered with mud obtained from termite mound. After 8 hours of heating the droplets of solution are collected in the bottom jar. The solution is applied over the external part of	Shri A.P. Palanivelu, Arasangudi, Thiruverambur, Trichy (Tamil Nadu) 620 013

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		the affected animal. The same procedure which mentioned in preparation of siratai thailam is used for preparation of *navivengaya* thailam for curing skin diseases in cattle. The ingredient for the preparation of *navivengaya* thailam from *Scilla byacinthina* instead of coconut shells. Andrographis *panniculata* (nilavembu), Oxalis corniculata (puliyarani), Aloe *vera, Cissus quadrangusis, Glycyrrhiza glabra,* Adhathoda *zeylanica*, Datura spp, pepper, *thippu*, ginger and *Withania somnifera (amukala kilangu)* are ground and orally administered to control infertility in animals. **Keywords:** snake bite, fever, paralysis, Andrographis *panniculata,* Oxalis corniculata, Aloe *vera, Cissus quadrangusis, Glycyrrhiza glabra*, Adhathoda zeylanica, Datura spp, pepper, *ginger, Withania somnifera, Scilla byacinthina*, coconut shell, skin disease, deep injuries	
254	Cure of animal diseases	The treatments given by Shri *Ayyathurai* Konar to cure animals from different diseases are as follows: *Paralysis:* The affected animal will be in lying down position, shiver its legs and froth will comes out of mouth. To cure the disease, 100 g leaves of *Aristolochia* indica is ground well, mixed with butter milk and administered 3 times a day. *Mastitis:* The affected *animlas* will be having swelling and pain in the udder portion and teats. It is cured by smearing 100 g well-ground leaves of Luffa *amara* over the udder region. In addition, about 10 g root of Aristolochia indica after pounding and mixing with 150 ml water is drenched. This treatment is followed for 3 days. *Blood tinged diarrhoea:* Blood-tinged loose motion can be noticed in the affected animal. For this, the animal is administered with a mixture of juice of 200 g leaves of Holarrhena antidysentrica in 500 ml water, in which juice of lime fruit is squeezed. The mixture is given 3 times a day. *Indigestion:* The affected animal will have gastric problem and excavation of its dung will be difficult. For this, a handful leaves of Andrographis *alata* or leaves of *koduppai yilai* are ground well, mixed with 500 ml water and administered orally. *Sprain or swelling in knee joint:* A *handfull* leaves	Shri Ayyathurai Konar, T Krishnapuram, Saptur, Peraiyur, Madurai (Tamil Nadu) 625 507

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of *Clerodendrum inerme* are ground well and administered orally. The same plant residue is used for smearing over the knee joint.

Frog disease: The affected animal will show extended growth of hoof and the animal walks like a frog. To cure the disease, 200 g leaves of *Clerodendrum phlomides* are ground well and given to the animal twice a day for 3 days.

Poison bite: The affected animal will have skin lesion with little swelling, hair will be erect and fever will also be noticed. A lemon fruit size of *Corollocarpus epigaeus* is powdered well into fine powder, which is drenched after mixing it with cow milk.

Vada: 50 g bark of *Delonix* alata and 2 or 3 garlic and onion are pounded together and made into a bolus of lemon fruit size, which is administered orally.

Haemorrhagic septicaemia: The affected animal will have swelling in the pharynx region and the animal will not take food. To cure this, one chicken (in the egg laying stage) is twisted in the neck, the blood is collected and drenched to the animal.

Ephemeral fever: The affected animal will be in lying position. For this, smoking near the nostril of the animal with leg of rabbit or steaming of 250 g boiled horsegram is done.

Asthma or cough: The animal shows symptoms of fast breathing. For this, about quarter measure of Ficus *tinctoria*, 50 g cumin and pieces of onion are pounded well and administered.

Constipation: The animal will have sore in the rectum region and difficulty to excavate its dung. About 100 g castor seeds are pounded well and administered orally. Instead of castor seeds, 200 ml castor oil can be given. In addition, kanji (a type of cooking resulting in semi-solid food) is prepared out of flour of pearlmillet and administered for about a week.

Horn itching: Itching is noticed in the horn region and due to this the animal will dash its horn against a wall or a tree. To cure this, 150 g root of Citrullus colocynthis is ground well, mixed in 250 ml water and administered.

Abstruction in nasal region: Snowing sound can be heard from the animal due to difficulties in breathing. It is treated with fruit of Solanum *surattens*

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		which are soaked in urine overnight. The fruits are squeezed and 5 drops are put into the nostril. *Fever:* The affected animal will be weak with high body temperature to treat the disease and 250 g tulsi leaves are ground well and administered orally. *Biting by pampuraani:* With this problem, dropping of hairs in the tail will occur. The animal will be biting its tail portion frequently. Ground leaves of *Aristolochea bracteata* are mixed with 50 g butter and applied over the tail region as cure of the problem. *Sores on the teat:* Seeds of Terminalia chebula are rubbed with coconut oil 2–3 times a day using shell of coconut. *Corneal opacity:* Leaves of Coccinia indica and a pinch of salt are added together and squeezed, and few drops are put in the eyes of the affected animal. It is to be followed for 2–3 days. **Keyword:** herbal medicines	
257	Ethno veterinary practice in cattle	Shri *Chinnan* has developed a practice for control of stomach disorders and stimulation of fertility in cattle. To control stomach disorder 10 g dried ginger and 10 pepper seeds are ground and mixed with 100 ml extract of *Ptychotis ajowan*. Oral administration of the mixture controls stomach disorders in cattle. To stimulate fertility in cattle, mushroom species which grow at the cut ends of *Albizia* amara tree are collected and soaked in water for over night and the filtrate is mixed with ground cumin seeds. Oral administration of these materials stimulates fertility in cattle. Also leaves of *Cardiospermum halicacabum* is mixed with tubers of *Bryonia cpigoea* and fed for 3 days continuously for poison bites. Oral administration of 5–6 leaves of Aloe indica is given for 10 days to improve sterility. 500 litre of neem oil is given before mating to the animal. After getting contacted one egg is given. 150 g *Grewia flavescens* tuber is fed raw to improve sterility. **Keywords:** cattle, stomach disorders, fertility, sterility, *Aloea* indica, neem oil, *Grewia flavescens, Albizia* amara, mushroom, cumin seeds, *Cardiospermum halicacabum, Bryonia epigoea,* ginger, *peper* seeds, *Ptychotis ajowan*	Shri K. *Chinnan*, S/o Kuppan, K. Pudukottai, *Merkuthottam, Kamatchimadai, Reddiyar Chatram* via, *Dindigul* (Tamil Nadu)

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259	Ethno veterinary practices for animal digestive problem	Ethno veterinary practices developed by Shri. *Mookan* to control digestive disorders, blood-tinged urine, diarrhoea and cough in cattle are indicated here. To control digestive disorders veins are punctured which are located in the underneath of the tongue in the oral cavity of the animal and allows the black colour blood to ooze out. Salt and tamarind fruits are used to rub the tongue of the animal. Oral administration of bolus to the animal for 2–3 times is done. The bolus is prepared by plants of *kandankathri* (Solanum *sueattense), chothu katralai* (Aloea vera), *siru thumbai (Leucus* aspera), kuppai meni (Acalypha indica), *pirandai* (Cissus *quadrangularis), kollanhovakizhangu (Corallocarpus* epigaeus), *puliam pirandai* (Cissus *setosa), moongil* (Bamboo leaves), viraali (*Dodonaea angustifolia*) and *avarmkolai* (Cassia *auriculata).* All the plants are dried in shade and pounded. The normal medicine which are given to the mother are added in the bolus. In addition, salt and culinary spices are added. Coconut, onion and palm jaggery are pounded and administered to the cattle for curing of animal digestive problem. To control blood- tinged urine, *veeli* leaves *(Cadaba fruiticosa)* are ground and mixed with butter milk. Oral administration of the mixture controls blood tinged urine. To control diarrhoea, leaves of *poovarasu* (*Thespesia populana)*, and banana inflorescence are ground and mixed together. Oral administration of the mixture controls diarrhoea. To control cough, *kandankathri* (Solanum *surattense*) plant is immersed in goat urine and the extract is applied in the nasal region of the cattle (2–4 drops at a time). **Keywords:** digestive problem, Solanum *sueattense,* Aloe vera, *Leucus* aspera, *Acalypha* indica, Cissus *quadrangularis, Corallocarpus* epigaeus, Cissus *setosa,* bamboo leaves, *Dodonaea angustifolia,* Cassia *auriculata, Cadaba fruitcosa,* banana inflorescence, Solanum *surattense*, blood-tinged urine, diarrhoea, cough	Shri Mookkan, Herbal healer, Colony street, Melaurappanur, Thirumangalam, Madurai (Tamil Nadu) 625 706
260	Treatments for animal diseases	The practices developed to cure diarrhoea, bloody diarrhoea, foot and mouth disease, stiffness, shivering, poisonous snake bite and fever to cattle are indicated here. *Pattai*, Aloe and *kasakasa* are added at 6 equal parts with the powder of *aavaram*	Shri R.S. Narayanan, Ithukkaadu, Thanjavur (Tamil Nadu)

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		(Cassia auriculata). The materials are pounded. This mixture is mixed with butter milk or fermented rice water and given to cattle to control diarrhoea. If the diarrhoea is due to ingestion of some insects or worms while feeding, *siriyanangai* (Polygala *grinerisis*) or *periyanangai (Andrographis* alata) leaves are ground and given to cattle followed by the previous treatment as mentioned above. Kasippatai, kasakasa and cumin are pounded along with the bark powder of aavaram (Cassia auriculata) or *vizhudhi* (Cadaba fruiticosa) and mixed in the extract of banana flowers and given to animals to control bloody diarrhoea. *Avuri* leaf *(Indigofera* tinctoria) tablet and *kungiliyapaspam* drugs are given to control foot and mouth disease and also for fever. Root paste of *sangam (Azima tetracantha), sandamarudham, pavazha paspam* are ground and given to the cattle to control stiffness and shivering. To control poisonous snake bite *tatooning* is done on the fore head with sickle. Strychnos *nuxvomica f*ruits are dried, *calcined* and powdered. The toxicant present in *nuxvomica* and the active drug principles are fortified. The oral administration of this powder is done to control snake bite. Keywords: Cassia auriculata, Aloe, *Polygalagri-nerisis*, Andrographis alata, Cadaba fruiticosa, cumin, banana flower, *Indigofera* tinctoria, *Azima tetracantha*, Strychnos *nuxvomica*	
261	Conservation of animal biodiversity	Ms. *Lakshmi of Vellampatti* village in Tamil Nadu maintains animal biodiversity in her house. Horse, monkey, parrots, fox, cat, goat, cow and bullock are reared in her house. She does not keep any restriction to the animal. The animals with good care of the owner live in harmony with the local agro-eco human system. **Keywords:** animal biodiversity	Ms. *Lakshmi, Velampatti, Natham,* Dindigul (Tamil Nadu)
264	Ethno veterinary practices in cattle	Ethno veterinary practices developed by Shri. *Palanisamy Gounde*r for treating fracture, gall, broken horns, facial *oedema*, tongue inflammation, nasal polyps, fits, tear eyes, diarrhoea, skin lesion/ patches, more milk secretion and healing wounds/injuries in cattle are indicated here. *Fracture:* First leaf extract of *Tridax procumbens (vettukayapoondu*) is used to clean the fractured part in cattle. Gingelly oil, zinc, copper sulphate, alum,	Shri Palanisamy *Goundar, Vembur, Pudur, Vilathikulam, Tuticorin* (Tamil Nadu)

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		Calotropis bark and Tridax procumbens are gently boiled and the extracted oily substance is anointed in the broken part. The anointed part is fixed in position by bamboo splits and tied with jute or cotton cloth. Hot tamarind seed paste is applied over the cotton cloth. The fractured bone become set right within 21 days. *Treating gall:* Leaf extract of Tridax procumbens (vettukayapoondu) is used to clean the gall portion of the cattle. The gall is incised and removed by sharp knife. Castor oil, zinc, neem oil, copper sulphate, turmeric powder, bark of Calotropis and lime powder are heated for some time till obtaining a gummy substance and smeared the oily substance on the operated portion. This practice gives good result. *Broken horns:* The leaf extract of Tridax procumbens (vettukayapoondu) is used to clean the core of the broken horn. Calotropis bark powder, jaggery, lime and an ointment prepared by carbon (deposited in chimneys) are mixed and applied over the oozing flood. Broken horn is tied over them to intact. *Facial oedema:* Equal parts of crab soil and sambarani (holy incense for making fumes) are smeared all over the head portion. The animals gets cured within 3 days. *Tongue inflammation:* veins under the tongue are punctured and blood is removed. Coconut fibre and paddy straw are put under the tongue. Pirandai (Cissus *quadragularis*), tamarind and salt are pounded and applied internally. This practice is orally administered for 3 days. During this treatment rice gruel and boiled water are given to the cattle. *Nasal polyps:* Polyps in the nasal cavity are incised and removed. Leaf extract of vettukayapoondu (Tridax procumbens) is applied in the nasal region. *Fits:* Acalypha indica *(kuppaimeni*) and pinch of common salt are pounded and the extract is squeezed as drops into the eyes and ears of the animals. This practice create sudden stimulus and leading to un leasing of twisted nerves. *Tear eyes (eyes with oozing of tears):* Leaves of *palampasi (Sida acuta*) is ground well and made the paste into 3 balls and administered to the animal along with butter milk on alternate days for 3 times.	

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		Diarrhoea: leaves of palampasi (Sida acuta), 2 lemon fruit juice and 3eggs are ground well and made the paste into 3 balls and orally administered to the cattle. This treatment is continued for 3 days. *Skin lesion/ patches: Kollankovai kizhangu (Solena amplexicauris*) tuber is soaked in water for over night and ground well and the extract is administered to the animal for 3 days. *Milk secretion:* Leaves of *manamurukki* (Euphorbia *cyathophora)* is pounded well and mixed the extract with banana fruit and administered to the animal for 3 days. This practice enhances the milk *secreation* in cattle. *Healing wounds/ injuries: Boomi vanangi (Elytrania acaulis)* leaves are pounded along with lime (calcium carbonate) and the paste is applied over the wound for 5 days to cattle. **Keywords:** fracture, Tridax procumbens, gingelly oil, zinc, copper sulphate, alum, Calotropis bark, cotton cloth, tamarind seed paste, galls, turmeric powder, lime, castor oil, neem oil, broken horns, carbon, jaggery, Cissus quadragularis, salt, Acalypha indica, Sida acuta, lemon fruit, butter milk, diarrhoea, eggs, *Solena amplexicauris,* Euphorbia *cyathophora, banana, Elytraia acaulis*.	
265	Treatment for animal diseases	The practices developed by Shri. *Periasamy* for curing bloody urination (Haematuria), respiratory problem, fever, diarrhoea, gas problem, diarrhoea with mucous, contusion and sprain are indicated here. *Bloody urination (Haematuria): Paalattan kolai* is ground and mixed with 1 litre of cow milk and administered orally. 50 g *seeragam* and 100 g sandal are mixed with 3 tender coconuts and administered if the haematuria is caused by onion poisoning. *Respiratory problems:* Leaves of *siruthumbai*, kuppaimeni (Acalypha indica), *thaivelai*, kandankathri (Solanum surattense) and *kattunochi (Debregeasia longifolia)* are ground and mixed with water and administered once. *Fever:* 50 g athimathuram *(Glycorshiza* glabra), 50 g *lavangapattai (Cinnamum* cassia), 50 g ginger, 50 g pepper, 50 g vetti roots (Coleus *vetiveroides)*, 200 g Vishnu *granthi (Evolvulus alsinoides) and 500 ml korai kilangu (Cyperus rotundus)* are powdered and mixed with 50 g live earth worms again ground	Shri Periyasamy, Teacher, S/o Sivanupillai, Thullukkankulam, Pillaiyarkulam, Srivilliputhur, Virudhunagar (Tamil Nadu)

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		and mixed with hot water and orally administered. This treatment is given for twice. *Diarrhoea:* 50 g *omam* (Carum *copticum*) is made into paste and mixed with butter milk and administered. *Gas problem:* 50 g *usilai* (Albizia amara) plant is powdered and ground and mixed with hot water and administered. 50 g poultry droppings is mixed with water and filtered the extract and given, if the problem is not cured by *usilai.* *Debility:* 500 g soaked horsegram (Cicer arietinum) or *kanapayaru* is fed daily till improvement. *Diarrhoea with mucous:* This problem is occurred when there is cancer in intestine. 50 g athimathuram (Glycorshiza glabra), 50 g lavangapattai *(Cinnamamum* cassia), 200 g korai kilangu (Cyperus rotundus), 50 g betel nut (Areca catechu), 100 g coconut flower core, 3 banana, 5 mango nut, 5 unripened pomegranate, 100 g curry leaf and 100 g tender leaves of *karuvelam* (babul) are pounded and mixed with butter milk and administered for three times. *Contusion/sprain:* 500 ml castor (*Ricinus communis)* seeds and 100 g garlic are ground and mixed with curd and applied to the affected area for 10 days. *Diarrhoea: Varagu (Paspalum scrobiculatum)* seeds, cotton seeds and *thuthi (Abution* indicum) leaves are ground and the mixture is administered to the cattle. **Keywords:** haematuria, Acalypha indica, Solanum surattense, Debregeasia longifolia, Glycorshiza glabra, *Cinnamomum* cassia, ginger, pepper, Coleus vetiveroides, Evolvulus alsinoides, Cyprus rotundus, earth worms, diarrhoea, Carum *copticum*, Albizia amara, poultry droppings, horsegram, betel nut, banana flower, coconut flower core, mango nut, pomegranate, curry leaf, babul tree, castor, garlic curd, *Paspalum scrobiculatum,* Abutilon indicum	
267	Ethno veterinary practices	Ethno veterinary practices developed by Shri. Subbiah *Nayakkar for curing chottai disease, diarrhoea*, intestinal worms and *haemorrogic* septicemia are mentioned here. *Chottai disease: Kinni poyeducchu* is the local	Shri V. *Subbiah Nayakkar, Kalnadai mattu vaithium, Sivakailasam, Alwarkuruchi,* Tirunelveli (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		name for this disease. Roots of *vellueruk*ku (Calotropis *procera*) is ground and the paste is administered for 3 times a day. 10 seeds of *kancharam* (Strychnos nuxvomica) is ground and the paste is smeared over the affected surface. Blackgram, omam (*Phychotis* ajowan) *narrukkumulam,* nutmeg and 500 g palm jaggery are ground well and the mixture is administered for chottai disease. This mixture is called bolus. *Diarrhoea:* Bolus is administered to cow for control diarrhoea. Leaves of *vellaikolunchi (Tephrosia purpurea)* and small onion are ground without adding water and administered. *Intestinal worms:* Leaves of *nilavagai* (Cassia *obtusca)* and 2 garlic are ground and administered for two times in a day. *Haemorrogic septicemia*: *Thronless sangamkuppi* (Clerodendron inerme) leaves is ground well and mixed with cow urine and administered once in a day. **Keywords:** Calotropis *procera,* Strychnos *nuxvimoca,* bolus, black pepper, Phychotis ajowan, nutmeg, palm jaggery, diarrhoea, *Tephrosia purpurea,* small onion, garlic, Cassia *obtusca*, intestinal worms, haemorrogic septicemia, Clerodendron inerme, cow urine.	
278	Indigenous livestock management	Rearing local breed of livestock to get milk and income is an age-old practice. This is in practice at Dharmapuri district in Tamil Nadu. Rearing of local breed of livestock increases income, milk and gives organic manure. Local breed is not common nowadays. To boost fertility a separate mixture prepared by *Atharkudu* is being given to the animal orally. Five farmers have been using this practice for the last 30 years. **Keywords:** local breed, livestock	Shri Perumal, Karikuttanoor, Sengadu, Palacode, Dharmapuri (Tamil Nadu)
499	Use of different indigenous methods to treat animal diseases	The farmers of *Porba* and surrounding villages in *Phek* district of *Nagaland* have adopted the use of different plants and other products as medicines to treat their animals as described below: *Burns and scalds:* For curing burn injury, even in human, a particular honey called *yiechodzu/rupodzu* (local name) is applied, whereby healing takes place very rapidly. If the burn is severe, skin of fresh frog is peeled off and pasted	Dr Kobu Khate, Porba village, via Pfutsero, Phek (Nagaland) 797 107

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over the burn for 3–4 days. It has been found that both the methods are very effective.

Maggotted wound: Fresh leaves of *tenichiede* (Ficus *dirta)* is fed to animal for 2–3 times. The maggots come out automatically within 12 hours.

Indigestion: Tsamhu seed (local name) is powdered and mixed proportionately with water and fed orally. Animals get relieves quickly.

Greenish-white diarrhoea in poultry: Gatta (local grass) root is crushed and mixed with poultry ration for 2 days. It controls the problem quickly.

Canine distemper: Dried fish and seed of *tsamhu* (local tree) in the ratio of 1: 2 is mixed with proportionate quantity of water and fed to the affected dog twice a day. The practice has been found to be very effective.

Water leech infestation: Tobacco-leaf extract and *tetsishe* (local plant) are pushed into the nostril of the animal for the control of water leech, and this practice is also found to be very effective.

Weak and listlessness: Kuvishurho leaf (local tree), when fed in sufficient quantity, the animals regain normal health soon.

First aid:

a. A moss, which is called *tenha* (local name), is made into a paste or chewed a little and applied over the cut wound. Bleeding stops very rapidly.

b. *Temiekhubou* (local name) is also found to be very effective for controlling bleeding.

c. *Tsurho/temvutsuthu* leaf extract is widely used for control of bleeding. It is also called iodine by the local people. The practices have been adopted by all the farmers since about 50 years back. As an alternate method, they approach veterinary doctors.

Keywords: burns and scalds, honey (*yiechodzü/ruyodzu)*, skin of frog, *maggotted* wound, indigestion, greenish white diarrhoea, canine distemper, water leech, weakness and listlessness

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
785	Treatment of various diseases of animals through plants found in high altitude of Shimla region	1. Pills prepared from the root of *nagchatri* and flour are given to animals who are suffering from fever, stomach pain and *lazyness* **Keywords:** pills, *nagchatri*, flour, fever, stomach pain*, lazyness.* 2. Pills prepared from *mirchadi buti* and flour or juice of *mirchadi buti* are given to animals who are suffering from fever, *lazyness* and yellowing of eyes. **Keywords:** *mirchadi buti,* juice, yellowing of eyes 3. Juice of *pathan vel (*Virginia sp.) or pills prepared with *Pathan vel* and flour is fed to animals who are suffering from fever and giddiness due to syphilis **Keywords:** *pathan vel* (Virginia sp.) giddiness, syphilis. 4. Animals suffering from mouth and throat pain are treated by massaging the ointment prepared from red root of *nila ratna*, black peper and butter on the affected throat **Keywords:** mouth and throat pain, ointment, *nila ratna*, black peper, butter 5. For remedy of snake bite in animals, ointment made of *phili mirchadi* is applied on the bite. **Keywords:** *phili marchadi,* snake bite. 6. For remedy of gastric problem in animals, *nila kunti* paste with *sanchar namak* is given to the animals. **Keywords:** gastric, *nila kunti, sanchar namak.* 7. For treatment of tumour in animals, ointment prepared from root of *damdona buti* with animal urine is applied on the tumour. **Keywords:** tumour, *damdona buti,* animals urine 8. In case of food poisoning in animals, grounded *khatti mamandi buti* with *khatti* (sour) lassi is given. **Keywords:** food poisoning, *khatti mamandi buti, khatti* lassi 9. For treatment of stomach pain, sauce of *chichri* leaves is given to animal with black salt. Keywords: stomach pain, *souce, chichri* leaves, black salt 10. Animals who are suffering from syphilis are treated by pills made from root of *vish khapda* and flour	Shri Surat Ram, Village Karyali, P.O. Majhar, Tehsil Theog, Shimla (Himachal Pradesh) 171 201

Code No.	Title of ITK	Description of ITK	Name and address of discloser/facilitator

11. For the treatment of adrang (patches appear on skin) and trembling of animals, root of *shalab bajhi,* is fried in ghee and applied on adrang/patch and bandaged. For treating trembling, it is given as feed.

Keywords: adrang, patch, trembling, *shalab bajhi*, bandage

12. For treatment of eye injury in animals juice of majru buti is applied on eye.

Keywords: eye *enjury,* majru buti

13. For treatment of eczema in animals, fried leaves of *khalbeer* buti with black pepper and mustard oil is rubbed on the animals body.

Keywords: eczema, *khalbeer* buti, black peper, mustard oil

14. For treatment of itching or eczema of animals paste prepared from root of *bhuthi* buti with salt and mustard oil is applied on the skin.

Keywords: itching, eczema, *bhuthi* buti

15. Bark or seeds of *tember* with sugar or sugar *candey* are grounded and given to animal with water who is suffering from dysentery

Keywords: bark/seed of *tember,* sugar/sugar *candey,* dysentery.

16. For treatment of wound in animals, crushed *pishmarn* buti is applied on wound.

Keywords: wound, crushed *pishmarn* buti

17. Root of *sunhare patte* is used for treatment of cough in animals.

Keywords: *sunhare patte*, cough

18. Paste of root of *nird* buti or *shogal* is given to the animals who are suffering from bloody urine.

Keywords*:* *nird* buti, *shogal,* bloody urine

19. Ointment prepared from *safed bhitti,* black peper, leaves of *thanidi*, mustard oil or butter is applied on the cracked udder for its treatment.

Keywords: s*afed bhitti, thanidi,* cracked udder

20. When leech enters into the nose of animal, it is removed from nose by pouring the juice of *barair* buti or by the ash of *barair* buti into nose of animal.

788	Remedy of giddiness in animals through pathan vel (Virginia)	Giddiness is the common disease in hilly areas, in which animals fall down on ground and discharge water from mouth. Sometimes it lead to death. Pathan vel (Virginia sp) is perennial climber. Its vegetative	Shri Surat Ram, Karyali, Majhar, Theog, Shimla (Himachal Pradesh) 171 201

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		part is given as feed in raw form or as powder with flour twice a day till its cure. This practice is followed by majority of farmers of Shimla region for last several years. **Keywords:** pathan vel (Virginia sp), giddiness, fall down, ground, discharging water from mouth, flour	
791	Traditional use of deodar wood (Cedrus deodara) oil *(kelo ka tel*) in cattle wound healing	Farmers believe that deodar wood oil acts as a disinfectant and thus facilitates wound healing in cattle. This oil is produced from the wood of deodar tree (Cedrus deodara). The wood pieces, are used to make the oil. The wood of old stumps and its roots are used for it. Traditionally people have been making the kelo ka tel or deodar oil from wood of *kelo* (deodar). The oil is produced by cutting small pieces of wood and then these are put into a earthen pot, called *ghara.* The mouth of the *ghara* is closed and the content is heated. When the wood pieces get sufficiently heated, the oil is released into the pot, which is separated for use. Use of deodar wood oil for wound healing is a common practice in different parts of Himachal Pradesh, especially in upper Himalayas, where deodar tree is commonly found. Some farmers have now extended the use of deodar wood oil for control of insect pests in plant nurseries. **Keywords:** deodar wood oil, *ghara*, wound	Dr *O.S*. Shad, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
792	Traditional method of treatment of animals	1. Animal discharges foam from mouth and walks lamely. For its treatment crushed onion is given to animals and ash is applied on the wound of hoof. **Keywords:** foam, walks lamely, onion, ash, wound of hoof 2. Animal stops feeding due to thorn appearing in throat. It is treated by cutting the thorn by skilled hand or rubbing of a grass, locally known *muji,* on throat. **Keywords:** thorn in throat, cutting the thorn, *muji* grass 3. For treatment of dysentery crushed root of *belgiri* or katha (catechu) is given to animal. **Keywords:** dysentery, root of *belgiri*, kattha (catechu) 4. Coarse meal of barley or soybean with ghee is fed to milch animals, to increase milk yield. Apple which is not eaten by human is also given	Shri Chet Ram *Dhani, Gagar, Purag, Kotkhai*, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		to animals for the same purpose. **Keywords:** coarse meal of barley or soybean, ghee, milch animal, increase in milk yield, apple 5. Agricultural works mainly depend on draught animals. Therefore to make them powerful and strong, oil is given to drink in summer. **Keywords:** powerful, oil 6. Bull is tied and laid on the ground that its testis is put on the rock piece or iron and then it is crushed with another rock for sterilization. **Keywords:** testes, crushed, sterilization 7. Throat of animal is fomented with warm copper for treatment of fever. **Keywords:** Copper	

793 Diseases of animals and their control

1. Following treatments are practised to treat the *golgontu*

(i) Pills prepared by crushed root of *tumbe* and flour are given to animals

(ii) Mixture of black pepper, black cumin-seed and *fatkadi* (in equal proportions), is rubbed on the tongue or fed twice a day for 1–2 days.

Keywords: *golgontu, tumbe, fatkadi*

2. Nausadar and *kalamshaura* powder with *shil garm* water is given to animal for treating constipation and for clear urine.

Keywords: nausadar, *kalamshaura, shil garm pani*

3. Leech enter the nose of animal when animal drinks water from pond or river. To remove leech from nose, potassium is sprayed in the nose by the help of hollow stick. It kills the leech.

Keywords: leech, diluted potassium

4. For treatment of bloody urine in animals, 1.5 kg root of *kashmal* is boiled in 4 kg water till it becomes half. Then solution is poured in bottle and 100 g mustard oil is added. It is given to animals in evening after the feeding.

Keywords: bloody urine, root of *kashmal*, mustard oil

5. To cure trembling of animals, the following measures are used:

(i) Kuchla is fried in ghee till it turns black, then it is powdered and pills are made. After that pills are kept inside the bread and cooked with ghee (clarified butter) and then given to animal every evening after feeding.

Keywords: *kuchla,* ghee, bread

Shri Deep Ram Verma, *Jagneri,* Theog, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		(ii) One kg bhang is boiled in 1 kg water and filtered. Two glasses of this solution are given to cure trembling. 6. Due to food poisoning whole body of animals gets swollen. To cure this, hing (asafoetida) is soaked in 10 g water. Then two tablespoons of sodium bicarbonate and 3–4 tablespoons of sugar are added and given to animals. After 4–5 hr. animal becomes healthy. **Keywords:** food poisoning, hing, sodium bicarbonate, sugar	
794	Indigenous veterinary practices	Following indigenous practices are being followed for diagnosis and treatment of animal diseases: *Cough:* The disease is due to eating grass with dust and mud. For *treatement*, ash (*swah)* of *kem (kupu)* and ash of pearlmillet are mixed and ground, and given with *pindi* to the ailing animal. *Vomiting:* Eating harmful grass causes the disease. For treatment, sour chhachh (butter milk) as old as possible, and lemon juice are given to the animal. *Diarrhoea:* Disease is caused due to overeating of green grass, due to heavy *perturbance* and also due to high heat. For treatment, *kathu (bhares*a fried in fire) is ground and made into *pindi* with salt and given to the animals. *Stomach ache:* Disease is caused by taking harmful wild leaves. Nerves on face become prominent. For treatment, tobacco, jaggery and ajwain are boiled in water and the decoction is given to the animal. *Tir lagand:* Hungry animal takes green *cloured* jamun tree and *roushe* plant leaves in a hurry without proper identification and selection. Animal gives bubbles from mouth and body starts shivering. For treatment, sour chhachh (butter milk) with grinded *galu* rod (stone) is given to animal. *Animal fever:* High fever, stomach swollen, shivering, round ball like gland in mouth, legs, throat and in skin are the symptoms of the disease. For treatment, hot iron (darat) is placed (*damara*) over the glands. Local *vishkapar* and *nagchhatri* are ground and given to the animal.	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Mindki: Thick blue layer on the tongue is the symptom of this disease. Animal dies in 3–4 days. This disease occurs during and after rainy season. For treatment, *talaba* grass or *khashusha* grass is rubbed on the tongue. Animal starts taking grass. *Bidi:* This disease is observed from hoof to knee and the animal is unable to move. *Sojis* is observed in hooves. For treatment, four inch diameter green branch of peach or jamun (about two feet) is cut in two longitudinal pieces. This branch (wood) is heated and placed on the effected pest. *Lal dhat (launda):* Animal urine becomes red or dark red. Animal becomes weak and then die. This disease is known as *Haemachuria.* For treatment, (a) bharesa fried in fire is given with jaggery (b) barley water (after soaking barley in water) is given to animal, (c) small cut pieces of radish and cut pieces of apple are given with green grass. Foot and mouth disease (Khareli): Symptoms are high fever, lesions in foot and mouth, bluster and even maggots in hooves. Treatment (a) dark black *coloured* lizard is killed and given to animal with wheat flour paste, (b) snake skin is ground and given to animal with salt and flour paste and (c) *faeces* of silk worm is given to the animal. **Keywords:** ash of kem and *barje*, sour chhachh, kathu, *tobacco,ajwain,jaggery,* hot iron, vishkapar, nagchhatri, *talaba* grass, *khashusha* grass, peach, jamun branch, bharesa, barley water, lizard, snake skin, silk worm *feaces*	
797	Treatment of sheep to prevent loss of wool hair	Pashmina wool of sheep has national and international market. The good quality wool must have long and soft hair. Cold climatic conditions are highly suitable for good-quality wool. But some times skin diseases in these animals cause wool loss and affect the income source of the shepherds. The wool loss in sheep is treated with the mixture of sulphur and mustard oil. This mixture is spread over the infected area. This ITK is used in several parts of Shimla and Kinnour district of Himachal Pradesh. **Keywords:** wool loss, sheep, sulphur, mustard oil	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
801	Multiple use of cow urine	Cow urine is used as medicine, pesticide, fire extinguisher and also in religious ceremony for sound health of newborn. Various uses of cow urine are. (1) 1–2 spoonfuls of cow urine is given orally for the patient suffering from the cough problem. (2). seeds of cabbage, cereals etc are soaked for 10–30 minutes in properly decomposed cow urine. This treatment protects the seeds from insect pest attack. (3). Use of cow urine ensures germ-free environment wherever used. (4). Antiseptic use is made against small cuts or wounds (5). In case of fire break out, cow urine mixed with water acts as fire extinguisher. This ITK is practised widely throughout west-Himalayan region since time immemorial. **Keywords:** cow urine, medicine, pesticide, fire extinguisher, antiseptic	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
821	Treatment of microbial disease *(pottalea)* in animals	To cure animals with digestive problem, farmers of most of the villages in Mandi district of Himachal Pradesh feed their animals a mixture of lassi with rock salt or lassi with rye plus turmeric powder and locally prepared ajawaine tea *(kaaddu*). The disease is commonly known *Pottaka* and *marri* by the people. But easy availability of better medicines from market has made its use less. **Keywords:** digestive problems, lassi with *rye, lassi* with rock salt, turmeric powder, ajawain tea, digestive problem	Shri Chaman Thakur Village Bhalwad, Tehsil Jangehli, *Distt*. Mandi, (Himachal Pradesh)
838	Treatment of loss of wool (*siptup)* disease in livestock	*Siptup* is a very common skin disease in hilly areas of Himachal Pradesh in sheep and goats. Outwardly, the most prominent symptoms are thickening and hardening of the skin, and loss of hair in the affected part. The diseased animals are treated with chulli oil (*Prunus armeniaca)* or mustard oil (Brassica campestris). The chulli oil is mixed with turmeric powder in 1: 1 ratio to make the paste. This paste is applied over the infected area. This paste is very effective in controlling loss of wool in livestock. This is very effective and has been practised in most of the villages in Lahaul and Spiti district of Himachal Pradesh since time immemorial. **Keywords:** *siptup,* sheep and goat, chulli oil, mustard oil, turmeric powder	Shri *Champaishi,* Lari, *Tabo,* Kaza, Lahaul and Spiti (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
844	Castration of testes of goat for meat production	To increase meat production, the farmers of Kurdang village in Lahaul and Spiti district of Himachal Pradesh castrate their goats. The legs of he-goat are tied gently, and with a sharp scissor the testes are removed from the scrotum very gently by the expert. It is a painful process but healing also takes place very shortly. This is a traditional method for the people of this region. **Keywords:** castration, he-goat	Shri Nawang Chhering Karpa, Kurdung, Keylong, Lahul and Spiti (Himachal Pradesh)
848	Treatment of l*aloo or kharyali* (summer stroke) in cattle	Cattle affected by summer stroke, commonly called *laloo or kharyali* at Baldhan village of Kangra district of Himachal Pradesh, show the following symptoms: saliva comes out from the mouth, suffering from fever and occurrence of wounds in the hoofs. The *laloo* or *kharyali* is treated with the help of *tarni* roots which are easily available at little cost. It is in practice for last several years by maximum number of farmers in the village. **Keywords:** *kharyali, laloo*, summer stroke, fever, saliva, *tarni* root	Shri Rajeev Kumar, Room No. 32 D NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175 001
850	Treatment of cattle suffering from *luha knad* (swelling of neck region)	*Luha knad* is very common in the *Sameoti* village in Kangra district of Himachal Pradesh. The symptoms of *luha knad* are swelling of neck region of cattle, and it does not take its fodder easily. In the treatment of *luha knad,* mixture of wheat flour, wild species onion, wild species of *colocasia* and butter are given to the cattle. It has no side effect. This is in practice for last several years and no modification has taken place till date by maximum number of farmers in the village. **Keywords:** *luha knad*, swelling, onion, *colocasia,* cattle	Shri Rajeev Kumar, Room No. 32 D NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175 001
856	Treatment of skin burning disease (*kharow*) in livestock	The infected livestock are sheep, goats, buffaloes, cows etc. show restlessness, hair loss, irritation and thickening of skin are the main symptoms of this infection. This infection is possibly due to some unknown *fungus.This* disease is treated by giving water bath that contains juice extracted from *kaddu* (*Lagenaria siceraria)*. This treatment is given 2–3 times in a day for 2–3 days. The juice extracted from *Lagenaria siceraria* contains *certains* anti-fungal and cooling substances, which help overcome skin burning in cattle. This is very effective and has been	Shri Bhadar Singh, Yula, Nichar, Kinnaur (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		practised in most of the villages in Kinnaur district of Himachal Pradesh. This is in use since time immemorial. Most of the farmers in the villages use this practice as first remedy for the skin burning disease. **Keywords:** skin disease, bath with kaddu extract, herb	
858	Treatment for skin problem	The main symptoms of skin problem in animal are hair loss and the animal becomes dull. Due to hair loss the animal is severely affected by cold in hilly areas. The oil extracted from stem of Cedrus deodara is poured over infected area (about 50 ml), which controls skin problem in animals. The farmers of *Khawangi* village of Kinnaur district in Himachal Pradesh are adopting this practice since several years. **Keywords:** Cedrus deodara, stem, cold oil, hilly areas	Shri *Rajman* Singh, *Khawangi*, Kalpa, *Rakangpeo,* Kinnaur (Himachal Pradesh)
862	Treatment of swellings in ear lobes and *mandibular* area (*bashar* disease) in cattle	*Bashar* is a very common disease in cattle. The main symptoms involved are swelling of teats (so milking becomes very painful), swelling of the ear lobes and *submandibular* area. The infected animals stop feeding. This problem is treated with various methods as described below. 1. 1–2 g of *Asphodelus tenuifolius (piazi*) and Piper nigrum (black pepper) is ground finely and mixed in 500–1000 g wheat flour. This mixture is fed to the cattle for 2–3 days and infected cattle gets relief from this disease. 2. *Bashar* of the teats in cattle is treated by rubbing *asafoetidia* (hing) between the hands and then hands are kept over water vapour for melting it. Hands containing asafoetida are applied carefully on the teats of the cattle, as is done during milking. This treatment is continued for 2–3 days to give relief to teats of the infected cattle. 3. Honeybee comb (about 10 g) is made into small pieces and mixed with wheat flour and fed orally to infected cattle, which is effective for *bashar* treatment. This treatment has been practised in lower parts of the Himachal Pradesh against *bashar* disease in cattle since time *immemo- rial*. **Keywords:** *bashar*, cattle, mixture of *piaz* and wheat flour, application of hing, bee comb, feeding orally	Shri Rajeev Kumar, Room No. 32 D NBH II, Hostel, Himachal Pradesh University, Summer Hill, Shimla (Himachal Pradesh) 175 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1175	Treatment of *matouna* problem in animals caused by eating linseed	When an animal eats linseed plants with their fruits, it suffer with *matouna* problem. This is a severe problem and even the animal can die. In those cases farmers of Sonarhi and Terhi villages of Banda district in Uttar Pradesh give 250 ml mixture prepared from black pepper and cow ghee to control the problem. The mixture has an excellent quality to neutralize the effect of linseed eating. **Keywords:** *matouna*, linseed eating, black pepper and cow ghee	Shri Ranjay K. Singh, Ph.D. Scholar, C/o. C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony Adhartal, Jabalpur (Madhya Pradesh) 482 004
1178	Treatment of paralysis in animals by goat milk with nai plant	Goat milk mixed with nai plant is given to the animal to treat paralysis. Farmers take about 500 ml goat milk and mix it thoroughly with the crushed nai plant (about 40–50 g) and give to the suffering animal. The dose is repeated twice with the interval of one day, and only two doses are sufficient to cure the disease. Nai plant is grown mostly as wild plant and is a type of perennial herb. **Keywords:** paralysis in animals, goat milk, nai plant, perennial wild herb	Shri Ranjay K. Singh, Ph.D. Scholar, C/o C.B. Singh, Dean, College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1180	Prevention of naval infection in newly born calf by mixture of cow ghee with vermilion (*sindoor)*	It is a common practice of farmers of Sonarhi and Terhi villages of Banda district of Uttar *Padesh* to protect naval infection in newly born calf by applying a mixture of cow ghee with the vermilion (*sindoor)*. The mixture is smeared on the naval every day once for 3 days. **Keywords:** naval infection, cow ghee, vermilion (*sindoor)*	Shri Ranjay K. Singh, Ph.D. Scholar, C/o. C.B. Singh, Dean College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1181	Treatment of animal that has eaten chemical fertilizer by giving whey (chhachh)	Some animals eat chemical fertilizers and fall sick. In such cases the farmers of *Sonarti* and Terhi villages of Banda district (Uttar Pradesh) give chhachh to the animal with the help of bamboo stick. Chhachh is given to the animal as much as it can take, three times a day. Chhachh is acidic and cool in nature, and hence neutralizes the effect of chemical fertilizer. **Keywords:** eating of chemical fertilizer by animals, whey (*chhachh*), acidic, bamboo stick	Shri Ranjay K. Singh, C/o. C.B. Singh, Dean College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1184	Treatment of conjunctivitis in animals by extract of *harra*l	For the animal suffering from conjunctivitis, extract of *harral* taken with the help of water is applied. It has the antiseptic property. During the night, 3–4 seeds of *harral* are put into fresh clean water and in the morning it is filtered through a fine cloth. The filtered water is ready to be dropped in the affected	Shri Ranjay K. Singh, C/o C.B. Singh, Dean College of Agriculture, C-2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		eye. The water is dropped/sprayed into the eyes with the help of cotton cloth. About 50–60 ml decoction is required for one dose, which is repeated for 7–8 days for complete cure. **Keywords:** conjunctivitis, extract of *harral*, decoction	
1193	Practices to get milk from cow or buffalo in case of death of young calves	In Sonapur village of Azamgarh district in Uttar Pradesh, the farmers follow a practice of spraying asafoetida solution on the udder and feeding of ground shoot of sugarcane with cooked barley and salt, to get milk from cows or buffaloes when the newly born calf dies. About 3–4 kg sugarcane shoot and 500 g - 1 kg cooked barley grains with salt are fed at a time after every milking. This practice has found to have an effectiveness of 80–90% and is followed by 200–300 farmers out of 10,00 farmers for the past 60–70 years. **Keywords:** asafoetida solution, spraying, udder, sugarcane shoot, cooked barley, milk production, dead calves	Shri Ranjay Kumar Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128
1194	Treatment of weak teeth by ash of banana leaf and cow butter	To treat animals having weak teeth, a heated mixture of banana leaf ash and cow butter is applied. This is done with the help of heated iron rod after casting the animal by the experts. About 70–80% efficacy has been observed. It is used by 20 to 30% farmers for the past 60–70 years. **Keywords:** treatment of weak teeth, banana-leaf ash, cow butter, heated iron rod	Shri Ranjay Kumar Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128
1195	Use of gular milk for control of switch dropping (leprosy)	The long hairy portion of the tail called switch is sometimes infected by bacteria and get destroyed. To treat this condition, farmers of Sonapur village in Azamgarh district of Uttar Pradesh apply gular milk to the affected portion. Gular milk may be having some antibacterial property and thus 70–80% effectiveness has been observed by the farmers. Gular milk (Ficus sp) is easily available in homestead areas or in the forest. About 20–25 ml gular milk is applied twice daily on the affected part. This is in practice for the past 80–90 years by 500–600 farmers out of 10,00. **Keywords:** gular milk, switch dropping	Shri Ranjay Kumar Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128

1198 Practices for livestock management

The different indigenous practices listed by Training Organizer, KVK, IVRI, Izatnagar for livestock management are given below.

Training Organizer, KVK, Indian Veterinary Research Institute, Izatnagar Bareilly (Uttar Pradesh) 243 122

Indigestion:

1. Decoction of *omum (Trachys-permum* ammi), black cumin seeds (*Cumium cynicnum)*, pepper harad (Terminalia chebula) bahera (Terminalia *bellerica)* and black cardamom.

2. Paste of jaggery, *omum,* fenugreek *(Trigonella focnum-graecum),* sodium bicarbonate and black salt.

3. Paste of *bittergourd (Momordica charantica)* along with its leaves and *jait* grass.

4. Paste of fenugreek seeds, sodium bicarbonate, jaggery, pepper, cumin seeds, *nausagar* and black salt.

5. Mixing onion, with the fodder to cure flatulence.

6. Decoction of *omum*, fenugreek, harad black pepper and *guarpatha.*

7. Paste of black pepper, sonth, cumin seeds, *omum*, curd, mustard oil.

8. Paste of *omum,* fenugreek, salt, *peepal* (Ficus *religiosa)* leaves, *amarbel (Cuscuta reflexa*) along with jaggery.

9. Mixture of mustard oil along with salt

10. Mixture of *cumim* seeds, asafoetida (Ferula f*actia)* and jaggery.

11. Powder of fenugreek, *omum,* black pepper and roasted *suhaga*.

12. Onion along with tablets of *nausagar.*

13. Mixture of *omum,* fenugreek and asafoetida along with mustard oil.

14. Pounded green root of pearlmillet

15. Mixture of black pepper, mustard oil and small amount of desi ghee.

16. Ground fenugreek, black pepper along with roasted *omum* and *suhaga* are mixed in mustard oil and is given to animal to drink with *narkuli*.

17. Placing strong wood of *arhar (Cajanus cajan*) in the nostrils of suffering animals.

18. Mixture of roasted *omum*, amaltas fruit and salt.

19. Mixture of root of *kartumabha*, fenugreek, *omum, guarpatta* and black pepper.

20. Mixture of root of mint, roasted *omum, amarbe*l, fenugreek along with jaggery.

21. Mixture of *guarpatta, amarbel, omum,* black

pepper and fenugreek along with jaggery.

22. Use of *jalkumbhi* to check indigestion.

23. Paste of amarbel, mint root and peepal leaves along with *sult*.

24. Decoction of grounded omum, salt, amaltas fruit, *fenugeek* and black pepper after mixing in roasted suhaga.

25. Paste of dudhi (Euphorbia *pllulttega*) and jalkumbhi (Pistta stratiots).

26. Paste of omum, saffron (Crocus *sativus*), black pepper, *saunth,* jaggery along with desi ghee.

27. Paste of guarpatta, *amarbel,and jalkumbhi* and cumin seeds.

28. Paste of dudhi and mustard oil.

Respiratory disorders:

1. Powdered omum and salt alongwith raw liquor prepared by jaggery.

2. Mixture of omum, fenugreek, black pepper, jaggery and salt.

3. Smoke of l*uban (Boswelia* sp.).

4. Omum juice along with raw liquor prepared for jaggery.

5. Allowing animal to drink raw liquor.

6. Tablets prepared by mixing young garlic, *saunth*, omum, salt and jaggery.

7. Powdered fenugreek after mixing in raw liquor.

Skin disorder:

1. Application of mustard oil after mixing sulphate in it.

2. Bark of babool (Acacia nilotica)

3. Babool bark and neem leaves are boiled in water, it is cooled and the animal is given its bath.

4. Application of paste of turmeric and tender neem (Azadirachta indica) leaves on affected area.

5. Application of paste of bark of babool tree, neem, turmeric and mustard oil.

6. Application of paste of garlic (Allium *satiuum)*.

Diarrhoea:

1. Mixture of jaggery, omum, pepper, cumin seeds, fenugreek along with black salt.

2. Mixing of roasted bael fruit (*Aegle marmelos)* and water.

3. Mixture of besan and water.

4. Mixture of shisham leaves (sesame) in Bengal gram (Cicer *aritinum)* flour, barley (*Hordeum* vulgare) flour and salt.

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5. Mixture of barley flour and water.
6. Mixture of barley, pearlmillet and sorghum flour
7. Shisham leaves along with water
8. Pulp of bael fruit
9. Solution of black salt, white salt and sugar.
10. Paste of jalkumbhi along with cumin seeds.
11. Jamun seeds are ground and mixed in water.
12. Water of tea leaves after mixing curd.
13. Use of rice starch.
14. Peel of pomegranate is ground and mixed in water of tea leaves obtained after boiling.
15. Paste of sprouted gram and plant of *alsi*.
16. Paste of dudhi and seed of jamun fruit.
17. Burnt wood of arhar is first ground and is given along with fodder.
18. Peel of pomegranate is ground and it is given along with curd.
19. Mixture of *maida* and barley flour alongwith water.
20. Mixture of *urea,and* salt along with mustard oil.
21. Mixture of urea in water.

Evacuation of dead calf:

1. Almonds along with jaggery.
2. Castor oil along with rice starch.
3. Pulp of coconut fruit.
4. Pulp of bael fruit.

Control of cough:

1. Kashmiri red chilli along with honey.
2. Kashmiri red chilli along with mustard oil.
3. Smoke of luban.
4. Mixture of onion juice with salt.
5. Feeding tender leaves of guar with black salt.
6. Feeding jaggery, black pepper and saunth.

Limping in cattle:

1. Application of *chuna* after mixing turmeric powder
2. Application of egg white and yolk after mixing thoroughly.
3. Application of paste of onion and mud water over the affected part.
4. Application of paste of turmeric, lime stone and guarpatha and tied with clean cloth.
5. Application of paste of cowdung and onion mud over affected part.
6. Application of *pundal* mud.
7. Leaves are tied over the affected part after

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applying mustard oil over it.

8. Tamarind leaves, tamarind seeds and pundal mud are boiled together and is tied over affected part after cooling it.

9. Roti prepared by bajra flour, over which the salt is sprinkled and tied over affected area.

10. A paste of turmeric, salt and omum is prepared over fire, which is spread over guarpatha and is applied over the affected area

11. Mustard oil and salt are spread over the castor leaves and is tied over the affected part.

12. Fomentation of boiled water of salt, soap and free *posta* pools.

13. Tying *gurch* leaves after boiling.

Animal fever:

1. Rubbing geru and salt after mixing in mustard oil over the entire body of animal; later it is covered with the help of gunny bags.

2. Ground leaves of *kasaudi* tree are given to eat.

3. Feeding pepper and white alum after keeping side the dough of wheat flour.

4. Mixture of jaggery, black pepper and mustard oil.

5. Onion juice along with raw liquor.

6. Feeding bittergourd after slicing.

7. Mixture of omum, black pepper, fenugreek along with mustard oil.

8. Decoction of *giloe (Tinospra cordifolia*) and flour.

9. Feeding omum and jaggery, fenugreek and saffron.

10. Leaves of grapes are tied over the nostrils of animals.

11. Feeding a paste of grape leaves along with jaggery.

12. Warm mustard oil is rubbed over the entire body of animal after adding garlic in it.

Swelling in neck:

1. Application of pure wax and coconut oil over the swollen area.

2. Onion juice is applied over affected area.
3. Leaves of banyan tree are tied over the affected part.
4. Tying leaves of *arandi*.
5. Application of coconut oil after mixing camphor in it.

6. Fomentation of warm alum water.

7. Fresh foam of milk is applied over the nostrils of the affected animal.

Mouth blisters:

1. Feeding chapati prepared from bengal gram *dal* after spreading mustard oil over it.

2. Washing animal mouth with water-boiled bark of babool tree.

3. Application of paste of turmeric powder, *tendu* leaves, salt and water.

4. Feeding common salt.

5. Application of paste prepared by using seeds, chilli seeds, and turmeric powder.

6. Application of foam of fresh milk.

7. Keeping tablets of *pepermint* in the nostril of animal.

Dropping of tail hairs:

1. Immersing tail in the boiled mustard oil after mixing camphor in it.

2. Tying leaves of *akauan* tree over the tail.

3. Application of coconut oil after adding camphor to it.

4. Tying ground red chilli, pepper and mixing in mustard oil.

5. Application of ground seeds of *thature* fruit on the tail.

Foot and mouth disease:

1. Feeding white alum water, skimmed milk and chapati of bengal gram flour roasted from one side mustard oil over it.

2. Washing legs and hooves of animal with water of babool tree.

3. Water of scales of fish is poured over the hooves.

4. Allowing animals to walk on hot sand.

5. Tying leaves of peach over the affected legs after spreading camphor on it, and later black burnt mobile oil is applied over the legs.

6. Feeding chapati of bengal gram flour, roasted from one side after spreading mustard oil over it.

7. Pouring vinegar on the foot of animals.

8. Limestone water is used in every 30 min to wash mouth of animals.

9. Feeding of tablets of *pipermint* and tobacco seeds.

10. Rubbing *gindal* mud over the foot.

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11. Washing affected foot with phenyl water and tobacco in the jaws.
12. Washing foot and mouth with white alum water.
13. Application of paste of turmeric and salt.

Wound

1. Application of paste of mustard oil and turmeric powder.
2. Application of paste of *mobil*-oil and ash of cowdung cakes.
3. Application of coconut oil after mixing camphor in it.
4. Application of paste of neem leaves and turmeric powder.
5. Application of paste of bittergourd leaves and jackfruit leaves.
6. Bandage of urea after dissolving in water.
7. Bandage with cloth after immersion in human urine.
8. Application of paste prepared by leather and mustard oil.
9. Application of mustard oil after boiling lizard in it.
10. 1 Application of paste of turmeric powder, gingelly seeds, gingelly oil and jaggery.
11. Application of paste of wheat flour and *moong* dal flour.

Fracture or dislocation

1. Rubbing honey and desi ghee over the affected part.
2. Tying guarpatta and turmeric.
3. *Tyeing* affected part with wooden sticks after bone setting and pouring mustard oil.
4. Application of paste of jaggery and limestone after setting and tying by bamboo splints and bandage to immobilize the affected limb.
5. Application of paste of ground fenugreek, wheat flour and mustard oil after setting and tying bone with bamboo sticks.

Broken horn

1. Tying women's hair on broken horn and pouring warm mustard oil over it.
2. Women's hair dipped in linseed oil is used as bandage.
3. Application of linseed oil and burnt *mobil*-oil on broken horn before bandage.

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4. Burnt blanket and women's hair is used as bandage.

Tympany

1. Feeding ground onion after keeping ½ tablet of nausadar in it.

Gangrene

1. Application of paste of *aiya* grass.
2. Application of paste of garlic and bark of neem tree.
3. Application of paste of garlic.
4. Application of paste of sulphur and ghee.

Dysentery

1. Feeding curd after mixing opium in it.
2. Feeding pulp of bael fruit.
3. Feeding jaggery and soda.
4. Feeding leaves of tendu and shisham.

Tick infestation

1. Feeding castor oil and salt
2. Feeding tobacco with water.
3. Feeding tobacco with mustard oil
4. Neem leaves are first boiled in mustard oil and oil is rubbed over the body of animal.

Urinary problem in bullocks

1. Feeding seeds of jamun fruit after immersing in water overnight.
2. Feeding peas flowers in water.
3. Feeding outer skin of boiled barley.
4. Feeding raw rice to affected animal.

Inflammation of udder

1. Sprinkling warm solution of alum water to wash udder.
2. Washing udder with warm salt solution.
3. Application of foams of fresh milk over inflamed udder.

4. Fomentation/smoke of *lauban.*

5. Tying castor leaves after applying heated mustard oil the teats.

Colic

1. Feeding bael fruit *murabba.*

2. Feeding mixture of common salt, jaggery, omum, fenugreek, and hing.

3. Feeding leaves of tamarind along with salt.

4. Feeding tender neem leaves, omum, salt, fenugreek, jaggery, and *asafoeatida.*

5. Feeding mixture of ground omum, black salt, black pepper, mint, fenugreek and garlic.

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Pneumonia 1. Feeding mixture of omum, fenugreek, old jaggery and saunth. 2. Feeding desi liquor to animals. 3. Rubbing ash of cowdung cakes over entire body of animal. *Feeding* 1. Feeding choker, *khur* and *lobia* along with green fodder in more quantity. 2. Feeding *kharia* along with green fodder. 3. Feeding chapati of moong dal *chuni.* 4. Feeding jaggery, omum, cumin seeds and *kharia* along with fodder. 5. Feeding *khajoor* along with fodder. *To increase milk yield and fat content* 1. Feeding *subabool* seeds with green fodder. 2. Processing and preservation of milk and milk products 3. Addition of pinch of sodium bicarbonate at the time of holding milk reduces chances of curdling. 4. Addition of one or two whole red chillies at the time of boiling large quantity of milk not only reduces chances of curdling but also improves its *flavour.* 5. Addition of small amount of cumin seeds in the *prepered* ghee improves its aroma. 6. T o maintain good aroma, earthen vessels are first fumigated with tender neem leaves. Addition of pinch of salt prevents rancidity in ghee, prepared at low temperature for longer period of time. **Keywords:** livestock disease, health-care, milk production, milk processing	
1199	Practices of wallowing of buffalo to prevent insect attack	Generally buffalo owners of *Siddharthnagar* district in Uttar Pradesh follow the practice of wallowing their animals (buffaloes) in early morning. They make free their buffaloes and allow them to go out for desired duration. As experienced by the buffalo owners, the problem of parasite infestation can be reduced effectively. The practice is being adopted by 27 out of 35 families and is followed since long time back. Keywords: buffalo wallowing, prevent insect attack	Shri Ram Yadav, S/o Sri Nandan *Rajwapur, Sohra, Siddharthnagar* (Uttar Pradesh) 272 193

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1201	Curing *b a n d h a , anjara*, foot-mouth disease, worm and eye infection	1. Village is kept isolated from outside entry to control *bandha.* 2. Sarson oil is given to the animals affected by *anjara.* 3. Alum and copper sulphate are used to treat foot and mouth disease. 4. Neem and gur (jaggery) are given to animals in worm infestation. Neem leaves are crushed and boiled before feeding in worm infestation. 5. Salt water is sprayed in eye infection. These are very old practices followed by the people of Haryana. Medicines from the market can also be used. **Keywords:** *bandha,* isolation, sarson oil, *anjara,* alum and copper sulphate, foot and mouth disease, neem, gur, worm *infestition,* salt water, eye infection	Shri *Sosrup Jhamala* communicated by Dr A.K. Mehta, Zonal Coordinator, *ZCUI,Transfe*r of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141 004
1220	Mange treatment in pigs	Mange is a major problem in pigs which affects the growth badly. In Samalkha village in Ambala district of Haryana, some farmers use diesel for its control as external application on the affected area. It controls all kind of mange within three days in pigs. Diesel is sprayed or applied with gunny bags on the affected portion of the diseased *animals.The* dose is 100 ml per animal. It controls mange in pigs fully within three days. The same process is repeated after 15 days and then as per need. This costs Rs 3–3.50 per animal. **Keywords:** mange, diesel	Shri *Sardar Jasbir* Singh (*Laddi),* Golden Piggery Farm, Samalkha, Bihta, Ambala (Haryana) 133 101
1221	Use of chhachh for treatment of *bhaunra* disease	In the *bhaunra* disease an animal takes speedy round and falls down on the earth and feels totally helpless. To control the disease, the farmers of Sonarhi and Terhi villages of Banda district of Uttar Pradesh give chhachh to the animal to drink from the *bmboo* pipe to get relief. **Keywords:** *bhaunra* disease, *chhachh*	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1224	Assessing the age of animals	Farmers assess the age of animals at the time of purchase by observing certain indicators, like dung structure, method of *jugali,* anus status, etc. The indicators are as follows: *Dung:* If the fodder material in the dung is in the large size, animals are in old age. If the size of the fodder in the dung is in the medium size, the animals are of middle age, while it is of very small size, i.e. nothing apparent of the fodder size in the dung, it is the sign of young age.	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Jugali: If the animal is doing jugali smoothly and gravitationally it is the sign of young age, and if their jugali is in *disbalanced* order it is the indication of old age. *Anus:* Anus is the best source of determining the age of animal. The structure of anus for the old age becomes big and very loose, while the anus of the young age animal will be small and tight. *Skin:* Smooth skin and tight order indicates the young while the loose and rough type skin is the sign of the old animal. These methods are adopted by the villagers of Sonapur in *Azamgrah* district of Uttar Pradesh. **Keywords:** age of animal, fodder in dung, jugali, anus, skin	
1226	Use of radish to animals for control of path *phootna*	Path *phootna* is one of the local names of the disease of the animals in which just like blain is developed on the neck part and bleeding *occurrs* when animal set down. Farmers consider that due to the constipation and heat of the stomach, this disease is mostly caused. The disease can be controlled by radish having anti constipation *characters.In* this condition farmers use the mixture of radish with the common salt to cure it. **Keywords:** path *phootna, raddish,* blain, bleeding	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1227	Use of gular milk for control of horn dusting of animals	Sometimes horn of the animals turns down towards the dust and gradually it is destroyed by the bacterial infection. Farmers of *Sonpur* village of *Aamgarh* district (UP) apply gular milk to treat the disease. **Keywords:** gular milk, dusting of horn, bacterial infection	Shri Ranjay Kumar Singh, C/o Dr C.B. Singh, Dean, College of Agriculture, JNKVV, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1252	Herbal preparation with *bakayan* for sun stroke in animals	*Bakayan* has medicinal value having cooling effect. About 500 g fresh green leaves of *bakayan* (Melia *azadirach*) are dipped in 2.5 litres water and kept in a pitcher in bright sunshine. After seven days 500 ml preparation is given to animals suffering from sun stroke. **Keywords:** sun stroke, *bakayan* extract	Dr Jawahar Lal, Principal Scientist, Division of Pharmacology and Toxicology IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1270	Treatment of broken horn in animals by human hair	For treating the broken horn of animal, a paste made with ash of human hair and mustard oil is applied in many villages of Bulandshahr, Aligarh, Etah and Hathras districts of Uttar Pradesh. The horn is cured	Shri Amar Singh, Nayabas Kutabpur, Dibai, BulandShahr (Uttar Pradesh) 202 393

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		in 3–4 days. This treatment costs Rs 10–20 per animal. **Keywords:** broken horn, human hair, mustard oil	
1275	To protect the animal from disease and loo (sun stroke)	To control *loo* (sun stroke) and other diseases in animal, 250 g neem oil is given orally to animal in the last week of March. This treatment costs Rs 45 per animals which is practised by farmers of *Multanpur* and its nearby villages of Uttar Pradesh **Keywords:** sun stroke, neem oil	Dr Niranjan Lal, Div. of Extension Education, IVRI, Izatnagar (Uttar Pradesh)
1283	Use of *kasaundhi* herb seeds for dog bite to the animal	*Kasaundhi* herb is very effective to cure the dog bite effect on the animal. Paste of *kasaundhi* seeds, salt, mustard oil and turmeric in equal quantity is heated and the paste is applied on bitten part of the animal. The infected animal is cured in two week time. This treatment costs Rs 2–5 per animal. This ITK is practised in many villages of *Shahajhanpu*r, Bulandshahr and Bareilly districts of Uttar Pradesh. **Keywords:** dog bite, *kasaundhi,* salt, mustard oil, turmeric	Dr (Miss) Shagufta Jamal, Department of Adult and Continuing Education and Extension, Jamia Millia Islamia University, Jamia Nagar (New Delhi) 110 025
1289	Treatment of blood in dung due to sun heat in bullocks	Mustard oil might be having cooling effect. About 250 g mustard oil is drenched to the animal twice with a gap of 2 hours. It costs Rs 40–50 per animal. The animal gets relief within one day. This is practised in many villages of Bulandshahr and Aligarh districts in Uttar Pradesh.	Shri Suraj Pal Singh, Nayabas Kutabpur, Dibai, *Bulanshahr* (Uttar Pradesh) 202 393
1290	Treatment of swelling of shoulders in bullocks	Shoulders of bullocks are swollen, due to which they become unable to take any work. Powder of snail shell-10 gm, alua 20 g, sahjan gum 10 g and geru 30 g are mixed in 150 g castor oil. This paste is heated. After cooling at warm stage, it is applied on the shoulder twice or thrice a day. This ITK is practiced in village Nayabas Kutabpur of Bulandashahr district of Uttar Pradesh. **Keywords:** swelling of shoulders, snail, shell, alua, *sahajan*, geru, castor oil	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No. 38, Purva ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1478	Animal husbandry - Practices in *Parasi* village of Tamar block in Ranchi (Jharkhand)	Villagers of *Parasi* village of Tamar block in Ranchi (Jharkhand) district rear cattle, buffalo, goat and sheep and keep them in separate rooms in a single building. They are separately tied and served with leaves and grass as feed. They are taken for grazing in nearby forest or pasture and all are gathered at	Shri Krishna Singh Munda, Zonal Coordinator-cum-*Convenor* & Secretary, *Parvartiya Durgam Shiksha Vikas,* South East Zone, *Parasi, Parasi*, Tamar, Ranchi (Jharkhand) 835225

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noon under a tree. This facilitates easy collection of cowdung or their drops. Pregnant animals are separated from the herd. Animals are treated when they are suffering from diseases by the following indigenous practices:

Fever

i. *Oal, maan, nivirsa, nilkant, pitusingh, samarcana, hathicana, gogotung, tanr* dudhi, tarn *susni, khet papri, saliwakla, vitnamak, kari* namak and onion are crushed and mixed together and given to animals.

ii. *Kalmegh, khet papri, gudsi cher, kari kuti jari patta virixcha, gemha sana*, onion, mustard oil and salt are ground and given to animals.

iii. Paste of neem leaves with honey is fed to animals.

iv. *Munga* leaves and garlic are ground and mustard is mixed in it and given to animals.

Galakanti

i. Ointment of wild ginger, common ginger, *titapat, mejur, junti,* kana sag and black pepper is given to animals.

ii. Honey, black pepper *kaccha* chuna (CaCO3), bhelwa oil and *vatapi* sindur are mixed and applied in the lower tongue

Chigia-bijya (swelling in lower tongue): sut, pipar, black pepper, oal kand, root of *kan chapdi, maan*, lajyavati, mustard and onion are ground and fed to animals.

Shimla swelling of tongue

Back of the animal is massaged with salt mixed oil and then fruit of *kundri patta* is given to animal.

Dangra pilha

i. *Kangaat kanda* root of *bhendra jada ka wakkal*, *kan papdi* leaf, *shali wakkal*, dudhi, *susni* tarn and onion are mixed and crushed and fed to animals.

ii. Spring/stem of banana is heated and animal is burnt with it.

Jahar vaat

i. *Rawar vakkal*, *geru patta*r, root of *dimbukanta, alag pui, sut* and black pepper are heated and animal is massaged with this.

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ii. *Kumhar* kanda, *mahakal* and *hirabraz* are heated and the animal is massaged with this.

Hadat *(downing of health)*

Paste of *dimbukata raghaundi* root, *dhuna* and sindur is made and half of it is fed to animal and half used to massage them.

Dena worms in mouth:

i. Hing and milk of she goat is applied on the wound of mouth.

ii. *Damar pakka* and hing are also applied on the wound in mouth.

Mirgi (Epilepsy)

i. Meat of deer, hing (asafoetida) and jeera (cumin seed) are mixed and given to the animals.

ii. Vali *bhera, ghurui pika* (an insect), *gurgurui*, jeera (cumin seed) *gud* (treacle) and hing (*asafoetide*) are powdered and fed to animals.

Bhiri (animal rotates in a place): *Karikati* root, *gudri* root, soil from potter's wheel, *kumhar* kanda and *gud* (treacle) are ground and fed to animals.

*Worm in live*r

i. Raw turmeric is burnt in kerosene oil and applied to animals as ointment.

ii. Maan kand, *kangat* kand, dimbukanta, sindur, and chuna (CaCO3) are given to animals.

Dysentery

i. Barley, coriander seed, *sendha* salt, *wasak* leaf, black cumin seed, *pitresingh*, hey *sagar* and water are given to animal.

ii. Tarn susni is fed to animals.

Worm

i. Seed of palash with *gud* (treacle) is given to animals.

ii. Water soaked *khesari* dal along with water is given to animals.

Small pox

i. *Gud* (treacle) with thorn of citrus, *padru* rug, vena cher root and pipal (holy big tree) dust are fed to animals.

ii. Pipal dust with honey is given.

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Vaat pi jowar (fever)

i. Tar susni, tar dudhi, gudri *chey* (root) kari *kuri* root, sali vakkal, oal, maan, *nirbisa, pitusee, teurimul, neetkunt, samar* kana, *hathi* kana, oil and onion are mixed and given to animals.

ii. Karanj, wakkal, tarn susni, khet papri, salt, oil and onion are ground and given to animals.

Bone fracture

i. Rooto f *ramdatun, eswar jata, matmati, harjoda, bhuinchapa* and onion are mixed and given to animals.

ii. Nil, *bari, aita, sadadu* and onion pills are fed to animals.

Sprain/twist

i. *Hera braz, fena*, onion and black pepper are mixed and pasted and then massaged on the twist.

ii. *Geekuwari* and *sunt* ointment is applied on the twist and massaged.

If animals *enhales* iron blade pine, cloth, etc and get *fever:* Seed of *khira, aaraba t*urmeric, *ber* seed and *kena* root are ground and fed to animals.

Worm in eye: Milk of *sheed or aakand* is applied on the back of head. Before its application oil is applied.

Cataract: a disease of the eye-netting: Droppings of pigeon and powder of glass are applied in the eye of animals.

To increase milk yield

i. Kan ta bajhi, *anant mul, nitadiya*, mahua, *suaam* are fed to milch animals.

ii. Bad *dag,* pipal *dagi*, patal kohra and *masur* dal are mixed and fed to animals.

If lactation is stopped or decreased: It is treated by heating the bhelwa seed and touched to udder 3 times.

Hydrosyl: Soil of mound *(butu)* and *paank mitti,* kumar kanda, soot *golki* (pepper) are applied.

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1480	Treatment for dog bite in cattle  Mesond plant used in cure of dog bite in animals	This practice is used for controlling the rabies disease in the animals. About 25 g bark of *mesond* root is ground properly and *dissloved* in 250 ml water. The solution is given orally to the animal as dog bite treatment. The treatment is applicable in cattle, buffalo, goat and pig, and the cost of treatment is Rs 25 per animal. About 65 out of 68 families of Dumar village of *Hazaribgh* district in Jharkhand use this age-old practice. **Keywords:** dog bite, rabies, *mesond* root, water, solution, animal	Shri Kiran Hembrom, S/o Late William Hembrom, Dumar, Churcha, Hazaribagh (Jharkhand) 825 411
1489	Treatment of kukrokshar or sara in animals	The kukrokshar or sara affected animal starts throwing its legs and lies down in restless position on the floor. Some type of delaying in this case may take the life of the affected animals. In this case, the lice and the ticks (3–4 in number) are put in the ears of the animal to be cured by kukrokshar. This is in practice for last 10 years by 25% of farmers in the Bihita village of Nawada district in Bihar. **Keywords:** kukrokshar, sara, lice and ticks, ears of the animal	Shri Naresh Ravidas, S/o late Shri Mishri Ravidas, Bihita, Samarigaarh, Pakribarawan, Nawada (Bihar)
1506	Relief from sprain by traditional method	Sprain is a common problem in cattle/buffaloes in the Sukurhuttu village of Ranchi district of Jharkhand. In this practice, turpentine oil and mustard oil are mixed together in equal proportions and massaged on the affected or sprained part of the animal twice a day for 3–4 days; the animal will get relief from sprain. This is in practice for last 50 years by maximum number of farmers in the village. **Keywords:** sprain, turpentine oil, mustard (Brassica campestris) oil, cattle/buffaloes	Shri Ranjay Kumar Singh, Research Associate, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1508	Relief of pain and inflammation through use of yellow soil in animals	The yellow soil has such characteristics that when it is coated on the inflamed area of the body of animal for 4–5 days, the animal get cured. A paste of yellow soil is prepared with water and plastered all around the inflamed water area in animal body. Detailed report on methodology adopted in using ITK: If any inflammation is there, it may be due to sprain etc. First yellow soil is taken, paste is made with water and it is plastered fully on the inflamed area all over. Thus process is repeated twice a day	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, Dostiya, Sheohar, (Bihar)

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		for 5–6 days till the inflammation goes away. Future perspective of the practice: It can be widely used as an authentic technique. It is a common practice in the villages of Sitamarhi district (Bihar) and has potential for further spread in other areas. In about 75% of cases it has been found effective. *Cost:* benefit is 1: 4 approx	
1510	Relief of pain through amarlatti or amarbel in case of inflammation in cattle and buffalo	The vine of *amarlatti* can be used to cure inflammation. It is boiled with water and applied over inflamed area twice or thrice daily for 4–5 days. This practice is followed in the villages of Patahi Block of Sitamarhi district (Bihar). Success has been reported in more than 80% of the cases. **Keywords:** *amarlatti*, vines, inflammation	Shri Viswesh Kumar C/o Shri Satyendra Prasad Singh, Kataiyan, *Dostiyan,* Sheohar, Sitamarhi (Bihar)
1516	Treatment of neck swelling in draught cattle and buffalo by pig fat	Fat of pig may have squeezing elements which cure the neck swelling. Pig fat @ 100 g is used twice a day for 4 days by massaging it on swelling neck of draught animals like cattle and buffalo. The practice is followed in village Madhupur of Madhupur Block in Deoghar district (Jharkhand).: The success has been observed in 70% of the cases. Cost: benefit is 1: 5 approx. **Keywords:** massaging, pig fat	Shri Praveen *Soren*, C/o Lok Jagriti Kendra, Madhupur, Deoghar (Jharkhand)
1521	Treatment of dysentery in goat through use of black pepper with sendha salt	Black pepper may have some medicinal properties against dysentery. Sendha namak and black pepper are ground and fed to goat by making its pill. The practice is followed in *Ghaghra* village of *Khunti* Block in Ranchi district (Jharkhand) and has potentiality for further spread. Success has been observed in more than 80% of the cases. **Keywords:** black pepper, dysentery, salt	Ms. Gita Kumari C/o K.N. Singh Munda, Matladih (Near filter house), Bagbera (Tatanagar), E.Singhbhum,(Jharkhand)
1526	Indigenous treatment of *semla* in cattle and buffalo	In area of Bhikhampur village in Dumka district of Jharkhand, small-sized indigenous cattle and buffalo are reared in Jharkhand suffering from *semla* disease. To cure this skin disease, farmers use milk/juice of banyan tree, because it has medicinal property and almost 50–60% problem is checked. Milk/juice of banyan tree is applied twice/thrice daily in the affected portion. This is age-old practice, adopted by 60% farmers in the village and cost, Rs 4 per cattle. **Keywords:** *semla*, cattle, buffalo, banyan tree, milk/juice	Shri Debasis Murmu, Shri Mohan Hansda, Agrarian Assistant Association, Bunder Jori, Dumka (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1531	Application of geru for prevention of diseases during epidemic conditions	This is in practice in Umarpur village of *Buxar* district of Bihar. Geru serves as anti-bacterial/antiseptic agent, and farmers apply it over the horns of animal/cattle specially in summer season when casualty occurs in animals. They also spread geru after dissolving in water throughout the body of animals. This is 60 years old practice, adopted by 100% farmers of the village and involves little cost. **Keywords:** geru, epidemic, antibacterial/antiseptic, cattle	Dr B. K. Roy, Associate Professor, RVC, Ranchi (Jharkhand) 834 006
1543	Cure from tongue burning in animals	Tongue burning is a disease in bigger animals like cattle and buffalo; to cure this disease, mixture of mustard oil and karanj oil is given orally to the animal. This disease occurs in animal when lot of heat is generated inside the body. It is 20 years old practice and adopted by almost all the village community. **Keywords:** tongue burning, mustard, karanj, cattle/buffalo	Shri R. K. Jha, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006
1544	Relief from severe pain by using turmeric powder and mustard oil	Turmeric powder with mustard oil (Brassica campestris) has characteristics that help cure the animal suffering from severe pain. It is given orally once or twice for 4–5 days. The given quantity of turmeric should be 100 g/ 100 kg body weight of animal. Even of wounds etc. the turmeric paste is applied. It is age-old practice and adopted by every farmers of the village. **Keywords:** turmeric, mustard (Brassica campestris), wounds and pain	Shri R. K. Jha, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1546	Cure of burns in animals	Sometimes animals receive fire injury and some part of its body may get burnt. It is cured by applying karanj oil, limewater and alsi oil in equal proportions. This is applied on the burnt part of the animal twice or thrice daily till it gets cured. This is in practice for last 50 years by maximum number of farmers in the Sukurhuttu village of Ranchi district of Jharkhand and involves little cost. **Keywords:** burns, karanj, limewater, alsi, animals	Shri R. K. Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand)
1550	Control of shoulder swelling of draught animal	Shoulder swelling and wounds are controlled with the help warm pig fat or mahua oil and turmeric. Pig fat or castor oil makes the swelled portion soft and turmeric acts as antiseptic. In this age-old practice, warm mustard oil is applied on the affected portion.	Shri *Dhiren* Murmu, S/o Shri Hari Murmu, *Jhunai Pahari, Nirsa*, Bara *Ambona*, Dhanbad (Jharkhand) 834 006

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		In wound, warm *lau kesari* paste is applied. This is applied for 4–5 days in case of swelling and 8–10 days if there is wounds. The success rate of the practice is 98% which involves Rs 25 to Rs 30 cost only per animal. All the farmers of the Jhunai Pahari village of Dhanbad district in Jharkhand use this practice. **Keywords:** swelling, wound, pig fat, mahua oil, turmeric, *lau kesari* paste, mustard oil, draught animal	
1551	Indigenous animal management	Majority of the farmers of village Pithra in Simdega district of Jharkhand rear cattle for farm work. They feed them green grass or dry straw. They also take them to pasture. Pregnant cows are separated from the herd. If animal gets fever, they are treated by the indigenous method. Oal (a tuber crop), jhol (carbon accumulated on the net of the spider in kitchen), tamarind, chilli, salt, *handia*, (rice beer), fat of pig, kujri oil and powder of *sarguja* are crushed and powdered. Then half of this powder is wetted with water and given to cattle. In another half mixture, fat of pig and kujri oil are added, and it is rubbed on the tongue of the cattle. **Keywords:** pregnant, separate fever, oal, jhol, tamarind, chilli, salt, handia, fat of pig, kujri oil	Shri M*atu Pradhan, Pithra Jitiatoli,* Pithra, Simdega (Jharkhand) 835 223
1557	Treatment of string-halt in animals by herbal massage	For the treatment of string- halt in animals, a herbal ointment is used by the farmers of Hazaribag district in Jharkhand. Ointment is prepared by mixing 250 g mustard oil, 50 g hartal, 50 g *ghodbaj (Acorus calamus),* 10 g of *tutia* (blue vitriol) and 10 g gandhak (sulphur) and heated in a vessel. When it cools down, ointment is applied on the swollen portion of thigh, and rubbed by placing the thigh between two parallel sticks. Massaging with parallel sticks and herbal ointment is continued for an hour. This wisdom is in use for the last 5 years in Kodhar village of Barhi block of Hazaribag district in Jharkhand. **Keywords:** string- halt, herbal ointment, mustard oil, *hartal, ghodbaj, tutia, gandhak*, thigh, parallel sticks, massaging	Shri *Radho Oraon*, Shri Yadu Saw, Shri Baso Gope, Shri Deglal Mahto, Kundwa, Barhi, Hazaribag (Jharkhand)
1559	Use of *akoan (Asclepias gigantea*) for curing swelling in animals	Akoan shrub is commonly found in the Boreya village of Ranchi district in Jharkhand. Akoan shrub has medicinal properties used for curing swelling in animals. Two-three heated leaves of *akoan (Asclepias gigantea willd)* are applied on swelling part and it is	Shri Ranjeet Bara, Pathlkudwa, Church Lane, Ranchi (Jharkhand

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		 Akoan–a plant used for treatment of swelling in animals tied with bandage for 3–4 days. This age-old practice is successful and adopted by maximum number of farmers in the village. **Keywords:** akoan (*Asclipias* gigantea), shrub, heated leaves and swelling in animals	
1565	Treatment of gathia (rheumatism) in animals	For the treatment of *gathia* (rheumatism) in animals, 10 g dhatura (thorn-apple) seed and 50 g *golmirch* (black pepper) are given to animals with 250 g milk for 10 days in evening. This indigenous wisdom is being practised by 80% of the farmers of *Kabra* village of Muzafferpur district in Bihar for the last several years without any modification. They claim that there is no side effect on the animals. **Keywords:** *gathia* (rheumatism), dhatura (thorn-apple), gol mirch (black pepper)	Dr Sunil Kumar, Kaen, Muzafferpur (Bihar) 842 001
1568	Use of bhang in treatment of dysentery in goats	Bhang may have some medicinal properties which cure dysentery in goats. Ground bhang is given to dysentery suffering goat for curing. The practice is followed in village *Kachha of Karandhi* Block in East *Singhghum* district (Jharkhand). The success has been observed in 90% of the cases. Cost: benefit is 1: 6 approx. **Keywords:** bhang, dysentery, goats	Ms Gita Kumari, C/o Shri K.N. Singh Munda, Mtladih (Near filter house), Bagveta Tatnagar, E. Singhbhum (Jharkhand) 831 002
1570	Indigenous treatment of semla in cattle and buffalo	Semla is a skin disease and very common in small sized indigenous cattle and buffalo. It is treated by sheep milk. It is applied in affected portion of cattle/buffalo. This low-cost practice has 50–60% of success rate and is used by 60% farmers of Bhikhampur village of Dumka district in Jharkhand. **Keywords:** semla, cattle, buffalo and sheep milk	Mohan Hansda, C/o Agrarian Association, Bunder Jori, Dumka (Jharkhand)

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1580	Cure of haematuria in animals by herbs	Haematuria is a serious problem in case of cattle and buffalo in which blood starts coming out from urine. In this 50 years old practice, 50 g bark of *semal*, one packet dust of isabgol, 100 g sugar and 200 g white soil are mixed thoroughly by applying water and given orally to the suffering animal twice in a day for 2–3 days or till it gets cured. It involves Rs 25 for treatment and is adopted by 30 out of 50 farm families. **Keywords:** haematuria, blood in urine, *semal* bark, isabgol, sugar, white soil, cattle/buffalo	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006
1581	*Garkati* disease in animal and its diagnosis	I n *garkati* disease, inner part of the tongue gets swollen and cattle stops feeding and drinking water, and it results in death of cattle. For its treatment, farmers of village *Asanbera* of *Thethaitangar* block in Simdega district of Jharkhand use oal kand, tamarind, salt, carbon, fat of pig, sindur (vermilion) and an iron rod. First, swollen tongue is burnt by the heated iron rod. Then 200 g oal kand, 20 g tamarind and salt each and 10 g carbon are powdered and mixed, and fed to animal. After that solution of pigs fat and sindur (vermilion) is rubbed on the tongue. Then water is given to drink. One treatment is enough to cure garkati. This indigenous treatment is being used by the farmers for the last several years without any modification. **Keywords:** garkati disease, tongue, swelling, results in death, oal kand, tamarind, salt, carbon, pigs fat, sindur (vermilion), iron rod, tongue is burnt rubbed	Shri Anjelus Kerketta, *Asanbera kathartoli, Lathakhaman*, Simdega (Jharkhand) 835235
1591	Treatment of rinder pest affected animals by use of barley flour and shisham leaves	People of many villages of Madhubani district in Bihar use barley flour and shisham leaves for treatment of RP affected animals. In this treatment, 250 g flour of barley and 100 g extract of shisham leaves are mixed together and fed to affected animals twice or thrice a day for 2–3 days. The effectiveness of this practice is almost 80%. All the farmers of the village use this age-old practice. **Keywords:** barley flour, extract of shisham leaves, animals	Ms Rekha Karn, C/o Akhileshwar Lal Das, Village. Betauna, P.O. Benipatti, Madhubani (Bihar) 847 223
1794	Control of *bagh*i disease using wild ash gourd	*Baghi* diseased animals suddenly fall down and stomach looks like a drum. Animals feel pain in neck and stomach. In such condition, farmers of Sonapur village in Jahanaganj block of Azamgarh district of Uttar Pradesh are feeding the animals with 300–400 g	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

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		of ash gourd pulp by mixing it with 100 g salt, two times at an interval of 3 hours for 3 days. **Keywords:** ash gourd, baghi disease	
1827	Use of Tephrosia purpurea leaf extract & *tabacco* dust for control of blood sucking ticks	The farmers of Ahmednagar collect Tephrosia purpurea leaf and crush to make juice. About 30–35 of juice is mixed with 10 g of tabacco dust. The paste is applied over the skin of the animal with help of a cloth. The attack of blood sucking ticks reduced to a considerable extent. **Keywords:** tobacco, Tephrosia purpurea, skin of animal, ticks.	KVK, *Babhaleswar Rahata* Ahmednagar (Maharashtra) 413 737
1830	Use of Camphor and coconut oil as a fly-repellent	In rainy season, small injuries attracts flies leading to maggot formation. To avoid this recurrence, rural people of Nanded use mixture of camphor and coconut oil. The offensive smell of the mixture repels the flies thus maggot formation is prevented. **Keywords:** camphor, coconut oil, maggot, flies	Dr.S.P. Deshmukh Trg. Associate Pokherni Nanded (Maharashtra)
1899	Breaking habit of urine drinking by the bullocks	When the bullock drinks its urine, farmers consider this as a bad habit. This is controlled by feeding the animal with *arush (Adhatoda* vasica) leaves. About 500–600 g *arush* green leaves are *grond* in water by mixing 5–6 g black pepper and is kept in pottery for drenching to the animal @ 100–250 ml two times a day. It has been used from last 70–80 years by 50% farmers in Sonapur village in Azamgarh district of Uttar Pradesh. **Keywords:** *arush* leaves, paste	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1910	Use of neem bark decoction for control of spondolytis in animals	Some young animals suffer from the problem of *spondolytis* disease, as a result the animals are not in a position to stand by their legs. To overcome this problem farmers collect 500 g neem tree bark which is grown on pipal tree and boil it by mixing with tonta stem in 2 litres water. Boiling is continued till the decoction remains 1.0 litres and turns to dark brown colour. This decoction is fed to the animal @ 200–250 ml three times a days for about 6–7 days. It is practised since 60–70 years in Sonapur village of *Jahanagangj* block of Azamgarh district of Uttar Pradesh **Keywords:** neem bark decoction, *spondolytis, tonta*	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1912	Use of mixture of mahua flower, *sanwa* grain and goat milk to control *langari* disease in animals	Animals suffering with severe *langari* disease are treated by using a paste made from 500 g mahua (Madhuca latifolia), 200–250 g *sanwa* grains and 250 ml of goat milk after boiling. The paste is applied on the infected part of leg and bandaged for about 7–8 days. 40–50% of the disease can be controlled by this practice. This is being used by the farmers of Sonapur village of Jahanaganj block of Azamgarh district in Uttar Pradesh. **Keywords:** *langari* disease, mahua, *sanwa,* goat milk, bandage	Shri Ranjay Kumar Singh, Sonapur, Azamgarh (Uttar Pradesh) 276 128
1922	Indigenous animal husbandry practices	Animal husbandry is agricultural based enterprise. Both are inter dependent. Bullocks are used as farm power in agricultural operations. The dung is used as manure. Agricultural crops and their residues are used as feeds and fodder for animals. The farmers maintain animals with known and age old practices. They select good and strong animals from market which have bright colour, have black eyes and are active. They make *tabela* (animal shed) for keeping animals. Animals are fed in the *tabela* in the morning and evening and are sent for grazing during the day. The crop plants and residues, grass, wheat straw and sorghum plants (stalks) are the fodder and feeds of animals. Proper feeding of animals, grazing, giving them drinking water timely, care of animal during sickness, keeping them in clean shed, bathing buffaloes, milking, sale of milk, milk processing and making milk products from milk and their sale are some of the prevalent animal husbandry practices. Animal husbandry is considered suitable only to those farmers who can do hard work, who can stay with farm animal and can take care all around the day and night if needed, specially during their *pasturition* and sickness. **Keywords:** *tabela*, feeding and grazing of animal, selection of animals, care of sick animals	Shri *Subhash Mahadevrao Vankhede, Borala, Arala, Amaravati* (Maharashtra)
1926	Control of haemorrhagic enteritis in ruminants by alum solution	More than 200 farm families in Waghi village of Nanded district in Maharashtra are adopting this practice for treating haemorrhagic enteritis in ruminants is controlled by drenching. Blood loss through faeces in haemorrhagic enteritis (dysentery) in ruminants. About 3% alum solution (0.5 to 1 litre) for 3–4 days. Alum causes coagulation of blood.	Dr S.P. Deshmukh, Training Associate, Krishi Vigyan Kendra, Pokharni, Limbgaon, Nanded (Maharashtra) 431 602

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		Keywords: ruminants, 3% alum solution, coagulant action	
1929	Use of roots of Holostemnia rheedii and Embelia ribes to check swelling in dairy animals	The swelling in dairy animals is cured by feeding the animals with roots of Holostemnia rheedii and Embelia ribes, made into paste and mixed with honey and given twice a day for 3 successive days. This extract act as pain reliever, diuretic agent and as a nerve tonic. The cost of treatment is Rs 25 and has been in use since 50 years by 50% of farmers in Kirlos village of Maharastra. **Keywords:** animal swelling, *Holostemnia reheedii, Embelia ribes*	Shri R. R. Tambe, Kirlos, Malvan, Sindhudurg (Maharashtra) 416 616.
1950	Luke paste of garlic, vermilion and mustard oil is applied to control langari disease.	I n winter seasons, animals suffer from langari disease jerk their legs and feed deficiency to walk properly. A mixture is prepared by frying 100–150 g. of garlic in 40–50 ml. oil and mixed with 10–15 g. vermilion. The same is applied on the affected part. This is continued for 10–15 days at 3 days interval. This practice is followed in Azamgarh of UP. **Keywords:** garlic, vermilion, mustard oil langari disease.	Shri Ranjay Kumar Singh, Ph.D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1966	Use of bhangariya to cure blain in animals	T o cure the animals from blain, farmers of Sonapur village in Azamgarh district of Uttar Pradesh use paste of *bhangariya*. About 200–250 g of *bhangariya* plant (leaf and stem) is collected from the field and washed before crushing. The paste is fried in 50–60 ml mustard oil. The fried paste is divided into three parts which are used in 3 days after changing the old doses. By this practice 80–90% of the problem is controlled for cattle, buffaloes and goats. Out of 1200 farmers, 400–500 farmers follow this practice. **Keywords:** blain, *bhangariya* paste, mustard oil	Shri Ranjay Kumar Singh, S/o Shri Haribansh Singh, Sonapur, Sewta, Azamgarh (Uttar Pradesh) 276 128
2170	N a t i v e traditional wisdom for livestock management	The indigestion and anorexia is controlled by: 1. Drenching the cattle with salt and warm water 2. Chilly powder is made into balls and is given to cattle 3. Drenching the cattle with ginger extract. **Keywords:** live-stock traditional wisdom	Shri *J.C.Katyal, NAARM, Rajendranagar,* Hyderabad (Andhra Pradesh) 500 030
2171	Rearing of domestic animals and poultry birds	Domestic animals such as cows, buffaloes, sheep, goats, pigs and poultry birds are maintained by the farmers of *Ganivada, Nidighattu* and *Sambayyapalem* villages of Vizianagaram district of Andhra Pradesh	Shri C. Bhaskara Rao, 38–13–11/1, Laxmi Nagar, *Marripallem, Vishakapatnam* (Andhra Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		for use of animal products for family consumption and for income generation through sale. **Keywords:** animal products, consumption, income generation	
2172	Allowing goat/sheep to graze and litter in fields	The goat/sheep are allowed to graze in the fallow lands prior to growing of crops. These check the weed growth and add manure in the farm of litter which is rich in nutrients. **Keywords:** sheep, goat grazing	Shri Yadgiri, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 506 101
2178	Sheep and goat penning in fallow season	Sheep and goats are allowed for grazing in fields during fallow season. Urine and excreta dropped in that field, act as manure and enrich the soil fertility. This practice also reduces the weed population. This is being practised in most parts of Andhra Pradesh since several years. **Keywords:** grazing, urine, excreta, manure, soil fertility, weed population	Training Organiser, Krishi Vigyan Kendra, *ANGRAU, Reddipalli*, Anantapur (Andhra Pradesh) 515701
2182	Keeping cattle in mud, a practice against the debilitated leg in cattle	For the debilitated leg (Telugu: *kallu chachubadatam*) symptoms, the infected cattle leg are kept in mud for one hour 2–3 times. The cattle work with rejuvenated activity in their legs. **Keywords:** debilitated leg, cattle, keeping in mud	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626. NagarJuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
2191	*Benkudu* mandu (Sprain medicine) with *tangedu* leaf	The sprain area is treated by collecting adequate Cassia auriculata (*tangedu)* leaves. Grind the leaves and add water and leaf to fumes. Then take warm leaves, apply on to the sprain area, put bandage daily once for three days. **Keywords:** *benkudu* mandu, *tangedu* leaf	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2192	*Benkudu* mandu (sprain medicine) with tamarind leaf	The sprain area on the body of cattle and buffalo is treated by grinding the collected tamarind leaves and made into fine paste. This is applied on the sprain area, and bandage is placed. This has to be done daily for three days. It is practised in *Bambilli* village of Visakhapatnam district in Andhra Pradesh. **Keywords:** *benkudu* mandu, tamarind leaf	Shri D.Dorai Raj Training Officer, Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005
2195	Use of onion, lemon and ginger mixed with honey for control of paralysis and goitre	About 15 ml of each of onion, lemon and ginger juice are mixed with honey and drunk by the animal thrice a day for 1 month to control the paralysis and goitre. All these ingradients are locally available and is being practiced by rural farming families.	Shri G.Ramulu, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirman Samithi, Jamaikunta,

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: onion, lemon, ginger juice, control of paralysis, goitre	K a r i m n a g a r , (Andhra Pradesh) 505 122
2203	Use of amla fruits for controlling joint pains in animals	About 5 to 10 spoonfuls of amla powder mixed with jaggery 2 times a day for one month is fed to the animal for the control of joint pains. It is effective over the use of *Diclofenac* sodium injections. **Keywords:** animal joint pains, amla	Shri *P.Rajaiah,* C/o Prakasam Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
2315	A n i m a l husbandary practices	T h e technologies that were followed for breed improvement in cattle and buffaloes are: 1. Castrating all males which are not used for breeding or religious sacrifice. 2. Bull was considered more important for breed improvement 3. Feeding animals as per schedules. 4. Following guidelines concerning construction of animal houses. **Keywords:** animal *husbandary* practices	Drs. G. *Subba* Reddy and H.P.Singh, CRIDA, *Santhoshnagar*, Hyderabad (Andhra Pradesh) 500 059
2260	B l o a t or tympany control in animals	Farmers in the different areas of Rajasthan are following different practices to control bloat in animals. *Jodhpur-Nagore:* 200 to 500 ml *seasame* oil is mixed in cold water and added 50–200 ml wine and administered to the animal. *Jaisalmer:* 100 ml human urine is taken and 5 drops of aak (Calotropis spp.) milk and 50 ml goat milk is mixed.. Then 10 drops of this mixture is dropped in the nostrils of animals. *Barmer:* 500 g *Ammilovage* mixed with 200 g salt along with 100 ml human urine, and it is fed along with water. *Ajmer-Nagore:* Sesame oil and warm water is mixed and drenched it to the animal. 50 g dry *thothumouba* and 50 g rai is ground, mix it well and add 100 g salt and 250 cc butter milk and drench it to the animals. **Keywords:** bloat, tympany, sesame oil, aak milk	Shri K.S. Hooda, Vidya Bhawan KVK, Badgaon, Udaipur (Rajasthan) 313001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2261	Pneumonia control in goat	Farmers in the different areas of Rajasthan are following different practices for pneumonia control in goat. *Jodhpur-Nagore:* The liver of infected animal is cut into small pieces and applied on the cut end of the ear, or infected goat liver is mixed with red chilli powder. It is mixed with spice, paste is prepared and applied to cut behind the ear and apply the paste to all the animals of the herd. *Jaisalmer:* Hot-iron treatment on nostrils. 1 teaspoon alum is ground, it is dissolved in water and drenched. 10 g alum is mixed with 100 g turmeric powder in water and it is drenched. *Barmer:* The infected liver of goat is cut into small pieces and inserted behind the ear by applying a cut. 100 ml of human urine is drenched. *Ajmer-Nagore:* Grained alum dissolved in cold water. 1 kg green ker leaves are dried and 50 g of sugar is added. It is heated and burnt; given 10 g ash to the animal. **Keywords:** pneumonia, goat, goat liver, alum	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
2263	Diarrhoea control in animals	Farmers in the different areas of Rajasthan are following different practices for diarrhoea control in animals *Jodhpur-Nagore* 1. 250 g turmeric is mixed in curd or buttermilk and given to the animal. 2. Multani soil, sesame oil and curd is mixed, and given to the animal. *Jaisalmer* 1. Multani soil and curd is mixed and drenched for 3 days. 2. Multani soil and turmeric powder is mixed and drenched for 3 days 3. 250 g jaggery is given in the night. In the next morning multani soil, curd and 1 teaspoonful of red chilli powder is mixed and drenched to the animal for 3 days. *Barmer* 1. Multani soil is soaked in water and 250 g curd, it is fed to the animal. 2. Tail is tied up tightly by a small piece of cloth. *Ajmer-Nagore* 1. Animal is fed with 1 kg sorghum/barley flour 2. 350 g bengal gram is roasted in sand and fed to	Shri K.S. Hooda, Vidya Bhawan KVK, Badgaon, Udaipur (Rajasthan) 313 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		the animal after grinding. **Keywords:** diarrhoea, turmeric, buttermilk	
2269	Fractures of bone in animals	Farmers in the different areas of Rajasthan are following different practices for fractures of bone in animals: *Jodhpur-Nagore:* After adjusting the bone at proper place, the *multani* soil is applied over it and bandaged. A mixture of 4 kg sugar, 4 kg fine flour, 4 kg *soanut*, 500 g turmeric powder is applied on the affected part on the animal. Later after 12 days, desi ghee is given for 7–8 days. *Jaisalmer:* A mixture of 5 g carbon black mixed with ghee is fed to the animals 4–5 times. *Barmer:* 100 g henna is mixed with 250 g alum and 5 g carbon; given to animal along with pearlmillet flour. *Ajmer-Nagore:* A mixture of eggs and 500 ml milk with turmeric powder is applied. **Keywords:** bone fracture, *multani* soil, ghee	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313 001
2270	Control of abdominal pain	Farmers in the different areas of Rajasthan are following different practices for control of abdominal pain *Jodhpur-Nagore:* The animal is fed with 500 ml lokimula plant extract boiled in water. Animal is fed 200 ml tea. *Jaisalmer:* Salt the animal is fed with *tumba* with in the holes made on them, dry it under sun and powder it. It is applied along with hot water. The essence prepared from *tumba* seed can also be massaged, on the animal part. *Barmer:* The animal is fed *tumba* in which 2–3 holes are made for inserting salt. Dry it under sun, grind and then give it with hot water. *Ajmer-Nagore:* 2–3 holes are made in green *tumba* and salt is inserted into it, dried under sun, and it is fed to the animal with hot water. **Keywords:** abdominal pain, animals, *tumba*, salt, lokimula	Shri K.S. Hooda, Vidya Bhawan Krishi Vigyan Kendra, Badgaon, Udaipur (Rajasthan) 313001
2278 and 2279	Different indigenous methods of animal rearing in arid zone	1. *Livestock migration and pastoralism:* This is a drought adjustment strategy. 2. *Traditionally skilled livestock breeders:* specific castes rear specific animals. 3. *Symbiotic relationship:* Between the settled non-	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)

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pastoralic and nomadic pastoralic people.

4. *Herding a mixture of animal types:* This is a risk-reduction strategy of animal products or procedure.

5. *Nada bandhana:* A traditional system/practice of controlled breeding by tying a knot on the rams of penis to avoid breeding during migration, and during acute summer and winter periods.

6. *Amar bakra:* A practice of maintaining a he-goat left in the name of god for breeding but avoiding its sale and slaughter.

7. *Khoda system:* A practice of maintaining a village bull on a co-operative basis for livestock breeding in the village.

8. *Foster parental care:* This is a system /practice concerning survival of livestock during scarcity of famine periods. Goats often act as foster mothers to lambs and cow calves.

9. *Toba system of water harvesting:* This is a dug up pond amidst sand dunes, used as a grass-water utilization by the pastoralists.

10. *God's system of grazing:* This is still prevalent among pastoral communities.

11. *Sansis and Sattia momads:* Traditionally skilled artisans practice castration of male calves.

12. *Rituals and beliefs towards animal life:* Traditional attitudes, beliefs/ faiths in gods/ goddesses, evil eye and ghosts spirits, pertaining to livestock disease and mortality.

13. *Grazing strategies are followed for the following:*

    (a) Distribution of herbs for grazing for judicious use of available vegetation

    (b) Diversion of manpower/family member/labour in grazing different types of livestock.

    (c) For collaborative way of livestock migration.

Keywords: livestock migration, pastoralism, livestock breeders, symbiotic, nada *bandhana, amar bakra, khoda,* foster parental care, toba

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2280	Indigenous technical knowledge for treatment of sick animals	Various practices followed in *Motinagar* (Rajasthan) are: 1. Dora bandhana: Tying a sacred thread, locally called dora bandhna, in the name of Baba Ram Deop (Godly Baba) Gosayiji and Pabuji, the Gods associated with livestock illness. 2. Hymns (Kirtans) citation throughout the night and offering in terms of coconut are made to the gods/goddess pertaining to livestock. 3. For protection from evil eye and ghost spirits, prayers and offerings are made to the gods/goddesses associated with livestock mortality, believed to be associated with evil eye and ghosts spirits. **Keywords:** sick animal's treatment, rural belief in ghosts	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)
2281	Livestock migration and pastoralism	Livestock migration associated with pastoralism is a predominant characteristic of arid and semiarid areas of Rajasthan. Pastoralism is the livelihood of the area. These communities make use of the *meagre* resources for their sustenance. It is of 2 types: migration for less than 1 month, and migration for more than 1 month. Livestock migration was highest in the pastoral tract (46%) as compared to rainfed (39%) and irrigated (31); *collobarative* ways of migration is followed. This is a free hold economy that uses the *meagre* available resources for sustaining and survival of livestock. *Nada bandhana:* Traditional practice of controlled breeding in order to avoid breeding during acute summer in sheep. *Amar Bakra:* Traditional practice of keeping few males in the name of god by avoiding sailing or slaughter. They are used for breeding. *Koda system:* Maintaining co-operative bull for breeding. *Koba system:* Efficient utilization of water harvesting and grazing lands. **Keywords:** livestock migration, pastoralism, nada bandhana, amar bakra	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2283	Indian pastoral communities following livestock migration as a drought-adjustment strategy	Pastoralism is a way of life, adopted to meet the conditions of different environments. Livestock migration is positively correlated with the intensity of drought, based on the method of grazing or pattern of migration. The nomadic tribes in Rajasthan follow seasonal migration, as follows: *Total nomadism:* In this system animal owners do not have a permanent residence. They do not follow regular cultivation. Their movement is somewhat of repetitive pattern. Sheep breeders of Madhya Pradesh and Banjaras of Andhra Pradesh are totally nomadic in past. They move from place to place with their herd. *Semi-nomadism:* Animal owners have permanent residence with suplementry cultivation and travel their herds to distant grazing lands. Some tribals of Kinnaur in Himachal Pradesh and Khas in Uttaranchal are following this practice. *Transhumance:* Grazing practiced by the farmers with permanent place of residence. Herds are tended by herdsmen for long periods. Rajasthan tribal population in hilly are practicing it. *Partial nomadism:* Permanent settlements keep herds in the vicinity. **Keywords:** pastoralism, types, places	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)
2284	Livestock migration and pastoralism	Livestock migration is a predominant characteristic of arid and semi-arid areas of Rajasthan. It is considered to be an ameliorative measure of drought, practiced by livestock raisers since generations. They are emigrated from Gujarat Malwa (MP) and Umarkot. About 50% livestock from Rajasthan migrates soon after November every year and returns in July next year. About 5–8 Raikas (hired persons) combine their flocks during migration. The cattle breeders of Rathi tract (Pugal and Bikaner) migrate to canal areas of Ganganagar district. Pastoralism is a way of life for these tribals, who have adopted it to the environment. These people depend on herds and flocks who are these main source of economy. Pastoralists of Rajasthan have a permanent location, while the herds shift round the pasture lands with their herdsmen **Keywords:** migration, pastoralism livestock	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2285	Socio economic and legal aspects of grazing lands, with emphasis on live-stocks migration and pastoralism in the arid zone of Rajasthan	Livestock/animal sector in Rajasthan accounts for 15% of total income. Nearly 40% of the total wool produced in the country comes from arid zone. Livestock grazing lands constitute 40% of the total area. Continuous increase in population resulted in reduction or deterioration of grazing lands. In these states the migration starts after *Diwali* festival in November, with the arrival of dry season; hence they migrate to fertile areas of Gujarat, Madhya Pradesh, Uttar Pradesh and Punjab and return to their villages with next onset monsoon rains. **Keywords:** livestock migration, socio-economic aspects	Shri Anil kumar Bharara, 5/49 A, Motinagar, (Rajasthan)
125(b)	Disease management in cattle	T h e practices regarding diarrhoea, retaining placenta, skin disease and cow conceive developed by Shri. *Kuppusamy.* *Diarrhoea management:* Oral administration of 5 kg leaves of *Thespesis populnea* (poovarasu) or leaves of bamboo controls diarrhoea in cattle. Two leaf sheath of *chotrukathala*i (Aloe vera) are *seperated* from *throns* are administered for quick relief. To conceive cow: Oral *adminstration* of fresh leaves o f *sirukurinjan (Gymnema sylvestre*) or powdered dry leaves of *Gymnema sylvestre* @ 50 g at a time is used to recover the problem. *Retaining of placenta:* Oral administration of fresh bamboo leaves used to retain the plancenta from cattle. *Skin disease:* Leaf extract of *vandukadi maram* (Cassia alata) and lime juice is given to control disease. **Keywords:** Thespesia *populnea*, bamboo, Aloe vera, *Gymnema sylvestre*, Cassia alata, lime	Shri Kuppusamy, Gengavaram, Kanakkankuppum, Gingee, Villupuram (Tamil Nadu)
251	Setting of fractured bone	Charcoal is prepared by burning a dry stem of kerada. The charcoal is powdered and mixed with pure ghee and the paste is applied over the fractured bone of the animal to set it. **Keywords:** bone fracture, charcoal	Drs T. Raj Bavin, Reslin, Selvin and T. Radhakrishnan, Department of Agricultural Extension and Rural Sociology, Agricultural College and Rural Institute, Madurai (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
447(s)	White Yorkshire pigs	In the *Srinikethan* area of West Bengal, *Rathindr*a K V K in collaboration with Animal Resource Department has introduced exotic White Yorkshire pigs, which have remarkably increased the productive power of the local female. **Keywords:** White Yorkshire, female, reproduction capacity	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(f)	Control of disease in cow	Smoke obtained from ridge gourd is used to control cold, fever and running nose in cow. **Keywords:** ridge gourd, smoke, running nose	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan(West Bengal) 731 236
447(d)	Control of fever in cow	Paste made of leaves of wild Solanum sp. is fed to cow to control fever. **Keywords:** fever, cow, wild Solanum	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(h)	Control of FMD in cattle	FMD in cattle is controlled by keeping the cattle in sandy places. **Keywords:** FMD, cattle, sandy place	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
447(i)	Treatment for stomach pain in cattle	Severe stomach pain in cow/goat is controlled by feeding them with 2 to 4 female lice. **Keywords:** stomach pain, cattle, female lice	Dr Dulal Chandra Manna, Rathindra KVK (ICAR), Srinikethan (West Bengal) 731 236
515	Use of khutura vegetable as galactogague	In this practice, the farmers of *Babulbil* village under Gossaigaon block in *Kokraijha*r district of Assam, use khutura vegetable, a mixture of rice and gourd, to increase milk production in cows and goat. This mixture is boiled and administered for 4–5 days. The mixture per dose costs about Rs 10 and this method has been found to increase milk production substantially. The practice has been in use for a long time by almost all the milk-producing farmers except a few. Alternatively, veterinary medicines are used. **Keywords:** *khutura* vegetable, *galactogague*, rice and gourd, milk production, cattle and goat	Shri Bhabani Roy, Babubil, Gossaigaon, Kokrajhar (Assam) 783 360
516	*Kaligira* used as *galactogogue*.	Farmers of *Kodamguri* Kokrajhar district of Assam feed kaligira to animals to increase milk production. About 100 g *kaligira* is taken in tender banana leaf and administered to milch cattle for 2–3 days. It is seen that milk productions is increased by 1–2 litres	Shri Mijibur Rahman, Village. Kodamguri, P.O.-gossaigon, Kokrajhar (Assam) 783 360

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		in local cows. This is followed by all the milk producing farmers and has been in practice for the last 30 years. **Keywords**: *kaligira*, galactogogue, increased milk production	
572	Bedding material for animals inside sheds	Dried leaves of oak or pine, collected from forest, are used as bedding material for animals. These leaves mixed with animal excreta are collected and used for preparing manure. Dried leaves (50 kg) provide bedding for 4 to 5 animals per day.The leaves are available in plenty in the forest free of cost. This is the cheapest available material, which provides a good-quality manure. **Keywords**: bedding, manure	Shri H C Tewari, SEWAK, A-46, Judge Farms, Haldwani Nainital (Uttaranchal)
887	Treatment of fever in livestock	The infected animals are buffaloes, sheep, goats, cows etc. The main symptoms are restlessness, loss of appetite, high temperature and sometimes discharge from nose. The infected cattle are treated with 10 g cumin seed (*Cumin caraway*) and 10 g garlic (*Allium sativum*). These materials are first crushed, ground and then mixed properly with local tea (karru). About 200 ml karru is given orally for 2–3 times a day. The soup extracted after boiling 0.5 kg *kulth* (*Dolichos uniflorus*) in about 2–3 litres water along with spices and salt, is also given in addition to above treatment.This treatment helps maintain the normal body temperature constant. This is practiced in most of the villages in hilly area of Lahaul and Spiti district of Himachal Pradesh, especially in Kaza area. **Keywords**: fever, cumin seed, garlic, local tea, oral feeding, *kulth*, spices, salt	Shri Chimit Dev, Tabo, Kaza, Lahaul Spiti (Himachal Pradesh)
889	Treatment of gastric ailments in cattle	Gastric problem in cattle is due to overeating of fodder. General symptoms observed are loss of appetite, restlessness and extreme docility. Gastric ailment in cattle is treated by feeding a mixture of *brahm-jeeri* seeds (5 g) and sugar (50 g).This mixture is added to 250 ml of water and given orally 2–3 times a day. *Brahm-jeeri* contains certain substances that help neutralize the acidity, maintain a desirable pH in stomach and provide relief to the cattle suffering from gastric ailment. This is very effective and has been practised in most of the villages in Gopalpur and Karsog area of Mandi district of Himachal Pradesh.	Shri Nanak Chand, Dol, Gopalpur, Sarkaghat, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: gastric problem, overeating, *brahm jeeri* seed, sugar, neutralization	
1805	Control of blood sucking ticks by Tephrosia and tobacco	About 30 ml leaf extract of Tephrosia purpurea is mixed with tobacco dust and applied over the body of animals infested with ticks. This practice is followed by animal *reares of Golarwadi* village of Ahmednagar district in Maharashtra. The practice has been in use since last 5–6 years and still 10 farmers in the village are using it. **Keywords:** Tephrosia purpurea, leaf extract, tobacco dust, body application	Krishi Vigyan Kendra, *Babhaleshewar*, Rahata, Ahmednagar (Maharastra) 413 757
1816	Indigenous practices in agriculture and animal husbandry	The different indigenous practices followed in *Tikamgarh* district of Madhya Pradesh are mentioned here: 1. Dry leaves of neem and methi (fenugreek) are used to protect grains from storage pest during storage. 2. Animal dung ash and kerosene oil are used to protect seed of greengram and *blackgram* from pest damage during storage. 3. Dusting of animal dung ash on leaves of cucurbitaceous vegetables for control of insect, red pumpkin beetle. 4. Use of leaves of *chhewla* for mulching in ginger, turmeric and arvi fields after sowing to conserve moisture, reduce incidence of weeds and improve soil fertility by decomposition of the leaves in the field. 5. Preservation of ginger rhizome in small pit under tree shed for seed purpose. 6. Intercultural operation by desi plough in broadcast sorghum crop after 35 days of sowing to reduce weeds, improve aeration and maintain plant population. 7. Sitaphal (custard apple) seed powder is used against storage pests. 8. Use of bamboo leaf, paddy grains and mixture of butter milk and besan (flour of chickpea) to expel retained placenta in cattle and buffalo. 9. To control foot and mouth disease the animal is kept in mud for 2–3 hours in standing position. 10. To control diarrhoea in animals, drenching of ground leaves of sesamum and butter milk are commonly used.	Officer *Incharge,* Krishi Vigyan Kendra, *Tikamgarh,* (Madhya Pradesh) 472 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: neem leaf, methi, storage pest, animal dung ash, kerosene oil, vegetable crops, chhewla leaf, desi plough, weed control, sitaphal, bamboo leaf, butter milk, retained placenta, foot and mouth disease, diarrhoea, sesamum	
1995	Use of methi to control indigestion.	About 250 g of methi seed and equal amount of gur is mixed. The mixture is fed to animals for 3–4 days to cure indigestion. The mixture has laxative property which helps in recovery. More that 85% of farmers of *Shivpuri* follow this practice. The cost involved per animal is Rs 15–20. **Keywords:** methi seed, gur, indigestion, laxative	Shri *Dwarika Pateria* *Samora Dinara Shivpuri* (Madhya Pradesh)
1998	Rope made of ketki (Caesalpinia bondue) plant	The farmers of *Gaildubba* village in *Chhindwara* district of Madhya Pradesh plant *ketki (Caesalpinia bondue*) around their fields to protect from animal  *Ketki fibres* for rope making grazing. This is a shrub with spines on the leaves. The leaves are used for making rope, which has a very good quality and it is even used to knot ship in sea. For making rope, the leaves are soaked in water for 15–20 days to release the compactness of tissue after which the leaves are fixed in Y shaped wood and stretched for removal of fibre. This has been in practice since 10–15 years and is adopted by 70 farmers. **Keywords:** *ketki*, rope	

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2305(a)	Practices for animal 2305 health care	*Pailag* (foot and mouth disease) symptoms of foot and mouth disease are blisters or vesicles on the membranes of the mouth and tongue and on the feet. The infected animal starts limping and stops eating. The animal likes to rub the hooves and taps them surface. According to farmers, bullocks are more susceptible than other bovines. Traditional practices for curing FMD are given here *under.In* a cattle byre, a fresh *mushi* fish (*Eulamia limbatus,* Muller and *Henle)* is kept in the *madaka* (earthen pot) containing water and this water is then poured on animals hooves. Oil is extracted from *cashewnut* shell by heating the earthen pot on *chulah*. The extracted oil is applied on the diseased part, which cures the disease to some extent. The leaves of *bhamburdi (Blumea lacera)* along with *nachni bhakri* (bread of finger millet) are fed to animal two to three times a day. Also, the leaves of *bhamburdi* are tied in between two halves of the hooves of animal and the animal is allowed to stand in a muddy field. The affected animals are forced to walk in saline water and then in hot sand/dust for two to three times or sometimes animals are tied on the hot sand floor. The farmers believe that organisms responsible for this disease are killed due to action of hot sand or dust. The practice of forcing the animals to walk in brine solution is likely to help in two ways, firstly it prevents secondary infection and secondly, being alkaline material, it is effective against viruses. *Application of aam:* The aam or *malic* acid locally called as *khati,* is collected early in the morning hours with the help of *musline* cloth from *harbhara* (chickpea) crop. The collected *malic* acid is applied on affected parts i.e. on hooves to control foot and mouth disease. *Cleaning with petrol or kerosene:* Disease affected part is cleaned with petrol or kerosene and then camphor pellets or *napthelene* balls are filled up in between the two halves of the hooves of the animal. Sometimes after cleaning the affected part with petrol or kerosene, the animals are forced to walk on hot sand/dust. *Application of oil extracted from biba (Semecarpus anacardium): Biba* is crushed and extracted oil is used to apply on affected part, due to which infection through house flies does not occur.	Dr N.D. Tawade, Professor and Head, Department of Extension Education, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (Maharashtra) 415 712

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		Application of lime water: Sometimes lime water or alum water is poured on the infected hooves of the animals. *Fever:* Symptoms of fever include high body temperature, chills, increased breathing rate, profuse salvation, depression and a characteristic cough. The animals become weak and lose their appetite. The practices to control fever are- Farmers allow the animals to inhale the smoke evolved by burning the outer dried cover of cowpea pods or dried seed coat of arecanut. For reducing cough, animals are allowed to inhale the *owa* (dill) smoke. People sometimes prepare a smoke by burning *carpentary* waste wood material. Farmers allow the animals to inhale the smoke evolved by burning the dried outer cover of cowpea pods, a spoonful of chilli powder and egg shell. Leaves of *tiweli* are crushed and the extract is applied all over the body of the animal, especially on forehead. This practice results into reducing body temperature of the animal considerably. Approximately 50 ml of bitter gourd juice is dropped in the nose of animal suffering from cough and fever. It enhances respiration through nose and reduces body temperature. A mixture of 100 g ginger, 50 g *kadukiraiit* and 100 g *dhane* (coriander) is crushed in a pot and then boiled it by adding 500 ml water and to make it one-third. This solution is given to animals for 3–4 days (by repeating the above procedure) continuously to cure the fever. Fresh leaves of *adulsa* (Adhatoda vasica) are collected and crushed for extraction of leaf juice. This extract (approx 1 liter) is given to animals continuously for 2–3 days. An extract is prepared by crushing leaves of *nataknari* or bark of *biwala bibla (Pterocarsus marsupium)*, which is then mixed with jaggery from fever for 2–3 days. Kale til (niger) oil is applied on all the body parts of the animal to cure the *faver.In* case of calf, a mixture of turmeric powder and salt (approx. 50–100 g) is rubbed on tongue of the calf. *Cough:* Farmers allow animals to inhale the smoke prepared by burning sodan (upper shell of coconut) and outer seed coat of arecanut along with *owa* (dill) in sufficient quantity. 2. Juice of onion extract of *adulsa* (Adhatoda vasica) leaves along with jaiphal/nutmeg (*Myristica* fragrance L.) powder is administered to calf. 3. Young calves are allowed to	

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inhale the smoke prepared by burning jute bag, triphala *(Zanthoxylum rhesta)* and owa (dill) for two times in a day. Animals suffer from diarrhoea resulting in weakness, loss of appetite and loss of weight. To cure this, following traditional practices are followed by the farmers.

1. A mixture of owa (dill) and onion juice (approx. 750 ml) is administered to the infected animal.
2. Leaves of *hedu (Adina* cordifolia) or *gulvel* (Tinospora cordifolia) or a bark of *sandruk* are collected and extracted (approximately 500 ml) is given to the animal.
3. Fresh fruits of *bokheda/bhokar (Cardia* oblique) are crushed and mixed in 500 ml of water in a proportion of 1: 2. This solution is given only to a suffering animal.
4. Some farmers give ash of paddy straw along with water to the animal twice a day.
5. The grind peel of *karambel* fruits along with butter milk in proportion of 1: 10 is administered to the animals.
6. 100 g of methi (fenugreek) is ground and soaked in 1 liter butter milk over a night to make it soft. Next morning, this mixture is fed to the animal.
7. A mixture of *ratam* tel (kokum oil) along with ghee is given to the infected animal.
8. Potassium permanganate along with rice flour is a very effective mixture on diarrhoea.

Wound: A mixture of *shendur* and camphor powder in a sufficient quantity is applied on a wounded site every day. Tree trunk of *lavasata* is rubbed on a stone pata and the paste so prepared is applied daily over animals wound. The wound is healed within a week,. Roots of *malkamali (Tagetes erecta)* are rubbed over the stone to make its paste for applying on the wound. Sometimes extract of leaves is used to apply on wounded *part.The* napthelene (prepared by crushing napthelene balls) is applied on wound and bandage is done. This procedure is daily followed for 6–7 days, till the wound is healed. Sometimes, a spoonful of salt is applied on wound. A rope is prepared from the bark of *aapta* (Bauhinia *racemosa)* then in the evening hours, the roots of the same plant from the northern side are uprooted ensuring at the same time that shadow will not fall on the uprooted roots. The

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uprooted roots are woven in a traditional manner with the rope, prepared earlier from the bark. Finally, this rope is tied tightly around the neck of the infected animal. It is believed that due to this practice, the wounds cure within a short *time.Leaves* of karanj tree (*Pongamia pinnata*) are crushed and paste is prepared which is applied on the wound. Wound is then covered by banana leaf sheath to form a bandage. The farmers believe that due to this practice, the organisms present in the wound get killed. This cleans the wound (after 2–3 days) which recovers soon by daily practicing the above procedure. Some farmers use a paste prepared by grinding 5–6 turmeric rhizomes and apply over the wound and then cover with a banana leaf sheath to form a bandage. The farmers believe that due to this practice, infection through other micro-organisms is not possible which results in early recovery of wound.

Tympanitis: Bloat is a condition in which the animal is unable to repel rumen gases through the esophagus and mouth in the normal manner. The rumen becomes greatly distended, protruding on the left side first and then rounding out on both sides of the abdomen. Death occurs in severe cases from unknown causes, which may be suffocation due to the gas pressure or absorption of toxic substances. Traditional treatments consisting of the oral administration of a material affecting surface tension to break the froth and release the gas are given here. 50 g of owa (dill) grain along with 500 ml of butter milk is given to animals. Some farmers give about 250 ml of groundnut oil to the animals, which acts as an effective agent in this regard. Some traditional dairymen give a mixture of caustic soda (100 g) dissolved in one liter of water and afterwards ½ kg of groundnut oil is administered to animal. In severe emergency cases or for immediate relief, a puncture may be made into the rumen (left side) in the area between the hip and the ribs just below the lion to allow the gas to escape *vafara*. This is done ideally by an expert person in the village. For this treatment, a sharp needle of three inch length is used. This practice results in giving immediate relief to the animal.

Pink eye: Common symptoms noted are a swelling of the eyelid, which becomes red and congested. A

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		watery discharge occurs in early stages, which later contains mucus and pus. In some cases, ulcers form on the eyeball, permanently blinding the cow, temporary blindness frequently occurs. It is cured adopting the following methods. A paste is prepared by grinding a fresh onion on stone and applied in the form of *lep* on either side of eye of the animal. The practice results in removal of dirt, dust and other foreign bodies, making eyes clean and clear. A very strange practice has been noticed on temporary blindness of the animal. An expert person in the village performs this practice. By breaking 3–4 bangles, the glass is ground finely, so as to pass from cloth piece. Such superfine sieve (cloth passed) glass powder, approximately 5 g is added in 100 g of red chilli powder and mixed well. This mixture is then *blowed* with the help of pipe in the affected eye of animal, at an interval of ½ to 1 hour for a day. It is believed that this practice cures eyesight. Another traditional practice used by some farmers is blowing of flour of fingermillet in the infected eye with the help of hallow pipe 3 to 4 times a day. Due to this practice, eye becomes clean and clear and helps in improving sight of animal. The affected animal is separated out from the herd. A solution of alum is prepared and legs and jaws of the affected animal are washed carefully with the solution. It is believed that, the practice reduces salivation. *Mouth ulcer:* Owa (dill) or bark of *bakuli (Mimusops elengi)* is fed to the animal. Sometimes bark of *bakuli* tree is rubbed on tongue. The farmers rub the paddy straw on tongue and inner side of neck. Then, a mixture of turmeric powder, salt and butter or groundnut oil in equal proportion is applied on tongue twice a day for two days continuously. *Poisoning:* The leaves of number of plants in which normal growth has been interfered with by frost, drought, trampling or other means, frequently contain hydrogen acid or lead, arsenic or nitrate in quantities which are poisonous. Symptoms of poisoning include profuse salvation, refusal to eat, diarrhoea, rapid breathing, blue *colouring* of normally pink membranes, death etc. The methods of cure for poisoning are given below. A leaf extract of *surcati viran* or a plant extract of *nagfani* (Opuntia *dilleni)* is prepared and administered to the animal affected	

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with poisoning. The practice results in vomiting and thus reducing poison effect. The pieces of *ghonaskande (Schleichera trijuga)* plant are given along with feed stuff for 7 to 8 days. This practice results in improving blood purity and reduces blood poisoning. Fresh fruits of *kondel* are crushed and mixed with water. This mixture is administered to cattle which results into vomiting, ultimately reducing poisoning. A leaf extract of umber (Ficus *glomerata)* is fed to the cattle once in a year. The practice results in destruction of intestinal worms and reduction of poisoning. Swelling of neck: Bark of *tetav* tree is crushed and mixed with lime in equal proportion. Thereafter, the mixture is applied on neck, externally. It is believed that, the practice results in reduction of swelling slowly in neck region. Prevention of disease, wherever possible, is the most effective and economical measure. The farmers tie half hard shell of coconut tightly around the neck region of the animal with cotton rope, as a preventive measure against swelling of neck.

Treatment for the dislocated/fractured part: The bark of dinda (Leea macrophylla or Leea *sambucina)* tree is crushed to make consistent paste and applied on the dislocated/fractured part of the animal. A cotton bandage is tied very tightly over it and thereafter bamboo sticks are tied to give support and kept it as such for 21 days. Some farmers use a paste prepared by crushing sandruk tree bark and soil of termite nest in 1: 2 proportion. Well ground consistent paste is applied on dislocated site and tied with jute cloth very tightly, supported by tying bamboo sticks over it. Then animals are kept as such for 7 days, the paste is removed and the dislocation site is tied once again with the help of jute strips and bamboo sticks only. A consistent paste is prepared by mixing 0.5 kg fingermillet flour, sandruk tree bark crushed paste along with 2 eggs. The paste so prepared is applied in the form of paste over dislocated or fractured part of animal and tied with bamboo sticks.

Treatment for the fractured horn: The horn, if get damaged/fractured from base, leaves back serious wound and it is very painful to animal. Traditionally, the farmers use a mixture of shendur, earthen tile and groundnut oil. By triturating earthen tile, cloth sieve powder is prepared. Later, shendur and earthen tile

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powder are weighed in equal proportion and mixed with groundnut oil to make a thin paste. This paste is applied on the wounded site. The paste remains attached firmly till the wound is recovered. Treatments to animals that refuse to feed a dose of 50 g owa (dill), 4 to 5 black pepper seeds, 50 g of ginger, 20 g garlic and honey is fed to the animal. The mixture is well prepared by triturating the ingredients, finally honey is added, for sweetness. A mixture of 100 g ginger, 50 g cumin seed and 50 g *vavdinga* (Embelia ribes) and honey for taste is prepared. This mixture is then placed at the center of fingermillet bread and a roll is prepared and fed to the animal. Some farmers in the interior also feed the mixture of owa (dill) 10 g and garlic 10 g by grinding it well for 2 to 3 times in a day. Acupuncturing is done on the tongue of the animals with the help of a pin or sharp pointed needle.

Displacement of uterus: Sometimes the uterus of the animal comes out which needs to be restored. During this period, the animal is treated with the leaves of *lajari* (Mimosa *pudica)*. The leaves are crushed and applied on the affected animal. Some farmers also feed the leaves of *lajari* to animal.

Imparting puberty: When the animal is not coming in heat or fails to conceive successfully, 5 pods of aapta (Bauhinia racemosa) are cut into pieces and fed to animals along with daily ration. This practice is followed for cows and the buffaloes for 5 to 6 days continuously. Due to this practice animal comes in heat and farmers anticipate successful conception by this method. Another practice is to administer approximately 100- 150 ml of over boiled used groundnut oil to animal for bringing the milch animal early in heat.

Pain and inflammation: Two - three turmeric rhizomes along with alum and water are rubbed over a atone to make a consistent paste. Then biba (Semecarpus anacardium) oil is added in it. The mixture is applied (hot application) in the form of paste over the *inflammed* leg, which gives relief from pain and inflammation to the animal.

Ectoparasites: In 250 ml of coconut oil, 4 to 5 camphor pellets are dissolved and then this mixture is applied on body of the infected animal with the help of cotton cloth/plug. Some farmers apply 100 g

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		of *gammexine* powder mixed with 200 g ash. Mixture is dusted or spread and rubbed on body of the affected animal. This practice is followed for 2–3 days continuously till the tick disappears from the body. During winter season, by taking advantage of natural phenomenon of dew deposition, some farmers keep the affected animals in open space for a night which results into dropping of ectoparasites from the body of animal. *Eradication of intestinal worms:* Heavily infected animals show loss of weight and become thin and weak. The remedial measures are: Tender leaves of *chikankhana* (Sida cordifolia or Sida acuta) are fed to the young calf. The farmers believe that due to this, worms die and are thrown away with excreta. The delicate external outer structure, tuff of hair recovered from shell of *kuyali* plant along with buttermilk or milk is given to animal. The tuff of hairs are fed sometimes with jaggery to the calves. Some dairy farmers feed mixture of black pepper powder (50 g) and owa (dill) powder (50 g) along with 300 ml of buttermilk to the animal. This treatment is effective for dropping of round worms and tapeworms from the stomach. Extract of tender twigs of safed *chafa* with leaves of *aasana* (*Bridelia* sp.) or *ain* (Terminalia *tomentosa)* trees and biba (Semecarpus anacardium) are administered to calves and cattle *also.A* pickle-*khar* (i.e. remaining ground spices in pickle, viz., fenugreek, turmeric and asafoetida) along with buttermilk is administered to cattle. A *kulith - kadha* is prepared by dissolving *kulith* (horsegram flour) (200 g) in 500 ml water and boiled to make one fourth quantity. This *kadha* is given to infected animal. A spoonful of asafoetida powder mixed with 500 ml of buttermilk is administered to the calf. *Eradication of screw worms:* Leaves of *harmala (Peganum harmala)* are crushed and extract is given to animal along with water. Generally, a dose of 250 ml of extract juice along with water for calf and 1000 ml for cows/buffaloes is given. Due to this practice, screw worms are expelled out with excreta of the animal. *Skin disease:* Fresh leaves of tulsi (Ocimum *gratissimum)* are collected and crushed for extraction of leaf juice. Animal having problem of skin disease is firstly bathed by lukewarm water and thereafter,	

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fresh extract of tulsi is pasted on the skin of animal.

Yokegall in bullock: Approximately 200 ml of edible oil or errand oil (Ricinus communis) along with boiled raw mango fruit and butter and turmeric powder (100 g) are taken and mixed well to make a paste, which is then applied on the *yokegall* of bullock to minimize pain and help in recovery.

Blocking of urinary tract: Cows and buffaloes, especially bullocks suffer from stones in urinary bladder. Leaves of harmala (Peganum *harmola)* are crushed and extract is given along with water to the animal having urinary trouble. The farmers believe that stone gets dissolved due to this practice and gives relief to the animal.

Indigestion: A mixture of 50 g garlic, 50 g ginger, 5–6 black pepper and a spoonful of caustic soda is given to suffering animal along with *pearlmillet,roti* or banana leaves. When it is not digested by young calves, 500 ml of butter mixed with asafetida powder (30 g) and salt is administered to the calves. Some farmers administer 50 ml of edible oil, 100 ml of buttermilk and 100 ml of milk to young calf.

Udder edema: Pendulous udder, strutting of the teats and udder so affected are most difficult to milk. If such a condition is observed in the animal, treatment with massage applying *samudra pheni* ful over the udder and hot and cold applications, as for any other swelling, proves to be of some benefit.

Increasing milk yield: Cows or buffaloes are fed with fingermillet straw, stored on *mandav machan*. It is believed that fingermillet straw stored on *mandav machan* absorbs dew and is easily digestible, resulting into increased milk *yield.Some* farmers give approximately 100–150 g chickpea flour along with 100–150 g jaggery daily to cows which increases the milk yield *considerably.Leaf* and root extract of *erandi* (Ricinus communis) is proved useful for increasing milk yield.

Feed stuff for winter: Bamboo leaves, especially of *manga* species (*Oxytenanthera stockeli)* are fed to the cattle. It is believed that it keeps animal warm, as it creates heat during digestion. Also, groundnut oil is administered to young calves.

Feed stuff for summer: During summer season, leaves of bibla (Pterocarsus marsupium) and *shivan (Gmelina arborea)* are fed to animals.

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Nutritive ration: Leaves of *pendguliwel* (Dalbergia *sympathetica) or dhamani* (Grewia *tiliaefolia*) or ain (Terminalia tomentosa) or aasana (Bridelia *tiana* or B. *montesa* or B. *retusa) or aowal/bakul* (Mimusops elengi) or biwala (Pterocarsus marsupium) are fed to cattle. Also fingermillet (Eleusine coracana) straw, peel of banana are useful to improve nutrition. Some grasses like *themeda* and *Heteropogan* sp., *Stylosanthus hamata* are utilized as a dry roughages. *Subabul (Leucaena* leucocephala) and *hadga (Sesbania grandiflora)* tree leaves are used as a fodder.

Poultry

Control of ticks: Smoke is made by burning dry cactus species in the poultry house. Sometimes, outer seed coat of cashewnut is used for preparation of smoke. A twig of *rui* (Calotropis *gingantea)* is used for cleaning the poultry house affected by tick *attack.The* leaves of *sabja/sabia* (Ocimum *basilicum)* are kept in the poultry house.

Ranikhet/newcastle disease: Birds become weak and have ruffled feathers, head may become twisted and be drawn between the legs, back over the shoulders, may walk in circles of backwards. A juice of tamarind (Tamarindus indica) is prepared and given to infected birds along with water. This practice results in reducing the disease to some extent. Spraying of fish water in the poultry house: Some *poultrymen* spray cow urine in the poultry house. Farmers give local wine/liquor to the affected birds. Sometimes garlic juice is also administered to the affected birds.

Preventive measures: Three - four droppings of *ranti sasa*/rabbit and tamarind (Tamarindus indica) leaves are pound together in the water and administered to the birds. The farmers believe that due to this practice, birds are able to fight against disease, as the rabbit eat all the grasses and leaves in the jungle. The *poultrymen* follow the following practice as a preventive measure against all the disease in poultry birds. By killing *salinder* (a porcupine bird) the intestine and other material from stomach is dried and powdered. This powder along with water is given to poultry birds. The farmers believe that due to this treatment, the birds become resistant to any infectious diseases.

Keywords: animal, poultry, management

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250	Control of ticks in poultry birds	To control ticks in poultry birds, farmers use leaves of Calotropis. The birds are totally protected against ticks. This is being followed by 10 farmers for the last 9 years in *Marangapallam* village of Tanjavur district in Tamil Nadu **Keywords:** ticks, Calotropis leaves	ShriN. Arunachalam, Kuruvikkarambai, Maramangapallam, Peravoorani,Tanjavur(Tamil Nadu) 614 802
2179	Use of custard leaves extract to control ticks/lice infestation	Application of freshly prepared extract of custard apple leaves on the lice/ticks infested parts of the cattle, continuously for four days control the lice/ticks infestation. **Keywords:** custard leaves extract, ticks/lice infestation.	Shri G. Chandra Sekhar, Principal Investigator Progress, 12–13–626, NagarJuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
274	Indigenous method for hatching eggs using mud pot	To hatch eggs, chicks are allowed to sit on the pots filled with mud hanging at different levels. To take food and water, birds may be kept down. After some  Egg hatching in earthen pots time, birds could be put on the mud pot until hatching. This is in practice in Karamadai village of Coimbatore district in Tamil Nadu **Keywords:** chicks, hatching, hanging mud pot	Shri S. Subramaniam Marudur, Karamadai, Coimbatore (Tamil Nadu)

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376	Bamboo chick feeder for broiler chicks	Hollow bamboo are cut into pieces of 3 to 3.5 feet length and bifurcated at the middle horizontally to produce two feeders. At the bottom of bamboo two wooden sticks are fixed to ensure stability of the feeder. One feeder will be sufficient to maintain 50 chicks up to 2 weeks with a cost of Rs 1 per 50 birds. The feeder can be used continuously for 3 to 4 months. This technique is being used as an alternative of plastic or wooden feeder in the *Nikhira* village of Balasore district in Orissa. **Keywords:** bamboo, chick feeder, broiler chicks	Shri *Maheswar Giri, Nikhira via Sigla,* Balasore (Orissa)
405	Control of ranikhet disease in poultry by using onion-bulb juice	Ranikhet disease in poultry is controlled by feeding the affected birds with onion-bulb extract @ 5 ml per bird for about 2 to 3 days (twice daily). It helps in reducing mortality of the affected birds and is being followed by 70% of tribal farmers, involving a cost of Rs 5 per bird. **Keywords:** *ranikhet* disease, poultry, onion bulb juice	Shri Harihar Naik, Pakjhola Semiliguda, Koraput (Orissa)
413	Treatment of *ranikhet* disease in poultry	About 10 ml country liquor, 50 g rice powder and a tinge of turmeric powder are mixed thoroughly. This mixture is fed to the affected birds daily twice for 2 days, which controls the *ranikhet* disease. It is being followed by 60 to 70% farm families in Makarbili village of Nawapada district in Orissa. **Keywords:** *ranikhet* disease, poultry, country liquor, rice powder, turmeric powder	Dr. Sarbani Das, Guru Govind Dham, Gandhi Amalapada, Angul (Orissa)
1170	Fumigation with *hawan samagri* in poultry house	Farmers of *Pandwala Kalan* village in Delhi adopt this method to increase the production of broiler birds. Handful of *hawan samagri* is burnt on a dried cowdung cake and taken to the poultry house. This practice controls poultry birds from several diseases and increase the body weight of the broilers. **Keywords:** broiler, poultry house, cowdung cake, *hawan samagri*	Shri *Manoj,* S/o *Kirori Mal, Pandwala Kalan,* Nazafgarh (Delhi)
1174	Dipping of eggs in lime water for increasing its life	Eggs are preserved by keeping them in the lime water. This practice is being followed by the farmers of Isia village of Raebareli district (Uttar Pradesh) for the last several years. **Keywords:** eggs, lime water	Shri *Rambilas Chaudhary, Isia, Bachrawa*, Raebareli (Uttar Pradesh)

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1218	Treatment of *coryza* in poultry	Tea leaves (100 g) + saunth (200 g) + black pepper (20 g) + water (2 litres) are boiled till the mixture is reduced to half. It is added to 5 litres drinking water for birds. Recovery of the poultry birds from *coryza* starts 8–9 hr after giving the treatment and it is repeated for 2 more days. This is practised in Nazafgarh, Delhi **Keywords:** poultry bird, *coryza,* tea leaf, saunth, black pepper	Shri *Yadavender* Singh, S/o Shri *Jagdish* Singh, *Paprawat* (Delhi) 110 043
1490	Control of diarrhoea/ white bacillus dysentery/ ranikhet disease in poultry by garlic	Poultry birds are infected during February to March, especially when flowering of semal starts. When initial symptoms of the *Dhurwa*, disease are observed, the infected birds are *segragated* and drinking water is restricted. About 2–3 flakes of garlic are crushed and fed to the birds until they recover. Users believe that garlic has medicinal properties and is anti-parasitic in nature. Success rate of the practice is 90%. It is in practice for last several years by maximum number of farmers in the *Kori* village of Gumla district in Jharkhand. **Keywords:** diarrhoea, white bacillus dysentery, ranikhet disease, garlic, *antiparasitic*	Ms *Milani* Marandi, Q No. B/54 (7), *Dhurwa,* Ranchi (Jharkhand) 834 004
1491	Control of diarrhoea/ white bacillus dysentery/ ranikhet disease in poultry by *rotkhot* fruits	Different types of diarrhoea are common in Sikudasai village of West Singhbhum district in Jharkhand. If birds are suffering from diarrhoea, only boiled and hot foods are given to them. Water is not given to birds until signs of recovery are seen on administering their local medicine. In this practice, *rotkhot* fruits are crushed and cooked with rice grains and given to the suffering birds twice/*thirce* in a day for 4–5 days. It has been found to give 95% success in controlling the diarrhoea. All farmers of the village use this age-old practice. **Keywords:** diarrhoea, birds, water, *rotkhot*, rice grain	Shri Shiv Charan *Padya,* Sikudasai, Chaibasa, West Singhbhum (Jharkhand) 833201
1492	Control of pox in poultry	Pox inflicted birds are unable to consume their feed and therefore after some time they die. Villagers of Sikudasai village of West Singhbhum district in Jharkhand practice it, which is effective in controlling pox in birds. The pox erupts in face of poultry, the lesions in and around legs and mouth of birds are pierced open by quilts of poultry feather and cleaned by hot water. On it paste of fermented rice grains, known as *maya*, is applied twice a day until birds	Shri Shiv Charan Pandya, Sikudasai, Chaibasa, West Singhbhum (Jharkhand) 833201

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		recover. Success rate of the practice is more then 95%. All farmers of the village use this age-old practice. **Keywords:** poultry, pox, fermented rice, maya, bird	
1493	Control of diarrhoea/ white bacillus dysentery/ ranikhet disease in poultry by mahua byproducts	Different types of diarrhoea in *pountry* are common for villagers of Sikudsai village of West Singhbhum district in Jharkhand. It is controlled with the help of mahua alcohol. It is prepared as follows: ripe flowers are fermented for a few days; then alcohol is obtained through steam distillation. In this practice, 5–10 drops of concentrated mahua alcohol are given to birds and water is strictly prohibited during this practice. All the villagers use this age-old practice. **Keywords:** diarrhoea, white bacillus dysentery, ranikhet disease, mahua (Madhuca indica) alcohol, steam distillation, fermentation	Shri Shiv Charan Padya, Sikudasai, Chaibasa, West Singhbhum (Jharkhand) 833201
1494	Control of pox in poultry birds by turmeric and neem oil	When poultry birds get inflicted with pox, they are unable to consume their feed and, therefore, after some time they die. Villagers of Sikudasai village of West Singhbhum district in Jharkhand adopt this practice, which they found it effective in controlling pox in birds. When pox erupts in face of poultry, the lesions in and around eyes and mouth of birds are pierced open by quills of poultry feather and cleaned by hot water. On it a paste of raw turmeric and neem oil is applied twice a day until the birds recover. All farmers in the village use this age-old practice and it involves little cost. **Keywords:** pox, turmeric, neem, poultry bird	Shri Shiv Charan Padya, Sikudasai, Chaibasa, West Singhbhum (Jharkhand) 833201
1498	`Control of diarrhoea/ white bacillus dysentery/ ranikhet disease in poultry by onion and rice	Diarrhoea ranikhet disease in poultry is a common infection disease prevalent round the year. Infected birds are segregated and water is not given to them. Traditional local medicine is given to birds to control the spreading of this disease to the other birds. Raw onion is cut into small pieces and crushed to coarse form and fed to the birds. Now raw turmeric is ground and cooked with rice in *khichdi* form and given to the affected birds. Villagers of Bagraisai village of Saraikela district of Jharkhand use this age-old practice which has 70% success rate. **Keywords:** diarrhoea, bird, poultry, onion, turmeric, rice	Ms Chami Murmu, Sahyogi Mahila, Bagraisai, Govindpur, Rajnagar, Saraikela Kharsawan (Jharkhand) 831002

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1538	Treatment of ranikhet disease in fowl through use of paste made of harad, bahera, pork fat, rice and salt	Harad *behra* has curative property, therefore it is considered effective medicine for the disease. To control ranikhet disease harad, *behra* (paste) one spoonful, pork fat, salt and rice are mixed and fed to the fowl. It is fed once or twice a day for 1 day only. The practice is followed in the villages of Kanke block of Ranchi district (Jharkhand) and has potential for its further spread. About 50% to 60% cases have been reported to be cured. Cost: benefit is 1.5 approx. **Keywords:** harad, *behra,* ranikhet, rice, pork fat, salt	Shri Md Aslam, Sibna Minj and *Samsuddin* Khan, Department of Agric. Extension, BAU, Kanke, Ranchi (Jharkhand) 834 006
1561	Use of multani *heeng* to cure ranikhet disease in poultry birds	Ranikhet disease or diarrhoea is very common in the S*hahpu*r village of Nawada district of Bihar. In this practice, multani *heeng* taken in very small amount (equal to mustard seed) is crushed and given in the mouth of the affected birds in a table or teaspoon twice a day for two by a few farm families. It involves Rs 10 for each treatment. **Keywords:** multani *heeng, ranikhet disease,* diarrhoea, poultry birds	Ms *Rukmani* Devi, W/o Late Krishna Nandan Singh, *Shahpur, Warsaligang*, Nawada (Bihar)
1584	Control of diarrhoea/ white *bacillulus* dysentery/ ranikhet disease in poultry through their burnt tail feathers	Diarrhoea disease or *bacillulus* dysentery is very common in poultry birds. When birds are showing symptoms of diarrhoea, both the sick as well as healthy birds tail feathers are collected and ash of burnt tail feathers is administered in one dose only. This ash of tail feathers of poultry birds contains some curative properties and the practice is about 95% effective. This age-old practice is used by a few farmers of the Sikudsai village of West Singhbhum district in Jharkhand. **Keywords:** diarrhoea/ranikhet disease, tail feathers, ash, poultry birds	Shri Shiv Charan Padya, *Siudasai*, Chaibasa, West Singhbhum (Jharkhand) 833 201

14

Fishery

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
419	Use of raw cowdung for preventing seepage in fish pond	During the preparation of farm pond, raw cowdung @ 10,000 kg/ha is added to prevent the seepage of pond water due to coarse texture of the soils of the farm pond. Almost all the farmers in the Basta village of Balasore district in Orissa are practising this technique for the last 30 years. **Keywords**: raw cowdung, seepage, fish pond	Shri Rabinarayan Mishra Assistant Professor, College of Fisheries (OUAT) Rangai Tunda, Berhampur (Orissa) 760 009
422	Aquatic vegetation (*Ipomoea* sp.) and palm leaves as substratum for better production of giant fresh water prawn (*Macrobrachium rosen bergii*)	Ponds infested with *ipomoea* are found to give better prawn biomass from a unit area. Then *ipomoea* are grown along the peripheral water of the pond because under oxygen depletion the prawns come up to the surface, where oxygen is more and cling on the floating weeds. The periphytons (algae), considered to be delicacy for the prawns, grow around the aquatic weeds. The palm leaves serve as a substratum. Though difficulties are created by aquatic vegetation to pond environment, it is being followed by 80% of the prawn-growing people of Gilarchat village in South 24-Parganas district of West Bengal. **Keywords**: *ipomoea*, prawn culture, palm	Dr Dipankar Saha Training Organiser, Ramkrishna Ashram, Krishi Vigyan Kendra, Nimpith Ashram, South 24-Parganas (West Bengal) 743 338
1296	Use of asafoetida (*hing*) in the supplementary diet of Indian major carps and common carps	Practising fishermen of southern Haryana (Rewari district) are using asafoetida (*hing*) in the supplementary diet (rice bran and mustard oil cake) of rohu, catla, mrigal and common carp, once a week for getting better production. About 1–2 g of *hing* per 5 kg feed is used. This measured quantity of *hing* is soaked overnight and a solution is prepared with moist feed in morning hours. As observed by the fishermen, there is an increase of 10–20% in production by adopting this practice. **Keywords**: asafoetida (*hing*), Indian major carps, common carps, supplementary diet, increased production	Shri N.N. Pandey Training Associate (Fishery), Krishi Vigyan Kendra, B.B. Ashram, Rampura-Rewari (Haryana) 123 401

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1614	Fish cultivation in seasonal pond	This is practised for higher production of desirable species of India's major carps. In this practice, farmers brings spawn, release it to their nursery pond for 15–20 days and then release the same to fish pond without calculating the number. Rice bran and mustard cake are used as fish feed and cowdung for natural food chain. In this procedure, farmer invests Rs 1000 for procurement of fish eggs. This is in practice for last 30 to 40 years by only 1 farmer in the Mohubani village of Dhanbad district of Jharkhand. **Keywords**: carps, spawn, fish pond, fish egg	Shri Jagannath Mondal, Mahubani, Govindpur, Dhanbad (Jharkhand) 828 201
1620	Use of light to provide live feed to the cultured fish	The cultured cat fishes are carnivorous in nature and it is difficult for a poor farmer to afford the costly item. In certain areas of Sitamarhi district, in the middle of the pond they keep some candles or other light, so that the insects get attracted towards it and fall into the water and serve prey for the fishes. This is in practice for last 20 years by five farmers in the village. **Keywords**: cat fish, carnivorous, pond candles, light	Shri R.K. Jha, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006
1621	Use weed fishes as fertilizer in rice field	During monsoon season in the rice fields, the small fishes for which these fields, are natural breeding ground to breed. The fishes are very rich source of organic and inorganic matter. These can serve as very good fertilizer for the paddy. When water goes down, fishes die. The dead fishes are allowed to rot into the paddy field. Finally they are purified and act as fertilizer for the paddy field. This is in practice for last 10–15 years by five farmers of the village Okhargarth of Ranchi district **Keywords**: fish, fertilizer, monsoon, organic/inorganic, breed	Shri R.K. Jha, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkahnd) 834 006
2210	Use of beef liver extract in the feed of prawns	Beef liver is made into small pieces and mixed with jaggery and yeast; and kept for fermentation for few days and the fermented product is filtered and the filtrate is mixed with feed. The sweet and proteinecious smell of the feed attracts more prawns towards feed by mixing this beef liver the yield of tiger prawn (*Peneaus monodon*) is increased by 25%. **Keywords**: beef liver, feed, prawns	Shri M.V.Ratna Prakash Training Assistant, Krishi Vigyan Kendra, Vinayashram, Cherukupally, Guntur (Andhra Pradesh) 522 309

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
423	Mohan seed oil cake as a pesticide in pisciculture	Mahua seedcake is spread in the pond to kill the unwanted fish and fauna species in the begining, as it contains some biochemicals like glycoside and alkaloids. The cost involved per application is RS 0.50/kg. It is being practised for very long time in Sundaripal village of Kandripari district in Orissa. **Keywords:** mahua seedcake, pisciculture	Shri M. Mohanty, Senior Research Fellow, NATP (RRPS-29) Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
424	Use of banana pseudostem in fish pond	Pseudo stems of banana, after harvesting the bunch, are added to the pond by cutting longtudinally, which increases the pH of pond water and oxygenation in water. This practice results in increase in fish yield. As it involves low cost, it is being followed by 80% of the farmers in the Basta village of Balasore district in Orissa. **Keywords:** banana, pseudo stem, fish, pH of water	Shri Rabinarayan Mishra, College of Fisheries (OUAT), Rangoi tunda, Berhampul, Ganjam (Orissa) 760 009
1295	Use of ash dust and neem cake for treatment of EUS disease in fishes	Epizootic Ulceratve Syndrome(EUS), commonly known as fish cancer of ulcer disease is treated by using ash dust and neem cake in fish pond. Neem cake is crushed in fish pond overnigh and made into solution with ash dust by using pond water, and is spread directly by bucket into pond from all four sides. About 50 kg earh of need cake and ash are used during November and January inone acre fish pond, costing about Rs 200 per ha per year. The recommended treatment for this problem is application of KMnO4, lime and CIFAX, which is expensive and not easily available. Therefore, this practice has become popular and is practised in the villages of Pranpura of Reqari district inHaryana, for the past 6 years. Keywords: neem cakem ash, cure, Epizootic Ulcerative Syndrome (EUS)	Shri N.N. Pandy, Training Associate (Fishery), Krishi Vigyan Kendra, B.B. Ashram, Rampura-Rewari (Haryana) 123 401
2211	A herbal extract containing Boerhavia diffusa to treat dropsy disease in fish	A herbal extract containing Boerhavia diffusa @ 0.2% vv in the feed contains principles that are anti bacterial kill the causative bacteria and also increase the appetite in fish by this practive 90% of the disease are kept under control in cutla and rohu the cost involved is Rs 30 in fish. Keywords: Boerhavia diffusa, dropsy fish	Shri V. Ratna Prakash (Training Assistant), Ksishi Vigyan Kendra, Vinayashram, Guntur (Andhra Pradesh) 522 309

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
284	Fish harvesting	Catching fish when they come out of water during rain. To reduce huge microbial activity, especially in summer, lime or potassium is added to the water. After heavy rain, fishes come out to the water surface of ponds. This is the time when drainage water pours in to the pond. Air breathing fishes are first to come, when fish catching is easy. During summer, if small oyster comes out of water, it is a signal that water condition is depleted, calling for addition of lime or potassium. In both cases, fishermen and poorer section of the society are benefited. This method is to catch all types of fish as well as to save oyster from microbial hazards. To catch fish, if cast net is used, it costs Rs 200, or if scoop net is used, it costs Rs 50. To save fish in the pond, lime (Rs 50) or potassium permanganate (Rs 100) can be used to clean the depleted water. **Keywords**: potassium permanganate, pond, fish, lime	Ms Saroja Bala Manna C/o Shri S.N. Manna, Bahichard, Midnapore (West Bengal) 721 627
285	Bait to attract fish	Eggs of ants are collected from their nest especially from mango tree using a net with long handle made of bamboo. These eggs are mixed with moist bread or flour with a little ghee to make it semi-solid. This is then cut into small pieces and used as bait. It is very useful to lure fish especially in off-season. Higher catch leads to good earning to fishermen. Total cost may be Rs 4 and Rs 2 for each bread and ghee respectively for 50 baits. **Keywords**: fish bait, eggs of ants	Shri Saroja Bala Manna C/o Shri S.N. Manna, Bahichard, Midnapore (West Bengal) 721 627
418	Indigenous fishing net  An indigenous fishing net	The fish flowing in the stream along with the water are caught by using a fishing net made of bamboo (*benda*) with a narrow mouth and wide body. This is placed in the downstream in slopy manner. Water flows through it and fishes are collected inside. It is a time saving and cost-effective technique, being followed in Makarbili village of Nawapada district in Orissa. **Keywords**: *benda*, fishing net	Shri Nila Madhab Das Gandhi Marg, Ammalapada, Angul (Orissa)
420	Using earthworm and wheat flour dough as bait for handline fishing	Fish in the river water are caught by using a handline fishing, using earthworm and wheat flour dough as bait. Fish get attracted to earthworm and wheat flour. When it eats the bait, it gets hooked and will be collected by lifting. This is practiced during leisure time by all the families since 25 years in Basta village	Shri Rabinarayan Mishra Assistant Professor, College of Fisheries OUAT, Rangai Tunda Berhampur (Orissa) 760 009

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		of Balasore district in Orissa. **Keywords**: fishing, bait, wheat flour, earthworms	
421	Use of *gamcha* for collection of tiger prawn seed	*Gamcha* is used for collection of seeds of tiger prawn (*Penarys monodon*) when it comes to the river mouth (low-salinity area) during high tide in the Rushikulya river. Through this, family members get additional income by selling the fish seeds. It is being used for the last 30 years, but recently *gamcha* has been replaced by triangular net made of nylon in the Damodarpur village of Ganjam district in Orissa. **Keywords**: *gamcha*, collection of tiger prawn seeds, nylon net	Shri Rabinarayan Mishra Assistant Professor, College of Fisheries OUAT, Rangai Tunda Berhampur, Ganjam (Orissa) 760 009
500	Trapping of riverine fisheries-cum-running water fish culture	This is a practice adopted in Alang village under Phunyar block in Ukhrul district of Manipur to minimize the input and to increase the production of fish. Fishes come upstream every monsoon to breed and come downstream during every autumn, viz. during October, with the downpour of rain. Taking advantage of this behaviour, the villagers construct every year temporary barricade across the stream. A conical shape structure with open mouth on the base of the cane and fencing of stream is incorporated as a barricade, so that all the fishes coming down are trapped in conical-shaped structure. When the period of trapping of fishes is over, the mouth of the trap is closed and culturable fishes are introduced in the impounded water by the barricade. Bamboo is used for barricade construction. This fishes are harvested during the last week of April next after daily intensive feeding. Tor, barilius, cat fishes, barbus sp. etc. and culturable species are the main common carp along with grass carp. All the 30 farm families in the village follow the practice though it is only about 1 year old. Now, instead of temporary barricade, semi-permanent structure is being used for the purpose; the post supporting the barricade structure is substituted by RCC. **Keywords**: riverine fishes, barricade, culture, breed, bamboo	Shri Ranaya Headman Alang Village, C/o District Fishery Officer, Ukhrul (Manipur) 795 142
884	Fish killing in natural water reservoir	In Sarkaghat tehsil and Dharampur block in Mandi district of Himachal Pradesh, the farmers use a plant called *terimiri* for killing fishes, which is called *mond* preparation. Milky juice extracted from the *chui* plant	Shri Suresh Kumar Dhanrasi, Sathot, Sarkaghat, Mandi (Himachal Pradesh)

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		is also used for fish killing. *Terimiri* is also used in funeral and other purposes like tooth paste. Electric shocks is another method practiced by the farmers. **Keywords**: *terimiri* plant, *mond* preparation, killing of fish, *chui* plant, electric shock	
1297	Low-cost traps used for fish partial harvesting	It is low cost trap to catch fish. Low-cost traps used for partial harvesting are known as *chhop* and *kulaharia*. It is conical in shape. Upper portion has small opening and lower has wider one. This depends on the size of the fish. The *chhop* is made up of pigeonpea *danthal* (sticks). The height of the *chhop* is 2–3 ft. *Kulaharia* is also same but made of wood and thread. **Keywords**: fish, harvesting, trap, *chhop, kulaharia*	Dr (Mrs) Bipasha David Training. Associate (Fish), Krishi Vigyan Kendra, Allahabad Agriculture Institute (Deemed University), Allahabad (Uttar Pradesh) 211 007
1547	Capture of carnivorous fish by boiled hooks and lines	Villagers of Madhusara in Sitamarhi district catch smaller cat fishes and are used as bait in hooks and lines. The hooks and lines are allowed in the water in the evening and collected back in the morning. The carnivorous fishes that come to eat the smaller fishes are caught in the hooks in which the smaller fishes are hanged. In this technique, live bait hooks are hanged down into the water and when the predatory fishes come and try to catch, these bait fishes are entangled into the hooks. This is in practice for last 50 years by 50 young fishers of the village. **Keywords**: carnivorous fish, cat fish, bait, predatory	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1616	Use of custard apple (*Annona squamosa*) leaves for fish harvesting	Fisherman knows that eradication of unwanted fishes from the water body or harvesting of fishes from a zig-zag pond full of stones/boulders is very difficult. They use leaves of *Annona squamosa* to kill the fishes, which has piscidal effects and do not have any adverse /side effect on human being. In this practice, he first collects leaves of *Annona squamosa*, and puts of all around the corners of the water of pond; after some time, the fishes can be seen on the water surface and can be collected easily. This is in practice for last 10–12 years by four families who have their ponds in the Okhargarha village of Ranchi district of Jharkhand. **Keywords**: *Annona squamosa*, fish and fisherman	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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2209	Collection of murrel fish seed from small tanks	The murrels (black fishes) are collected from small tanks and are cultured along with crops, as these murrels are having good market demand. The feeding adopted is artificial feeding (rice bran, oilcake, soyabean cake, etc) and natural feed (phyto and zoo plankton). **Keywords**: murrel fish, collection, small tanks	Shri Boini Sampath, C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122
1298	Method of preserving fish of different species  Preservation of fishes	Frying of fishes increases their preservation quality under local conditions. Fish are cleaned with water. A mixture of juice of four lime (20 ml), 30–50 g turmeric powder, 10 g colour *jalebi* is prepared in one litre water. Small fish as such and large fish in pieces are placed in the mixture for 20–25 minutes. These fishes are then placed on the dry grass or hay. The grass is subjected to fire. The fish are fried dry in this method and are as such preserved. This is practised in Kanderkhera village in Jabalpur district of Madhya Pradesh. **Keywords**: fish preservation, lime juice, termeric powder, colouring agent, frying, roasting	Shri S. Punekar, Training Associate, Krishi Vigyan Kendra, IVRI, Izatnagar, Bareilly (Uttar Pradesh) 243 122
1615	Fish farming of *singhi* and *mangur* fish	Villagers of Sadar block of Hazaribagh (Jharkhand) are practising fish farming along with agriculture. They rear different fishes like shallow water fishes, deep water fishes and medium depth water fishes in a pond or a well. They feed them waste of food, kneaded flour, waste of fishes, and waste of chicken. Now they are rearing *singhi and mangur* fish at low cost but high return. **Keywords**: fish farming, rearing, shallow, deep, medium depth water, pond, well, waste food, kneaded flour, waste of chicken, *singhi, mangur*	Shri Karma Kachchap, Director, Jan Vikas Kendra, Near Petrol Pump, Hazaribagh (Jharkhand) 825 301
1617	Fish-cum-pig farming	Tribals of Gunja village in the Ranchi district of Jharkhand normally put the pig excreta into their fish pond. The pig excreta is a rich source of nutrients for pond water and increases its biological productivity. Some fishes like common carp (*Cyprinus carpio*) can directly feed on the 60% of the excreta of pig. Farmers spend 60% money in feed for fish, but this problem can be solved by putting pig excreta into the pond. Generally pig house is built on the pond embarkment, all the waste-water and excreta goes into the pond.	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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		When water level reduces or pond becomes more greenish, the farmers stop putting manure in the pond for a few days. It is an old practice and out of four fishers two are practising this technique. **Keywords**: tribals, pig excreta, nutrient, common carp (*Cyprinus carpio*), manure, fish	
1618	Fish-cum-duck farming	Tribals of Vijang village of Jharkhand are keeping small birds like ducks, poultry etc. in their houses. Duck excreta is used as a manure in fish farming, which reduces almost 60% of the input investment. The farmers do not have any extra liabilities in rearing of ducks, because no extra management is needed. The ducks can go by their own to the pond after sunrise and come back to their home before sunset. If the pond is productive, during the whole day ducks will feed on the organisms which are not the food for fish. Now farmers are adopting new breeds of ducks which gives more eggs (250/300 eggs per year) and receiving more income. This is in practice for last 5–6 years by five fish families in the village. **Keywords**: fish, duck, pond, duck excreta	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1622	Fish as indigenous medicine	For the past several years people of rural areas of Sitamarhi district of Bihar are using fishes as a medicine. 1. Use of singhi, magur fishes for 10 days reduces the dysentery of patients. 2. Blood circulation of patient can be improved by the use of *sidhari, chelwa, chenari* fishes, 3. Asthma patient should take *sidhari* fish (fried in fire) regularly in his meal. 4. Skin infected patient should apply burned ash of wallago fish or *sidhari* fish for 7 days. 5. Taking mollus (*pila*) once a month in diet helps as preventive measure for asthma 6. If a male does not want to raise moustache, he should take *bulla* fish regularly during his childhood. 7. Pregnant women should not take fish. They may suffer from digestive problem, fever and eosniophilia. 8. A person should not take ghee, milk, curd along with fish, he may suffer from white leprosy. 9. If a person is suffering from eye disease (*roha*), he should wear the gallant of rotice teeth for	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006

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		curing. Very few people are using above mentioned age-old practices. **Keywords**: fish as indigenous medicine, patient	
1623	General precautionary practices followed by the fishers in fish farming	There are certain indigenous methods to test the land and soil for pond construction, such as the level of population in the pond, to check oxygen level and to prevent entry of harmful insects into the pond. 1. To test the soil, the soil sample is taken, in the form of rounded ball and fell down from the height of 4 feet. If ball shape of soil is maintained with out any damaga, the soil is fit for pond construction 2. Leakage problem of water in pond is solved by putting a layer of mixture of cattle dung and rotten soil/black on the inner side wall 3. To test the level of pollution, drop bettle nut into the pond water and if it becomes black then the water is acidic and it should be limed. 4. Fishes coming on the water surface or greenish colour of pond changes into brown colour indicates oxygen deficiency. It can be solved by using banana plant floating into pond, allow animals to go into the pond and also ducks to go disturbing water by any means. 5. If there are lots of harmful animals are entering into the pond, then plantation of pine apple on the pond, embankment and on the pond can be surrounded by the scales of onion. These are in practices for 20 years and followed by almost all farm families in the Madhesar village of Sitamarhi district of Jharkhand. **Keywords**: fish farming, pollution, pond, oxygen level, harmful insect, leakage	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006
1624	Capture fisheries in rice field	Monsoon season is the breeding season for most of the fishes. The self-recruited species like *pothia (Puntus* sp.) breeds naturally in rice fields. In this practice fisherman of Gobar gushi village of Palamu district in Jharkhand constructed a small pit in the lowermost paddy field. Paddy field is the natural breeding ground for these fishes. The fishes breed when the water level of the field will be lowering down. The fishes go in search of water body. In the field itself it gets that and stayed over there. The farmers then take out these fishes from that on regular	Shri R. K. Jha Department of Fisheries, Ranchi Veterinary College, Birssa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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		investment. This is in practice for last 5–6 years by a very few farm families. **Keywords**: fish, monsoon season, paddy field, pit, water level	
2305(b)	Practices for management of fisheries	Marine fishing preservative for fishing nets: The bark extract of ain (Terminalia tomentosa) is used as preservative for fishing nets. The preservative is made by boiling bark in water. Then extract is filtered and the fishing nets are dipped in the filtrate. After treating, the nets are dried in the sun, and this process is repeated two to three times. The fishermen point out that this treatment helps in keeping rodents away from the nets, initiates antifungal and antibacterial properties and is inexpensive and efficient as well. Traditionally, the nets prepared from cotton twine and hemp twine are used for this purpose. Protecting boats from wood borers and barnades Kadu tel and chandras in equal proportion (approxi 1 kg) are mixed well to form a slurry of medium thickness which is applied externally. In some areas, liver oil of mushi fish is used. The fishermen believe that application of oil helps to increase the life of the boat by protecting it from wood borers and chandras increases adherence of oil to the wood. This type of preservation is efficient and less expensive as compared to synthetic paints which act superficially without penetrating deep into the wood.Types of nets used by the fishermen in Ratnagiri district. Wavri (gill net). This is a surface drift net used all along the coast. The net consists of 20 to 25 pieces, each piece varies from 140'×240' and 15' in width. Mesh size is 3 to 4 inches (stretch). Nets are made out of hemp and cotton twine varying from 9 to 15 plies of 18 to 20 counts. The net is used for catching pomfrets, seer fish, tuna etc. these nets are used from September to December and late in summer during April-May. Saranga jal (pas net): This is also a type of surface drift net and as the name indicates, is exclusively used for catching pomfrets, saranga etc. The net consists of 20–40 pieces, each piece measuring 240' in length and 15' in breadth with mesh size of 5 to 6 inch. The nets are prepared from cotton/hemp twine. Ghol net: As the name suggests, the net is used mainly to catch ghol fish. Net consists of 12 to 16 pieces, each piece measuring 120' in length and 10'	Dr N.D. Tawade, Professor and Head, Department of Extension Education, Dr Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Ratnagiri (Maharashtra) 415 712

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in breadth with mesh size of 6 inch. Budi net. This is a bottom set gill net made of hemp of 24 plies as the net is used for catching big fishes like sharks, rays etc. the mesh size is 8 to 9 inches. Each unit consists of 7 to 19 pieces, each piece measuring 100 ft. in length and 12 ft. in breadth.*Seine nets/rampan* net (shore seine). The net consists of 3 pieces known as karel, madan and ghol. In rampan net of 100 pieces, karel part consists of 60 *pieces, madan* 22, and *ghol* 18 pieces.

Approximately, 34 to 40 persons are required for drugging the net. Material used for making the gear is hemp and cotton twine. *Dol* nets (bag nets). This is funnel shaped net and consists of distinct portions namely, *mhor, chirate, katra, majola and khola.* The mesh size reduces from 9" to ½" from mhor to khola. The length of the net varies from 80' to 120' and is fixed with the help of *sus* (barrels). Dol is used only in the areas where fairly strong currents are prevailing. Fishes caught in the net are mandeli, prawns, ribbon fish etc.

Bokshi: This is a miniature of *dol* net operated in the creeks (mainly Guhagar and Sangmashwar tahsils).

Cash net (pag): The net is prepared from cotton twine and has a circumference of 125' and radius of 12' to 18'. Mesh size varies from 1/8th to 1 inch. Fishes caught in the net are sardines, prawns etc.

Methods of netting: Kavi/sajIn this method, dol nets are used for catching fishes like prawns.

Rapan: In this method, *wavari* nets are used for catching big fishes like *surmai*, pomfrcts, *gejar, bhingpala* etc. *BudiNets* are dropped, up to the bottom of sea. Generally, gill nets are used in this system.

Daalit method: In this method, pas nets are used. These surface drift nets are set at night time for catching fishes like pomfrets.

Pag: In this type of fishing, a variety of fishes are harvested. For example, prawns, *mandeli, bangada*, saradine etc. for catching *bangada*, a special type of pag is used.

Fishing season: Fishing season starts from *narali pournima* after offering a coconut to the sea God and lasts till the end of May. A peak period of fishing starts from *gokul ashtami* to *dattajyanti.* There is practically no fishing during monsoon period, except

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in the creeks.

Boat building material: Traditionally, wooden boats of various sizes are in use for fishing in sea. For preparation of wooden boats, wood of *shivan (Gmelina arborea) or sagwan (Tectona grandis*) or *mango (Mangifera indica)* is preferred. These woods do not split even after long exposure to sun and are good absorbers of preservatives as well.These boats are drived with the help of wind velocity by means of shid. For nearby fishing in sea valhawa boats are used. Also some boats with *uldi* attachment are used for fishing in sea. *Uldi* is a long narrow light piece of wood attached on one or either side at a distance with the help of bamboos, due to which the boat manages to keep its balance in the roaring sea.

Detection of time: The fishermen use sand watch for taking approximate measurement of time. Some experienced fishermen can detect the direction with the help of nakshatra or star position in the sky.

Preservative of fish: During fishing, the fishermen use salt or ice or a mixture of both for preservation of fish. This method of preservation (wet salted fish preservation) is used when fishermen are in sea continuously for 3–4 days for fishing.

Dry preservation: When fishing is in abundance, the fresh, good quality fishes are selected for dry preservation. For this purpose, a frame work made up of bamboo sticks is used where the fishes are hanged at some spots. Old nets are utilized for curing purpose.The common fish varieties preferred for dry preservation are *bangada, bombil, renvi, kolim, jawala* etc.The remaining fishes which are not suited for consumption, are cured near road side and afterwards utilized for preparation of fish manure.

Storage: For storage of dried, as well as, wet fish, a storage structure is prepared with the help of coconut leaves, bamboo sticks locally called as zopadi near jeti. When fish are preserved for long duration, the fishermen use excess quantity of salt and cure the fishes to maximum extent.

Predictions about the catch: More fishes are observed on *amavasya* (i.e. maximum fishing chances are in the darkness as compared to that during moonlight period).

Keywords: fisheries, management

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1625	Use of indigenous herbal technique to cure diseases in fish	Herbal plants are used by the villagers of the Madhesar village of Sitamarhi district in Jharkhand to cure the widespread *epizootic ulcerative syndrome* found in fish. Farmers adopted following methodology. 1. If turmeric powder and common salt in equal proportion are mixed and put into the pond at the rate of 50 kg/hectare, the fish suffering from *epizootic ulcerative syndrome* will be cured. 2. In case of *epizootic ulcerative syndrome*, ash of rice straw and ash of banana thumb and leaves are put in the pond at the rate of 10 kg/hectare; then the fishes will be cured. This is in practice for last 3–4 years by 14 fishermen in the village. **Keywords**: herbal plants, *epizootic ulcerative syndrome*, turmeric powder, rice straw, banana thumb, banana leaves, fish-pond	Shri Rajeev Kumar Jha, Research Associate, Department of Fisheries, Ranchi Veterinary College, Birsa Agriculture University, Kanke, Ranchi (Jharkhand) 834 006

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Ethno-botany and Agro-biodiversity

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
63	Use of barley straw, *orad* wood, oak fibre and *ber* for various purposes	The following are the uses of various plants, trees and animals. 1. *Panchava* is used to collect and arrange fodder, specially barley straw after winnowing. 2. *Oda* (basket) and band made up of *orad* wood is used to provide fodder to animals. 3. Fibre of oak stone is used to make ropes. Threads are also prepared to make ropes and mattresses. 4. *Ber (boradi*) wood is used to make odi for keeping the fodder for animal feeding. It is also used to make other items used in agriculture like *chaukani, chhe singi, bemi, jemi,* etc. **Keywords**: *panchava, oda, dand, orad, oak, ber, boradi, odi, chaukani, bemi, jemi*, agro-biodiversity	Shri Kheta Ram Bhil S/o Shri Chuna Ram, Gilankaur, Jodhpur (Rajasthan) 342 309
286	Biodiversity conservation and exploitation for health care	Shri P.G. Jagannathan has identified 191 medicinal and aromatic plant species that are used for health care. **Keywords**: medicinal and aromatic plants, health care	Shri P.G. Jagannathan Nannammukru (South), Ponani, Andat-Hode, Malappuram (Kerala) 679 575
426	*Nirgundi/begunia (Vitex negundo)* leaf as a mosquito repellent	About 2 to 3 branches of *nirgundi (Vitex negundo*) are hung on the roof of the room during night-time to repel the mosquito. *Nirgundi* branches contain volatile biochemicals, which act as repellent. ***Keywords***: nirgundi, mosquito repellent	Shri M. Mohanty Senior Research Fellow, NATP (RRPS), Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751 003
501	Agro-biodiversity in shifting cultivation (*jhum*)	*Jhuming* is a common practice followed by the farmers of Nagaland, especially in the high altitude areas. The farmers, however, have started maintaining agro-biodiversity in *jhum* fields by sowing agricultural crops amidst naturally regenerated plants preserved in *jhum* cycle. The practice of maintaining the agro-biodiversity has been an important factor in sustaining village life through a wide range of food, medicine, fibre and fuel crops over many decades	Shri Nourhieno Zetsui C/o Kepelhouno Meyase, Department of Horticulture, N.U. SASRD, Medziphema (Nagaland) 797 106

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		now. The agro-diversity depends on different altitudinal zones, consisting of cold, warm and sub-tropical regions. The crops used are mainly rice or maize, followed by soybean, millets etc., specially cultivated in the terraces. On the contour bunds, short-duration crops like beans and mustard are grown, followed by biennial root crops such as ginger, which also serves as vegetative barrier for soil conservation. Boundaries are demarcated through the cultivation of creeper crops like cucumber, pumpkin etc. Almost all the crops grown in the field are also found near the household. Due to such agricultural bio-diversity practiced by the farming community in Nagaland, the villagers are almost self-dependent. The only item they look forward to have from outside source is salt. The main advantage of the practice is that the ecosystem is maintained and preserved, besides ensuring availability of food, fuel etc., including medicinal plants for immediate local use. Local varieties of paddy, maize, soybean, millets, root crops, mustard and wide range of vegetables besides timber like teak, hollock, *titachap* and alder in specific areas. Almost all the farmers in higher altitude have been practicing this since 50–60 years. **Keywords**: *jhuming*, agro-biodiversity, high altitude, soil conservation, sustaining.	
562	Use of *hishalu (Rubus ellipticus*) roots for treating stomachach	The roots of the *hishalu (Rubus ellipticus*) plant possess anti-dysenteric and anti-diarrhoea property which is used to treat abdominal pain. The roots are fed to the suffering person @ 10 g. The plant used in this treatment is easily available in the area. **Keywords**: stomachache, diarrhoea, root, *hishalu*	Shri Laxman Singh, Ginni, Girgaon, Pithoragarh (Uttaranchal
885	*Zanthoxylum* spp (*rheus*) used as tooth brush and for medicinal purpose	Twigs of *Zanthoxylum* spp, which grow in abundance in wild, are used as tooth brush by the people of western Himalayas. It is also used as medicinal purpose as it has astringent and anti microbial property. **Keywords**: *Zanthoxylum* spp, tooth brush, medicinal purpose	Shri S.S. Sharma, Deptt. of Bio Sciences, Himachal Pradesh University, Shimla, (Himachal Pradesh) 171 005
893	Use of *bhojpatra* (birch) bark for letter writing pads	Farmers of Kurdung in Lahaul district of Himachal Pradesh area are adopting this methoid. Farmers use bark of the *bhojpattra* plants for letter writing pad. Bark from plant is scrapped and cut in the different	Shri Nawang Chherug, Kardubg, Keylong, Kinnaur (Himachal Pradesh)

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		shapes and sizes and then used for converging message. This is in practice for several years. **Keywords**: letter writing pad, *bhojpatra*	
894	Soaps from soap nut (*Sapindus mukorossi*) and *bayul* (*Grawia optiva*)	The fleshy fruits of soapnut and *bayul* contain saponin and are used as a substitute for washing soap, shampoo and detergents. About ½ kg fruits of *Sapindus mukorossi* commonly called dode are soaked in 5 litres water for about 24 hours. The solution is taken, filtered and the filtrate is used for washing dirty clothes and hairs. *Grawia optiva* (*bayul*) twigs are crushed with stone, kept in water (1–2 litres) for 2–3 hours and then supernatant is extracted. The supernatant is used for washing the dirty clothes and hair. This is an effective method and has been practised in various parts of Himachal Pradesh for washing the clothes and hair. **Keywords**: soap nut, *bayul* fruits, soaked in water, filter filtrate as soap	Ms Roshni Devi, W/o Shri B.S. Rao, VPO. Gopalpur, Tehsil Sarkaghat, Mandi (Himachal Pradesh)
896	*Jurinea dolomiaea* as incense for worship and for cleaning surrounding environment	Most of the people in the hilly area are optimistic and pray to God by burning the roots of *Jurinea dolomiaea* for betterment of agriculture and for their health, as they have to face various adverse climatic conditions during winter. *Jurinea dolomiaea* is basically a stemless perennial herb with woody roots. Smoke of roots release certain gases, which help clear the surrounding environment by trapping or converting pollutants. The aromatic roots are commercial source of incense (*dhoop*). This has been practised in most of the villages in the hilly areas of Lahaul and Spiti of Himachal Pradesh. **Keywords**: *Jurinea dolomiaea* root, burning, worship, pollutants	Shri Dhhani Ram, Village & P.O. Kokshar, Tehsil Keylong, Lohul & Spiti (Himachal Pradesh)
897	Bio-fencing with sea buckthorn (*Hippophae rhamnoides*)	Sea buckthorn (*Hippophae rhamnoides*) is a multipurpose thorny plant, which is used by the people of Spiti district in Himachal Pradesh for protecting their crops from stray animals. Due to its well developed root system, it is an excellent material for holding soils on a fragile slope and about 30% of top soil loss is checked by this plant during monsoon. A natural sea buckthorn forest can yield 750–1500 g of berries per hectare. Its fruit is a rich source of vitamin (Vitamin C). Oil, pulp and seeds are valued for its medicinal properties. It supplies palatable	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		forage to all classes of livestock. The plant is used as nitrogen fixer, conservation of moisture, firewood etc. Majority of farmers of the area practise this for the last several years. **Keywords**: sea buckthorn, multiple purpose, protection of crop, soil loss, medicinal plant, nitrogen fixer, moisture conservation	
1639	Use of *palwa*	This is in practice in the Tutihara village of Ranchi district of Jharkhand. Stomach problems are very common in animals/cattle. In this practice, tender leaves of *imli (Tamarindus indica*) are dried under sunlight and grinded as *palwa*. It is used against stomach problems because of its pain-relieving and digestive properties. Palwa is mixed with hot rice along with rice water (*mand*) and a little salt is added before giving the cattle/animal. This is age-old practice and adopted by maximum number of farmers in the village. ***Keywords***: *palwa*, animals/cattle, stomach, *imli*, salt, *mand*	Ms Sushmita khalkho C/o Dr Niva Bara, Department of Extension Education, Kanke, Ranchi (Jharkhand) 834 006
1640	Use of *bathua (Chenopodium album*) as green vegetable and as medicine against constipation, indigestion and night blindness	*Bathua* is the rich source of iron, protein, and vitamins A and K. It has some medicinal properties for curing constipation, indigestion and night blindness. *Bathua* is uprooted and washed with fresh water and then boiled (except root). After boiling it is cooked with mustard oil, green chillies and salt. This ITK is practised in Bhohan, Patahin, Bhalhuiyan and Parasani villages of Rauni Saidpur Block in Sitamarhi district (Bihar). It is 40–50% more nutritive than other green vegetables. About 80% success has been observed through its use. **Keywords**: *bathua*, vitamin, mustard oil, green chilli, salt	Shri Ranjay Kumar Singh Research Associate, Department of Extension Education Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1659	Muchri (Lymnophylla conferta) sag for liver ailments	*Muchri* has high medicinal value for liver ailment. When it is used as *sag* (vegetable) it is cooked with onion, tomato and oil, when it is used as medicine it is taken with sugar. It is widely used in tribal areas of Ranchi district (Jharkhand) and has vast potential for its use where it is available abundantly or may also be cultivated. About 80% people consider it cheap and nutritious vegetable with medicinal value. Cost: benefit is 1: 3 approx. **Keywords**: *muchri*, liver ailments	Ms Sushmita Khalkho C/o Dr. (Ms.) Niva Bara, Department of Agril.Extension, Ranchi (Jharkhand) 834 006

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1660	Grass for broom making	*Jharu* grass (broom grass) is collected in March to April by cutting it 12 to 17 cm above the ground and sun dried. Thorns and unusable parts of the grass are removed. Before making broom it is dipped into water or mud for making it soft. Next day, broom is made by folding the *jharu* grass and tying it. This practice is being used for the last several years without any modification by the farmers of Shildha village of Khunti block in Ranchi district (Jharkhand) **Keywords**: *jharu* ghas (broom grass), collected in March to April, sun dried, dipped in water or mud, soft, folding, tied	Mrs Bhalane Sanga Silda, Khunti, Ranchi (Jharkhand)
1661	Anti intoxicant effects of *Centella asiatica*	*Centella asiatica* plant is abundantly available in dampy and marshy area of Chotanagpur plateau in Jharkhand. It protects the vital organs of the body like liver, heart, and kidney from the pollutants, adulterated feed and alcohol. It has also active principle of nervous tonic and skin tonic, and has immuno-modulator effects. This age-old practice is adopted by only 30–40% farm families. **Keywords**: *Centella asiatica*, vital organs of the body, pesticides, fertilizer, tonic	Shri Bhanjan Singh Karge Mandar, Ranchi (Jharkhand)
1668	Use of *sunsunia sag* as vegetable and medicine	It has high nutritional and medicinal value against the diseases caused by nutritional deficiency and also for sleeplessness. *Sunsunia* sag is used as vegetable and medicine. When it is used as vegetable, it is cooked with onion, tomato and oil; when it is used as medicine its leaf juice is mixed with sugar. This is a common practice among tribal people of Namkum Block in Ranchi district (Jharkhand) and potentials for its further spread in the areas, where it is largely available. About 80% people are satisfied with the practice. **Keywords**: *sunsunia* sag, nutritional deficiency	Ms Sushmita Khalkho C/o Dr (Ms) Niva Bara, Department of Agril.Extension, Ranchi (Jharkhand) 834 006
1973	Plant materials in environment	Shri Govind Prasad Mishra of Jabalpur has disclosed the utility of plant materials in the poetry form which are as follows: Man has destroyed the forest. Due to rash cutting of forest, water level has gone down. It is the need of hour to start planting trees and restore agro-biodiversity and animal kingdom. Forest is full of life. It gives us oxygen which is the base of life. How can we forget beautiful trees such as mango, neem, banyan, tulsi etc. which are full of colour.	Shri Govind Prasad Mishra, 17, Alok Nagar, Adhartal, Jabalpur (Madhya Pradesh) 482 004

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		Cutting of tree should definitely be stopped. A small piece of land if properly irrigated and given good fertilizer gives sufficient vegetable, one can change ones fate by doing labour in kitchen garden. **Keywords**: tree, environment, agro-biodiversity, animal kingdom, kitchen garden	
1974	Tree plantation for the benefit of farmers	Tree plantation has been considered as a source of happiness through the media of Hindi poem has discussed the advantages of tree plantations. Trees are planted on the bunds while paddy is planted in the field. Fruits and vegetables are planted in orchards. Trees reduce deserts, *neem* tree has medicinal value, mango tree gives juicy fruits and *pipal* tree is considered as *kalpavriksha*. Plantation of trees are encouraged and deforestation and cutting of trees are discouraged. **Keywords**: tree plantation, deforestation or cutting of tree, trees on bunds.	Shri Anand Shukla 634, Ramnagar, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1975	To sow *kali tur (Cajanus cajan)* as drought tolerant crop	Osmanabad and Solapur districts of Maharashtra come under scarcity zone where rainfall is less and erratic. The *kali tur* variety is drought tolerant and resistant to pod borers and hence the farmers use this variety, which yields well under such condition. The farmers get at least 8 to 10 q seed yield and 2 to 3 q dry *bhusa* per hectare. The benefit: cost ratio is 3 : 5 : 1 **Keywords**: *kali tur*, drought, tolerant, bhusa	Dr L.C Mohatkar Zonal Agril. Research Station, 97, Raviwar Peth, Soalpur (Maharashtra) 413 002
64	Use of *amrita* green twigs for treatment of snake-bite	The snake-bite in the Nayatalab village of Hathai post of Dungarpur district of Rajasthan is cured by feeding the extract obtained by *amrita* green twigs 250 ml to the animal. It is given by one of the villager Mangi free of cost, though it involves an expenditure. **Keywords**: *amrita* twigs, snake-bite	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
65	Use of *rohida (Tecomela undulata)* tree leaves to treat gynocological problem	Gynaecological problems in the ladies, about bleeding after monthly course, in Naya Talab village of Hathai block in Dungarpur district of Rajasthan is cured by using green leaves of a commonly occurring *rohida* tree. These are crushed and the extract is given to the suffering ladies for about 4 to 7 days to gets relief. **Keywords**: *rohida*, gynaecological problem	Shri Kheta Ram Bhil S/o Shri Chuna Ram, Gilankaur, Jodhpur (Rajasthan) 342 309

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66	Use of *rohida* to treat pneumonia	Tribes in the Dungarpur district of Rajasthan cure pneumonia in the children and adults by using the bark of *rohida* plant crushed into small pieces and extract the juice, which is given 100 ml to the adults and 50 ml to the children. A village man Nanoma gives it very cheep, costing Rs 10–20. **Keywords**: *rohida*, pneumonia	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
67	Use of *kadda* and i to cure male impotency	In the Naya Talab village there are couples who do not have child due to impotency of male in village Manji. The treatment is mixing of 250 g *kadda* flower along with 250 g *heriiya* creeper fruits, 50 g sendra tree bark and 50 g *gur* (jaggery) is done. After mixing, material is crushed and tablets are prepared. It is taken for 7 days in the morning before breakfast. It has helped the couples in having children. **Keywords**: *kadda, fleriya*, male impotency	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
68	Use of Ficus leaves milk to treat *Bacillus tuberculosis*	Ill health, malnutrition and tuberculosis in the Naya Talab village of Dungarpur district in Rajasthan are cured as follows. A hole at one end of coconut is prepared. The milk of *Baniyan* tree (obtained from leaves and twigs) is poured then wrapped with cloth and provide the plaster of cowdung and clay of 1 inch thick layer. About 250 g wheat flour is taken and balls are prepared in the fire for proper cooking. After cooking these balls are crushed into fine powder and mixed with *ghee* and sugar. 7 big pallets are prepared and administered for 7 days. **Keywords**: Ficus milk, *Bacillus tuberculosis*	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
69	Use of giloe to treat snake bite	Snakebite is cured by using roots from the creeper of *giloe (Tinospora urgensia),* which is cut into small pieces of inches length. It is ground using a little water, and the extract is filtered and given to the patient. It is given by the well-known villager Raggaji for 7 days. It is being practiced in Kolkhanda village of Dungarpur district of Rajasthan. **Keywords**: *giloe*, snake bite	Shri Raga Pargi S/o Shri Velaji Pargi, Kol Khanda, Dungarpur (Rajasthan)
70	Use of *giloe* to treat jaundice	Shri Raga ji is a well-known person for jaundice treatment in Kol khanda village of Dungarpur district of Rajasthan, who recommends the use of *giloe* (*Tinospora urgensia*) root extract. It is prepared by grinding and filtering the *giloe* roots for about 7 days for curing jaundice. Most of the villagers are	Shri Raga Pargi S/o Shri Velaji Pargi, Kol Khanda, Dungarpur (Rajasthan)

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		following this practice to cure jaundice **Keywords**: *giloe*, jaundice	
71	Use of *giloe* to treat urinal infection	The problem of white bleeding with urine or discharge of white secretion with urine, causing weakness in the patients is cured by taking the root extract of *giloe* plant for about 7 days. The extract is prepared by taking 2 inch long piece of *giloe* root, ground with a cup of water and filtered. It is being followed in Kol khanda village of Durgarpur district in Rajasthan **Keywords**: *giloe*, urinal infection	Shri Raga Pargi S/o Shri Velaji Pargi, Kol Khanda, Dungarpur (Rajasthan)
72	Use of *Echinopsis* for easy delivery in pregnant woman	The roots from the *camel thistle* (a bush found in the locality) of height 2" is taken and given to the pregnant lady at the time of delivery on the head so as to touch with the body leads to give safe delivery to baby. It is being followed for a long time and is given by Ragaji Pargi to nearly 30 persons each year in the Kolkhanda village of Dungarpur district of Rajasthan. **Keywords**: *Echinopsis*, delivery, pregnant women	Shri Raga Pargi S/o Shri Velaji Pargi, Kol Khanda, Dungarpur (Rajasthan)
73	Use of *kathal* to reduce body weight	An effective treatment being followed in Dungarpur district of Rajasthan to reduce the weight of persons is the consuming the fruits of *kathal (Artocarpus-heterophyllus*) tree after boiling daily in the morning for about 12 days. It is economical and safe and is available naturally. **Keywords**: *kathal*, body weight	Shri Raga Pargi S/o Shri Velaji Pargi, Kol Khanda, Dungarpur (Rajasthan)
74	Use of *kukar* and *Calotropis* to treat dog-bite and snake-bite	The persons affected by dog and snake bite in Dungarpur district of Rajasthan are cured by applying a mixture of *kukar pada* seeds or bitter gourd @ 10 g and *Calotropis procera* (secretion of leaf and twig) 2–3 drops, house-fly 4, and milk of black goat 100 ml for 2 to 3 days. It can be applied to animals with 2 doses. **Keywords**: *kukar*, *Calotropis*, dog-bite, snake-bite	Shri Goutam Lal Pargi S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)
75	Use of *Calotropis* and *oont kantala* to provide relief to rabies affected persons	The rabies affected persons in the Dungarpur district of Rajasthan are treated by feeding roots of *Calotropis* and *oont kantala* (50 g each) in equal quantity with 100 ml water. **Keywords**: *Calotropis, oont kantala*, rabbies	Shri Goutam Lal Pargi S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
76	Use of *sagran, jawasa* and *bijora* to remove bladder stone	In Dungarpur district of Rajasthan, the bladder stone are removed by crushing a mixture of 100 g *sagvan (Tectona grandis*) seed, 100 g *jawasa (Alghai comelorum*) root and 250 g of *bijora (Citrus madicatypica*) fruit into powder separately and mixing. It is fed @ 1 teaspoon thrice a day for about 5 days to control stone bladder. **Keywords**: *sagvan, jawasa, bijora*, stone bladder	Shri Goutam Lal Pargi, S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)
77	Use of *Salvadora, giloe* and *bilva* to cure jaundice	Green leaves (250 g) *jal (salvadora)*, *giloe* and *bilva (Semicarpus anacardium*) are collected from plant, dried under shade and made into powder, and taken along with milk in the morning for about 7 days to control jaundice. It is being followed in the entire block of Sagwada in Dungarpur district in Rajasthan. **Keywords**: *Salvadora, bilva,* jaundice	Shri Goutam Lal Pargi, S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)
78 and 79	Indiginous method to cure TB	The TB in the Bamasa village of Sagwada block in Dungarpur district in Rajasthan is 78 to 79% cured by taking 250 ml water which is kept for 1 day in a hollow cavity made in the stem of *peepal (Ficus religeosa)* plant. It has to be taken daily for about 7 days. **Keywords**: TB, *Ficus religeosa*	Shri Goutam Lal Pargi, S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)
80	Use of *masa nagfani* root and somili root and leaves for treatment of piles	Piles trouble usually occurs due to constant constipation and imbalance in digestion. For immediate relief Sahri Goutam Lal has been suggesting the use of 500 g dry root powder of *masa nagfani (Opuntia dilleni*) root and 125 g *bavaseer somili (Abrus prekatirius)* green root. These are ground into fine powder and 1 tea spoon fed daily to the patient suffering with piles for 7 days. It is being followed in the Bamosa village of Dungarpur district of Rajasthan. **Keywords**: *masa nagfani, somili* root, piles	Shri Goutam Lal Pargi, S/o Shri Jagnath ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)
81	Use of *arjun* tree bark for treatment of gastric and cough troubles	Shri Goutam Lal, a local person, treats the gastric and cough troubles of tribals in the Bamasa village of Sagwada block in Dungarpur Rajasthan by using 100 g *arjun* bark. It is ground to powder from and given to patient along with tea without sugar and milk. It is being used from generation to generations. **Keywords**: *arjun*, gastric and cough troubles	Shri Goutam Lal Pargi, S/o Shri Jagnath Ji Pargi, Bamasa, Sabla, Sagwada, Dungarpur (Rajasthan)

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82	Use of *morphankli* to control piles	*Morphankli (Knopteris radiata)* is an annual herb used to treat piles in the tribal areas of Udaipur. The dried leaves and roots of *morphankli* is taken and soaked in water overnight, it is ground in the morning by adding sugar and given to the patient for about 7 days as breakfast to control the piles. It is being used from generation to generation. **Keywords**: *morphankli*, piles control	Shri Kapoor Lalji Pujari Ramdas ka Mandi, near Kalaji Garaji, Udaipur (Rajasthan)
83	Use dry fruit of coconut and *amrita* for old wounds and burns	Dungarpur district lies in south-eastern part of Rajasthan inhabited by tribal people, where the practice of herbal medication is common. To treat old wounds and burns, dry fruit of coconut (*khopra); (Cocos nucifera), amrita (Tinospora urgensia)* and mustard oil (*Brassica spp*.) are used. Coconut (200 g) and *amrita* (250 g) are burned separately and ash of these two are mixed in an utensil. A teaspoonful of the mixture is taken and mixed with mustard oil. The mixture/paste is applied on the wounds till it is cured. This is a very cheap treatment with effective results, which has been in practice for generations. **Keywords**: coconut, *amrita*, mustard oil, wound and burn treatment	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
84	Use of *sendra* for curing diarrhoea	The bark of *sendra* tree (*Moringa oleifera*) 100 g is crushed and soaked in water. Then it is filtered and the filtrate is used to cure diarrhoea in human being. It is used 2–3 times till the patient gets relief. This is a very old and cheap practice followed in Naya Talab village of Dungarpur district in Rajasthan. **Keywords**: *sendra* bark, cure, diarrhoea, human being	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)
85	Use of sendra bark for treatment of dog-bite	The extract of *sendra* bark (*Moringa oleifera*) is used by villagers of Naya Talab of Dungarpur district in Rajasthan for treating dog-bite in human being. About 1–2 kg *sendra* bark is taken and the extract of about a cupful or 250 ml is given to the patient within 8 days of bite. This is a very cheap practice, which is followed since a long time back by many people and especially in remote area. **Keywords**: *sendra* bark, dog-bite	Shri Manji Nanoma S/o Shri Harji Nanoma, Naya Talab, Hathai, Dungarpur (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
86	Use of *giloe* to treat asthama and snake-bite	The extract of root of a creeper plant, *giloe (Tinospora urgensia*) is used by Kol khanda, Falavari villagers of Dungarpur district in Rajasthan for treating snake-bite and asthma. About 2 inches long root of *giloe* is crushed/ or ground with addition of a little quantity of water. This is filtered through a fine cloth and the extract is given to snake-bitten patient. Another utility of the extract is for asthma and urinary tract infection, where the treatment is continued for 7 days. Restriction is for consumption of red chili, sour things, liquor etc. during the course of medication. This is a very old practice, which has been passed from generation to generation. **Keywords**: *giloe* root extract, snake-bite, asthma and urinary tract infection	Shri Raga ji Pargi S/o Shri Velaji Pargi, Kol Khanda, Falavari, Dungarpur (Rajasthan)
87	Use of *kewada* for family planning	The root of *Panndanus tectorius* (fragrant scrow pine, *kewada*) is used for family planning. The root is made into powder after drying. About 10 g of this powder is mixed in 200 ml water and boiled, till the content is reduced to half. It is then given to the lady for 3 days after the M.C. (menstruation cycle) is clean. This is an age-old practice for the people of Bamada village of Dungarpur district in Rajasthan, which is still in practice. **Keywords**: *kewada* root, family planning	Shri Gautam Lal Pargi C/o Shri Jagnath ji Pargi, Bamasa (Naya Fala Koobakudi), Bamasa, Sabla, Dungarpur (Rajasthan)
88	Use of *sinia* root and *bekria* grass for typhoid treatment in human being	Roots of *sinia (Crotalaria burhia*) and seed of *bekria (Indigofera cordifolia)* are used for treating typhoid in man. About 200 g root of *sinia* is chopped and boiled in 1 litre water till the content is evaporated to 250 ml. In another container 50 g of seed *bekria* grass is boiled in 1 litre water till the content is evaporated to 250 ml. Both are cooled and filtered. Then the filtrates are mixed and kept in a good container for use. About 25 ml of the prepared solution is taken twice a day for about 10–20 days till the patient gets relief. The materials are easily available and also cultivated by some villagers. *Bekria* is a seasonal plant, which is found in rainy season; therefore, it is being preserved by the local *vaidyas*. This is an age-old practice for the people of Gangana and other villages of Jodhpur district in Rajasthan. **Keywords**: *sinia* root, *bekria* seed, treatment for typhoid	Shri Raju Ram Central Arid Zone Research Insitute, Jodhpur (Rajasthan) 342 003

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89	Use of *kaner* leaves to cure old wounds	Old wounds and burns on the body of tribal are cured by using extract prepared by taking 35 matured leaves of *kaner (Nerium oleandar)* and warming on hot iron plate. It is applied on the wounds by mixing with ghee as an ointment. It is being used from generation to generation. **Keywords**: *kaner* leaves, wounds cure	Shri Gautam Lal Pargi C/o Shri Jagnath ji Pargi, Bamasa (Naya Fala Koobakudi), Bamasa, Sabla, Dungarpur (Rajasthan)
886	Use of fruits of *bhazarbianga* plant as medicine	Fruits of *bhazarbianga* (50 g) are used by the farmers for treating throat problem in human being. Anti-microbial substances which are present in it helps to cure the problem. The fruits are sweet in taste. Farmers of Keylong of Lahul and Spiti district in Himachal Pradesh use this method. **Keywords**: *bhazarbianga* fruit, throat problem	Shri Chering Doreje Keylong, Lahul and Spiti (Himachal Pradesh)
888	Herbal treatment of cholera (haiza) in human beings	The infected patient is treated with the *thymol karru* mixed with the juice extracted from the leaves of mint and one onion piece. The *mint* leaves and onion are ground properly and then juice is extracted with cotton cloth. One spoon of this juice is given orally to patients 2–3 times a day.This is practiced in most of the villages of Mandi district of Himachal Pradesh to treat patients suffering from vomiting, gastric problem, and diarrhoea. **Keywords**: cholera, *haiza*, human being, thymol, mint, onion, extract fed to patients, vomiting, diarrhoea	Shri Ram Lal Village Tikkari, P.O. Mendi, Tehsil Karsog, Mandi (Himachal Pradesh)
890	Treatment of asthma in human being	Asthma is a fatal disease. The main cause of this disease is the allergy but now it is identified as viral infection. The observed symptoms in infected patients are restlessness, breathing problem and even death due to prolong illness. Asthma is treated with ash of the freshwater cancer rockcrab (paratelplusha). About 1–2 g ash of cancer rockcrab (paratelplusha) is given orally with a glass of water or milk to the patient daily early in the morning for about a week. This treatment is very effective for controlling asthma infected patients mostly in children.This infection is also treated with finely ground powder of the seeds of *Datura stramonium.* Its powder (2 g) is mixed in a glass of milk (200 ml).This treatment is given orally daily early in morning for about a week. These treatments may contain certain anti-allergic or anti-viral substances which help to overcome asthma	Shri Gireeja Ram Village and P.O. Kaa, Tehsil Karsog, Mandi (Himachal Pradesh)

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		infection. These are practised in most of the villages of the Mandi district of Himachal Pradesh. **Keywords**: asthma, cancer rockcrab ash, water, milk orally, ground *Datura stramonnium*	
891	*Kulth (Dolichos vniftrus),* blackgram and maize for the treatment of kidney stone	Kidney stone is a very serious problem in human being. This problem is due to the accumulation of smaller indigestible particles in the kidney or related system mostly in children and man. The main symptoms of this problem are intolerable pain in left side of stomach and bloody discharge during urination. This problem is treated by feeding the patients with 200 ml soup extracted from the *kulth (Dolichos vniftrus*) and soup of blackgram. About 200 ml juice or soup given orally daily for about a week is quite effective for control of stone problem, i.e. dissolution of stone and easy release through the urinary passage of the patients. This problem can also be overcome by oral feeding of the female corn of maize (*Zea mays*), mixed with vegetables like cauliflower, brinjal etc. These plants contain certain substances that help dissolve the stones in kidney and other related organs. These are very effective and has been practiced in most of the villages in the Karsog block of Mandi district of Himachal Pradesh since time immemorial. **Keywords**: kidney stone, feeding soup of *kulth* and blackgram, maize (corn), cauliflower, brinjal	Shri Chaman Rao Research Scholar, Department of Bio Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
892	Treatment of whooping cough	Banana inflorescence, *badi ilaichi* and *pudhcanda* ash (10 g each) are ground well and mixed in honey. Oral administration of this mixture one spoonful with milk to children controls cough problem due to its anti microbial substances which are present in the mixture. Boiled leaves, black pepper (10 g each) and honey (20 g) are ground and milk is added and orally administered. Most of the villagers in Mandi district of Himachal Pradesh are practising this method to control diarrhoea. **Keywords**: banana inflorescence, cough, honey, *pudhcanda* ash, black pepper, *badi-ilaichi*	Roshni Devi Rao Gopalpur, Sarleaghat, Mandi (Himachal Pradesh) 175 007
895	Honey, red sandal and wheat oil for treatment of eye infection	Eye infection is treated by two methods: 1. With honey and red sandal (*Santlum* album), 2–3 drops each are instilled into the eyes early in the morning for about 2–3 days. This treatment	Shri Balbir Singh Village & P.O. Gopalpur, Tehsil Sarkaghat, Mandi (Himachal Pradesh)

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		is quite effective for wound healing and allergic ailments in eyes. 2. The eye ailments are also cured with the oil extracted from the wheat grains. Wheat grains are kept in a flat tray and pressed with a hot iron tough and the oil extracted from it is instilled into the infected eyes to overcome the eye infection. These are quite effective treatments and have been practised in most of the hilly areas of Mandi district of Himachal Pradesh since time immemorial. **Keywords**: eye infection, honey, red sandal, wheat oil, instil to eyes	
1630	*Sarla (Katai venguria):* a plant species for consumption and medicinal use	*Sarla (Katai venuguria)* mostly found in the forests of Jharkhand, is used as vegetable. It is rich in iron and vitamins and has medicinal value for curing liver problem. Onion, tomato and chilli are fried in a little oil for 3–4 minutes; then 0.5 litre rice water is put in utensil. After 5–8 minutes, four spoonfuls of sarla powder is put in boiled rice water. Sarla is ready for use. It is cheap, nutritious vegetable, used as a herbal medicine in liver problem. About 90% farmers of Katkahi village follow this practice. **Keywords**: *sarla/Katai* venuguria, medicine, herbal	Ms Prabha Bara Pathalkudwa, Church Lane, Ranchi (Jharkhand)
1631	Use of *munga (Moringa oleifera)* leaves for medicinal purpose	*Munga* (*Moringa oleifera*) is a perennial plant which is most commonly found in Jharkhand region, Its leaves, flowers and fruits are used as medicine. For the treatment of weakness, ground leaves of munga are taken with *gur, jeera* (cumin seed), *elaichi* (cardamom) and *saunf* (aniseed) twice a day. This is being practised by most of the villagers and till now no any modification has been made. **Keywords**: *munga, gur, jeeera, elaichi, saunf*	Smt Sinago Murmu Pandugitti, Govindpur, Police Station, Rajnagar, Saraikela (Jharkhand)
1632	Use of *neem* leaves as medicine	Whole parts of the *neem (Azadirachta indica*) tree are used as medicine by the people of Jharkhand area. For the treatment of itching, leaves of *neem* are used. Paste is prepared from boiled neem leaves, camphor and coconut oil, and applied on the itch. The practice is being used by 90% of the villagers and success has been observed in 80% of the area. **Keywords**: *neem*, camphor, coconut oil, itch	Smt Sinago Murmu Pandugitti, Govindpur, Police Station, Rajnagar, Saraikela (Jharkhand)

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1633	Use of akawan (*Asclipias gigantia*) for medicinal purpose	*Akawan* has pain deterrent/removing property and has been used by the people of Saraikela district in Jharkhand for the last several years. Green and fresh leaves of *akawan* are boiled with mustard oil and heated. Then it is kept on the pain area and tied for 4 hours or till pain is relieved. **Keywords**: *akawan*, pain deterrent, mustard oil	Shri Ajit Kumar Birsa Agricultural University, Residential Complex, Kanke, Ranchi (Jharkhand)
1634	Medicinal use of *tulsi* leaves	Pills prepared from crushed leaves of tulsi and powder of black pepper are taken for treatment of gall malaria thrice a day with water. Success has been  Tulsi—an important medicinal plant observed in 80% of the cases. This medicine is being used by the majority of the people (90%) in Jharkhand area and till now any modification is made. **Keywords**: leaves of *tulsi*, black pepper, gall malaria	Smt Sinago Murmu, Pandugitti, Govindpur, Police Station, Rajnagar, Saraikela (Jharkhand)
1635	Medicinal use of *vasak* (*Adathoda vasica*)	*Vasak (Adathoda vasica*) is a perennial plant and used for medicine in human beings and also in animals. Two tablespoonfuls of juice is extracted from the leaves of *vasak* and taken with 5 g *gur* (molasses) or honey, twice a day for 5–6 days. This is reported that 60% of people of Jharkhand are using this medicine and success has been observed in 80% of the cases. **Keywords**: *vasak*, perennial, medicinal, juice extracted, gur, honey	Ms Prabha Bara Pathelkudwa, Church Lane, Ranchi (Jharkhand) 834 001
1636	Medicinal use of *jova, exha* and *dumar* flower	For the treatment of stomach pain in human beings, pills prepared from the powder of *jova, exha, dumar* flower, fried *methi*, sugar and powder of *saluk* are taken thrice a day. All these materials are easily available in surrounding. Flowers of *java, exha* and *dumar* are collected from their tree or shrub, which	Ms Singo Murmu Pandugitti, Govindpur, Saraikela (Jharkhand)

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		are perennial. These medicinal plants are being used for the last several years without any modification by the villagers of Saraikela district of Jharkhand. Success has been observed in 80% of the cases. **Keywords**: stomach pain, *jova, exha, dumar* flower, fried , sugar, saluk	
1641	Use of tender tamarind leaves for control of dysentery and diarrohea	Tender tamarind leaves cure dysentery and diarrohea. First of all tender tamarind leaves are plucked from the tamarind tree. The leaves are sun-dried, then ground and boiled with water and salt. It is used to control dysentery and diarrohea. This ITK is practised in villages Tutihara, Singuseren and Rampur of Namkum Block in Ranchi dirtrict (Jharkhand). About 60–70% of the cases have been observed successful. **Keywords**: tamarind leaves, diarrhoea, dysentery	Shri Ranjay Kumar Singh Research Associate, Department of Extension Education Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1646	Utility of *harad*	Villagers of Ursi village of Kuchai block in Saraikela-Kharsawan district of Jharkhand treat their eye pain by the fruit of *harad*. Fruits of *harad* are dipped in water for whole night and in next morning eyes are washed with its water. It gives relief to eyes from pain and keeps them cool. This wisdom is being in practice for the last several years. **Keywords**: *harad*, dipped in water, eyes, eye pain	Ms Gita Kumari C/o Shri K N Singh Munda, Maltaadi (Near Filter House), Bagbera(Tatanagar), East Singhbhum (Jharkhand) 831 002
1647	*Hajardana* sauce to cure jaundice	Whole plant part of *hajardana* including roots is ground and used for making sauce. Appropriate quantity of common salt is added to it. It is taken along with food to cure jaundice in human beings. This practice is followed in Amlesha village of Tamar Block in Ranchi district. Jaundice is reported to be controlled to an extent of 90% through use of this practice. **Keywords**: *hajardana* souce, jaundice, human beings	Shri Parvatiya Durgam Shiksha Vikas, Ranchi (Jharkhand)
1648	Use of *sakhua* fruit to cure dysentery in humans	Fruits of *sakua* (sal) are boiled, crushed and then pills are made and taken to cure dysentery. This medicine is in practice for the last several years. So far no modification has been made in this wisdom by the villagers of Rugdi of Tamar block in Ranchi district of Jharkhand. **Keywords**: *sakhua* fruit, boiled, crushed, pills, dysentery cure	Ms Gita Kumari C/o Shri K N Singh Munda, Maltaadi (Near Filter House), Bagbera(Tatanagar), East Singhbhum (Jharkhand) 831 002

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1649	*Kujri* seed oil to cure T.B.	Oil extract of *kujri* seed has medicinal property against T.B. Oil is extracted from *kujri* seed and given to patients suffering from T.B. This is practised in Bari Village of Murhu Block in Ranchi district (Jharkhand) and has potentiality for its further spread in the areas where *kujri* plants are found. *Kujri* oil is consumed and used for treatment of T.B. patients. **Keywords**: *kujri* oil extract, T.B.	Ms Gita Kumari C/o Shri K.N. Singh Munda, Bagbera, E. Singhbhum (Jharkhand) 831 002
1650	Treatment of itch by *karanj* oil (*Pongamia pinnata*) and *dudhiya* grass	Juice of *dudhiya* grass and *gandhak* (sulphur) are mixed in karanj oil and applied on the itch. This medicine is being used by the villagers of Ghagra village of Kunti block in Ranchi district of Jharkhand for the last two decades. **Keywords**: *dudhiya grass*, *gandhak* (sulphur), *karanj* oil, itch	Ms Rashmi Kandulna, Hawai Nagar (Merina X ray clinic), Hatia, Ranchi (Jharkhand) 834 003
1651	Treatment of jaundice by radish leaves	Juice is extracted from the leaves of radish and it is taken with or without sugar, one glass daily. Drinking of radish juice 3–4 times in a day cures jaundice. This wisdom is being practiced by the villagers of Singhpur of Ratu block in Ranchi district of Jharkhand for the last several years without any modification. **Keywords**: juice, leaves of radish, drink, jaundice	Ms Rashmi Kandulna, Hawai Nagar (Merina X-Ray Clinic), Hatai, Ranchi (Jharkhand) 834 003
1652	Protection of newly born babies from rangbad by use of different plant materials	*Rangbad* is a disease of new born babies, in which red pimples appear on tongue, lip, face, stomach etc. For its treatment, equal quantity of root of *bhuin chapa, gundri saag, anantmul* and *kantabaghi* are cooked in ghee and given or applied on the body 3–4 times a day. This practice is being followed by the villagers of Kharshidag of Khijri in Ranchi district of Jharkhand for the last several years without any modification. **Keywords**: *rangbad*, red pimples, new born babies, *bhuinchapa, gundri saag, anantmul, kantabaghi, ghee*	Ms Rashmi Kandulna, Hawai Nagar (Merina X-Ray Clinic), Hatai, Ranchi (Jharkhand) 834 003
1653	*Chakor* seed for treating diabetes	*Chakor* is annual plant and has medicinal property against diabetes. Seed of *chakor* is powdered and boiled in water, then it is given to the patient. This solutions is locally known as chao. It is being practised by more than 80% of the villagers of Karandi block in East Singhbhum district of Jharkhand for last several years **Keywords**: *chakor*, medicinal property, diabetes	Ms Gita Kumari, C/o K N Singh Munda, Matladih, Bagbera(Tatanagar), East Singhbhum (Jharkhand) 833 201

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1655	Use of *bhui neem, dub* grass and *mehndi* (myrtle) against jaundice	*Bhui neem*, *dub* grass and *mehndi* have some medicinal properties and cure jaundice in human being. Juice prepared from it and sugar/sugar candy is tasty and taken for 3–4 times everyday till the jaundice is cured. The practice is followed in Badla village of Tamar Block in Ranchi district (Jharkhand). Success has been observed in 80% of the cases. **Keywords**: *bhui neem, mehndi, dub* grass, jaundice	Ms Rashmi Kandulna, Hawai Nagar (Merina X-ray Clinic), Hatia, Ranchi (Jharkhand) 834 003
1656	Use of *putus (Lantana camara*) for remedy of malaria	Leaves of *Lantana* have some medical properties which cure malaria. Crushed leaves of *putus (Lantana camara*) are taken twice a day for 3–4 days. The practice is followed in tribal village Bara Jaypur of Rania block in Ranchi district (Jharkhand). Success has been observed in 80% of the cases. Cost: benefit: 1: 8 approximately. **Keywords**: *Lantana camara*, malaria, medicinal value	Ms Rashmi Kandulna, Hawai Nagar, Merina X-ray Clinic Hatia, Ranchi (Jharkhand) 834 003
1657	Treatment of kidney stone by *kulthi*	*Kulthi* (horse gram) has some element which melts the stone of the body, and the melted stone flows out from the body with urine. Boiled kulthi or *kulthi* dal is taken every day till kidney stone is cured. The practice is followed by the tribal people in Sirkadhi village of Arki Block of Ranchi district (Jharkhand). Success has been observed in 90% of the cases. **Keywords**: *kulthi* (horsegram), stone problem,	Ms Rashmi Kandulna, Hawai Nagar, (Merina X-ray Clinic) Hatia, Ranchi (Jharkhand) 834 003
1658	Utility of pomegranate leaves in treating ringworm	Paste of pomegranate leaves is used by the villagers of Hethu baon of Khijri block in Ranchi district of Jharkhand to cure *dadd* (ringworm). Hair-dropping is also controlled by applying the paste on affected parts of the body. This wisdom is being in practice for the last several years without any modification. **Keywords**: pomegranate, *d a d d* (ringworm), hair-dropping	Ms Rashmi Kandulna, Hawai Nagar (Merina X-Ray Clinic) Hatai, Ranchi (Jharkhand) 834 003
1662	*Chiraita (Sweria anguestifolia)* as blood purifier	*Chiraita (Sweria angustifolia)* plant helps in boold purification. Its leaves and stems are cut in small pieces and kept in water during night. Its filtered water (250 ml) is taken as drink in morning at least for 15 days.The practice is prevalent in Balubaru village of Tantnagar block in West Singhbhum district (Jharkhand) and it has potential for wider use. In 90% of the cases success has been reported. Cost: benefit	Shri Ranjay Kumar Singh, Department of Extention Education,BAU, Kanke, Ranchi (Jharkhand) 834 006

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		is 1: 6 approx. **Keywords**: *chiraita*, blood purifier	
1664	Use of *aparajita* for increasing memory power	Use of *aparajita* (*Clitoria* spp.) helps increase the memory power and also decrease the problems of mental disorders in human beings. Paste of *aparajita* seed and root is prepared with honey and given to the patients. The practice is followed in the villages of Namkum Block in Ranchi district (Jharkhand). About 60% satisfaction is reported. **Keywords**: *aparajita*, memory power	Ms Sushmita Khalkho C/o Dr (Ms) Niva Bara, Department of Agril. Extension, Ranchi (Jharkhand) 834 006
1666	*Jirhul* flower used as food and medicine	*Jirhul* flower is tasty and nutritive. Tribals believe that by eating *jirhul* flower body become healthy because it has nutritive and medicinal value. *Jirhul* flower is taken either fresh or preserved (sun-dried). Before sun drying, fresh *jirhul* flower is boiled.This ITK is practised by tribal people of Garja village of Simdega Block in Simdega district (Jharkhand). Almost 100% of people use or eat it. **Keywords**: *jirhul* flower, nutritive	Ms Kanak Tirkey Pathalkadwa, Munda Kocha, Ranchi (Jharkhand) 834 001
1667	Medicinal use of *machkund* flower	*Machkund* is perennial tree which flowers in summer. The flowers are collected in summer and preserved by sun drying. *Machkund* flower has some medicinal values, which is used in treatment of dysentery. One flower is crushed to make a paste, which is taken twice a day for 3 days. This treatment of dysentery is being practised by 60% of the villagers of Namkum block in Ranchi district of Jharkhand for the last several years with 80–90% success. **Keywords**: *machkund*, perennial tree, flowering in summer, medicinal values, dysentery	Ms Kanak Bara Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001
1669	Medicinal properties of *vankhira*	*Vankhira* is a seasonal climber, fruiting occurs during summer. It is used in treatment of kidney stone, jaundice and *Lalpur, futka* diseases by the people of Simdega district of Jharkhand. Juice is extracted from the fruits of *vankhira* and taken as such with common salt or taken one glass of juice daily after boiling till full cure of disease. This is very cheap method with no side effect and observed very successful in treatment of diseases. It has been in practice for the last many years without any modification. **Keywords**: *vankhira*, seasonal climber, kidney stone, jaundice, common salt, cure of disease	Ms S. Khalkho 3/11 Income Tax Colony, Ranchi (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1670	Use of *machkund* flower (*Ptetrospermum aceriflolium*) for medicinal use	*Machkund (Pterospermum aceriflolium)* is large tree with nerved, cordite leaves, rich in medicinal properties. Flowers are large, fragrant white and yellow in colour. These are used for treatment of indigestion and dehydration. Flowers are soaked overnight in water and filtered. Some sugar is added in the filtrate and given once daily in the morning with empty stomach for 3 days for curing indigestion and dehydration. It is controlled up to 80%. The cost of the treatment is very low. About 80% farmers in the Tanger and Karkat villages of Ranchi district in Jharkhand use this age-old practice. **Keywords**: *machkund* flower, indigestion, dehydration, sugar	Shri Ranjit Bara Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001
1671	Use of *sadabahar* flower (*Catharathus roseus*) for medicinal use	Flowers of *sadabahar* are available around the year and used for controlling stomach diseases like dysentery, indigestion etc. The flower is having white and purple colour and some medicinal properties. When any person is suffering from stomach disease, 5–6 flowers of *sadabahar* are minced and mixed with little salt. Water mixed solution of sadabaha*r* orally given to the patient twice or thrice a day for 2 days. The treatment has 80% success rate. About 1800 persons of Govindpur and Bagraisai villages of Rajnagar district in Jharkhand use this age-old practice. **Keywords**: *sadabahar* flower, stomach disease, indigestion, salt	Shri Ranjit Bara Pathaladwa, Church Lane, Ranchi (Jharkhand) 834 001
1672	Use of *bhui aonla (Phylanthus amarus*) for medicinal use	*Bhui* aonla is an important plant. Its root, stem, leaves, fruits and flowers have medicinal properties. Villagers of Torpa village of same block in Ranchi district of Jharkhand use paste of *bhui* aonla to cure itch and pimples. Paste is made by curing the whole *bhui* aonla plant and common salt is added and applied on the itch and pimples. It is also taken two-tablespoonful of its solution twice a day. This is very economic practice (about 25 paise per treatment). It is in practice for the last several years. Success has been observed in 80% of the cases. **Keywords**: medicinal properties, bhui aonla (*Phylanthus amarus*), itch and pimples, common salt, economic practice	Ms Prabha Bara Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1673	Medicinal use of *gheekuaar* (Aloe vera)  Aloe vera—a medicinal plant	*Aloe vera (gheekuaar*) is a medicinal plant and mostly used in skin burn and piles. The adhesive solution extracted from leaves of *Aloe vera* is placed in the burnt area of body. It gives relief immediately. A few drops of solution is mixed with *ghee* and given orally twice or thrice a day for 2–3 days for piles. It cures 95% of problems. About 3500 people of Konki village of Ranchi district in Jharkhand use this age-old practice. **Keywords**: *Aloe vera, gheekuaar,* leaves, skin burn, piles and ghee	Ms Prabha Bara Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001
1674	Medicinal use of *udhul (Hibisnosa sinensis)*	Flowers of *udhul* are used for increasing the strength and power in women, especially in post-pregnancy period. It has some medicinal properties and is used for making energetic tonic for women. *Gur* (condenced sugarcane juice or molasses) and *udhul* flower are kept in an earthen pot, layer by layer, respectively. Then this earthen pot is placed under sunlight for 15–20 days and the tonic of flower of *udhul* is ready for use after filtration. All the people of Bagraisai and Rajnagar village of West Singhbhum district in Jharkhand use this age-old practice. It is effective in up to 90% of cases. **Keywords**: medicinal use of *udhul*, post-pregnancy, *gur*, tonic, women	Ms Prabha Bara Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001
233	Conservation and propagation of wild *Curcuma*	Wild arrow root (*Curcuma* spp.) is grown during rainy season, the roots is used as food as well as medicine. The root is in sandal colour. The roots are planted in the same place from where the roots have been harvested. New leaves are grown as the flowers are dried. Fruits are rarely seen. **Keywords**: wild arrow root, *Curcuma* spp	Shri P.M. Salim Pichan House, Puzhamudi, Kalpetta, Wayanad (Kerala) 673 121
289	Products of plant origin for health care	Shri P.G. Jagannathan has developed products from different plant species, some of which are as follows: *Herbal tooth powder*: It is made from eight kinds of medicinal, aromatic herbs and plants; six kinds of spices; bark, hardwood and roots of 6 medicinal plants. *Decoction for fever, cold and cough*: It is made	Shri P.G. Jagannnathan Kalloorma, Nannammukku, Malappuram (Kerala)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		from fresh leaves of five herbal juices, two herbs and three kinds of spices. *Oil (thailam*) for joint pains: It is made from leaf, bark, root of 33 kinds of herbs, medicinal plants, creepers, runners and five kinds of vegetable oils. *Chocolate*: It is made from cocoa beans, sesame, groundnut, coconut milk, *ghee*, sugar and malt (powder of fried rice). *Soft-drink concentrate*: It is made from a combination of nine medicinal herbs, plants and creepers. Keywords: health care, medicinal and aromatic plants	
315	Cure of jaundice	Paste made from leaves of *Vannan avuri* , a herb, is being used for the last 27 years to cure human beings and animals from jaundice. Method of use of *Vannan avuri* varies depending on the age of the persons. For animals, feeding is done thrice. **Keywords**: jaundice, *vannan avuri*	Shri S. Ganesan, Tamil Teacher, 35, Vellalar Nadu Theru, Virudhunagar (Tamil Nadu) 626 132
317	Herbal treatment for animals	The formulations prescribed by Shri Samikkalai for curing problems of animal and human beings are as follows: *Animal deworming and poison bite: Croallocarpus epigaes* 2 parts, *Andrographis paniculata* 1 part and *Aristolochia indica* 2 parts are mixed and ground well. This powder is fed to the animals for all types of internal parasites or worms. About 60 g of the powder is mixed with water and administered 3 times a day. For treating poison bite, Luffa amara and Citrullus colocynthis are added in addition to the above ingredients. *Kandamalai disease*: Children at the age of 7 years old, sometimes have swelling on either side of the neck which is very hard and round.For treating this problem, 100 g tubers of *Pergularia daemia* are ground well, mixed with 100 ml milk of goat and taken thrice a day for 3 days. For children taking mother's milk, both mother and child are adivised to take the dose. *Asthma*: Leaves of *Solanum trilobatum, Ocimum spp., Adathoda zeylanica, Capparis devaricata, Acacia pennata* and *Oldenlandia corymbosa* are taken in equal quantities and ground well after drying in shade. About 100 g powder is to be taken with	Shri V. Samikkalai, Sathiravellalapapatti, Palamedu, Vadipatti, Madurai (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		goat's milk 3 times a day for 5 days. *Body pain*: Ginger (100 g), *Trianthema decandra* (500 g) and *Kolikalaichan vithai* (100 g) are dried, mixed and ground into powder. The powder is to be taken with milk 3 times a day for 3 days. *Swelling*: Swelling on the body surface is cured by applying the paste prepared using a mixture of turmeric powder 50 g, castor oil 25 g and *datura* leaf 50 g. If *athalporuthi* powder is smeared on the swelling, within 3 days it will be cured. **Keyword**: herbal treatment	
412	Medicinal plants for health care	Dr. Arati Bala Prusti has disclosed the use of medicinal plants which are used in Banigocha village of Nayagarh district of Orissa for curing gastro-intestinal ailments in animals and human beings as indicated below. A paste of bark of *dholanku (Alangium salvifolium*) is mixed with black pepper and given for acute gastritis. Fine paste of whole plant of *kantamariso (Amaranthus spinosus*) is rubbed well on the head for bilious derangements. Paste of fresh root of *pannoain (Aristolochina indica*) with seven black peppers is given orally for jaundice. Paste of root is mixed with water to make sherbet and given orally to reduce pain due to chronic piles. Latex of *aak (Calotropis gigantea*) is made into pills of 2 g each and given orally for bhagandara, fistula-in-ano. Paste of root of *punarnava (Boerhavia diffusa*) with rice washed water is given in empty stomach for 30 days for jaundice. Bark juice of *kumbi (Careya arborea*) is mixed with sugar candy and given to check blood dysentery. Paste of bark is given orally to check diarrhoea associated with post-natal conditions. Leaf juice of *dohiya (Cocculus hirsutus*) is made into a jelly and is given with sugar candy for bilious derangements. Paste of rhizome of *gaigandalia (Costus speciosus*) is given with cow's milk for stomachache due to indigestion. Paste of whole plant of *narahari (Euphorbia hirta)* is given with curd to check chronic dysentery. Root paste of *dholakaith (Feronia elephantum)* with honey is given internally to check blood dysentery. Paste of fresh root of *bhainsakoli (Flacourtia indica)* with black pepper is given internally in serious blood dysentery for 21 days. Paste of fresh rhizome of *langali*	Dr. Arati Bala Prusti Plot no. 2658, B.J.B. Nagar, Bhubaneshwar (Orissa) 751 014

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		(*Gloriosa superba*) is applied externally for 21 days to reduce bleeding piles. Paste of a mixture of root of *Glycosmis pentaphylla*, bark of *Holarrhena autidysenterica* and root of *Tephrosia purpurea* is taken orally to check diarrhoea. Bark of *Halarrhena* antidysenterica is mixed with bark of mango and made into a paste which is given for stomatitis. Paste of five fresh leaves of *amarpoi (Kalanchoe pinnata)* with as many black peppers is given to control severe diarrhoea due to indigestion. Paste of root and leaf of *manjuati (Lawsonia inermis)* with rice-washed water is given for 3 weeks for jaundice. Paste of whole plant of *musakani (Merremia emarginata)* is mixed with sugar candy and is given for blood dysentery. Water extract of the root of *birchi (Milletia extensa)* is given as a mild laxative. Paste of fresh leaves of *joda (Ricinus communis*) is applied locally in piles. Latex of *sahada (Streblus aspera*) is applied for piles after defecation. Pulp of fruit of *sal (Shorea robusta*) is eaten to check diarrhoea. Fresh bark (5 g) of *arjun (Terminalia arjuna*) is chewed after one hour of each meal in APD. Paste of fresh root of *hetamundia (Trichodesma indicum*) is given as demulcent. **Keywords**: medicinal plants, ailments.	
526	A high-potency fungus (*Cordiceps sinensis*)	The fungus (*Cordiceps sinensis*) possesses some alkaloids that act as sex stimulant. Small dried pieces of the fungus are chewed raw with milk. Alternatively the dried pieces are thoroughly mixed with condensed milk. The solid mixture in the form of small balls is eaten one per day. Besides acting as sex tonic, the fungus is also useful for curing many body ailments like backache and arthritis. The fungus is locally available. **Keywords**: *Cordiceps* sinensis, tonic	Shri P. S. Mehta, NBPGR, New Delhi 110 012  Fruit bodies of a high potency fungus (Cordiceps sinensis)
543	Use of *siling* bark for abdominal pain	Bark of *siling (Osmanthus fragans*) tree is used as a remedy for stomach pain. Bark of the tree is crushed and fed (10 g) to the patient. It gives quick relief to the patient. **Keywords**: *siling* bark, stomoch pain	Dr Nirmal Chand Senior Scientist (Agric. Extn), VPRAS, Almora (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
544	*Ciraita* (*Swertia chirata*) an herbal medicine for pain	The plant possesses some anti pyretic properties and also acts as laxative. The whole plant, especially leaves, are used as medicine for fever. The treatment is applicable for both the animals as well as human. **Keywords**: *ciraita*, anti-pyretic, fever	Dr Nirmal Chand Senior Scientist, (Agril. Extn), VPRAS, Almora (Uttaranchal)
545	Use of *kut-kut* plants for stomach ailments	The plant cures stomach ailments. The roots of the plant are used in the technique. It is claimed that the roots of *Kut-kut* plant cures all stomach problems and is cost effective. **Keywords**: *kut-kut* roots, stomach ailments	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
546	Kutki (*Picroriza kurrooa*) a medicinal herb	The plant possesses glycosides. Roots of the plant are used as purgative, stomachic and cathratic whereas the leaves of the plant are used against fever. The herb is very effective for stomachache and fever, and cost effective. **Keywords**: *kutki*, medicinal herb, stomach ache	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
547	Use of atish (*Aconitum heterophyllum*) for abdominal pain	Roots of the plant possess alcoloids which are used to cure stomach problems. Roots of the tuber of the plant are used to treat various stomach problems like diarrhoea and dyspepsia. Stomach problems are cured effectively. **Keywords**: *atish*, roots and tuber, diarrhoea, dyspepsia	Dr Nirmal Chand Senior Scientist, (Agril. Extn), VPRAS, Almora (Uttaranchal)
548	*Salam mishri*- a remedy for urinary problems	Roots of the plant have some medicinal properties which cures urinary disorders. **Keywords**: *salam mishri*, roots, urinary problems	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
549	*Salam panja (Orchis latifolia)* - an antiseptic herb	Roots of the plant possess antiseptic property which are used as astringent in cuts and wounds. Roots effectively heals the wounds and cuts. **Keywords**: *salam panja*, roots, astringent	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
550	Use of *pasanbhed (Berginia ligulata)* - for control of kidney stone	The roots of the plant possess some active ingredients which act as stone remover. The roots of the plant are eaten by the patient as such. The technique is highly cost effective. **Keywords**: *pasanbhed*, kidney stone, roots	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
551	Use of *samewa (Valeriana wallichii*) for preparation of incense	The roots of the plant possess a sharp pleasant smell which is used for making incense and in treatment of epilepsi. **Keywords**: *samewa*, incense, epilepsi	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
552	*Rianj (Querecus lanuginosa*) a cockroch repellant	The leaves of the *rianj (Querecus lanuginosa*) have some insect repellant property. The leaves are kept at the cockroach infested places. It repels the cockroaches effectively. **Keywords**: *rianj* leaves, insect repellant	Dr Nirmal Chand Senior Scientist (Agril. Extn), VPRAS, Almora (Uttaranchal)
960	Impact of *gucchi* collection on income generation	Collection of *gucchi (Morchelle* spp.) by local people of Himachal Pradesh is directly linked to their income strata and land holdings. People with less land and with low income group usually collect *gucchi* and earn money for livelihood. The income generated varies from season to season but it is usually a substantial amount which can sustain the collectors for 3–6 months. There is a need to regulate collections and devise better method for marketing because mostly the middlemen are benefited through sales. People sell them at about Rs 400 to Rs 500 /kg, whereas market price is about Rs 5,000–6,000 /kg. **Keywords**: *gucchi* collection, income generating, land holding	Dr O.S. Shad and Shri T.N. Lalchanpa Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
961	Traditional practices in collection and preservation of *gucchi*	*Gucchi*, one of the most prized mushrooms, found in Himalayas are collected by natives of Himachal Pradesh, Jammu and Kashmir and Uttar Pradesh for whole day in the jungle. People of this region believe that *gucchi* (*Morchelle* spp) appears through cracks created by thunder accompanying rain. They appear more on burnt soil. All the six species of *gucchi* reported from the world occur in the Himalayas and all are edible. Its sale price in the market is Rs 6,000–7,000 /kg. Morels are considered a delicacy and morgil is exported, which earns about Rs 4 crores a year in Himachal Pradesh. **Keywords**: *gucchi*, burnt soil, morel, morgil	Dr O.S. Shad and Shri T.N. Lalchanpal, Department of Bio-sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1714	Household commodities and ornamental things made from bamboo	Villagers of Pandripani village of Thethaitangar in Simdega district of Jharkhand use mature bamboo to prepare different commodities like *sup (winnowing basket*), umbrella, *daura, chetka (storage structure), bhar* (basket for carrying soil, compost, rock etc),	Ms B Ekka Q.No DT 1327, Dhurwa, Ranchi (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		bags, fan etc and ornamental things like lamp shade, wall hanging etc. Sucker and tender bamboo are used to prepare *karil.* *Karil* is the small cut piece of tender bamboo. Pickle is prepared by heating *karil* to remove water. Crushed ginger, garlic, chilli, mustard, aniseed and *panchporan* are mixed in *karil*. Salt is added according to taste and then packed in a jar and left for 1–2 days in the sunlight. Fermented *karil* is locally known as *handua* used as chatni. Bamboo is being in use for preparing above things for the last several years by the people of Jharkhand. **Keywords**: bamboo, *karil, handua*	
1731	Use of *sadabahar* flower for control of high blood pressure	Farmers of Balubara, Khaspukhuria and Kalaburu villages of West Singhbhum district of Jharkhand are adopting traditional practices for control of high blood pressure. Three flowers of *sadabahar (Catharanthus roseus)* and two pieces of black pepper (*Piper nigrum*) are ground together with water and orally administered to the affected persons. This practice controls high blood pressure. **Keywords**: *sadabahar (Catharanthus roseus*), black pepper (*Piper nigrum*)	Shri Ranjay Kumar Singh, Dep. of Extension, Birsa Agricultural University, Ranchi (Jharkhand) 834 006
2224 2225 2226 2244 2245 2246 2247 2248 2249	Use of plant products in health care	Following practices related to health care using botanical products. 1. *Rasam* of black horsegram is given to nursing mothers to prevent abdominal and joint pains which result from pregnancy. 2. Ocimum leaf, honey and ginger paste is given to children below six years to control common cold and cough. 3. *Samai rice/uda* rice is given to patient during post illness due to its easily digestable nature. 4. Stored honey is given to control blood motions. 5. Stored honey is applied to eyes to control eye infection. 6. Dried *mahua* bud is used to substitute jaggery/sugar for sweetness. 7. Ocimum leaf is given for easy digestion. 8. Castor oil is given to children to prevent constipation. 9. *Henna* roots is used to make abortions. **Keywords**: black horsegram, abdominal and joint pains, Ocimum leaf, honey, ginger, cold and cough control, samai *rice/uda* rice, digestable, blood	Training Associate, Krishi Vigyan Kendra, Rastakuntubai, Vizianagaram (Andhra Pradesh) 532 523

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		motions, eye infections, jaggery, *mahua* buds, castor oil, constipation, *henna*, abortions	
2316	Indigenous agro-forestry systems	The traditional agro-forestry practices adopted by the rainfed farming communities are indicated here by Dr G. Subba Reddy and Dr H.P. Singh. Growing of palmyrah trees between crop plants of sorghum/ pearl millet/ cotton/ groundnut/ pulses is practised in peninsular India. Planting tamarind trees on field boundaries and growing of sunflower/ pulses with *kapok* tree which gives high quality fibre in southern part of India are other systems. Growing of crops in existing stand of *khejri* (*P. cineraria*) and *babul* tree (*A.nilotica*) as intercropping with cereals and pulses in western Rajasthan. Custard apple with cereals and pulses in Telangana region of Andhra Pradesh and *Acacia nilotica (kikar) + Butea monosperma (dhak*) in Kandi area of north-west region are being practiced. **Keywords**: palmyrah tree, sorghum, pearlmillet, cotton, groundnut, pulse, agro-forestry practices	Dr G. Subba Reddy and Dr H.P. Singh, Central Research Institute for Dry-land Agriculture, Santosh Nagar, Saidabad, Hyderabad (Andhra Pradesh) 500 059

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Weather Forecasting

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
427	Observation of ants for anticipating rains	Based on the activity and movement of ants, the condition of the weather is forecast for undertaking farming activity. It is being followed by 30% of the farmers for 100 years in the Shibiloon village of Burdwan district in West Bengal. **Keywords:** ant movement, weather forecasting	Ms *Madhumita Ghosh*, Shibiloon, Burdwan, (West Bengal) 713 130
928	Rainfall prediction through the swarming of dragon fly (*Plathemis lydia)*	Farmers in Himachal Pradesh predict weather conditions when some insects show peculiar swarming *behaviour*. If the dragonfly appears in the rainy season and is observed to swarm in a large group over a water surface (pond), dry weather is predicted. If they swarm over open dry lands or fields, early rainfall is predicted by the farmers. This knowledge is practised in most of the villages in Himachal Pradesh since time immemorial for weather prediction. **Keywords:** dragonfly, swarm over pond, swarm over dry field	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
930	Weather prediction through centipedes	If centipedes emerge from their holes carrying their eggs in swarm in order to shift them to a safer place (within the house) the farmer predicts early rainfall. The centipedes do this so as to avoid egg damage, due to rain water. The prediction of rainfall by this method is followed by a majority of farmers for the last several years. Forecast made in radio, *T.V*. etc. are also followed by the farmers. **Keywords:** weather prediction, centipedes, carrying of eggs	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
933	Predicting rain from movement of ants	Movement of ants in a particular direction indicates rainfall occurrence. In this way weather forecasting is useful to the farming community for deciding the appropriate time for implementation of specific agronomic practices. Movement of ants in the specific direction contributes in predicting dry and rainy weather conditions. Generally, ants move in a way followed by all of them and also in opposite direction.	Shri *Rajinder Rajan, Rajan Tyre* Service, Theog, *Shimla(Himachal* Pradesh) 171 201

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Some are to go in one direction and remaining are in opposite direction in the same path. By doing so they store food grains for themselves. It indicates forthcoming dry weather conditions. But when all ants follow one direction and start entering their holes, it indicates the occurrence of rainfall. This ITK is simple and easy to follow, and is used in various parts of Himachal Pradesh for prediction of rainfall or dry weather since time immemorial. **Keywords:** rainfall forecast, movement of ants, specific direction	
1299	Forecasting rain by the activity of insects (ants and dragonfly)	Rainfall is predicted to occur in a day or two if it is observed that a swarm of dragonflies are flying erratically for quite some time (1–2 hours) during day time. Movement of an army of ants with their eggs signifies onset of rain within a day or two. This practice is followed by the farmers in Allahabad district of Uttar Pradesh and the practice is dependable most of the time. This helps them to take timely decision regarding field preparation, irrigation and post-harvest management. This is an age-old practice. **Keywords:** rainfall, prediction, dragonflies, ant movement	Shri Gyanendra Singh, Training Associate (Agril. Engg.), Krishi Vigyan Kendra, Allahabad Agri. Institution (Deemed University) Allahabad (Uttar Pradesh) 211 007
1302	Transfer of eggs by ants from one place to another as indicator of rain	Ants transfer eggs due to change in temperature, humidity, atmospheric pressure or some other reasons of nature which might be the indicator of rain. During summer, one week prior to rains, the ants can be observed to transfer their eggs from one place to other in houses. This is an indication of rains within one week, as followed by the villagers of *Ramnagar* in Bulandshahr district of Uttar Pradesh. **Keywords:** ants *transfering* eggs, indicator of rain	Dr Tung Vir Singh, D-37, Medical Collage Campus, Meerut (Uttar Pradesh) 250 004
1692	Forecasting the start and end of rains through spider webs	In this practice the weather is predicted with the help of spider's web. When the rain is about to begin, the spider makes its webs in opposite direction to which the rain is coming, i.e., spider makes web Ranchi vertical to the earth and sky; and after rain the direction of web is horizontal to the earth and sky. All the farmers of the Banda Jaipur village of Ranchi district in Jharkhand use this age-old practice. **Keywords:** weather forecasting, spider, web, vertical and horizontal, direction	Ms R. *Kandulna, Hawai* Nagar (*Merina* X-ray clinic), *Hatia,* (Jharkhand) 834 003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1983	Carrying of eggs by the ants as indicator of heavy rainfall	Prediction of rainfall is also done by observing the ants behaviour by the farmers of *Bisapur* village, *Mohkhed* block in Chhindwara district of Madhya Pradesh. A heavy rainfall is expected when the ants carry their eggs to other places. This prediction has an accuracy of 80–90% and is in practice since time immemorial by 1900–1500 farm families out of 2000. **Keywords:** carrying of eggs by ant, prediction of heavy rainfall	Shri Ranjay Kumar Singh Ph. D. Scholar (Agri. Extn.), C/o Dr C. B. Singh, Dean, College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
921	Rainfall prediction through *nialu* birds	It is believed that on a hot summer day, the chirping of the bird *nialu* near the water reservoir (pond) brings rainfall. This ITK is followed in various parts of Himachal Pradesh since time immemorial to predict rainfall. **Keywords:** bird *nialu, chirping*	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
922	Rainfall prediction through *matilari (Apus affinis)* bird	Agronomic practices like ploughing, hoeing, sowing and harvesting are done according to the weather/climatic conditions. Weather predictions are generally made by various skillful ways which are very helpful to the farming community. During the rainy season, farmers observe the *matilari* bird's seasonal migration. If this bird flies very high in the sky, the farming community predicts heavy rainfall occurrence. This ITK is followed in various parts of Himachal Pradesh since time immemorial for heavy rainfall occurrence. **Keywords:** weather prediction, *matilari* bird, seasonal migration, rainfall	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
923	Rainfall prediction through maina (Acridothers tristis) bird	Rainfall prediction is made by the specific activity of the bird. If the bird bathes in the water pond, it indicates that there will be rainfall within 1 or 2 days. This indigenous knowledge is very helpful for prediction about rainfall occurrence throughout the Himachal Pradesh since time immemorial. **Keywords:** *maina* bird, pond bathing	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
924	Weather prediction through theapiha bird.	During long hot days in summer if the cry of *theapiha* bird is heard, the people believe that god will quench its thirst and there will be rainfall after 1 or 2 days. The practice is in use by majority of the farmers in Himachal Pradesh for the last several years. Weather forecast from radio, T.V. etc are also followed. **Keywords:** weather prediction, cry of *theapiha* bird, quench, thirst, rainfall	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
925	Weather prediction through sparrow bird	A group of sparrow frolicking in the sand indicates that there will be rainfall that day or the next day, and if they are observed to be playing in water, it is believed that the weather will be dry for some days to come. The practices are in use by majority of the farmers in Himachal Pradesh for the last several years. Weather forecast from radio, T.V. etc are also considered. **Keywords:** weather forecast, frolicking sparrow, sand, rainfall, playing in water	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
927	Rainfall prediction through egg laying of tatihari bird	Weather forecasting is a good indicator about the rainfall onset, occurrence etc. or whatever may be weather in that particular area. Traditionally, farmers have certain good methods, which are very appropriate for weather prediction. These methods are also useful for deciding the suitable time for various agronomic practice like sowing, hoeing, basin preparation and harvesting. It the tatihari (lapwing) bird lays eggs on the higher portion of the field, heavy rainfall is predicted during the coming rainy season, but if the eggs are laid in the lower portion of the field, a drought is predicted. These birds never construct nest, but lay eggs on bare soil. This ITK is practised in most of the villages in hilly area of Himachal Pradesh since time immemorial. **Keywords:** prediction of rainfall, tatihari bird, eggs laying, higher and lower places	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
929	Rainfall prediction through *titar (Francolinus pondicerianus)* bird	If the colour of the clouds is similar to the wing colour of the *titar* bird, i.e. grey or black grey and strong eastern winds are also blowing, sure rainfall is predicted by the farmers. The clouds of a colour similar to that of the said bird are rain-bearing clouds, i.e of cumulonimbus type. This ITK practise is practiced throughout Himachal Pradesh to predict rainfall. **Keywords:** *titar* bird, cloud *clour*, wing colour, cumulonimbus	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1301	Fluttering of sparrow on dust: natural indicator of rain	Sparrow is very sensitive bird to changes in weather. When it sits on the dust and flutters its wings, this indicates that rain will occur within 48 hours. Its theory is that sparrow (*guraiya)* is very sensitive to changes in temperature and relative humidity. On this change it flutters its wings in groups on lukewarm dry sand.	Dr Tung Vir Singh, D-37, Medical College Campus, Meerut (Uttar Pradesh) 250 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: sparrow (guraiya), weather forecast, fluttering on dry lukewarm dust, rain forecast	
1689	Weather forecasting through nest	Villagers o f *Khaspokharia* village of west Singhbhum district in Jharkhand use bird nest for weather forecasting. In this practice, if birds make their nest in lower portion of the tree, it means heavy rainfall will occur; and if birds make their nest in upper portion of the tree it means low intensity of rainfall will occur in coming year. This is very common practice for last several years by majority of farmers in the village. **Keywords:** weather forecasting, bird, nest, rainfall	Shri *Sanat* Kumar *Sawaiyan,* Birsa Agricultural University, Department of Extension Education, Kanke, Ranchi (Jharkhand) 834 006
1980	Weather forecasting	Farmers o f *Chopan* village of Amravati district of Maharashtra make decisions on rain-related agriculture activities by observing the *behavioural* changes of birds, ants, trees and cloud as indicated below. 1. When *kokila* (black cuckoo) birds sing intensively in the night hours it indicates arrival of rains next day. 2. When ants move fast in the ant hill, it indicates arrival of rains in a day or two. When heavy rains are to arrive, a typical grinding sound is heard through the ant hills. 3. When green leaves sprout profusely, on *salai* (*Boswellia sarata)* trees, the rains are expected to be normal. 4. When winds move south-north direction continuously for three days then the rains are expected in next 2–3 days. **Keywords:** *kokila* bird, ant movement, *salai* tree, direction of wind movement	Dr O. P Ingle, Department of Extension Education, Dr *Panjab* Rao *Desmukh* Krishi Vidyapeeth, Akola (Maharashtra) 444 104
1982	Frequent dipping of *pandubby* birds as indicator of rainfall	The farmers of Bisapur village. Mohkhed block in Chhindwara district of Madhya Pradesh also predict the coming of rain by observing the behaviour of *pandubby* birds. The farmers believe that frequent dips made by these birds indicate the coming of rainfall, with an accuracy of about 70–80%. A total of 1400–1500 farm families out of 2000 are following this practice. **Keywords:** frequent dip by *pandubby* birds, indication for rainfall	Shri Ranjay Kumar Singh, Ph. D. Scholar (Agri. Extn.), C/o Dr C. B. Singh, Dean, College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
92	Method of weather forecasting by observing flowering in *khejri*	Weather forecasting by observing the number of flowers and fruits in *khejri* tree is practiced by the farmers of *Atiyasan* village of *Bhunduwa Panchayat* in Nagour district (Rajasthan). If there are more number of flowers and fruits in *khejri* tree, it is predicted that there will be heavy rain at night. This practice is in use for the several years. **Keywords:** weather forecasting, flowers and fruits, *khejri* tree, heavy rain, observing at night	Shri *Yugi* Ram, S/o Shri *Bhunda* Ram, *Athiyasan,* Nagour (Rajasthan)
94	Method of weather forecasting by observing flowering and fruiting of neem	Farmers of Balaya village of Mundva *panchayat* in Nagour district (Rajasthan) practice weather forecasting by observing the fruiting of neem and their ripening. If there are more number of fruits and maximum of them ripen on the tree, it is supposed that there will be heavy rain. If there is less number of fruits, low rain fall is predicted. This practice is being observed by the few farmers for many years. **Keywords:** weather forecasting, fruiting, ripening, heavy rain	Shri Ganga Ram, S/o Shri *Kisan* Ji, Balaya, Mundva, Nagour (Rajasthan)
931	Weather prediction through *rhejri* tree	If the *rhejri* tree bears good fruit in a particular year, the farmers predict good rainfall during the next rainy season and vice-versa. This practice is followed by majority of the farmers in the state of Himachal Pradesh to predict weather for the last several years. Weather forecast on radio, T.V. etc. are also followed by the farmers. **Keywords:** weather prediction, *rhejri* tree, fruiting	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1690	Palash *(Butea monosperma)* for weather forecasting	Generally flowers appear in palash tree in February and March. By observing the number of flowers in palash tree, weather forecasting is done by the villagers of Toro of *Manjhari* block in West Singhbhum district (Jharkhand). If there is a single flower in the top of the tree, it is supposed that there will be no rain. If there is more flower it means heavy rain will occur. Another method of weather forecasting is also used in which they observe the seed setting in the palash fruit. Generally three seeds are present in a fruit. If all are present, it is supposed that normal rain will occur. If first one is absent, it means monsoon will be late. If second one is absent, no rain in the middle of the rainy season (*Sawan)* and if third one is absent it indicates no rain in the third phase (*Bhado)*. This wisdom of weather	Shri Sanat Kumar Sawaiyan, Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

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		forecasting is in use from last several years. **Keywords:** palash (Butea monosperma), weather forecasting, observing number of flowers, seed setting	
1691	Tamarind fruits and mahua flowers as weather indicators	When stored tamarind and mahua softens, it indicates incoming of rains shortly. Tamarind and mahua are hygroscopic, due to presence of sugar, which absorbs moisture from the atmosphere in humid conditions, it indicates rainfall. This 20 year old practice is followed by 62% farmers in the *Dakari* and Ashanpahari villages of Dumka district in Jharkhand. **Keywords:** tamarind fruit, mahua flower, weather, hygroscopic	Shri Veeresh Kumar Department of Extension Education, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006
1985	Occurrence of rainfall by observing peepal tree.	Farmers of Chhindwara revealed that the fall down and turning blackish colour of peepal leaves is an indicator of rainfall. Accordingly they decide their farming operations. Over the years it was found to be approximately correct. **Keywords:** peepal leaf, indicator, rain fall.	Shri Ranjay Kumar Singh Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
1986	Flowering of kanse weed as indicator of end of rainy season.	To take decision on farming practices based on rainfall, farmers of Chhindwara (MP) use their wisdom of observing flowering habit of *kanse* weed. It is believed that when the weed starts flowering, end of rainy season is indicated. **Keywords:** *kanse* weed, rainfall forecast.	Shri Ranjay Kumar Singh Ph. D Scholar (Agril. Extn.) C/o Dr C B Singh, Dean College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
926	Rainfall prediction through leaches	Traditionally farmers have certain methods which are very appropriate for weather prediction. These methods are also useful for deciding the suitable time for various agronomic practices to be performed. If the *jonks* (leaches) are immobile/stationery at the water surface (pond), the dry weather is predicted. But if they move rapidly in the upward and downward directions then rainfall is predicted. This ITK is practised in most of the villages in hilly areas of Himachal Pradesh since time immemorial for weather prediction. **Keywords:** rainfall prediction, leach, stationery in water surface, movement in water	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1981	Jumping of fish as indicator of rainfall	The farmers of Bisapur village, Mohkhed block in Chhindwara district of Madhya Pradesh observe the behaviour of fish to forecast weather. The farmers believe that when the fish start jumping, it indicates good rain. This practice has 70–80% accuracy and has been in practice since time immemorial. About 1400–1500 farm families out of a total of 2000 are following this practice. **Keywords:** jumping of fish, weather forecast, good rain	Shri Ranjay Kumar Singh Ph. D. Scholar (Agri. Extn.), C/o Dr C. B. Singh, Dean, College of Agriculture, C2 Krishi Nagar Colony, Adhartal, Jabalpur (Madhya Pradesh) 482 004
920	Cloud and wind direction	Farmers/people predict weather after observing the accumulation of clouds in the south-east direction in a layered form accompanied by wind blowing from the southern direction. In such an event it is claimed that there will be rainfall within a day or two. This ITK is practised throughout the Himachal Pradesh to predict rainfall from the last several years. **Keywords:** cloud, wind direction, rainfall prediction	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1685	Forecasting of rain by wind direction	People of Bara *Baghmara* village of Dhanbad district in Jharkhand forecast of rain with the help of wind direction. According to the villagers, if wind is blowing east to west, it confirms that heavy rainfall occurs after a few days. This is practised for last several years by 75% of families in the village. **Keywords:** forecast, weather, rainfall, wind direction	Shri Maheswar Mahto Bara Baghmara, Govindpur, Bagsuma, Dhanbad (Jharkhand)
1978	Weather forecasting through weather change	During the first fortnight of June the farmers observe the weather. When there are clouds in the sky, seasonal winds blow from West to East and *mriga nakshatra* starts, the farmers are also able to forecast the weather. The rain will start soon. As much sun heat is there in sun rays as much rain will occur is the forecast by the farmers. Farmers also reported that there is heavy/adequate rain on every fifth year and the remaining four remain with less rainfall. **Keywords:** seasonal winds, *mriga nakshatra,* wind blowing from west to east, forecast of rain	Shri Subhash Mahadevrao Vankhede, Borala, Arala, Amaravati (Maharastra)
95	Prediction of sowing period for gram as per *nakshatra*	*Borunda* farmers are cultivating gram during *Chitra nakshatra.* This experience or prediction period during *Chitra nakshatra* for gram sowing is being followed for hundreds of years. *Chitra nakshatra* usually appears in aswina (October). By doing so, chances of frost also become less, and chances of	Shri Ratan Singh, *Borunda* Jodhpur (Rajasthan) 342 604

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		occurrence of wilt in gram will become less. Seed germinates properly. They are being observing *Swati* nakshatra for wheat sowing, which appears in *Kartika* (November). This ITK is an indicator of time for gram sowing. **Keywords:** weather forecasting, gram sowing, nakshatra	
919	Rainfall prediction through sun or moon	Traditional weather forecasting methods are visible spectrum around the sun very significant for the prediction about and the moon the onset, occurrence and receipt of the rainfall. These predictions are also useful for the farmers to decide the appropriate time for sowing and harvesting the crops. People predict weather after observing the visible spectrum around the sun or moon. If the spectrum around the sun has a greater diameter than that around the moon, they predict rainfall after a day or two. It is also believed that if the spectrum around the sun has a larger diameter, then rain is sure. This ITK is practised throughout Himachal Pradesh since time immemorial. **Keywords:** visible spectrum, sun, moon, weather, forecasting rain	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
932	Rainfall forecast through white rings encircling the moon	The ring encircling the moon indicates the occurrence of rainfall which is helpful for the farming community for deciding the appropriate time of sowing and harvesting. There is a famous saying in the hilly region that "paniyar padda door, barish hogi jaroor", i.e., if the rings encircling moon is at greater distance, it indicates that rain definitely would come. White ring encircling moon in the night is visible by the naked eye. This ITK practise is simple and is followed since time immemorial in the hilly areas of Himachal Pradesh. **Keywords:** rainfall prediction, white ring, moon	Shri Rajinder Rajan Rajan Tyre Service, Theog, Shimla (Himachal Pradesh) 171 201
1300	Indicators of rain	Forecast of rains is made by the villagers with the following indications: 1. Water hull around moon is indicator of heavy rain. 2. High rainfall-High activities of birds in Shravan month and laying of eggs by tatihari bird at higher elevation. 3. I t the millipeds come out of the soil, it indicates forthcoming rains.	Shri Mahabir Singh Village Datrath, Communicated by Zonal Coordinator, ZCU, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: water bird, hull around moon, egg laying, *milliped,* tatihari	
93	Method of weather forecasting by observing behaviour of insects, animals, birds and the moon	Farmers of Athiyasan village of *Bundwa* panchayat in Nagour district (Rajasthan) predict the occurrence of rain by observing the behaviour of ants, goats, birds and the moon. If ants come out from their mound, holding eggs; goat wants to go toward wind; or birds bath in soil; or if there is foggy ring appearing around the moon, all these help in predicting the occurrence of rainfall. This method of weather forecasting is in use for the last many years. **Keywords:** prediction, occurrence of rain, observes, ants, goats, birds, the moon, behaviour, holding eggs, foggy ring	Shri *Lakha* Ram S/o Shri *Narsingh* Ram, Village Athiyasan, P.O. Mundva, Nagour (Rajasthan)
96	Weather forecasting in Thar desert	The useful parameters considered in weather forecasting are: 1. If khejri (*Prosopis Sineraria)* or neem (Azadirachta indica) drops flowers before setting fruits it considered as a sign of poor crop in the coming season. If the tender leaves at the top of neem and khejri tree wither during periods of high humidity, chance of rainfall is more. 2. If *bargad* (Ficus *benghalensis*) bears hanging roots or there is a emergence of roots before monsoon to a length of 9–12 inches, rains may be expected in 2–3 days. 3. If chameleon (*girgit)* changes its colour to sky blue, there is a chance of rain in a short period. **Keywords:** weather forecasting, khejri, neem, *bargad, girgit*	Shri Z. D. Kavia Principal Scientist, Agriculture Extension, CAZRI, Jodhpur (Rajasthan) 342 003
287	Indicators for prediction of rainfall	Almost all the families of Bahichard village in Midnapore district of West Bengal observe the following for prediction of rainfall. 1. Rain will come very shortly when there is a circular ring of white rays called *parash,* at some distance from the moon. Rain will be delayed when the ring is very near to the moon. 2. Rain will occur shortly when the small black ants come out of their nests in earth. 3. Rain will occur in near future when earthworms roll on dry earth. 4. Rain will fall if a housefly bites a man. 5. Heavy rain is expected with heavy wind if black	Dr R.K. Manna, Scientist, CICFRI, 22 (1031), 80 Ft Road, *Rajajinaga*r, Bangalore (Karnataka) 560 010

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		cloud forms in north-east corner of the sky in late *Chaitra* or early *Baishakhi*. 6. It is good for the country if there is rain in the last part of the month *Magha.* **Keywords:** black ant, housefly, cloud in north-east sky	
288	Forecasting of rain	Forecasting of rain by the villagers of Karamadai block in Coimbatore district in Tamil Nadu are as follows: 1. Moth fly is plenty. 2. Frogs make continous noise. 3. Entry of ants is seen in all item of food. 4. Lightning in the north-east corner of the sky. **Keywords:** moth, frog, ant, lightning, north-eastern sky	Shri S. Athithan, Training Associate (*Agri.Engg*.), Krishi Vigyan Kendra, Vivekanandapuram, Coimbatore (Tamil Nadu) 641 113
428	Colour of flower and fruit setting of badhi for forecast of rainfall  Badhi—A plant used for forecasting rainfall	The time of occurrence or onset of monsoon is assessed based on the colour of the flower and the position of seed in the fruit of *badhi* plant. It bears white flowers, which is the indication of approaching rain. If the seed inside the fruit is present near stalk end, it indicates late occurrence of rain. If the seed is present in middle position, the rain occurrence will be normal. If it is in the apex end of the fruit, there is a chance of early occurrence of rain. **Keywords:** rain, *badhi* plant, seed position in the fruit, colour of flower	Shri Rama *Khora, Tentoligudo,* Koraput (Orissa)
429	Movement of crabs as indicator of rain and flood	If the crabs crawl towards hill area from river water, this is the indication of heavy rain and there is chance of occurrence of flood in that particular river. **Keywords:** rain, crab, crawl, hill	Shri Pati Toila, Gopalput, Koraput (Orissa)
430	Rainfall forecasting by observing flowering pattern in Asparagus racemosa	Pattern of rainfall is judged by observing the sequence of flowering in *deobadin* plant (Asparagus racemosa), follows: 1. Flowering from base to top: There will be rain throughout the rainy season covering all the months. 2. Flowering from base up to middle: There will be rain in the first half of the season	Shri Pati Toila, Gopalput, Koraput (Orissa)

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		3. Flowering in patches from base to top of the plant: Sporadic rain throughout the rainy season. About 50% of the people predict rains by observing these symptoms. **Keywords:** Asparagus racemosa, flowering pattern	
563	Method of weather forecasting	Farmers observe tobacco and jaggery during summer. When these starts becoming moist, it is an indication that rain will come. Tobacco and jaggery become moist when humidity increases in atmosphere, indicating the arrival of rain. **Keywords:** tobacco, jaggary, weather forecasting	Dr. Nirmal Chandra and Ms *Deepa* Pandey VPRAS, Almora (Uttaranchal)
934	Weather forecasting methods	The following indicators are used in prediction of rainfall. 1. Rain will not occur if clouds are white dull coloured. 2. I f the clouds are dark black and there is no wind, these are the symptoms of rain clouds. 3. If the clouds are dark black and wind is blowing with changing speed and direction, the rain will be there after some time. 4. If clouds are red and wind is blowing, there will be no rain. 5. If the clouds move towards Mandi, there will be sure rain in 1 or 2 days. If the clouds move towards Kullu, there will be no rain for 1 month at least. 6. I f rainbow is visible, there will be no rain for 1 month. **Keywords:** white dull coloured clouds, dark black clouds, red clouds, direction of cloud movement, rainbow	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)
1303	Climbing of black snake in tree is indicator of heavy rain	When black snake climbs up the tree, it is an indicator of heavy rain as followed by the farmers of Nayabas Kutubpur and near by villages of Bulandshahr district of Uttar Pradesh. **Keywords:** black snake, tree climbing	Shri Prem Pal Singh Arya C/o Shri Daal Chand, House No.38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1304	Natural indicators of rain	Prior indication and prediction of rain help the farmers to take appropriate decision on the farm *activities.When* a house bird *(gauraiyya)* moves its wings while sitting on the sand, it is the indication that rain will be there within short *time.This*	Shri Prem Pal Singh Arya C/o Shri Daal Chand, House No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)

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		 Natural indicator of rain–sparrow frolicking in sand information has been reported from *Nayahar Kutalapur* village of *Buland Shahr* district (Uttar Pradesh). **Keywords:** house bird (gauraiyya), indication of rain	
1305	Transfer of eggs by ants as indicators of heavy rain	Prior indication and prediction of rain helps the farmers to take appropriate decisions on the farm activities. Ants transfer their eggs from one place to another. It is a sign of heavy rain, as followed by the farmers of Nayabas Kutubpur in Bulandshahr district of Uttar Pradesh. **Keywords:** ants, transfer of eggs, heavy rain	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No. 38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1686	Methods of weather forecasting	People of Jharkhand still now depend on their traditional weather forecasting techniques, eg. weather forecasting techniques by seeing the cloud, by hearing the sound of frog and *gingur* (grass-hopper) and by seeing the buds of mango. It is reported that certainty has been observed in 90% of the cases. **Keywords:** weather forecasting, techniques, cloud, sound of frog and *gingur*, buds of mango	Er Karma *Kachchap,* Director, Jan Vikas Kendra, Near Jain Petrol Pump, Hazaribag (Jharkhand) 825 301
1687	Bio-indicators for weather forecasting	Ants come out from the ground holding eggs in mouth and running to all directions in search of safe place. This indicates that rain will come within next 8 hours. This wisdom is being used by farmers of Jharkhand for last several years and no any modification has been made. **Keywords:** bio-indicator, ant, come out from ground, run in to and fro direction, rainfed condition	Shri Sanat Kumar Sawaiyan, Department of Extension Education, Ranchi Agricultural College, Birsa Agricultural University, Kanke, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1688	Methods of weather forecasting by observing changes in behaviour of insects, plants and weather	Signs of nature are keenly observed, which act as indicators in Bara *Sigdi* village of East Singhbhum district of Jharkhand in weather forecasting; these are indicated here. 1. If stored chickpea, ripe mahua flowers and ripe tamarind fruits soften, it will rain within a week or two. 2. If bundles of stored sal leaves become soft, it indicates rainfall within 3–5 days. 3. If wind blows from east to west direction for 3–4 days, it will rain within 7–8 days. 4. If crickets in a group of 10–12 are seen in branches of trees and moving like bees, it will rain within 24–26 hours. 5. In dry soils, if white ants are seen lifting moist soil from within, it will rain within a week. 6. Palash tree bear fruits having three seeds. If the fruit has all the three seeds intact, rainfall will be adequate and crop yield will be good. If the first and last seeds are present while the middle one is missing, the initial and late rainfall are sure. If the first seed is missing and the other two are present, there will be no rainfall at the beginning of the monsoon period. And if first two seeds are present while last one is missing, there won't be rainfall at the end of the rainy season. 7. During sowing of paddy if top portion is eaten by the weevil, early rainfall occurs. If the end portion is eaten up by the weevil, late rainfall is predicted; and if middle portion is destroyed by them (weevils), mid-season rainfall will occur. 8. If rainbow is seen in western sky, heavy rainfall is predicted. 9. If clouds come from north-west direction, heavy rainfall occurs, and if clouds come from eastern direction, less water for a few days and more disease occurrence is predicted. 10. After 15 January, a bird known as *chora or piyo* (local *santhali* language) found in jungle makes 'tring-trong' sound, intermittent rainfall occurs but if makes long sounding note, heavy rainfall occurs. 11. If *bagula* (crane) drops its egg on ground, it is believed that there would not be rain for about a month.	Shri *Sideshwa*r Secretary, *Paryavaran Chetna* Kendra, Bara *Sigdi, Potka*, East *Sighbhum,* (Jharkhand) 831 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: rainfall, forecast, insect, plant, weather, chickpea, mahua, tamarind, sal, wind, cricket, white ant, palash, chora/piyo, crane	
1979	Method of rainfall prediction by observing *titahari* eggs	If four eggs of *titahari* birds are found together at one place, it is observed that all the four months of rainy season get rains. **Keywords:** *titahari* eggs, prediction of rain during rainy season.	Shri Swami *Triptanandj*i C/o Shri R.K. *Mehra, Tulsinagar, Ranjh*i, Jabalpur (Madhya Pradesh) 482 005
1984	Prediction of rainfall	The receipt of rain is predicted based on heavy occurrence of dragon fly insect, dancing of peacock in the farm area, flying o f *carcoche* birds in big groups, heavy lightning towards eastern side, reddish colour strips on eastern side in between late night and early morning and blowing of winds from south-west side. Approximately 70% of farmers i n *Nanaj* village of North Solapur district of Maharashtra follow this practice. **Keywords:** weather forecasting, receipt of rain, dragonfly, peacock, *carcoche* birds	Chief Scientist *AICRP* for Dryland Agriculture, *Krishak* Bhawan' Near *DAV* College, Solapur (Maharashtra) 413 002
2212	Indigenous methods of weather forecasting	If wind blows from east, it implies that cyclone/depression is going to occur. If wind blows from south-east, it is good for pulse crops. If the young calves run with a joy lifting their tails indicates occurrence of rain based on their experience and weather situation the crop management is done. **Keywords:** weather fore casting, wind blowing	Shri *G.Chandra* Sekhar Progress 12–13–626, Nagarjuna Nagar, Tarnaka, Hyderabad (Andhra Pradesh)
2286	Methods of weather forecting	Widely believed methods of weather forecasting based on indigenous knowledge of Jaisalmer district in western Rajasthan are the following: 1. Climatic behavioral changes as weather forecasting Western and southwestern wind-blowing of south-western wind indicates no rain in future, famine is predicted. Wind and clouds-rumbling of clouds on first day after end of May no rain during July and August. 2. Vegetational behaviour changes as weather forecasting Blooming and fruiting of local trees: khejri (Prosopis cineraria), and neem (Azadiracta indica). Under normal fruiting /more than normal fruiting, normal or surplus rainy year is predicted. *Bordi (Zizyphus nummularia)* fruiting in odd season: good year.	Dr L.P. Bharara Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan) 342 003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		3. Animal/birds behavioral changes as weather forecasting: Among animal, if village bulls move around the village, rain is certain. Howling of jackal during daytime indicates great famine. 4. Belief on folklore: On *Dooj* night going by chance to friend house for asking something, if he refuses it will be drought, but if he gives happily, it indicates good year. **Keywords:** weather forecasting, bird, animal, climate behaviour	
1322	Method of weather forecasting	Different weather forecasting methods are followed in the villages of Potka, *Jamshedpur, Mushabani, Dumria* and *Patamda* blocks in east Singhbhum district (Jharkhand) which are as follows: 1. Fruit of palash (Butea monosperma) has three seeds, which are set in row. If all three are present then it is supposed that rain will occur normally in that year, If first seed is absent and second and third are present then it is supposed that rain will not occur in first phase of the year. If second seed is absent, no rain in second phase and if third seed is absent, no rain in third phase and influence on yield of rabi crops. 2. Chickpea or tamarind, which are kept in house if becomes soft then rain will occur within a week. 3. If the bundle of dry *sakua* leaves become soft then the rain will occur within next 3 to 5 days. 4. Black ants if run in a row with holding eggs in mouth, indicate the occurrence of rain within next 3 to 5 days. 5. If *haron* drop her eggs on the ground, there will be no rain in that month. 6. A wild bird known as *raat* chora, when sounds ting *toda*, it indicates discontinuous rain, when it produce long sound it means heavy rain will occur. 7. Wind blows from east to west indicate the rain occurrence within next 7–8 days. 8. When the moon is encircled by foggy ring and stars also seen under the circle then the rain may occur within next 1 or 2 days. 9. If *jhingur* (grass hopper) are in a group of 10–12 then it is supposed that rain will occur in next 24 hours.	Paryavaran Chetna Kendra, Polka, East Singhbhum (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		10. Appearing of rainbow in west indicates heavy incidence of rain. 11. Cock is made to fly. When cock fly in one particular direction then it is supposed that rain will occur in that direction. When cock fly in curb or circle then it is supposed that rain will also occur as cock fly. 12. If termite carries wet soil from the dry area it indicates the occurance of rain within a week. **Keywords:** fruit of palash, chickpea, tamarind become soft, handle of sakua leaf, black ant, holding eggs by mouth, heron drop egg, wild bird, raat chora, wind blow east to west, f*ogy ring, rainbow, cock, termite, jhingr.*	

17

Fuel Management

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
938	Fuel wood for *chulha*	Wood, cowdung cakes, maize *dande* (stalks) and other thin woods are used in *chulha*. Wild trees are also planted in the pasture lands and bunds which are dual purpose. Their leaves are used as animal fodder whereas wood is used as fuel. **Keywords**: fuel wood, cowdung cake, fodder-cum-fuel wood trees	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
1694	*Jalawan* fuel management	A majority of villagers of *Sindega* district in Jharkhand use dried leaves, dried cowdung and dried wood as fuel to cook meal, parboiled rice, and protect them from cold. Dried leaves and dried cowdung are used in summer for at least 3 month and for rest period they are used as fuel. Fuel of leaves and cowdung is stored in gunny bag or basket and kept in the house. Wooden fuel is kept either in house or kept on tree to protect it from termites and rain water. This fuel is being used for the last several years and there are no any alternatives for villagers. **Keywords**: dried leaves, dried cowdung, wooden fuel, parboiling, cooking meal, gunny bag, basket	Shri Mariyana Guryiya Simdega Dumertoli, Simdega, Simdega (Jharkhand) 835 223
1696	Fuel management from forest harvest	In Simdega district of Jharkhand in the forest area wood is generally used as fuel by all villagers. Wood is collected from forest and dried by using following practices: 1. Woods are kept on the platform made of rocks (pillar) and wooden beam. 2. Woods are kept on big plat rock. 3. Woods are kept on the tree. These practices save the fuel wood from rain and termites. **Keywords**: forest, wood, dried, platform made of rocks and beam, big plat rock	Shri M P Surin, Bano, Simdega (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
431	Traditional method of using coconut plant by-products for fuel	To prevent wastage, farmers of Sumana Sasan village in Khurda district of Orissa, utilize coconut plant by-product like left inflorescence and boot leaves and old branches often harvested as fuel. Leaves and shells are sun-dried and stored in bundles in the outer *varandah* at the rear side of the house for use as fuel during rainy season and when required. These are covered with dry branches of coconut to prevent from seasonal hazards. For the past 50 years this is in practice, which is followed by all the families in the village. Some families also use *chakunda*, *deodar* and other tree branches and kerosene as fuel. **Keywords**: coconut by-product as fuel, *deodar*, *chakunda*, kerosene	Ms Bishnupriya Mishra, Training Associate (Agri. Extn.), Krishi Vigyan Kendra, Bhanjanagar, Ganjam (Orissa) 761 126
432	Use of cowdung cake as fuel	Fresh cowdung, collected from the farmyards or at village road-side is made into round-shape balls and pasted on the backside of wall. After drying they are used as fuel. As the purchasing power of the farmers in the village is very low. It is used as fuel and is available locally. Cowdung is being used as a fuel since ages in the Danda Mukundaper village of Puri district in Orissa. **Keywords**: cowdung, fuel	Shri Bishnupriya Mishra, Training Associate (Agriculture Extension), Krishi Vigyan Kendra, Bhanjanagar, Ganjam (Orissa) 761 126
433	Use of *Sesbania* sticks as fuel wood	Branches of *Sesbania* spp. which is grown on the field bunds, are cut during July/August and used as green-manure for rice and the plants are harvested in October for fuel wood purpose. By this practice farmers obtain fuel-wood as an additional source. Wood obtained from one plant is sufficient to cook food for 1 day for a family of five members. **Keywords**: *Sesbania*, fuel wood, green manure	Shri M. Mohanty, Senior Research Fellow, NATP (RRPS), Agroforestry Wing, Directorate of Research, OUAT, Bhubaneshwar (Orissa) 751003
1695	Use of gul as fuel material prepared from coal dust	*Gul* is prepared from coal dust and is used as fuel material for cooking. In this practice, the coal dust is mixed with soil, cowdung and starch with the help of water. A small ball is prepared and dried under sunlight and stored in an plastic coated bag or earthen pot. This is in practice for last 50 years by 75% of farm families in the Chota Ambona village of Dhanbad district of Jharkhand. **Keywords**: *gul*, coal dust, soil, cowdung, small ball	Shri Kangali Soren, Ambona, Nirsa, Dhanbad (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2213	Fuel management	Country wood, palm leaves, barks, twigs, wood of tamarind and *babul* cut into pieces dried under sun and stored in a covered place.These are used as a fuelwood in all seasons. Most of the villagers are using wood stoves occasionally charcoal chullahs. **Keywords**: fuel, countrywood barks, twigs, tamarind	Shri C.Bhaskar Rao, 38–13–11/1, Lakshmi Nagar, Marripalem, Vishakapatnam (Andhra Pradesh)
289	Use of fire wood for cooking	Using firewood for cooking is an age-old practice. Fire wood from the forest or trees is used as fuel. Mud stoves can be prepared easily at any time and anywhere to make it possible for cooking. One or two mud stove can be made with separate provision for *chimney*. Fire-wood cooking is considered as an age-old practice. Within 2–2½ hours cooking can be done. **Keywords**: fire-wood, cooking, forest, mud stove	Shri R. Radha, Betamugalam, Galligattam, Dharmapuri (Tamil Nadu)

18

Thermal Efficiency

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
292	Use of wood stove (*chullha*) in tribal areas	All tribal villagers of Karamadai block of Tamil Nadu are adopting the method mentioned here. A wood stove (*chullha*) is used to prepare food items speedily by using fire wood available in their fields. Mud *chullha*, bricks, sand, cement and cowdung paste are the materials uses for making wood strove. About 50% of time, fire-wood and energy are saved by this method. The cost of the implements is Rs 150. **Keywords**: wood stove (*chullha*)	Ms Gowri Adhitya Training Associate, Shri Avincashilingam, Vivekanandapuram, Karamadai, Coimbatore (Tamil Nadu) 641 113
293	Design and fabrication of portable single-pan, improved, high-efficiency wood-stove for domestic and industrial application  Portable single pan wood stove	Design and fabrication of portable single-pan wood-stove with high efficiency could be put in use both for domestic as well as industrial applications. The present design and fabrication of the improved wood-stove is a low-cost device. The stove is cylindrical in shape and made up of mild steel of thickness 2 mm. It is divided into two chambers, called combustion chamber which is located in the central part of the stove, and annular surface surrounded by combustion chamber called air-flow chamber. The air-flow chamber is conical in shape. There are two types of air control valves available to regulate air supply. The primary air control valve, is directly joined to the combustion chamber to enrich the combustion rate. The secondary air-control valve, is joined to the air-flow chamber and the air is passed to the inlet of the combustion chamber from the top. The secondary air from the air-flow chamber increases the flame temperature at the top of the combustion chamber and exits from the air-flow chamber. It also burns the unburnt combustibles. The height of the combustion chamber from air nozzle to grate is about 12 cm. The grate is placed in the middle of the combustion chamber. The fuel or wood is loaded in the grate up to the level of air nozzle. The bottom of the grate has an iron-wire mesh, which is used to retain heat in the combustion chamber, where the wood is placed. The primary air passes between the	Shri I. Sulthan Sikkanther S/o Shri Y. Ismaeil, 50, Staff Quarters, Telephone Exchange Melur, Madurai (Tamil Nadu) 625 106

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		grate and the iron-wire mesh through primary air control valve. The area below the iron wire-mesh is known as the ash pit. The ash and the residuals from the combustion chamber drop in the ash pit after burning and can be removed easily. The stove is placed on the base of an iron stand. Field level use of improved wood-stove at Guru Match Industry at Sivakasi, Tamil Nadu proved that the cost of wax melting costs per month has gone down to Rs 450 from Rs 1000. **Keywords**: domestic application, industrial application, single-pan wood-stove	
435	Smokeless chullha	Smokeless *chullha* made of red mud and tin-metal chimney has 2 openings for cooking and an outlet for smoke to let off. Two items can be cooked at the same time. Therefore, the consumption of fuel is less. Smoke outlet opens to the roof, thereby reducing blackening of utensils and darkening of walls; no suffocation due to carbon monoxide and carbon dioxide and risk of fire is avoided in thatched houses. Charcoal stove (*sigri*) is used by heating wood. This stove has one opening at the base to release ash. The chulha is being used for the last 5 years in Mudulipalli village of Ganjam district in Orissa. **Keywords**: smokeless *chullha*, charcoal stove	Ms Saswati Parichha Training Associate(Home Science), Benakunda, Ganjam (Orissa) 761 126
436	Small-wood chullha	Special type of small wood *chullha* is made of long cast-iron pipe (inverted), square shaped with two openings. In this, small amount of wood is consumed, generating high thermal power to the users, with less smoke. It takes less time for cooking and is being used in the Bagdia village in Angul district of Orissa. **Keywords**: wood *chullha*, cast iron	Shri Binod Bihari Ghuntulipasi, Angul (Orissa) 759 124
944	Fuel management	There is very low temperature in hilly areas, therefore fire or *angati* is essential in home to warm up the room. For its management, following technique is followed. 1. For making coal from woods, *moru* woods are kept in 3 ft deep pit and waste materials are put on it and fired. Then whole pit is covered. A hole is left in cover for passing air. Coal is prepared within 8–10 days. Quality coal is used to warm up the room and other is used in *angati*. **Keywords**: *angati*, warm up the room	Shri Chet Ram Dhani Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
945	Use of domestic *chullha* and *angithi* for warming	Domestic *chullha* is used continuously for two months during November-December. Without these chullhas life during snow fall is very hard. *Chullhas* are of many kinds: 1. *Dhalan wale* (Iron triangle): These *chullhas* consume more wood but give more heat. Every house had these chullha 8–10 years back. 2. *Dhanladhar:* These consume less fuel, produce less smoke and less pollution. These were very useful but are not in use these days. 3. *Tandoor:* It is a box type of iron plate, which is closed from all sides and at one end a door is opened for placing wood. It is costly. It has a long pipe which sucks smoke outside. It consumes more wood but keeps room clean. It is being used these days. 4. *Bhattidar:* It is quite cheap and less expensive. It is made by house wives with clay soil and cow dung. It consumes less wood. More cooking can be done with less fuel. It is very useful. 5. *Angithi:* This is made of iron plate and is used for warming. Charcoal is used as fuel in this. It is used in cities and towns. Villagers do not like it as charcoal is not available in the villages. Secondly, it produces gas which is not liked by villagers. Usually, in villages chullhas are used for warming also. **Keywords**: domestic *chullha*, *dhalam wale*, *dhanladhar*, *tandoor*, *bhattidar angithi*, housewives	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
946	Traditional wood stove known as tandoor	The *tandoors* are made of tin/iron; are flat or have half portion raised; fitted with a pipe for smoke with outlet at the top of roof. It is in practice for cooking as well as heating the room and is very economic. This is in practice for long and is used by every farmer in the village. This practice is best suited to climatic and socio-economic conditions of the state. **Keywords**: *tandoor*, tin/iron, cooking, climate, socio-economic	Shri Mohinder Singh, AES, Entomology, KVK, Kinnaur, Kinnaur (Himachal Pradesh) 172 107

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1697	Wooden *chullha*/earthen *chullha*	In rural areas of Boro block in Ranchi where most of the houses are made of soil earthen *chullhas* (stove) are used. Earthen *chullha* is simple and made of red or clay soil. Flame can be controlled by inserting or exiting the wooden fuel in mouth of *chullha*. There may be one or two or three openings on the *chullha*, on which cooking is done. This earthen *chullha* is in use for the last several years without any modification. **Keywords**: red or clay soil, flame, control, inserting, wooden fuel	Ms B. Ekka Qr. No DT 1327, P.O. Dhurwa, Ranchi (Jharkhand)
1698	*Bhussi* or *kunni ka chullha* (saw dust or paddy husk stove)	*Bhussi* (sawdust) and *kunni* (paddy husk) are easily available in homes of villagers of Gadgaon village of Bero block in Ranchi district (Jharkhand). They are using these materials as fuel. Body of the stove is made of iron sheet or soil. A mouth is made in the side of the body of stove. Pipe is put in the standing position at the center of the stove and saw dust or paddy husk is tightly filled around the pipe and then pipe is removed from the stove. It creates a hole made in the centre. After that another hole is made by hand from the mouth of the stove such that it open in the previous hall. Then it is fired at the mouth of stove. Flame goes through the hole and comes out from the upper side of the hall and heats the pan kept on the stove. **Keywords**: *bhussi*, *kunni*, iron sheet or soil, pipe	Ms B. Ekka Q.No DT 1327, P.O. Dhurwa, Ranchi (Jharkhand)
1989	*Wooden chullah*	The indigenous *chullah* is made by the farmers with the local soil, but sometimes with bricks, stones, lime with iron rods also. It gives 90% energy (heat) utilization. It is made up of different kinds costing from Rs 20 to Rs 200. **Keywords**: *chullah*	Shri Randhir Singh Bais Shahpur, East Nimar Khandwa (Madhya Pradesh)
2216	Use of *pontha chullha*	A mud *chullha* with two pot seats is constructed with one fire place. While food on the first pot seat where fire wood is placed the heat generated is used at the second pot seat. It is having higher thermal efficiency and some of the heat generated at the first pot seat is disseminated to side. **Keywords**: *pontha chullha*	Shri Doodam Rathamma C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505 122

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1748	*Do achiya chullha*	Villagers of Simdega *Dumertoli* village of Simdega district of Jharkhand have been using *kaccha chullha* (earthen stove) to cook meal and paraboil the rice. Stove is prepared by kneaded red soil. There is a mouth, through which wooden fuel is inserted and one or two openings *(do achiya*) are made on the upper side through which flame come out. Pot or pan is kept on the opening s for heating them and cooking food or parboil the rice. *Kand-mool* (tuber root) is cooked/fired on burning charcoal in stove. Wood, paddy husk, dried leaves and straw are used as fuel. This type of stove is in practice for the last several years without any modification. **Keywords**: *kaccha chullha* (earthen stove), cook, meal, para boil, knead, red soil, wooden fuel	Shri Mariana Gudiya, Simdega Dumertoli, Simdega, Simdega (Jharkhand) 835 223

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Waste Water Management

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
295	Waste water utilization	Water from street ditch is diverted to banana plantation for irrigation purpose. Some farmers are practicing this in this village **Keywords**: street ditch water, irrigation, banana	Shri Kariyan S/o Shri Mariyappan, Vengode, Kallakuruchi, Villupuram (Tamil Nadu) 606 207
		 Waste water utilization in banana cultivation	
296	Waste water management	To use waste water from kitchen, wash basin and bathroom, construction or digging of *kuzhi* (hole) is found to be very effective. *Kuzhi* is dug to a required depth and width at a point closer to the kitchen to collect water and it is closed with wooden slab. After waste water is coolected, filtered water is allowed to be used for plants, especially for banana or other kitchen garden plants. The deposit at the bottom of this *kuzhi* is also considered as manure for crops. **Keywords**: waste water management	Shri Gopal Samankottai, Kotturmalai, Palacode Dharmapuri (Tamil Nadu)
947	Use of waste water for irrigation	Waste water of hand pump is directed to a specially constructed pit (water reservoir). The stored water is used for small irrigation at the time of drought. In this way waste water does not create any dirt filthy place. **Keywords**: hand pump, collection of water, irrigation	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1307	Use of waste water in salt affected soils	Water of city drainage system has rich nutrients to grow crops required in salt-affected spills. Farmers use water of city drainage system for raising crops in salt-affected soils in Jhuljhulli village, Nazafgarh, Delhi, **Keywords**: city drainage water, irrigation, salt-affected soil	Shri Parmjeet Singh, Jhuljhulli, Nazafgarh,New Delhi (Delhi)
1699	Soakage pit for proper disposal of waste water	Stagnant pools of waste water around houses are creating health hazard and becoming breeding places for mosquitoes. In this practice, soaking pits are dug near the drain outlet of house. Stones of large, medium and small sizes are put at the bottom of the pit, so that water is absorbed in the sub soil. It is used for irrigating the kitchen garden and utilized for vegetable cultivation. This is in practice for last 50 to 60 years by 60% of farm families in the Kurchi village of Dhanbad district of Jharkhand. **Keywords**: waste water, pit, irrigate, kitchen garden, vegetable cultivation	Shri Lakhi Ram Mahto, Kurchi, Gobindpur, Gortoppa, Dhanbad (Jharkhand) 828 109

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Garbage Disposal and Management

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
948	Garbage disposal and its management	A pit is dug and its bottom is plastered and soil is spread up to the height of 6 inches. Then 100 kg garbage and 30 kg cowdung is poured in pit along with about 500 earthworms. After that the pit is covered with grasses or gunny bags and watering is done at an interval of 2–3 days for 20–25 days. **Keywords**: garbage, pit, earthworm	Shri Chet Ram Dhani Gagar, Purag, Kotkhai, Shimla (Himachal Pradesh)
949	Method of garbage disposal	Garbage disposal is an important activity for every human being. Easily decomposable wastes like kitchen waste etc. are collected and put in a pit which is decomposed easily in a few weeks. Weeds which are difficult to destroy are collected and dried and then burnt. Plastic materials are also collected and burnt, since it cannot be decomposed easily. **Keywords**: garbage disposal, weed, plastic	Shri Netra Singh Thakur Kataru, Sangahwana, Mandi (Himachal Pradesh)
1700	Preparation of compost by decomposition of waste materials	Waste material compost is used by the farmers of Olmunda village of Gumla district in Jharkhand. Compost is the best fertilizer for cultivation of the crops and is maintains the soil fertility. In this practice, waste materials like cowdung, fodder, daily-use materials of home, leaves, *puwal* etc are kept in garbage and covered with soil. After a few days it decomposes and is ready for use. Every farmer of the village uses this practice, which involves little cost. **Keywords**: compost, decomposition, waste materials, garbage, fertilizer	Shri D Oraon Olmunda, Gumla (Jharkhand)
1701	Converting garbage into compost	Compost is used to improve the physical properties of soil and to add plant nutrients for higher crop production. Plant residues, wooden ash, dung and bedding of farm animals and the domestic residues are used for compost making. For the process of decomposing, layers of plant residues, wooden ash, domestic residues and farm animals residues are spread evenly in a pit for decomposing. By this	Shri Maga Ram Mahto Barabaghmara, Gobindpur, Dhanbad (Jharkhand)828109

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		process garbage is converted into compost, which is used as supplement to chemical fertilizer. All the farmers of Barabaghmara village of Dhanbad district in Jharkhand use this since about 60 years. **Keywords**: garbage, compost, plant nutrient	
347	Sargada compost (compsiting)	Compost is prepared from the agricultural and domestic waste by placing it in a pit near the cowshed and watering regularly. It is used as an organic manure and the technique is eco-friendly. This practice is being followed by 100% farmers for the last 100 years in Shibiloon village of Burdwan in West Bengal. **Keywords**: compost, domestic waste	Shri Tapomoy Ghosh Shibiloon, Burdwan (West Bengal) 713 310
1122	Garbage disposal and dung as manure	Garbage and dung have good amount of essential elements required to make manure. The house waste, tree leaves, dung, etc. are collected in heaps outside the village and kept for 6 months and thereafter used as manure in fields. Manure is prepared with almost zero input. **Keywords**: house waste, manure	Ms Phoolwati, Ladpur Kanjhawala (Delhi)
1654	Use of *mera* (waste of *hanria*/ricebeer) for remedy of wound/injury	*Mera* has some medicinal value and is useful in curing chronic wound/injury. For chronic treatment of chronic wounds, *mera* is plastered on the wounds. It results in faster curing and recovery of wound. This ITK is practised in village Kamdara of Rania Block of Ranchi district (Jharkhand). Success has been claimed in 80% of the cases. **Keywords**: *mera*, waste of *hanria*, rice beer, wound	Ms Rashmi Kandulna Hawai Nagar, (Merina X-ray Clinic), Hatia, Ranchi (Jharkhand) 834 003
2217	Garbage, farmyard manure	The household waste materials (garbage) is used as manure after decomposition which is a rich source of nutrients. Addition of this garbage to soil enhance the fertility status of the soil. But care should be taken that disposal should be away from living surroundings to provide hygenic condition **Keywords**: garbage, farmyard manure	Training Associate Krishi Vigyan Kendra, Rastakuntabai, Vizianagaram (Andhra Pradesh) 532 523
2218	Disposing garbage at compost beds	The household garbage and kitchen waste is dumped on to composting beds at cattle sheds or home court. The garbage decomposes to farm a rich organic manure. All the families having cattle population surrounding villages of Bhimpally in Karimnagar district of Andhra Pradesh are following the practice **Keywords**: garbage disposal, compost	Ms Pasula Laxmi C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, arimnagar (Andhra Pradesh) 505 122

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Food Product Development

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
301	Boiling of sweet potato without water	Sweet potato (500 g) is taken in an earthen pot of 3 litres capacity. The pot is filled with sugarcane trash or vines of sweet potato and covered with a lid. The pot is buried in soil upside down so that the bottom of the pot just appears. Dried leaves are kept over it and then it is burnt for half an hour. The pot is taken out of the pit after it is cooled. The boiled sweet potato inside the pot is ready for consumption. Sweet potato boiled by using this method is more tasty and nutritious as compared to the conventional boiling in water. This is being in used by the villagers in Belgaum district. **Keywords**: sweet potato, earthen pot	Shri Shivanand Lakamagouda Patil, Hulloli, Hukkeri, Belgaum (Karnataka) 591 301
440	*Muri bhaja* or *pitha ghra*	Dehusking of paddy by rubbing with two stones is common in West Bengal. This is an age-old practice, called as *muri bhaja* or *pitha ghra*. **Keywords**: dehusking	Shri Tapomoy Ghosh Shibiloon, Burdwan (West Bengal) 713 130
564	*Chaunsa* an ethenic food made from *urd* (blackgram)	Paste of *urd* is fried in oil till it becomes brown. This is cooked like curry with the required salt and spices. This curry is called *chaunsa*. **Keywords**: *chaunsa*, *urd*, curry	Shri Magan Lal Nalgaon Chamoli (Uttaranchal)
956	*Cannabis* species: great value as a food product	*Bhang* or *hemp* (*Cannabis* sp.) plant is grown in the Jaugehli area of Mandi district in Himachal Pradesh. Farmers extract oil and salt from it and its *khalli* (residue after extraction) is used as a feed for animals. Oil and salt are used for food preparation in cooking. It is in practise for last several years but now it is totally extinct, because now-a-days cheap, best and nutritional products are available to farmers in markets. **Keywords**: *Cannabis*, *bhang*, extraction, *khalli*, oil, salt	Shri Mehar Chand, Ter, Sanglamara, Theong, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1309	Preparation of *rabri*	Wheat flour and *lassi* are mixed and kept for one hour. It is then cooked in the evening and kept for the whole night. The following day it is mixed with fresh *lassi*. Roasted cumin seeds, salt and green chillies are added. This food prevents from heat stroke. This is practised by the people of Ujwa village in Delhi State since long time. **Keywords**: *rabri* preparation, wheat flour, *lassi*, cumin seeds, salt, chilli	Ms Sumita Rana. D/o Shri Joginder Singh, Ujwa, Nazafgarh, (Delhi) 110 073
1311	Preparation of *sattu*, a semi-liquid food item in summer	People prepare *sattu*, a semi-liquid food item, and used to eat during summer to prevent them from sun stroke and other health abnormalities due to high atmospheric temperature and hot air blowing (*loo*) much as anorexia, epitexis, dysentery, fainting, indigestion, lunacy and nausea etc. *Sattu* acts as good appetizer for digestion, provides energy to the body as well as protein. Fried barley, *khand* (loafy sugar) and water are main ingredients of *sattu*. After cleaning and washing, the barley is sun dried properly and then roasted in sand. Husk is separated and grinding is done. After sieving to remove husk again, the barley flour is mixed with sufficient quantity of loafy sugar as per the taste. The mixed powder is ready to serve. This is mixed with double quantity of water a few minutes before serving. This prcatice is followed in Haryana. **Keywords**: *sattu*, barley, fried in sand, *khand* (loafy sugar), sun stroke, health abnormalities due to high temperature	Ms Rajkumar Training Assistant (H.Sci.), Krishi Vigyan Kendra, Rampura-Rewari, (Haryana) 123401
1663	Preparation of sweets in tribal area	*Tadi pitta* is a sweet prepared by the tribals of Jama block in Dumka (Jharkhand) district. Juice of *tad* (*palmyra*), flour of wheat or rice and sugar are required for its preparation. Solution of flour, sugar and *tadi* juice is made and fried in mustard oil or any cooking oil. *Tadi pitta* is considered very tasty and nutritive food by tribal people. This food is being in use for the last 100 years. **Keywords**: *tadi pitta*, sweet, tribal, juice, flour of wheat or rice, sugar, solution, fried	Ms Chami MumurSahyogi Mahila, Bagrasarai, Saraikela, Singhbhum (Jharkhand)
1702	*Marua roti*	*Marua* (finger millet) gives high yields with low cost of production; therefore it is cultivated by the farmers of Jharkhand state. *Marua roti* is protenious and tasty food, and gives much energy in comparison to other	Shri Ishidor Tete Asanbeda, Lathokhamhan, Simdega (Jharkhand)

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		food. Apart from *roti*, *latta* and *khichri* are also prepared from *marua*. *Marua roti* is prepared by a simple method by crushing in *chakki* (grinding mill) to make flour. Then it is put in boiling water and kneaded. After that, round cake (*roti*) is made and roasted/ fermented. **Keywords**: *marua* (finger millet), proteinous, tasty, energy, *latta*, *khichri*	
1706	Preparation of *ghee* from cow and buffalo milk	*Ghee* preparation from cow and buffalo milk is an age-old practice. In this process, milk is first boiled and kept undisturbed for 4–5 hours. Then the upper creamy layer which form in due course is collected and processed by means of centrifugation and then it is boiled. The liquid remained after boiling is collected as ghee, which is very delicious and increases the taste of meal as well as nutritious, rich in fat and lipid. It is a good source of energy. This method is practiced in Madheshra village of Bhuthi block in Sihamurhi district of Bihar since ages by almost all the families. **Keywords**: *ghee*, cow and buffalo milk, creamy layer, centrifugation	Shri Rajiv Kumar Jha Research Associate, Deptt. of Fishery, Ranchi Veterinary college, Kanke, Ranchi (Jharkhand)
1709	*Dhan ka lawa - a reciepe to increase appetite*	*Dhan ka lawa* is used as indigenous recipe by the villagers of Madhupur village of Jama block in Deoghar district of Jharkhand. They belive that it is an energetic food and has some medicinal value which increases the appetite in human beings. *Dhan ka lawa* is cooked in water with salt and then taken as food. This is being used for the last several years by the majority of the villagers without any modification. **Keywords**: *dhan ka lawa*, recipe, medicinal value, energetic food, increases appetite	Shri Varun Lal Lok Jagriti Kendra, Madhupur, Deoghar (Jharkhand)
1713	Indigenous pudding, *futka*	It is highly nutritious and used during special occasions. Preparation of food (pudding) is very simple. About 1 kg milk is kept on the stove in a container to boil and slowly grinded *mahua* (1 kg) is added in it with addition of fingermillet flour (1/4 kg) in medium heat till it water evaporates, and then it is cooked under steam heat for 15 minutes. The practice is followed in Chainpur village of Dumari Block of Gumla district (Jharkhand) and has potential for its spread in other similar areas, where *mahua* is	Shri Binita Kujur C/o Dr. N. Bara, Department of Extension Education, BAU, Kanke, Ranchi (Jharkhand) 834006

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		abundantly available. It has been found more proteinous and rich source of energy in comparison to other locally available food materials. Cost: benefit is 1: 6 approx. **Keywords**: *futka*, indigenous food, *fingermillet*, *mahua*	
1994	Preparation of *chapati* from *mango* seed (*guthali*)	Mango *guthali chapati* is a tasty food in rainy season for the people of chhindwara (MP). The mango seeds are collected and kept in water overnight. Then spread under shade then pressed under leaf of *tendu* or teak for 4–5 days. Fungus is produced from the material. The fungal affected seeds are crushed and spread over muslin with in bamboo basket. The same is placed in running water for 5 days to remove bitter taste. Finally mango *guthli* flour is made from which *chapati* is made by pressing with *mahua* leaf followed by roasting. **Keywords**: *mango guthli*, *chapati*, leaf of *tendu*, teak and *mahua*, bamboo basket, muslin cloth.	Mrs.Shasi Gour, Trg. Ass. (Home Sci.) KVK, Chandangaon Chhindwara(Madhya Pradesh) 480 001
502 & 504	Preparation of *gheeand churpi (wetcheese) from milk*	*Ghee* and *churpi* (wet cheese) are prepared by the people of Chuna, Jithang, Mago, Thimber, Luguthang, Jung, Lompo, Zemithang, Khinjemane, Taksang, Gompa, Sokseng, Bumla, Crating, Mukto etc. villages is Tawang district and Thungi, Chander, Nyumadung, Senge, Lubrang, Madlaphudung, Tenjing Gaon villages in West Kameng district of Arunachal Pradesh, *Churpi* is prepared predominantly from milk obtained from yak and dzomo (yak X cattle hybrid F1 female). Apart from this, cow milk is also used. A minimum of 10–12 litres milk is required for preparation of one batch of *churpi* and *ghee*. After collection of milk, it is held for 2–3 days until it is fermented to curd by natural process. In winter, milk is heated intermittently for the same. Usually milk is kept in a bucket by side of the *chullha* (fire-place). The curd is then transferred in a churning machine locally called *zsopu*. This churner is made of bamboo and wood. The diameter and height of *zsopu* depends on the amount of milk to be processed. The churner consists of some other parts, viz. *rhupli* (made of wood, with which churning is done), *khaskor* (also made of wood and ghee is collected here) and *khakhep* (wooden cover for *khaskor*). *Khaskor* is fixed with *zsopu* with the help of flour dough. Churning is done for about 1–1.5 hr.	Dr S.K. Barari, NRC on Yak, Dirang, West Kameng (Arunachal Pradesh) 790 101

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		During churning, *zsopu* is kept near *chullha* for intermittent heating. Slowly, all sides are heated. Churning extracts *ghee*, which is formed and deposited in *khaskor*. It requires some experience to know when to stop churning. After extraction of *ghee*, the remaining portion is transferred in a copper container, named *tow* and heated in low heat over a *chullha* for about 30 minutes with intermittent stirring. *Churpi* is separated and watery portion (whey) is left. The watery *churpi* is taken out with the help of a wooden ladle, called *zeru*, and it is kept in a bamboo netting container, called *therkhap* (flat type, larger) or *churtsa* (small bucket type) for stirring the watery portion. *Churpi* is ready for consumption. Usually it is stored for some time before consumption for drying above *chullha*. After drying, *churpi* is stored in locally made yak-leather bags. Whey is fed to the guard dogs or other animals. For ages the system is in practice, though exact number of farmers practicing it is not known. **Keywords**: *ghee*, *churpi*, milk, yak, *dzono*, curd, whey	
503	Use of indigenously prepared fresh and dry fermented bamboo	The fermented bamboo shoot, both wet and dry form, is an indigenously prepared food shoot item, used mainly by Rengma, Lotha, Angami, Zeliang and some other tribes of Nagaland. The method of preparation in this text is from Nsünyu village in Kohima district of Nagaland. The product is used as taste-maker in the food preparation and also some people believed that this neutralizes the effect of poisonor toxin in any food item, when cooked along with it.Onset of monsoon initiates the new growth of bamboo shoot. Soft and succulent shoots (top) are harvested and sliced or crushed to pieces. It is then kept in airtight containers, preferably plastic/wooden/glass for fermentation. After 30–35 days, it becomes ready for consumption as fresh-fermented bamboo shoot. For dry bamboo shoot, fermented fresh shoots are dried on a clean woven bamboo mat/plastic sheet in the sun, which is kept away from domestic birds and animals to prevent it from contamination, as it is directly consumed without further washing/cleaning. The dried shoots can be stored/kept in any container for use. The product can be stored for very long period, if stored properly. No preservative is required for its preservation. This is practiced by every family in the village for time immemorial.	Shri K. Kath District Agricultural Office, Dimapur (Nagaland) 797112

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		Keywords: bamboo shoot, fermented, taste-maker, neutralization of poision effect	
299	Supplementary food for infants	Some useful supplementary food items in use for infants are given below: Ingredients like wheat (550 g), rice (500 g), greengram (600 g), sesame seed (50 g), groundnut seed (200 g) and cardamum (5 g) are roasted separately, ground and mixed well. Red skin of groundnut is removed before use. The instant food mixture is stored in an air-tight container. Three tablespoonfuls of the food is mixed with small quantity of boiled water to make a porridge. Sugar or jaggery is added to taste before feeding. Milk and ghee can also be added, if available. Fingermillet grain (900 g) is soaked overnight in water. The water is drained and the grains are allowed to sprout on a tray by covering with a damp cloth for 1 day. The sprouted seeds are dried in the sun, roasted till they develop a flavour and ground to powder. Roasted greengram (400 g), roasted groundnut (100 g), roasted sesame seed (50 g) and cardamum (5 g) are ground separately. All the ingredients are mixed well and stored in air-tight containers. This mixture is being prepared in tribal settlement of Kerala. **Keywords:** infant food	Ms P. Girija, Training Associate (Home Science), Krishi Vigyan Kendra, Mitranikatan, Vellanad, Thiruvananthapuram (Kerala) 695 543
302	A device for separating iron particles from wheat, maida and gram flour	Shri Sundarajan developed a device for separating iron particles from wheat, maida and gram flour. A rectangular funnel like structure which is made by iron frame is fixed over by iron support. The flour is made to flow through this funnel slowly and uniformly in small quantities. A stable magnet is also fixed in a plate in the funnel like structure. Different size of iron particles are attracted by magnet. The cost of the device is Rs 70. Magnet available in the abondened old transistor is used to separate out the iron particles. **Keywords:** rectangular funnel, iron particles, iron frame, magnet, gram flour, old transistor	Shri V. Sundaraajan, Retd. Arts Teacher, 53, Singamada Street, Srivilliputhur, Virudhunagar (Tamil Nadu) 626125
304	Preperation of cake from milk	Cake is made from goat or sheep milk. One leaf of *thuyal* is dropped in a cup of milk, which gets transformed into a cake after 2 hours. It is a nutritious food being prepared for last the 10 years in Kovil Puraiyur Thoppu village. **Keywords**: goat milk, sheep milk, *thuyal* leaf	Shri D. Gunasekaran,Kovil Puraiyur Thippu, Nochalur, Gingee, Villupuram (Tamil Nadu)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
306	Preperation of indigenous food	Some indigenous food items prepared in West Bengal are mentioned below: *Various types of* bori: Small conical shaped. Pigeon pea (*beuli*) is kept overnight in water, smashed to semi-solid state, salt added placed on a plate smeared with mustard oil. After sun drying they are used as food by frying in oil. *Large conical shaped:* Quashed *beuli* mixed with salt, cumin (*jeera*) powder, red chilly powder, crushed bottlegourd and *katchumuro*, could be prepared as explained above. *Designed:* It is like *gilipi*. This is prepared along with poppy seeds. The procedure is similar to small and large *bori* preparation. Small oyster i.e. (*googly*) from pond are collected, boiled with water and inner flesh taken out, and cooked as any meat preparation. *Googly* is equivalent to any meat, which cures dysentery. These two food preparations are considered as a special dish in West Bengal in winter. **Keywords**: new food, pigeonpea, *beuli*, *bori*, oyster, *googly*, *katchumuro*	Mrs Saroja Bala Manna, C/o Shri S.N. Manna, Bahichard, Midnapore (West Bengal) 721 627
568	Soft drink-namkin jya	The bark of *thumer* (*Texas baccata*) is powdered and boiled like tea. This is then mixed with milk, *ghee* and salt with the help of a locally made equipment *dumka*. The drink (*jya*) is ready to serve. **Keywords**: *jya*, *thumer*, *Texas baccata*	Ms Meena Devi, Dhapa, Dummar, Pithoragarh (Uttaranchal)



Thumer tree (*Texas baccata*)

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951	Method of oil extraction by *kolhu*	All parts of the oil extracting instrument are made of wood of *killar* and *deodar*. The extraction rate is 0.5 kg. Oil is extracted from 2 kg mustard seed in 3 hours. The husk left after extraction is called *khel*, which is used as cattle feed and it is good for health of the cattle. This technique is adopted for last several years by maximum number of farmers in the villages of Chamba district of Himachal Pradesh. It is easy for handling and involves little cost. **Keywords**: oil extraction, mustard, *killar*, *khel*, animal feed	Dr. Z.C. Rathor Lecturer in Zoology, Government Post Graduate College, Chamba (Himachal Pradesh)
952	Traditional method of wine making	The method of preparation of distilled country liquor from surplus and wild fruits in Kinnaur district of Himachal Pradesh is in use from time immemorial in the cold region as part of tradition. Generally individual or combination of different fruits such as apple, grape, wild apricot, pears, almond etc. are used to prepare the liquor. Fruits are cut into coarse pieces or mashed by hand or feet, seeds removed or remained in the pulp (as required) and then are filled in large tanks/ drums (concrete or wooden). Wooden drums are preffered because of its suitability for transfer from one place to another and for maintenance of suitable temperature. For generating the desired temperature, the drums are sometimes kept in a cowdung pit for fast fermentation. Occasionally jaggery or molasses are added to the fermenting tank to increase alcohol content. Drums/ tanks are then tightly sealed with heavy wooden/stone (slate) lids.These drums are kept as such for 15–20 days for fermentation and completion is judged by alcoholic odour, appearance of small vapour inside the lid or non-stickly nature of the pulp when pressed between forefinger and thumb. For distillation of the fermented liquid, a large vessel having capacity of 10–15 litres, made up of bronze is used. The vessel is kept on the fire after putting the fermented liquid into it. The liquid is boiled with continuous heating and its vapour is cooled in the neck-like structure working as condenser on the top of the vessel mouth. The distillate is collected from the neck of the vessel in a container. Boiling at moderate heat is preffered for quality and maximum recovery of the liquor. **Keywords**: distilled country liquor, surplus fruits, wild fruits, high methyl alcohol content	Dr V.K. Joshi and Shashi Bhusan, Dep. of PHT, Dr YSPUHF, Nauni, Solan (Himachal Pradesh) 173 230

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
953	Seeds of Prinsepia utilis (bhekal) as source of cooking oil, illumination and medicinal purposes	Seeds of *bhekal* are collected in June/July and also in October/November. The oil extracted from the seeds is used for cooking, as illuminant and for medicinal purposes. This is used by hilly people of Himachal Pradesh and Uttaranchal. **Keywords**: oil extract of *bhekal*, cooking, illuminant, medicinal purpose	Shri Shoud S. Sharma Deptt. of Bio Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
959	*Gur* (molasses) preparation method	*Gur* (molasses) is prepared from stem juices of sugarcane, which serves as a good source of energy. Most of the farmers in the rural areas believe that gur has some medicinal value. It is prepared from the stem of sugarcane (*Saccharum officinarum*). Juice extracted from the stem is boiled in an open container for making it more concentrated. Then it is poured in an open flat container for making pieces of suitable size. After that, it is ready for eating. Ground coconut and *sounf* (*Pimpinella anisum*) are added for making *patish* (*patisha*) which is eaten by the children. This is used in various parts of Himachal Pradesh. **Keywords**: *gur*, extract of sugarcane, boil, cooled, coconut, *sounf*, *patish*	Shri Dila Ram Mera Kushsi, Nawahi, Tehsil Sarkaghat, Mandi (Himachal Pradesh)
963	Wine making	Wine is prepared traditinally by the local people in some districts of Himachal Pradesh. The main raw material is fruits such as grapes (*Vitis vinifera*) , wild apricot *chulli* (*Prunus armeniaca*), pears (*Pyrus communis*), apple (*Pynus malus*), wild almond behmi (*Prunus delicis*) etc. The fermented product of these fruits is distilled and then conserved by the people. Fruits like apple or pears are cut into pieces before putting for fermentation. *Chulli* fruits are dried on the roof after taking out the seeds. The fruits are then put in the drums. Generally the wooden drums are preferred for fermentation, as they keep the materials warm. Molasses are also used with the fruits. The drums are then tightly covered with wooden or stone lid. Opening the lid makes the judgement of fermentation. When the larva in the pulp dies, it means the fermentation is over. Drop of water inside the lid is other indication. Another way of judgement is that if a burning stick is taken on the pulp and if it extinguishes, the material is ready. The pulp is put in a metallic pitcher, which is covered with a slate of stone with a hole in the centre. This slate is used to avoid overflow of material during boiling. A metallic	Prof. L. R. Verma Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		pan is kept on this slate, which also has a hole of the same size of that of slate. It has also a side pipe through which the condensed alcohol comes out. This utensil is covered with a bigger size metallic pan, which is cooled during the extraction. Two pipes, one inlet and other outlet open in this pan through which cold water falls on the pan and warm water goes out. The topmost pan is kept a bit slanting. The inlet of water is on upper side and outlet is at lower side. This cools the bottom of utensil and condenses the alcohol vapours touching its lower surface. The condensed material runs out through the side pipe of the lower utensil from where it is collected in small pot. A rubber pipe is also attached to metallic side pipe to keep some distance between the collection pot and the distillation plant. Approximately 12–13 bottles of alcohol are collected from 40 kg of fruit material. However, when it is mixed with 5–6 kg molasses the yield is 18–19 bottles. This is mainly used in Kinnaur district since time immemorial. **Keywords**: wine making, fermentation, distillation	
1312	Use of herb (*van tulsa*) to stop killing of honey bees while extracting honey	*Van tulsa* might be repellent to honey bees.The extract of *van tulsa* leaves is pasted/applied on the body of honey extracter. Honey bees do not bite and are also not killed. The honey can be extracted easily from natural combs. This is practiced in Easepur village of Etah district in Uttar Pradesh. **Keywords**: *van tulsa*, honey bee repellent, honey extraction	Shri Prem Pal Singh Arya, C/o Shri Daal Chand, House No.38, Purva Ahiran, Indra Chowk, Meerut (Uttar Pradesh)
1710	Indigenous method of oil extracting from fruits of *mahua* and *kusum* trees	*Mahua* and *kusum* seeds (seedcoat removed) are separately crushed and steam cooked, then filled in bark-made cups. Cups are then kept between two heavy wooden beams and pressed. It results in extraction of oil, which is collected in a container. Oil extract from *mahua* is known as *dori tel* (oil) and used on body. It prevents cracking of skin. *Kusum tel* (oil) is used on hair. It also checks cracking of skin. Both oils are used for cooking. This practice of oil extraction is being used by the villagers of Bandipahar village of Thethaitangar block in Simdega district (Jharkhand) since the ancient time without modifying the technology. **Keywords**: *mahua*, *kusum*, crushed, steam cooked, bark-made cup, beams, pressed, *dori tel*, *kusum tel*, cracking of skin, oil extraction	Smt B. Ekka, Qt. No. D.T. 1327 Dhurwa, Ranchi (Jharkhand) 834 004

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1711	Handia (rice beer), tribal drink	*Handia* is a alchoholic drink taken by tribals of the Jharkhand area. It stimulate for hard work and also protect human body from hot winds in summer. Broken rice is boiled as such that there is no water remain after cooking. After cooling *ranu* (fermenting agent) is mixed properly with it and then poured in another cane or pot and leave for 3 days for fermentation. Fermented rice is then diluted by adding water and filtered then taken as alcholic or stimulus drink. *Handia* is taken by most of the tribals of Jharkhand State. It has been reported that most of the tribal people drink *handia*. Cost: benefit is 1: 4 approx. **Keywords**: *handia*, *ranu*, rice beer, tribal drink	Shri Sibna Minj, Department of Extension Education, BAU, Kanke, Ranchi (Jharkhand) 834006
2219	Use of *Phyllanthus niruri* plant against jaundic	Every day at night meals take 10 cloves of garlic along with curd rice. It acts as medicine and control the blood pressure, heart diseases, allergy and diarrhoea etc. for about 40 days as this garlic act as medicine. **Keywords**: disease control, garlic	Ms Y. Parvathamma, Kondajutur panyam, Kurnool (Andhra Pradesh)
2220	Use of white pepper with honey for the control of bronchitial diseases	About 30 g white pepper and 20 nos *karakaya* are powdered and soaked in 400 g of honey. One tablespoon of this is mixed with honey and take three times a day continuously for about 40 days control bronchitial disease. **Keywords**: white pepper, *karakaya*, bronchitial	Ms R. Lakshmi narayanamma, Kondajutur panyam, Kurnool (Andhra Pradesh)
2222	*Kaikum*, therapeutic food	*Kaikum* is prepared with roots of pippallu cardamom, pepper, ginger, turmeric, coriander, cumin, fenugreek, garlic, clove, nutmeg all ingradients will be placed in a cloth and dip in a pot which has water and boiled for 6 hrs. The boiled water paste prepared from all ingradients will be given to lactating mother along with rice, increase the milk production of mother and reduce the abdominal and joint pains which has resulted from pregnancy. **Keywords**: *kaikum*, therapeutic food	Shri T. Hiranjee Vely, Krishi Vigyan Kendra, (Training Organisor), Rastakuntabai, Vizianagaram (Andhra Pradesh) 532 523

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2223	Mango marmalade	The unripened mango will be cut into pieces dried for 8–10 days and stored as dried *varugulu* is used and cooked during off season. Or these can be used in 2 forms; these are used to mix with other vegetables in curries or these are mixed with jaggery/ sugar syrup used to take as snacks. **Keywords**: mango, marmalade	Ms Patima Laxmi Mande Kurupan, Vizianagarm (Andhra Pradesh) 532 523
2228	Using *kuradu* (*kali*)	he rice-washed water and *gangi* strained from cooked rice are mixed in mud pot and kept for fermenting for one day and taken in the morning. This fermented food provides vitamins B and C and improves the digestion. It is good for health especially in summer months. **Keywords**: *karudu*, *kali*	Ms Hanmakka C/o Prakasam, Krishi Vigyan Kendra, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikunta, Karimnagar (Andhra Pradesh) 505122
2229	Mango bar for preservation	B y preparing mango bar *(mamidi thandra*) from the mango pulp, instead of preparing mango *vorugulu* the farmers are getting price of about Rs 20/kg of mango slab. Mango bar can be preserved and consumed during the off season. **Keywords**: mango bar, preservation, higher price	Ms A.Sarojini W/o Shri A Kurma Rao, Mande Kurupan, Vizianagaram (Andhra Pradesh) 532 523
2230	*Uggu* (weaning food) for infants	Feeding of infants with *uggu* made of a fine *rava* of rice and pulse mixed with milk and sugar/jaggery @ 100 g per day at the age of 6 months onwards provides a good supplementary food for the baby from breast milk. **Keywords**: *uggu*, weaning food, infant	Ms Madadi Radhika C/o Prakasam KVK, Grama Nava Nirmana Samithi, Jayaprakash Nagar, Jamaikanta, Karim nagar, (Andhra Pradesh) 505 122
505	Dry gooseberry as mouth refresher	This is practiced in villages of Medziphema, Chumukedima etc. in Dimapur district of Nagaland. The practice is to preserve gooseberry for off-season. For preparation, gooseberry or amla is boiled in a container in water. Seed or nut is removed and the fleshy portion is broken into pieces. These pieces are taken into a container and sugar is sprinkled over it. If gooseberry is 1 kg, 400–500 g sugar will be required. Then the container is covered with lid. After 3–4 days sugar gets dissolved and the juice is taken out and can be used as drink. This juice helps in controlling blood pressure and stomach problems. The pieces of gooseberry will be dried nicely in the sun (keeping these pieces over a paper. When it is	D r (Mrs) Anamika Sharma Training Assistant (T5), ICAR Research Complex for NEH Region, Jharnapani (Nagaland) 797 106

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		dried, it can be packed in small polythene bags and can be stored for about 8–10 months. These gooseberry pieces are used as mouth refresher and appetizer also. It is eaten at any time.This product is believed to have therapeutic value in controlling blood pressure as well as stomach problems. The product is packed in small polythene bag and is sold in the market through which one can earn money. An average 25 farm families in the village use the practice which is in use for the last 50 years. The reason for non-use of this practice is due to non-availability of the material i.e. gooseberry. Some farm families prepare pickle with gooseberry as another product. In this method, chilli and salt is added and boiled. It is then dried well in the sun. **Keywords**: gooseberry, mouth refresher, therapeutic value, pickle, boiling, drying in sun	
506	Bamboo shoot as food item	This is a food item for the people of Nagaland and Meghalaya. Young shoots of bamboo are collected and the outer coverings are sliced out. The inner soft part is taken which is then sliced into smaller pieces. The sliced shoots are kept in a basket and then covered with banana leaves. It is then kept for 2–3 months after which the liquid portion is drained off. The remaining sliced shoots are packed in an airtight container. This can be preserved for years together. Young tender shoots are also taken as such with other food items. This product is used for preparation of different curries, as preservative in pickle and supplement of tomato during off season. Decoction of the shoot, when taken with teaspoonful of honey once or twice a day cures respiratory disease.This practice is followed by all the people of Nagaland and Meghalaya for about 100 years. **Keywords**: bamboo shoot, pickle, preservative	Dr Angaule Khate Zeliang C/o Dr T. Zeliang, Khushiabil, P.O. Dimapur, (Nagaland) 797 112
507	Ngüghü, a dried fermented mustard leaf	*Ngüghü* is dried fermented mustard leaf, which is used as taste maker in preparation of different varieties of local delicacies. This is a popular food item in Nsünyu, Kontsünyu, Tseminyu etc. in Kohima district of Nagaland, which is gaining popularity even among other tribes. This is usually prepared during summer season, where mustard leaves are harvested from mixed farming with paddy. For preparation, a pit about 2–3 feet deep and 2–3 feet wide is dug. Then it	Shri Tezenmo, Nsünyu Village, P.O. Tseminyu, Kohima (Nagaland) 797109

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		is covered properly with either *athama* or *amejan* leaves (local name) both at the bottom and sides. Mustard leaves are washed and kept in the sun for some time to reduce the moisture content. Then these leaves (mustard) are placed in the pit nicely, so that minimum air space is maintained in pit. After this, the mustard leaves are covered at the top with either of the two leaves used. Lastly, it is covered with earth making it airtight and raised from the surroundings so that waterlodging does not take place.After about 3 weeks, mustard leaves get fermented and are removed from the pit and dried in the sun. The materials used for the preparation is locally available. Fermentation period should be monitored carefully so that spoilage is reduced to the minimum. The practice has been in use since time immemorial by almost all the farmers in the villages. A slight modification has been made by some farmers by using large polythene bags instead o f *athama* or *amejan* leaves for covering the mustard leaves. **Keywords**: mustard leaf, *ngüghü*, pit, ferment, tastemaker, *athama* and *amejan* leaves	
300	Food preservation	Some items of food preservation are: *Lime juice:* One cup of lime juice is well mixed with 2 to 3 cups of sugar in a bottle. The bottle is kept in the sun, to enable the sugar to form a thick syrup. This is kept in fridge. The juice could be prepared when needed with addition of water. *Amla chutney: Amla* is boiled for 2–3 minutes. It is kept in shade for drying. After drying, add salt, tamarind, red chilli, garlic and water, and grind into smooth paste and then store in bottle for 4–5 minutes. **Keywords**: *amla*, lime juice	Principal, J.S.S. Krishi Vigyan Kendra, Nanjangud, Mysore (Karnataka) 571129
439	Preservation of aonla and ber (Ziziphus spp.) fruits	The collected good-quality *aonla* and *ber* fruits after washing are spread evenly on wooden tray and the tray is covered with polythene sheet having holes to provide hot air inside.The fruits are cut vertically and the seeds are removed before the treatment. The inner lining of the box with a black polythene sheet is kept under sun for 2 days to increase the temperature. Thus the fruits can be stored and can be taken in the off-season. This practice is being followed for 20 years in Benakunda village of Ganjam district in Orissa **Keywords**: *aonla*, *ber*, preservation, sun drying, polythene sheet	Ms Saswati Parichha, Training Associate (Home Science), Benakunda, Ganjam (Orissa)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
443	Traditional method of fish preservation through salting	Small-sized marine fish, caught from the sea, is preserved by putting in the earthen pot containing saturated brine water made by dissolving 1 kg coarse salt in 10 litres sea water along the seashore for 2 to 3 days. The fish is removed and washed in sea-water and dried under sunlight for 3 to 4 days. By this, the fish can be stored without spoilage. This practice is being followed since 30 years by all the farm families in new Buxipalli village of Ganjam district of Orissa **Keywords**: fish preservation, salting, brine water	Shri Rabinarayan Mishra, (Assistant Professor), Rangailunda Berhampur, Ganjam (Orissa) 760 019
566	Pickle of *kwiral* (*kachnar*)	The flower buds of *kwiral* (*kachnar*) are boiled in water and sun dried. It is supposed that the flower buds of *kachnar* are rich in calcium which gives stength to bones and teeth.The dried buds are mixed with spices, salt, fried cumin seeds, green chillies and mustard oil. The jar is then kept in sunlight for 3 weeks. **Keywords**: pickle, *kwiral, kachnar*, calcium	Shri Balbir Singh Pundir, Government Seed Store, Narainbagad, Chamoli (Uttaranchal)
567	Method of vegetable preservation known as *suksa*	Vegetables when abundantly available are cut into small pieces during summer and dried thoroughly in sunlight. These dried vegetables can be preserved for a long time. The vegetables used for the purpose are raddish, cauliflower, cucurbits etc. **Keywords**: preservation, vegetable	Shri Lalitesh Kumar,Lal lodge, Upper Bazar, Pauri (Uttaranchal)
1308	Preservation of carrot	The carrot is peeled, cut and boiled. Then red chilli, salt, turmeric and water are added to it and kept in earthen pot for 2–3 days. This preparation lasts for about 15 days. This method of preservation has been used by Loadpur villagers of Delhi state since long time, but this is no longer in use. **Keywords**: carrot, preservation	Ms Phoolwati Devi, W/o Mr Jawala Singh, Loadpur, Kanjhwala, (Delhi)
1703	Preservation of bamboo shoots (*Bambusa arundinacea*)	Tender new parts of bamboo (*Bambusa arundinacea*) are consumed in various ways by villagers of Tangar of Ranchi district. Tender new bamboo shoots are cut in small thin pieces and packed in *potom*, made of *sakhua* (*Shorea robusta*) leaves. After sealing properly, packets are kept in bamboo baskets and again covered with leaves of *sakhua*. It is preserved there for 4–5 days, when it gets prepared with sour taste, which is called *sandhana*, and is used for pickle making. *Sandhana* is kept for sun drying for 4–5 days. It is powdered after complete drying and kept in leaf bags, commonly known as *handwa*. **Keywords**: bamboo (*Bambusa arundinacea*), *potom*, *sandhana*, pickle, *handwa*	Shri Ranjit Bara, Pathalkudwa, Church Lane, Ranchi (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: bamboo (Bambusa arundinacea), potom, sandhana, pickle, handwa	
1704	Imli bar making (imli preservation)	Generally *imli* is preserved by sun-drying method with salt. In this practice, first farmers collect ripe *imli* from tree and then remove the cover from it. Now they dry them under sunlight, after that seeds are removed as well as other unwanted materials from it. Salt is mixed in it and again dried under sunlight. Dried material is mixed with mustard. Iron dias of different size and shape are prepared and placed the material into it. Then collection is done as in bars. This is in practice for last 10 years by 5-10% farmers in Gobarghusi village of West Singhbhum district of Jharkhand. **Keywords**: *imli*, preservation, sunlight, iron, bars	Shri Tapas K Paila, Shramajivi Unnayan, Gobarghusi, Palamada, East Singhbhum (Jharkhand)
1705	Fish preservation	This practice is operated by most of the villagers in Jharkhand. In this, after collecting fishes, they clean its scales, fins and intestine. If it is big in size, they cut it into small pieces. Again clean it with fresh water with eatable salt and turmeric dust. For 5-10 hours fish can easily be preserved by this method. This is age-old practice and is adopted by all fisherman. **Keywords**: fish, preservation, fin, salt, turmeric	Shri Tapas K Paila, Shramajivi Unnayan, Gobarghusi, Palamada, East Singhbhum (Jharkhand)
1707	Preservation of fish	For preserving fish, it is well washed and packed in a folded cup of *sakhua* leaf with little amount of turmeric and kept on the hot pan for cooking. It is pressed by putting a heavy stone on the folded cup. Next day, it is picked out and sun dried properly. After that it is kept in dry folded cup of *sakhua* leaf and hanged 7–8 feet above the *chulha*. This practice is being practised by majority of the villagers of Rania block in Ranchi district (Jharkhand) for the last several years. **Keywords**: preservation, washed, packed, folded cup of *sakhua* leaf, turmeric, cooking, pressed, heavy stone, sun dried, hanged 7–8 feet above the *chulha*	Ms Rashmi Kandulna, Hawai Nagar (Merima X-Ray clinic), Hatia, Ranchi (Jharkhand) 834 003
1708	Preservation of vegetables (koyanar, putkal)	*Koyanar* and *putkal saag* (leaf) is boiled and then sun dried. After that it is kept in a folded cup of *sakua/sal* leaf and hanged over the *chullha*. This technique preserves it for one or more years. This practice is being practised by the villagers of Rania block in Ranchi district for the last several years, without any	Ms Rashmi Kandulna, Hawai Nagar (Merima X-Ray clinic), Hatia, Ranchi (Jharkhand) 834003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		modification in indigenous technique of preservation. **Keywords**: *koyanar*, *putkal*, *saag*, boiled, sun dried, hanged over *chullh*	
1712	Vinegar of jamun (Szygium cuminii)	*Jamun* (*Szygium cuminii*), a multipurpose fruit is generally oblong or round in shape, deep purple or blackish blue in colour, having juicy sweet pulp and stone. Ripe fruits are collected in earthen pots, covered and sealed properly with paste of wheat/rice flour. After making the pot airtight, it is kept under sun for at least 15 days for fermentation, and the fermented juice is ready for use. In tribal villages like Samtoli of Simdega district people use venegar/syrup of *jamun* for curing sugar, diarrhoea, heart and liver ailments. About 98% of farmers in the village use this age-old practice. **Keywords**: venegar/syrup, *jamun*, fermentation, pulp, stone	Miss Prabha Bara, Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001
2287	Jaggery-making assembly in *Gogunda*	The jaggery-making assembly used for making jaggery in the Udaipur district of Rajasthan consists of iron crusher (*kolhu*), pipeline, *kadahi*, *chulha* and chimney. The iron crusher is driven by a pair of bullocks. The GI pipeline transfers the cane juice to *kadahi*. The chimney creates a draft, helping in inflow of fresh air. **Keywords**: jaggery making, *gogunda*	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, GI 17/399, Chopasni Housing Board, Jodhpur (Rajasthan)
510	*Ziegi-chang dvi* as food item	*Zeigi-chang dvi* is a decocted semi-liquid of mustard leaf which is prepared in Poilwa village in Kohima district of Nagaland and is popular among the Zeliang tribe of Nagaland. Mustard leaf, cooking vessels, airtight container and fire woods are the materials required for preparation of this food item. Mustard leaves are washed properly and grinded in paste form. It is then kept in an airtight container for a week. The paste is then squeezed to get the juice. The juice is then boiled in a cooking vessel into a semi-liquid form and then used. Excess quantity is preserved in a bamboo cup. It could be preserved up to 2 years if properly covered. This practice is being followed by all the farmers in the village for more than 100 years. Materials used in the preparation are locally available. **Keywords**: *ziegi-chang-dvi*, mustard leaf, decoction, grind, semi-liquid	Ms Namheu Khate, D/o Dr T. Zeliang, Khushiabil, P.O. Dimapur, Nagaland 797112

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
995	Use of kulath (Docilches uniflorns) soup for treatment of kidney and urinary tract stones	*Kulath* is a leguminous crop. People generally grow this crop for the purpose of a special dish, locally called inderes soup. This soup is good for the patients suffering from stones of kidney and urinary tracts.*Kulath* soup is prepared by grinding *kulath* and then it is boiled. Spices (salt, chilli etc.) are added into it according to taste. This soup is given regularly to the patient suffering kidney stone problem and urinary tract. Continuous use of this soup for 5 to 6 months cure the patient effectively.This ITK is used throughout Himachal Pradesh for treating stones problem in human being, since time immemorial. **Keywords**: *kulath* soup, kidney stone, urinary tract	Dr O.S. Shad, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1007	Preparation of paproo	In this practice cumin and salt are added to wheat flour which is kneaded properly. Small *chapati* is prepared and dried in the sun. It is consumed after frying in clarified butter. The food is prepared by the people of Matour village in Kangra district of Himachal Pradesh during *Holi asthami* festival. As the food do not get contaminated, it is carried by the people for consumption during long journey. **Keywords**: *paproo*, cumin, salt, wheat flour, sun dry, butter	Shri Rajeev Kumar, Room No. 32D, NBH Hostel-II, Himachal Pradesh University, Shimla (Himachal Pradesh)
10011	Preparation of non-vegetarian *momo*	Non-vegetarian *momo* is the traditional food of tribal belts mostly of Lahaul and Spiti. It is prepared from meat of sheep, goat and yak. Meat is cooked properly, and bones are discarded from flesh. Only small pieces of flesh of meat are fried in *ghee* with spices, chilli, onion, salt (one spoon each). These ingrediants are stuffed i n *rotis*/chapatis prepared from kneaded wheat flour. The *roties*/chapaties are cooked over steam and eaten with soup. This soup is prepared from the bone extraction left alter cooking. Spices, onion, garlic, chilli powder, salts etc. are added accordingly for making it more delicious. This is a very effective ethnic food and is being consumed in tribal belts mostly of Lahaul-Spiti region, since time immemorial because of its nutritional and cold resistance properties. **Keywords**: *momo*, boneless meat, steam cooking, soup, nutrition, cold resistance	Shri Dharam Chand, Tabo, Kaza, Lahaul and Spiti (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1619	Pickling of small sized fishes	The small-sized fishes, mainly weed fishes, are not commercially important. To get better price or consume in better way, they are processed and then consumed. The smaller sized fishes are not consumed very much as the layer fishes. These fishes can be cousumed in different ways such as pickle, so that they give better taste. Small fishes are collected and sundried for 5–6 days. Then salt is sprinkled on it. After that it is kept in earthen *handia.* Then mustard oil is put, the layer of oil should be above the fishes. Then the fishes along with the *handia* are buried into the earth almost at 1 m depth for 5–6 days. After the period it is taken out and consumed as pickle. The practice is followed by farmers of Okhargarha village of Kanke block of Ranchi district of Jharkhand. It has been found successful in more than 60% of the cases. **Keywords**: pickle, fish, oil	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand 834 006
1643	Use of young bamboo as pickle or vegetable	The young branches of bamboo are cut into pieces and stored in earthen pitcher for 7–8 days for fermentation. Then the fermented bamboo is cut; it is called *sandhna*. It can be eaten as vegetable or in the form of pickle by putting salt and other ingredients. The practice is being done in village Sukurhuttu of Kanke Block of Ranchi district of Jharkhand and has potential for its further spread. It is very popular due to its delicacy. Cost: benefit is 1: 6 approx. **Keywords**: pickle, *sandhna*	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834006
1644	Making of fish *papad* and *chakli*	*Papad* and *chakli* are common ration item in Indian family. The farmers make fish *papad* and *chakli*. It provides extra energy, protein and vitamins and increases disease resistance and it is therapeutic value as food. There are certain varieties of fishes which are not important commercially. These fishes can be used along with the normal ingredients of *papad* and *chakli* to increase then market value. The fish is first boiled into the water and then the flesh is separated from the bones. The flesh is minced and then mixed with the flour of *papad*. The percentage of flour to fish flesh should to 9: 1 to 9: 2 depending upon the choice of the person. This practice is being used in Madhesera village of Bhutahi Block of Sitamarhi of Bihar. The success has been observed in more than	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834 006

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		75% of the cases. Cost: benefit is 1: 7 approx. **Keywords**: fish *papad*, *chakli*, energy	
1645	Making of fish pickle	Pickle is a common ration item in Indian family. There are certain varieties of fishes which are not important commercially called trash fishes. These fishes can be used along with the normal ingredients to make pickle to get good market price and to improve the quality of the product. The process and ingredients of fish pickle are almost same as the other pickles. First the fishes are washed, and cut in such a way that bones should not be there. Then little pieces are cut. The cut pieces are then fried thoroughly in mustard oil with some spices. After cooling these are stored in a bottle and mustard oil is put into it above 2.5 cm level of the pieces. Some preservative can also be used for longer storage. This practice is being done in village Madhesera of Bhutahi Block of Sitamarhi of Bihar, and has potential for its further spread. The success has been observed in more than 80% of the cases. Cost: benefit is 1.7 approx. **Keywords**: long storage, fish pickle	Shri Rajeev Kumar Jha Research Associate, Department of Fisheries, Ranchi Veterinary College, Ranchi (Jharkhand) 834006
957	Packing of pickles	Pickles of mango, *galgal* and lemon are placed in sterilized earthen pots in lower parts of Himachal Pradesh. To sterilize the earthen pots these are placed on burning fumes of red pepper, asafoetida (*heeng*) and mustard oil in the containers because the burning fume has antimicrobial properties. This is in practice for last several years and it increases the life of the product. Now-a-days farmers use inorganic chemicals to sterilize containers, since excess use of chemicals may pose serious health problems. **Keywords**: pickle, sterilize, red pepper, asafoetida, mustard oil, antimicrobial, inorganic chemicals	Dr P.C. Sharma C/o Deptt. of Post Harvest Technology, Dr Y.S. Parmar, University of Horticulture, Nauni, Solan (Himachal Pradesh) 171 005
2227	Appetizer	In buffalo and cattle in case of non-acceptance (off feed or decreased intake of feed) *aizwain*, dry ginger, asafoetida jaggery and salt (about 25 g each) are mixed, grind to paste and applied on the tongue. **Keywords**: appetizer, cattle	Shri Dorai Raj Krishi Vigyan Kendra, Haripuram, Rambili, Visakhapatnam (Andhra Pradesh) 531 005

22

Natural Yarns, Dyes and Weaves

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
977	Shoe-making from Cannabis	This practice is being used for shoe making in Janjali village of Mandi district in Himachal Pradesh. All the people of that village having 24–30 pair of shoes for self, and sometimes these are given as gift item for guests. The method for making a shoe is very easy; first *cannabis* plant is dried and the bark of the plant is removed for making threads. This thread is used for lower portion of the shoe and upper portion of shoe prepared by the goat wool. This is made by 0.5 cm needle. **Keywords**: Cannabis thread, goat wool, needle	Shri Indra Thakur,C/o Shri K.L. Thakur, House No. 28, Type IV, Block Host, Shimla (Himachal Pradesh)
2236	Jute rope cot	Farmers of Thotaguda village of Vizianagaram in Andhra Pradesh are practicing this method to make cot by using jute/*mesta*. Yarn of jute/*mesta* is weaved into rope and then used for knitting the cot instead of cotton and plastic which are available in the market. The cotton and plastic are very expensive as compared to jute rope. Villagers of Thotaguda are very much skilled in weaving the ropes and during the leisure time they get engaged in weaving the rope. This is in practice for several years. **Keywords**: jute, *mesta*, knitting cot, low cost	Ms Biddiki Gangemme, Thotaguda, Karupam, Vizianagaram (Andhra Pradesh)
573	Rope of rambans	*Aul* is abundantly available which provides fiber for making rope. The whole plant is dipped in the water for a week for rottening. The epidermis of the stem is removed and used for making rope. It is cheapest source of fiber for rope making. **Keywords**: *aul*, plant fibre, rope	Shri Ram Singh,Ginni, Girgoan, Pithoragarh (Uttaranchal)
574	Rope of rambans	The leaves of *rambans* are crushed to obtain fibre. The fiber is removed for making rope. High quality fiber is obtained. The *rambans* is abundantly available in the area. It provides employment to the people as cottage industry. **Keywords**: *rambans*, fibre, rope, cottage industry	Shri Mohan Singh,Main Market, Thal, Pithoragarh (Uttaranchal)  Rope prepared from rambans

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
970	Method of making rope from bhang (Cannabis sativum)	Traditionally ropes are prepared from the fibres extracted from *Cannabis spp*. These ropes are of multipurpose household use. In Himachal Pradesh, *bhang* is cultivated for extraction of fibres and seeds. After maturation, harvested crop is set aside to dry. After drying, the seeds are collected and the fibre is separated from the stems and branches. Its fibre is stronger than jute, and is used for making ropes of desired thickness. This ITK is practised throughout the Himalayan region of Himachal Pradesh since time immemorial. **Keywords**: *Cannabis sativum*, fibre	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
972	Indigenous method of fibre preparation	People of Mandi district of Himachal Pradesh obtain fibre from *bayool* plant for making ropes. Dried twigs of *bayool* plants are waterratted for 1 month, and then fibres are extracted by striking the bundles of twigs on stones. Fibres are used for making bed, rope for tying animals and also for tying grass and wood. This technique is adopted by maximum number of farmers and involves little money. **Keywords**: fibre, *bayool*, water ratting, rope, bed	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
974	Use of yak hairs for making rope	Ropes made from yak hairs are used for tying domestic animals like cow and yak. Yak hairs on tail are long and having good plasticity that is suitable for making rope. Yak hairs are cut with scissors and then bob (knot of hairs) are cleared. These hairs are first moistened with water and then woven in the form of rope after spinning. Yak hairs are about 2 feet long and contain protein (keratin) that gives enough strength to the rope for durability. This is very common in most of the villages in tribal area of Lahaul and Spiti district of Himachal Pradesh. **Keywords**: yak hair, rope, woven, plasticity	Shri Dharam Chand, V.P.O Tabo, Tehsil Kaza, Lahaul, Spiti (Himachal Pradesh)
97	Dyeing and printing of different clothes with plant based colours	Black, yellow, red, blue and saffron colours are prepared for printing cotton, woollen and ryon clothes with the use of different plant materials and dissolvents. Black colour is prepared by keeping steel pieces with jaggery and *heerakasi* in water for 10–15 days. Simultaneously *herda* is mixed with water and clothes are dipped, and thereafter dried. Yellow colour is prepared by boiling *haldi* (turmeric) with pomegranate rind in water and the extract is used for printing the clothes. For shining, alum is used in the	Shri Yusuf Yaseen, Opp. Badi Maszid, Balotra, Pachpadra, Barmer (Rajathan) 344 022

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		extract. Red colour is prepared by adding ground tamarind seeds in red alum dissolved and filtered water. In this solution *alijar* and *sakoot* are added and boiled. Printing is done with this red-coloured solution. Blue colour is prepared by dissolving indica with lime, which is used for printing and dyeing. Saffron colour is prepared by dissolving *kevla* flowers in water for a few days. **Keywords**: steel pieces, jaggery, *heerakasi*, *herda*, turmeric, pomegranate, alum, tamarind, *alijar*, *sakoot*, indica, lime, *kevla*	
309	Plant dye from fruits of *sara* tree	Plant dye is used as *dhobi* mark. Washermen taking clothes from different households for washing, generally mark clothes with some identification. Fruits from *sara* tree has colouring and dyeing properties, which is black in colour. Using needle, the black liquid directly marked on to the cloth which stays long. Washermen uses this technique earlier, and it has been in use for several years. **Keywords**: *sara* tree, dye, *dhobi*	Shri Sivaraj, Karikuttanoor, Palacode, Dharmapuri (Tamil Nadu)
975	Red dye (mystle) made of *Chrysanthemum indicum* and *Lawsonia inernis*	To dye hair, hands and feet, leaves of *Chrysanthemum indicum*, and *mehandi* plant, are used by most of the people of Kurog and Gopalpur blocks in Mandi district of Himachal Pradesh. The leaves are ground properly and applied to the grey hair or in a decorated fashion to hands and feet on special occasions at marriage time. This is an age-old practice and now-a-days people also add *amla*, lemon, tea etc. to improve the quality of dying. Others use synthetic dyes for grey hairs because use of this practice is laborious. **Keywords**: dye, *Chrysanthemum indicum*, *Lawsonia inernis*, hair, hand, feet	Shri Goutam Ram, Kubham, Karsog, Mandi (Himachal Pradesh)
1716	Preparation of dyes from *palash* (*Butea monosperma*) flower	Villagers of Kuchai block in Saraikela district (Jharkhand) use flower of *palash* for colouring their clothes. This natural dye is prepared by boiling flowers of *palash* with water for an hour. It is being used by majority of villagers for the last several years without any modification in process. **Keywords**: flower of *palash*, colouring clothes, natural dye, boiling	Ms Gita kumari, C/o K. N. Singh Munda, Matladih, Bagbera (Tatanagar), East Singhbhum (Jharkhand) 833 201

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1717	Bark of *arjun* and *asan* used for making natural dyes and colours	Bark of *arjun* and *asan* is boiled, minimum for 2 days after soaking in water for a week. Then the product is used as dye. At the time of use it is again boiled. The practice is followed widely in the villages of Rajnagar Block of Sarikela district (Jharkhand) and has potentiality for its further spread in the areas, where *arjun* and *asan* trees are abundantly available. Farmers are 100% satisfied with the practice. Cost: benefit is 1: 8 approximately. **Keywords**: *arjun*, *asan*, natural dye	Shri Sahyogi Mahila, Bagaraisai, Sarikela (Jharkhand)
976	Traditional method of harvesting, processing and weaving of sheep wool	In upper Himachal Pradesh, farmers use large-sized shearer or scissor for shearing wool from goats and sheep. The sheared wool is combed and made smooth either with a special comber called *kangroo* or with special arrow-like device called *phanani.* The combed wool is stored in a small bamboo basket (*kamoli*) in the form of a small pack. These woollen packs are used for spinning a thread with a special device known as *taklu*. These woollen threads are used for making woollen fabrics like blankets, long woollen cloth, coat, *shawls* etc. This is a traditional practice adopted by a majority of the farmers for the last several years. **Keywords**: wool, goat, sheep, *kangroo*, *phanani*, *kamoli*, *taklu*, blankets, woollen cloth	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
98	Animal-based yarn used for wearing	Hair of camel and goat (called *beggar*) are cut by scissor, whereas wool from sheep is taken out by a special scissor, called *kat*, which is about 2 feet long. *Beggar* is cleaned by beating with wood or *pinjar*. Wool is cleaned by hand. Both *beggar* and wool are then given the shape of thread with the help of *batiya* or *atiya*. *Atiya* is different than Gandhiji's spinning wheel. *Pattu* (showd) are prepared from wood, where as camel *beggar* is used for making *ganwai kalin*. Goat *beggar* is used for making *pattiye*, which are used to keep fodder for transport by bullock or camel cart. Goat *beggar* is also used to make the rope for tying the animals. **Keywords**: hair of camel and goat (*beggar*), wool of sheep, *pattu*, *pattiya*, *ganwai kalin*, *pinjar*, *atiya*, *batiya*	Shri Kheta Ram Bhil,S/o Shri Chuna Ram, Gilankaur, Jodhpur (Rajasthan) 342309

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
308	Silkworm rearing with wet mulbery leaves	Some farmers use wet leaves of mulberry to feed the silkworm. The leaves and twigs of mulberry are washed by dipping in water to get rid of powdery mildew or other dust in the leaves. The water in the leaves is drained before being fed to the silk worms. By this practice, about 80% of diseases of silkworm are controlled, which results in high yield and good quality cocoons. For the last 5 years, two silkworm rearers are practicing this method in Belgaum district in Karnataka. **Keywords** mulberry leaf and twig, powdery mildew, silkworm	Shri Vasanthayya Shankarayya Hiremath, Amarapur, Veerapur, Bailhongal, Belgaum (Karnataka) 591118
508	Technique of indigenous dye	I n the ancient times when readymade yarn/threads were not available for making different designs of cloths, the people of Nsungu village, under Tsemingu block in Kohima districts of Nagaland, used indigenous plants for dying yarns threads into varieties of colours. Different plants are used for dying to get different colours 1. *Black dye:* A particular plant called *nushunphangha*, is planted near the house or garden and is use for black colour of shawl/clothes and dresses. *Process of dyeing:* The leaves are plucked from the plants and boiled along with the yarn in a big earthen pot for 2 to 3 hours. The yarn is then takenout and dried in the sunshine. The process is repeated till the yarn is turned into completely black. 2. *Red dye:* There are two plants whose roots are used for red colour, called *allawi*, which means red yarn. The shrub called *achaque* is a creeping plant with sticky stem and leaves, which grows mostly in the bank of river and swam areas. Another plant called *akughon*, which grows in any area, is also used in combination with *achaque* for dyeing white yarn into red. The combination of these two roots is the best ingredient for red colour dyeing of yarn. *Process of dyeing:* The roots are cut into pieces and put into the big earthen pot and boiled along with the yarn or fur for several hours and yarn is taken out and replaced with its fresh roots and the same process of boiling with yarn/fur is repeated, and is dried in sun. Again, it will be	Shri A.K Rengma, AHM, GHS Chunlikha P.O Tsemingu, Kohima (Nagaland) 797 109

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		sucked in the wooden vessel and fermented for 2 to 3 days. Then it is taken out from the vessel, contents are boiled and liquid of plants and dried it again. 3. *Yellow dye:* Roots of *khentsu* and *ahicho* are used for yellow dye. Process of dyeing is the same as that of black and red dye. The plant materials used for dyeing are locally available from nearby and in the jungle. Almost all the people in the village have been using this method. Due to the laborious work and availability of readymade yarns of different colours in the market, the use of this practice has almost stopped. **Keywords**: dye, yarn	
570	Red dye from roots of *shayama* (*Echinochloa frumentacea*)	The roots of *shayama* plants possess colouring property. The roots are crushed and boiled in water. The clothes are then boiled with the water for 20 minutes. The dye gives red colour to the wool.The roots of *shayama* are easily available and the price of this process is cheap. **Keywords**: natural dye	Ms Lila Devi, Dhapa, Dumar, Munsyari-Pithoragarh (Uttaranchal)
571	Natural dye for carpet	Different types of attractive colours and dyes are being made from locally available materials like different plants, herbs, ferns, etc. by SEWAK, an  Carpet coloured with natural dye NGO. The plant materials or herbs are cut into pieces and put into a container having water in it. Then this water is boiled to extract the colour. The spinned wool is dipped in this container. To fix the colour, alum and some locally available herbs having acidic properties are also mixed into it. The coloured woollen yarn is taken out and dried in shade. Direct	Shri H.C. Tiwari, Society for Employment, Welfare and Agriculture Knowledge (SEWAK), A-46, Judge Farms, Haldwani, NainiTal (Uttaranchal)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		sunlight is avoided. The coloured wool is used for making carpets, *shawls*, *thulmas*, *chutkas*, sweater, etc. **Keywords**: natural dyes	
968	Indigenous method for preparation of *shawls* from traditional handicrafts	Wooden instruments are used for making *shawls*, dying and washing. Woollen threads are locally prepared from sheep/goat hair. This practice is time  Indigenous methods for shawl preparation consuming but economically good for local people, and the pattern varies from valley to valley in the region. This is in practice for last several years. **Keywords**: wooden instruments, *shawls*, dying and washing, handicraft	Shri Z. Chandra Rathore, Lecturer in Zoology, Govt. P.G. College, Chamba, (Himachal Pradesh).
969	Use of goat skin as a sack for storage of food grains	Goat skin sacks are cheap and durable materials used for storage of food grains. Farmers believe that insect-pests do not affect grains stored in such sacks. The skin of slaughtered goat is peeled off by knife and then treated with salt and oil to make it soft. It is allowed to dry in air after filling it with pine needles for 15–20 days. Then sack-like structure is made from this, which is used for grain storage. Goat skin sacks were in common use in temperate Himalayan region. However, now with several types of cheap synthetic sacks available in the market, its use is declining. **Keywords**: goat, skin, insect-pest, sack, grain storage	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
971	Animal-based yarn	Animal based yarn, i.e. wool production from sheep and preparation of yarn is the traditional practice. Each family keeps 1 or 2 sheep, from which they take wool and spin yarn of two types, thin and thick. This yarn is used for *shawl* making, whereas thick yarn is used for *pattu* making (cloth used in winter).	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Generally local weavers prepare clothes and *shawls*. **Keywords**: wool production, spinning yarn, *patt*	
1715	*Rassi* (rope) and other useful things made of *sanai* (sun hemp)	*Sanai* (sun hemp) is cultivated in upland as sole or mixed crop with *arhar* (pigeonpea), *marua* (finger millet) and *gora dhan* (upland rice). Farmers of Thaitangar block in Simdega district of Jharkhand are utilizing *sanai* leaves, flowers and fruits as food (*chatni*) and its stems are used to get fibre to make rope and other domestic things. Bundles of *sanai* plant are dipped into water (spoiling). After 4–5 days, these are taken out and barks are rubbed and washed well to got the fibre. This natural fibre is being used for the last several years without any modification, but there is need to make them water resistant. **Keywords**: *sanai* (sunhemp), fibre, spoiling, dipped into water	Ms B Ekka, Q. No. DT-1327, Dhurwa, Ranchi (Jharkhand) 834004
2289	Indigenous practice in sericulture	The practices identified and studied by Shri Mahanthesh for his Masters degree in Sericulture are as follows: Mulberry cultivation ***Mulberry planting and cultural operations*** 1. Paired set planting 2. East-west row planting 3. Nipping of apical bud a week before harvest 4. Paired row system of planting 5. Removal of stump below 2'' soil surface 6. Copping knife for cutting the planting materials 7. Use of wooden plough for inter cultivation 8. Deep digging before planting (1.5 feet) by using crowbar 9. Soil turning by spade to minimize weeds 10. Use of mysore local leaves for chawki rearing ***Application of organic matter and other nutrients*** 1. Broadcasting FYM 2. Application of jute from silk reeling and litter waste as manure 3. Oilcake application (*honge* and *neem*) 4. Poultry-manure application 5. Tank-silt application once a year 6. Use of night soil 7. Use of sheep manure 8. Burying of coconut leaves in mulberry field	Shri H K Mahanthesh, Department of Agricultural Extension, University of Agricultural Sciences, Banglore (Karnataka) 560 065

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
		9. Application of only organic matter to chawki garden 10. Covering the mulberry field with paddy straw or pasture etc 11. Covering soil with organic matter to avoid weeds 12. Application of gypsum 13. Use of green-manure crops like sunhemp, cowpea, horsegram etc ***Irrigation*** 1. Frequent irrigation to mulberry plots 2. Water spraying a day before harvesting 3. Puddled tank to store bore-well water for irrigation ***Control of pests and diseases*** 1. Growing of maize plants around the mulberry plots 2. Leaving of border plants without harvesting 3. Spray of tonic conofix for mulberry 4. Keeping the mulberry field away from tobacco field ***Harvesting*** 1. Leaf harvest in the afternoon 2. Removal of male plants in mulberry 3. Tying small bundles of branches for transportation 4. Harvesting the crop to the bottom level 5. Removal of bottom leaves up to 8'' above ground before chopping 6. Webbing of grown mulberry branches in the form of arches ***Storage of leaves*** 1. Storing the leaves upside down 2. Covering the stored leaves with wet gunny cloth 3. Preparing the sand bed and adjusting drip and keeping the harvested branches in rearing house ***Silkwarm rearing house*** 1. Air flows in the roof by giving gap between slabs 2. Growing of mango trees around the rearing house	

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		3. Use of cement bricks for construction of rearing of house 4. Raised roof for rearing 5. Small channels with water all along the rearing house (inside) 6. Raising good canopy all around the house 7. Use of asbestos sheet for the roof for the rearing house 8. Perforated holes in godowns or fixing of exhaust fans inside the go downs 9. Rearing house with more number of small windows 10. Rearing worms in dwelling house ***Egg incubation*** 1. Use of earthen pots for egg incubation 2. Hanging of egg sheets 3. Use of feather for brushing of young worms 4. Use of newspaper instead of paraffin paper 5. Zero-energy chamber for egg incubation 6. Use of banana leaves instead of paraffin paper 7. Use of banana leaves for carrying eggs from the grainage 8. Giving soft touch to the blue staged eggs ***Chawki rearing*** 1. Use of tender leaves (apical bud) for feeding 2. Bed cleaning once, up to 3rd instar 3. Removal of petiole and then feeding it to *chawki* worms 4. Treating first two instars only as *chawki* worms 5. Long leaf strand bits for *chawki* worms 6. Single feeding to *chawki* worms daily 7. Shifting of *chawki* worms by using cycle tyres/nylon cloth 8. Green house for *chawki* rearing 9. Use of tamarind seed powder over the trays 10. Trying of binding wires to the rims of the trays 11. Detachable multiple rearing stand 12. Single-bed cleaning in late-age worm rearing in shoot feeding system 13. Use of newspaper in trays at the bottom during IV and V instar rearing 14. Covering windows with wet gunny cloth 15. Immediately after 3rd and 4th moult to worms giving chopped leaves	

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16. Storage of chawki leaves inside the earthen pots.

Late-age worm rearing

1. Use of entire shoot for feeding
2. Use of altered and modified rearing stand
3. Use of nylon rope for construction of rearing stand with GI wire

Maintenance of temperature and humidity

1. Use of electric bulbs to increase temperature
2. Use of wet gunny cloth to the window, to the lintel or away from windows
3. Covering of coconut fronts or pongamea leaves or paddy straw to the roof or rearing house
4. Hanging of water-filled earthen pots to the roof
5. Fixing of drips to the walls to moisten it
6. Erection of pandals near windows and doors
7. Growing of Acacia auriculiformis or casuarina hedge in front of windows
8. Fixing drips outside the windows
9. Tying Pongamea branches to the lintel of windows and doors
10. 10. Narrow-mouthed earthen pots covered with two folds of cloth and tied to the roof and cotton thread connecting the gunny cloth from pot to keep it in wet condition
11. Use of Cymbogan grass and hollow bricks for constructing pandals around the rearing house
12. Covering inner roof with thermocol sheet

Control of pests and diseases

1. Smearing cowdung slurry to the rearing trays
2. Washing rearing equipments with water
3. Watering around and inside the rearing house
4. Removal of shoot tips and old leaves 3 to 4 days prior to feeding of lateage worms
5. Lime powder application to the bed, floor, windows gunny cloth and to rearing trays
6. Women in periods (menturation) are not being allowed inside the rearing house
7. Use of asiphor liquid to control uzi fly
8. Fixing of drips to the walls to disinfect.
9. Bleaching powder as bed disinfectant
10. Mixing of Osimum cannum with mulberry leaves and offering it for feeding
11. Smoking loban (sambrani) inside the raring house
12. mearing coal tar to the rim and base of the rearing trays.
13. Use of cement cicterns for disinfection purpose
14. Use of burner for disinfection of trays andchandrikas

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15. Lightening fire by using hay or thrash of sugarcane or litter to the rearing trays
16. Use of alcohol as spray to the rearing trays and chandrikas
17. Use of white earth powder on the rearing bed
18. Maintenance of dry sand beds beneath the rearing stand in winter to trap uzi maggots
19. Use of DDT or BHC or band to the rearing stand or chandrikas
20. Use of tamarind seed powder or grease band
21. Replacement of old bamboo mat with new one
22. Use of ash rings around the legs of mountage
23. Anteroom made of nylon mesh
24. Paste made of paper bits, menthya, tamarind and seed powder used for smearing trays

Mounting and harvesting

1. Hanging a dead crow or doll man near mountages
2. Tying of old cassette (apes to the sticks and keeping it near mountage)
3. Exposing chandrikas to morning sunlight
4. Kepping the chandrikas with mounted worms in the rearing stand
5. Use of large and thin cloth or bags for transportation of cocoons to market
6. Pooling the non-spinning worms in one tray and covering with gunny cloth and exposing it to sunlight
7. Use of toothbrush to remove floss from spirals
8. Dipping non-spinning worms in luke warm water for half a minute
9. Covering the non-spinning worms in trays with paddy straw or eucalyptus or coconut leaves and covering the tray with gunny cloth/another tray
10. Construction of low cost mountage sheds
11. Use of self-mounting mountage

Keywords: silkworm rearing, chandrikas, mountage

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2237	Woollen blankets from sheep wool	The hair of sheep are collected, the hair is then spun with the help of a *kunduru* after which woolen threads of blanket length (2.5 m) are prepared and treated with starch prepared from paste of tamarind seed. (tamarind seed are soaked overnight and boiled) then woolen is soaked in the tamarind seed starch to strengthen threads. The starched threads are fixed on weave and blankets are woven. To prepare a blanket 4 kg of wool is needed. **Keywords**: sheep wool, blankets, tamarind seed	Shri Chintalabagunda Satyanarayana, Kotham Gudam, Vikarabad (Andhra Pradesh)

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Low-cost Housing Materials

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
445	Use of *Tal patra* for preparation of roof of the houses	Palm leaves, locally called *tal patra*, are used for preparation of roof of the houses. It has been in use for a long period by the poor families in Shibiloon village of Burdwan district in West Bengal. **Keywords**: *tal patra*, roofing, poor families	Shri Tapomoy Ghosh, Shibiloon, Burdwan (West Bengal) 713 130
575	*Babeela* (*Scireus* spp.) grass as roofing material	This is durable, straight and long leaved grass available in the area in abundance. The grass is used as a roofing material. Due to its outwards slope, it passes the water outside and doesn't allow the water to penetrate. It keeps room temperature constant as it acts as a good insulator. **Keywords**: *babeela*, roofing material	Shri Mahanand Tiwari, Triyugi Narain, Chamoli (Uttaranchal)
987	Use of soil for construction of wall of house	The houses in Machyar village in Kangra district of Himachal Pradesh are constructed with soil/mud, which is packed inside wooden structure. This is locally called *bhati*. The advantage of this structure is that it keeps the house cool during summer and warm during winter. The *bhati* is strong structure, which can even withstand earthquakes. The practice is followed by about 70% of the villagers and the rest have cement concrete houses. **Keywords**: mud, wood structure, *bhati*, wall	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1315	Mud house with wood sticks and thatch roofing	Almost in all the villages in Haryana, houses are constructed with mud, wooden sticks and thatch roofing. This is found among the lower section of the people with less income. Now, these type of houses are limited due to property and improved status and more *pakka* houses have replaced most of these mud houses. **Keywords**: mud house, wooden stick, thatch roofing	Dr A.K. Mehta, Zonal Coordinator, ZCUI, Transfer of Technology Project, ICAR, PAU Campus, Ludhiana (Punjab) 141004
1719	Construction of mud house	Mud house is constructed with the support of bamboo and is thatched with paddy straw to get protection from scorching sunlight, rain water, cold wave and natural hazards. In this practice, bamboo sticks are used for door; logs of wood and bamboo for internal	Shri Md. Rafiq Ansari,Bastipur, Kashi Tand, Gobindpur, Bagh Summa Dhanbad (Jharkhand) 828 109

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		house structure; paddy straw for thatching; clay and mud mixed with paddy/wheat husk to avoid cracking of wall and finally plastering of wall by soil mixed with ash. This practice is in use for last many years by 65% of farm families in Bastipur village of Dhanbad district in Jharkhand. **Keywords**: mud house, bomboo, paddy straw, clay, mud, paddy/wheat husk	
1723	*Khaprail mitti ka ghar* (earthen house)	Almost all Asanbera houses in village of Thataitangar block in Simdega district of Jharkhand are made of soil with *kapra* (earthen curved slave) roof. Locally available red and *angra mitti* (clay soil) are kneaded and wall is constructed by pressing or compelling. *Kapra* (earthen curved slave) is also made by same material, by the use of potter's wheel, and then it is kept in fire for dressing. Roof is made by wooden beam and arranging thick wooden sticks or bamboo over that. Then *kapra* is arranged over that in such manner that it completely covers the roof, and does not allow any water drop inside the house. Wall is plastered with clay soil by the women. Door and windows are made by wood. This type of earthen house is being in use for the last several years. **Keywords**: *khaprail*, *mitti*, *ghar*, earthen house, soil, *kapra*, kneaded, kept in fire for dressing, roof, beams, thick wooden sticks, bamboo	Shri Isidore Tete, Asanbera, Lathakhamna, Simdega (Jharkhand) 835 235
2001	Non-erodable mud plaster	A simple technology of plastering with a non erodable mud plaster is used to made the water proof mud walls. The mud plaster is prepared easily in the village by the following procedure. 1. The soil used for preparation of mud plaster should neither be too clayey nor too sandy. It is preferable to use 1.8 kg chopped and crushed wheat stem (*bhusa*) for every cubic foot of soil. The soil and *bhusa* should be mixed well, kept wet and kneaded every day for a week to ensure decomposition. 2. In the second stage, bitumen (45 kg; 80/200 grade) is first heated. The molten bitumen is poured into kerosene (9 kg) slowly while stirring the whole mass. 3. Once the mud compound and cutback is ready, the final product is prepared. For every cubic foot of soil and *bhusa* mixture 1.8 kg of cutback	Shri Nilesh Vinayakrao Kakade, Sushilnagar Cotton Mill Road, Rajpath, Amravati (Maharastra)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		should be added. 4. 4. A thickness of 1.5 to 2 cm mud plaster makes the wall non-erodable. When the plaster dried up it developed some shrinkage or cracks. The cracks is filled with additional application of mud plaster. 5. 5. Finally, a dung wash is applied all over the walls and allowed to dry for 24 hrs. The dung wash consists of one part of dung and one part of soil mixed well with 2 kg of cutback. **Keywords**: mud house, chopped wheat stem (*bhusa*), bitumen, dung wash, water proof	
2239	Mud house with roof of *rellu* grass	The bamboo sticks are used for foundation of the house inter connecting with rope. This is covered with mud. The roof of the house is covered with *rellu* grass/paddy straw, which are locally available. It is less expensive and all are locally available. It is not suitable during rainy season and cyclone. **Keywords**: mud house, *rellu* grass	Shri Kondagori Chinna Rao, Konda Baridi, Gl Puram, Vizianagarm (Andhra Pradesh)
579	Wood and stone houses  Use of stone and wood for construction of earthquake resistant house	The wood and stone houses are supposed to be earth-quake proof. The wooden logs absorb shock which are placed after one feet of stone wall from all sides. Some houses are made by slate and stone walls and the roofs are made of woods. These houses are earth-quake proof and provide good insulation against cold. **Keywords**: wood, earth-quake proof, insulator	Shri Gajendra Singh, Dharali, Marshil, Uttarkashi (Uttaranchal)
310	Tractor operated device for brick making	Shri M. Muthukaruppan of Koundanpatti village in Tamil Nadu has developed a tractor-operated device to make bricks mechanically. Initially bow like moulds were prepared, for which 6 persons are needed to mix soil and filling in the boxes. In one operation 61 bricks can be cut neatly and at this rate 1, 000 bricks from mould boxes could be cut per hour. **Keywords**: brick-making, device	Shri M. Muthukaruppan, Koundanpatti, Sevalpatty, Manapparai, Trichy (Tamil Nadu) 621 316
311	Concrete mix conveyor-a low cost device for transfer of building materials to elevated site	In many cities conventional lift is usually followed for conserving the building materials especially in the construction of multistoried building. Such lift costs Rs 4 lakhs. This is not beneficial for contractors engaged in small building work. Over the last 2 years,	Shri Govindan Venkatachelem Engineering Industries, 8, Sivan Santhi, Velipalayam, Nagapattinam (Tamil Nadu) 611 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Shri. Govindan tried new designs and he developed a prototype. He has developed a ladder frame for moving the conveyor drum. It moves at 70–80 º angle. It is operated through a 7.5 HP oil engine by using iron rope. He has designed this machine so as to move up to 120 feet i.e., for 3 floors/ storeys. He has invested Rs 1 lakh for completing this design. It has a drum capacity of conveying 500 kg of building materials which include concrete mixture. **Keywords**: concrete mixture, building materials, conveyor	
981	Cowdung and clay mixture for *kothi* making	Farm women in several parts of Himachal Pradesh use semi-solid mixture of cowdung, clay, dry straw and water for storing growing grains. This mixture is applied at the floor of the houses or both sides of *peri* and *kothi*. This is in practice for repelling the insect/pests and also for hindering the development of soil-dwelling insects. **Keywords**: cowdung, clay, straw, *peri*, *kothi*, insects/pests	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
982	Indigenous method of house construction	Earthquake resistant houses in earthquake-prone areas are constructed from 80% wood (*deodar*, *kail* or pinus), clay and stones on the roof. These houses are less destructive, safe against earthquake and are adopted by all the villagers of the area. **Keywords**: earthquake, earthquake-prone area houses	Shri Zapum Chandra Rathore, Lecturer in Zoology, Govt. P.G. College, Chamba, (Himachal Pradesh)
983	*Multang* materials for house construction	People of Kinnaur district in Shimla (Himachal Pradesh) use soil, dried grass, cowdung, sand and timber for house construction. Wall is prepared by soil. For strengthening the wall, little amount of sand and cowdung are mixed with soil. When wall is built up to roof height, timbers are placed on the wall. Roof is covered with dried grass or *bhojpatra* and it is plastered with soil. Doors and windows are prepared by wood. They opined that this type of *pakka* house is good for health and is safer. This technique of house construction is being practised for last several years. **Keywords**: Multang material, soil, dried grass, cowdung, sand, timber, *bhojpatra*	Shri Iswari Das, Manjhgaon, Sarahan, Rampur, Shimla (Himachal Pradesh) 172102

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
984	Traditional harvesting, processing and use of timber for house	Most of the farmers in Himachal Pradesh make extensive use of wood from both house construction private and community forests for building Himachal Pradesh all kinds of houses, shelters etc. Skilled persons only can do this work and the practice is a traditional one, which is still in use. **Keywords**: timber tree, skilled person, construction of houses, shelter	Prof. L.R. Verma, Department of Bio-Sciences, University, Shimla (Himachal Pradesh) 171 005
985	Materials for low-cost house construction	Stones are collected and used for house construction with clay soil. The clay soil is powdered and made into a paste and used in place of cement. A special green leafy grass, called *kharere*, is used in place of slate. The walls are pasted with cowdung mixed with clay soil. These houses are cheap and comfortable in all seasons. **Keywords**: stones, clay soil, *kharere* grass, cheap, comfortable	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)
986	Renovation material for home	Husk is thoroughly mixed in soil, which is called *gara*, and is used for making walls smooth and beautiful. This is traditionally used by the people of Mandi district of Himachal Pradesh, but these days cement and concrete have almost replaced it's use. **Keywords**: husk, soil, *gara*, making walls, cement and concrete	Shri Pawan Rane P.O. Tihra, Tehsil Sarkaghat, Mandi (Himachal Pradesh) 175 026
1718	Low-cost housing materials	There are different methods used to build house at low-cost by the villagers of Tamar block in Ranchi district (Jharkhand). 1. Wooden pillars are placed on 3 to 4 feet deep pits in erect position, at the corner of the proposed house. Then wall is prepared by binding the brushwood and bamboo and it is tied with pillars. After that brushwood wall is plastered with mud soil. Roof of the house is also made of brushwood or bamboo sticks and covered with straw. 2. Wall of the house is build by earthen bricks or stones and adhered by mud soil. Roof is made by arranging beams, *balli* (thick sticks) and bamboos and is covered with *kapda* (curve earthen slab). 3. Concrete pillar is built and wall is kept erect by adhering bricks with mud soil. Asbestus, tin sheet or concrete are used as roofing of the	Shri Krishna Singh Munda, Zonal Coordinator-cum-Convenor Secretary, Parvartiya Durgam Shiksha Vikas, South-East Zone, Parasi, Tamar, Ranchi (Jharkhand) 835 225

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		house. Windows and doors are prepared by ordinary wood or tin sheet. **Keywords**: pillar, pit, erect position, corner, binding, brushwood, bamboo, tied, plastered, mud soil, straw, earthen bricks, stone, beam, *bakli*, *kapda*, tin sheet, concrete	
1720	Use of different types of soils for decorating house wall	Villagers of Gambariya of Saraikela district use different types of soil for decorating house wall, and for keeping neat and clean. These houses are cool in summer and warm in winter. The mode of using the soil is as wall materials and plastering. This is age-old practice and adopted by maximum number of farmers. **Keywords**: soil, decorating, house wall, plastering, house	Ms Chami Murmu, Sahyogi Mahila, Saraikela Rajnagar, (Jharkhand)
1721	Low -cost housing with natural materials	Soil, cowdung and bark of *arjun* and *asan* are used for plastering the houses. Bark of *arjun* and *asan* is soaked in water for 2 days. Then it is boiled for an hour and natural brown clour is obtained. This colour is mixed with soil and cowdung. The houses are very durable, hygienic and attractive. The practice is widely adopted in the villages of Saraikela district of Jharkhand and has potential for further spread in the areas where *arjun* and *asan* trees are abundantly available. The houses look attractive and sooting and remain hygienic. Cost: benefit is 1: 3 approx. **Keywords**: *arjun*, *asan*, bark, plastering house	Shri Sahogi Mahila, Bagaraisai, Sarakela (Jharkhand)
1722	Low-cost wall material	It is very common practice in Karra village of Ranchi district of Jharkhand, because every material is easily available at home. In this practice, paddy straw or straw are cut into 2–3 cm pieces and mixed with such a concentration that its elasticity and durability increases. This is in practice for last several years by 95% of farmers in the village and involves little cost. **Keywords**: low cost wall material, paddy straw, elasticity/durability	Shri Nelson Tirkey, Bhitha, Ranchi University, Ranchi (Jharkhand)
1724	*Khaparpos* - low-cost housing materials	To protect themselves and their domestic animals from rain, sunlight, cold and also from wild animals, villagers of Simdega-Dumartoli village of Simdega district (Jharkhand) build their houses with soil, bamboo, wood and *balli* (thick stick). Wall is constructed by soil and/or earthen bricks adhered by	Shri Mariyana Guriya, Simdega Simdega Dumartoli, (Jharkhand) 835 223

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		mud. Roof of the house is made of beams of wood, balli and bamboo. It is covered by either straw *kapda* (earthen slave). Doors and windows are made by strong wood or bamboo. This type of house is constructed by all the villagers. **Keywords**: protect, rain, sunlight, cold, wild, animal, soil, bamboo, wood, *balli* (thick stick), wall, roof, windows, doors, straw, *kapda*	
1725	Wood of *ameda* used in making roof	Wood of *ameda* is strong but light in weight; therefore it is used in making roof by the majority of villagers of Saraikela district in Jharkhand. Its fruit is also useful, having abundance of vitamin 'C'. This is claimed by the users that *ameda* wood is long lasting material and also very cheap in comparison to other roofing materials. **Keywords**: *ameda* wood, strong, light in weight, making roof, fruit abundant in vitamin C, long lasting, cheap	Shri Devasis Murmu, C/o Agrarian Assistance Association, Dumka (Jharkhand)
318	Hand operated bending machine	A hand operated equipment employed for bending steel sheet plates in desirable shapes for manufacture of household materials such as cot, bench, table etc has been prepared. **Keywords**: bending steel sheets, household materials	Shri S.A. Ramachandran Ramah Steel Industries, Mannar Thirumalai Street, W. Pudhupatti, Watrap, Virudhunagar (Tamil Nadu) 626 116
322	Desk top publication machine	Shri. Sathanantham developed a equipment called desk top publication machine by adopting low cost technology. It is a mini off set printing type machine. By this method papers are automatically inserted in to the printer. This printing machine costs Rs 1.25 lakh. Two labours are required and ¼ hp electric motor is sufficient to operate this machine. Frequent maintenance is not required for this machine. Only small place is occupied by this machine and it weighs 0.5 feet. **Keywords**: off set printer, paper, electric motor	Shri K.R. Sathanantham, Press mechanic, KRS Engineering Industries, 22, Naanayakara, Nagoor, Nagapattinam (Tamil Nadu) 611 002
323	Room air cooler	Room air cooler has been developed by Shri. Sundarajan by adopting low cost technology. Fifteen to twenty holes are made in the rear side of the rectangular shape wooden box by driller to allow air to pass into the box. 2 feet× 3/4 feet size rectangular window in the front side of the box is made. Wire mesh is firmly fixed in the window. The box is placed	Shri V. Sundaraajan, Retd. Arts Teacher, 53, Singamada Street, Srivilliputhur, Virudhunagar (Tamil Nadu) 626 125

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		on a 2½ feet height metal stand. Rectangular aluminium tray is placed at the bottom of the wooden box. Cold water is filled initially on that tray. Small table fan is fixed within the box in an inverted position. Electric connection is provided. The air from the fan is sucked through rear holes. Moderately cool air is flown out in to the room uniformly through the wire mesh window. **Keywords**: wooden box, wire mesh, metal stand, aluminium tray, water, table fan, electric connection	
324	A wooden board to hold small articles	A wooden board developed by Shri. Sundarajan for the purpose to hold small articles at one place in home is indicated here. Top side of the 37 cm×25 cm×4 cm wooden metre box is removed by using blades. Five old speakers (which is a stable magnet) are kept inside. Thin tin sheet is used to covered the material. Tin sheet is folded an all four sides of the wooden box. Board is hanged on a wall in a prominent place at home. Small articles are attracted by the use of magnetic force. **Keywords**: wooden meter box, old speaker, tin sheet, wooden stand	Shri V. Sundarajan, Retd. Arts Teacher, 53, Singamada Street, Srivilliputhur, Virudhunagar (Tamil Nadu) 626 125
973	Technique of making *dalichaa*	Villagers use straw of paddy crop or cone cover of female maize for making *dalichaa* (sheets). These raw materials are easily available and the method is adopted for last several years by all the farmers in the village. *Dalichaa* is a low cost housing material for farmers. **Keywords**: *dalichaa*, straw of paddy, cone cover, low-cost housing material	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1063	Management of *vas* land	*Vas* (residential) land could be both levelled as well as slopy. In slopy land, foundation is kept sufficiently deep and more wood is used in house construction, which protects them from earthquake and heavy snowfall. House to house distance is kept minimum. In the middle of village, an open space is kept for assembling, recreation, social function and feasts. **Keywords**: *vas* land, deep foundation, wood, earthquake, snowfall	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh)

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Ethnic food

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
509	Preparation of *kumal chawl*	*Kunal chawl* is ethnic food of Assamese of Khoudachuk village under Puranigudam block in Nagaon district of Assam. This is prepared from *chowkua* paddy (local name), a paddy variety of low amylase content, which is never consumed without processing. The unique property of processed chowkua rice is that the soaked rice can be eaten straight away without giving any heat treatment. Traditionally processed *chowkua* rice or *kumal chawl* is used in three ways. i. the soaked rice is eaten by mixing with oil, green chili, onion and salt as done during ploughing season. ii. the soaked rice is consumed with curd and jaggery as breakfast cereal, and iii. the soaked rice is consumed as a ceremonial food at ritual ceremonies with curds and jaggery mostly by elderly people. Preparation is a tedious job. The process involved is the conventional parboiling of the soaked paddy, drying of the parboiled paddy at one stretch in sunlight in one day and then milling. The milled rice on soaking thereafter becomes soft in texture and is locally called kunal chawl. Materials used for preparation of the food items are chowkua paddy, saucepan, water, sieve or bamboo basket, *kamahi,* firewood, *dheki* (traditional hand and foot operated milling and pounding unit) and bamboo mat, containers or storage tins. The method of preparation is as follows. *Kunal chawl* is taken in a saucepan and water is poured into it. The water should be double the amount of rice. After about 30 minutes, the water is drained off and kept for 10 to 15 minutes. Now *kunal chawl* is ready and it can be eaten. Consumption of *kunal chawl* along with curd and jaggery has been found to have beneficial effect of keeping the body cool, hence	Ms Ritu Gen Goswami, Regional Agricultural Research Station, AAU Shillongani, Nagaon (Assam)

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		the farmers prefer to have it in summer. It does not lead to any indigestion or abdominal discomfort, and stomach feels full for a long time. The risk involved in preparation of this food is that after parboiling, the paddy has to be dried at one stretch in bright sunshine for 1 day. If it is not dried in 1 day, the rice kernels will break during milling and good quality kunal chawl would not be obtained. This practice has been in use since time immemorial with no modification. About 15 families out of 18, follow this practice and the reason for nonuse of the practice by others is the decreasing level of evaluation of chowkua paddy as the farmers go for high-yielding varieties, use of *dheki* is tedious job, and availability of ready-made breakfast products. **Keywords:** *kunal chawl, chowkua* rice, parboiling, soaked paddy, milling	
514	*Anüshe* (colocassia) leaf biscuit as ethnic food	*Anüshe* is an ethnic food item of Ao Naga Community under Mokokchung district of Nagaland. It is used as taste maker and also for use during lean period when the availability of fresh leaf is less. For preparation, large quantity of colocasia leaves are required. The leaves are collected and kept for some period till they become yellowish. The ribs of the leaves are excluded for the preparation. After this the leaves are pound nicely till they are made into paste. The pound leaves are then wrapped with banana leaves in which small holes are made in the lower part. This is then placed in one place, over which a heavy object like stone is kept for about 3 to 4 hours to drain out juice.Again, it is transferred to the metallic plate, which is placed over the fire. Ash is spread over the metallic plate before placing the wrapped colocasia leaves over it. Heavy objects are again placed over it and time to time it is turned over. After a few hours, it is ground again with addition of dry chilli, salt and local spices. Some people do not add anything. This paste is again made into biscuit form, having a diameter of about 2 inches, for drying over the fire. The taste is better if dried quickly. Hence people go for overnight drying. *Preparation in powdered form:* Dried Anüshe is heated in pan with continuous stirring and then pound in large mortar into powder. Cooked smoked meat, dry chilli, salt and other local species are added to it	Shri Tangitla Pongen, NRC on Mithun, Nagaland, Jharnapani, Medzhiphema (Nagaland) 797 106

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		and ground again. This can be taken as such with rice.This ethnic food has very good market value, costing Rs 160–180 per kg and has been in practice since time immemorial by almost all the Ao Naga community. **Keywords:** *anüshe,* colocassia leaf, pound, drying	
580	*Chandra (Pacoima emodi)* vegetable	Tips of *chandra* plant are cut into pieces and boiled in water. The vegtable is prepared as usual. This is very rich in iron and calcium which is also used for medicinal purposes.. **Keywords:** *chandra,* iron, calcium	Shri Diwani Ram, Gairvaram, Chamoli (Uttaranchal)
989	Use of *Pteridophyte* as an ethnic food  Utility part of Pteridophyte used for preperation of kasrod	In April and May months large amount of *kasrod* grows on shady area in high altitude. *Kasrod (a Pteridophyte)* is available in jungles. Tender kasrod is eaten during April and May as vegetable with maize. Local people also make pickle, which is highly delicious and due to unemployment it is easy to earn some money for livelihood. This is adopted for last several years by maximum number of farmers in the villages. **Keywords:** *kasrod,* ethnic food, high atlitute	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
997	Preparation of traditional food *moori*	*Moori* is a traditional food of the local people of Kullu district (Himachal Pradesh). The peasantry of the whole district of Kullu has been using this food since many centuries. It is a dry Himachal Pradesh food and is made of seeds of wheat, barley, maize, *sariana, bhang* and soybean. *Bhang (Cannabis* sp.) seeds are used is all types of *moori*. Walnuts are also mixed in the *moori* preparation now-a-days. It is made by heating the seeds in an earthen pot or iron pot with continuous stirring. *Bhang* seeds are separately cooked and then mixed with cooked seeds of wheat, barley, maize or *sariana. Moori* is used as food by the local people. Its shelf life is very long. Therefore, the long distance travellers and shepherds use it as the best food to take with themselves. Women use moori as a gift food while visiting their relatives. It is also used during religious ceremonies, child naming ceremony for distribution to others. This food	Dr O.S. Shad and Shri T.N. Lalchaupal, Department of Bio-Sciences, University, Shimla (Himachal Pradesh) 171 005

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		is used since evolution of agriculture and at present around 20,000 families are using the practice. **Keywords:** *moori,* traditional food, *bhang* seeds, walnut	
998	Traditional use of *lingur (Diplazium sp.)*	*Lingur (Diplazium spp.)* plant is traditionally used as food item vegetable by the people of Himachal Pradesh since time immemorial. The young plants have circled heads called *Circinate ptyxis* and these are collected by the local people for self consumption and are also sold in the markets. It is cooked after removing the hairs from the plant and cutting into small pieces. This is used as food item, pickle and *salad,* and it is believed to have high iron content and purify blood. This is found abundantly in nature. *Lingur* grows wild in nature and is found mostly along the water side. The young plants are traditionally used as a vegetable by the local people. It is used by different ways, such as *salad* and for making pickles. It is a good source of iron and acts as blood purifier. The young plants of *lingur* have circled head, called *Circinate ptyxis.* These plants are collected by local people for self-consumption and also sold in the markets. It is cleaned by removing the hairs from the plant and cutting into small pieces. Then these are fried in *ghee* by adding adequate amount of species, salt, chilli, onion and garlic. This is practised in most of the districts of Himachal Pradesh. **Keywords:** *lingur,* vegetable, pickle, dish, *Diphazium* spp., food item	Dr O.S. Shad and Shri T.N. Lalchaupal, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1000	*Sattu* (made of maize)	One of the special food for summer is *sattu* (made of maize), which is taken by the people of the Shimla region. They also keep it with themseles during long journey. This is a ready made long durable dry food. It does not need any preparation before eating. It is prepared by two processes. In first process, *sattu* is prepared from the green/fresh maize. Grains are picked out (removed) from the green cobs of maize, and then fried for a few minute. After that grains of maize are taken and boiled. They are sun-dried and powdered to make *sattu.* Materials used for making *sattu* are easily available at home. This ethnic food is in practice for last several years. **Keywords:** *sattu,* green cobs of maize	Ms Krishna Hetta, Deorighat, Thoeg, Theog, Shimla (Himachal Pradesh) 171 201

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1001	Sattu (made of jowar)	Sattu (made of jowar) is a ready-made easily preparable, time-saving and preserved fast food, which is taken by the majority of farmers of Shimla region. Sattu of jowar is prepared from the green and fresh cobs of jowar. Cobs are cut into pieces and tied together by making small bunches, then these are hanged over the fire. After that these are allowed to sun dry. This practice facilitates easy removal of grains from cobs. When grains are fully dried, they are ground to make sattu. This can be taken with water, milk, lassi, etc. Materials used for making sattu are easily available at home. This ethnic food is being used by local people for the last several years. **Keywords**: sattu, jowar, cobs of jowar, hanging over the fire, sun-dried, grain	Ms Krishna Hetta, Deorighat, Thoeg, Theog, Shimla (Himachal Pradesh) 171 201
1005	5 Use of kachnar (Bahunia variegata) flower buds for making pickle and vegetables	The name of the product is kachnar pickle, and materials used for the preparation are, kachnar flower buds, rai, oil, salt, turmeric, cumin seeds and red chilies. Flower buds of kachnar are kept in boiling water for 5 minutes and then dried. Rai is heated on tava and ground. Oil is heated and cumin seeds, turmeric, red chilies and salt are added along with flower buds and cooked for sometime. Lastly rai is added to it. This is practised by people of Kamand, Harabag, Dasehra, Leda, Kothi villages of Mandi district of Himachal Pradesh and it is an age-old practice. **Keywords**: kachnar flower buds, pickle	Dr S. K. Sharma, Krishi Vigyan Kendra, CSK, Himachal Pradesh Krishi Vishwavidyalaya, Mandi (Himachal Pradesh) 175 001
1009	Kheer (sweat dish)	Kheer is a very delicious, hygienic and good appetizer sweet dish. This dish is prepared from milk and rice. About 2–3 kg milk is first boiled in a large open container and then about 200 g rice is added to it (after cleaning and washing with water) and cooked with continuous stirring. Giri (Cocos nucifera), badam (Prunus dulcis), kaju (Anacardum occidentale), dakh (Vitis vinifera) and sugar are added according to the taste.It is mixed properly for about 5 minutes with continous stirring. This has been practised mostly throughout Himachal Pradesh since time immemorial. **Keywords**; kheer, milk, rice, cooked, continuous stirring, giri, badam, kaju, sugar	Ms Padma Dekit, Kaza, Lahaul and Spiti (Himachal Pradesh)

Code No.	Title of ITK	Discription of theITK	Name and address of discloser/facilitaor
1014	Preparation of *chhura*	Chhura is quite nutritive and hygienic fermented food. Chhura is rich in nutrients like carbohydrate, protein, vitamins and minerals. It is prepared from mixture of properly kneaded wheat flour (½ kg), *chhang* (local wine) 100 ml, and *lassi* (50 ml), baking powder (5–10 g), spices, chilli, salt according to taste. All the required contents are mixed, kneaded adequately and then circular *rotis* are prepared and cooked. These *rotis* are called *chhura* and are eaten with salted tea. This food is eaten specially in winter season as fast food for getting instant energy. This is practised in most of the villages in hilly areas of Himachal Pradesh since time immemorial. **Keywords**: *chhura*, fermented food, kneaded wheat flour, *chhang*, *lassi*, baking, fast food	Ms Dolama, Kirrrat, Tabo, Kaza, Lahaul and Spiti (Himachal Pradesh)
1015	Preparation of noodle *thukpa*	*Thukpa* is a fast food. It is a good source of energy. *Thukpa* is a local noodle, prepared in two ways: Vegetable *thukpa* and Non-vegetarian *thukpa*. **Vegetable *thukpa*:** Vegetable noodles are prepared from finely kneaded wheat flour and then dried and broken in small pieces. These noodles are fried in *ghee* or mustard oil, and vegetables like radish, cauliflower are added after cutting into small pieces. Onion and garlic (10 g each), spices, chilli and salt are added. Finally 100 ml water is added for proper cooking. This dish is then ready as fast food. **Non-vegetarian *thukpa*:** 1 kg meat of yak, sheep or goat is properly cooked and bones from the meat are discarded. The meat is cut into small pieces and the soft pieces of meat are fried in *ghee*/mustard oil. Then 20 g onion and garlic are added and cooked in 500 ml water. The noodles with spices, chilli and salt are added. The dishes are served with chilli soup. Both the dishes are nutritive, hygienic and provide resistance to cold in hilly areas of Himachal Pradesh. These have been practised since time immemorial. **Keywords**: vegetarian and non-vegetarian *thukpa*, wheat flour, *ghee*, mustard oil, yak meat, sheep and goat meat	Shri Nam Pchipa, Nacpchip, pukkar, Lahaul and Spiti (Himachal Pradesh)
1016	Preparation of *thuktal*	This dish is nutritionally better and hygienic, and also provie resistance to cold. *Thuktal* is prepared from finely kneaded wheat flour. *Rotis* are prepared and stuffed with a mixture of potato (50 g), garlic, onion, salt, chilli and spices. These *rotis* are cooked over heat and eaten with traditional soup called *pakhane*. *Pakhane* is prepared by mixing 1 litre *lassi* (whey) in 200 g fried *paneer pieces* and salt, chilli and	Shri Prem Singh, Kirat, Tabo, Kaza, Lahaul and Spiti (Himachal Pradesh)

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		heat and eaten with traditional soup called *pakhane*. *Pakhane* is prepared by mixing 1 litre *lassi* (whey) in 200 g fried *paneer pieces* and salt, chilli and spices, and this mixture is boiled for about 20 minutes. This dish is eaten especially in winter in most of the villages of Lahaul and Spiti. This is a good source of energy and has been practised since time immemorial. **Keywords**: *thuktal*, wheat flour, *roti*, *pakhane*, *lassi*, fried *paneer*	
1017	*Namkeen* (salted) *halwa* (*thango*)	*Namkeen* (salted) *halwa* (*thango*) is a very famous traditional fast food, prepared from wheat flour. About 200 g wheat flour is fried in *ghee*. Then 500 ml water, 10 g *fafra* (*khamir*) and 1–2 spoonsful salt and spices are added according to taste. This dish is very delicious, hygienic and nutritionally better. This is good source of instant energy. This dish is prepared mostly in winter season in most of the villages in Lahaul and Spiti district of Himachal Pradesh. This has been practised since time immemorial. **Keywords**: *namkeen halwa*, wheat flour, frying, *fafra*, salt, spices	Shri Suresh Kapoor, Tholang, Molang, Lahaul and Spiti (Himachal Pradesh)
1018	Ethnic food: fermented *roti* or *babroo*	*Babroo* are considered to be more nutritious than those of the unfermented one. Because fermentation converts complex nutrients into simple substances. The sound of fermented dough is attributed to the gas formation (CO_2) upon fermentation. Wheat flour is made to a dough by adding water and little quantily of jaggery (for each kg of flour 250 g *gur* is used). Starter culture is prepared by mixing wheat flour and *gur* in equal proportion and converting it to a dough. The dough is allowed to ferment for 3–4 days. The starter culture is locally called *malera*. During dough preparation, a previously prepared natural starter culture @ 10% is mixed and the whole mass is then covered with a thick cloth to allow the fermentation to complete. The completeness of fermentation is judged by the typical sound produced after tapping the dough or from the loosing of dough texture. From the fermented dough, *roti* is prepared as per usual practice by frying in oil. This type of fermented and fried *roti/babroo* are prepared throughout Himachal Pradesh during special occasions or on festivals. In different parts of the state it is known by different names. **Keywords**: fermentation, *babroo*, nutrients	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173 230

Code No.	Title of ITK	Discription of theITK	Name and addressof discloser/facilitaor
1020	Traditional noodles *sewian*	It is a traditional product during wheat growing region. *Sewian* is ready to eat cereal and is used to prepare instant product. In its preparation, wheat flour mixed with a little water is made to a dough and then passed through a machine under mechanical pressure to get long tube like noodles in a clean cloth. The cloth with noodles is dried under sun for 8–10 days and then the dried product is stored in earthen pots for its later use in preparation of instant products. *Sewian* is prepared throughout Himachal Pradesh region. It is easy to prepare and can be used later to prepare instant product. **Keywords**: *sewian*, noodle, wheat	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173 230
1021	Maize flour ball - *choorma*	*Choorma* is a nutritious item, easy to make. It is prepared especially for school going kids in the villages. Maize flour is made to a dough with water to prepare *roti*. This *roti* is then crushed between hands and mixed with *gur/shakkar* and *desi ghee* to convert it into round balls, commonly called *choorma*. This ITK is used in Theog Tehsil of Shimla district in Himachal Pradesh since time immemorial. In the past, farmers prepared this easy and nutririous food for school-going kids. Now-a-days its use is not common. **Keywords**: *choorma*, *desi ghee*, *gur/shakker*, maize	Ms Krishna Hetta, Senior Research Fellow, TK Project MRDA, Shimla (Himachal Pradesh) 171005
1024	*Badia* (nutrigs nuguts) from peeled *colocasia* (*Colocasia antiquorum*) stalks	*Badia* is considered to be nutritive and hygienic food product. *Colocasia* stalks contain certain nutrients which are very tasty and also easily digestive. In this ITK all available parts of the plant are used which otherwise go waste. In its preparation, a fine gravy of soaked and mashed blackgram and spices is prepared and then smeared or pasted to the peeled *colocasia* stalks (rod shaped), followed by sun-drying to a constant weight. The dried *colocasia* is stored for its use, later. Proper drying leads to better storage of the product. Product prepared is very delicious and is used in home cooking as a special dish in Chotta Bhangal area of district Kangra of Himachal Pradesh. **Keywords**: *badia*, *colocasia* stalk, dish, blackgram, spices, sun drying	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173230

Code No.	Title of ITK	Discription of the ITK	Name and address of discloser/facilitaor
1025	Preparation of fermented *roti*, *poltu*	*Poltu* is prepared from wheat flour. About ½ kg wheat flour is mixed with 5 g yeast (*oogla*) and kneaded properly by adding water. It is allowed to stand for about 4–5 hr for fermentation. Then circular *rotis* are prepared and fried in ghee or mustard oil. These *rotis* are very tasty and hygienic and eaten as fast food with tea. This is practiced in most of the villages of Kinnaur district of Himachal Pradesh. People practised this since time immemorial as an instant energy food. **Keywords**: *poltu*, fermented *roti*, wheat flour, *oogla*, fast food	Ms Arpana Negi, Kothi, Tehsil Kalpa, Kinnaur (Himachal Pradesh)
1026	Traditional food made of rice flour, *eklu*	*Eklu* is a traditional food which is prepared during Dewali festival by the villagers of Solan district in Himachal Pradesh. Paste is prepared by rice flour and it is put on the flat rocks which have cup like ditches on the upper surface. This is covered and cooked by heating the rock. *Eklu* is taken with *ghee*, sugar or *dal* (pulses) and *sabji* (vegetable). **Keywords**: *eklu*, traditional food, *dewali* festival, paste, rice flour, flat rock, cup like ditches	Shri Vidya Datt Sharma, Lab. Assistant, Deptt. of Bio Sciences, Shimla, Himachal Pradesh, University, (Himachal Pradesh) 171005
1027	*Krida*- a dish made of maize flour	*Krida* is a traditional dish of Shimla district in Himachal Pradesh, prepared from maize flour, generally taken in hot season. Maize flour is kneaded with jaggery water, and *laddu* is prepared. A big container is taken and sticks are placed at the bottom and some dried grasses are kept on the sticks. Little amount of water is poured in container and then it is heated. When steam comes out from container, *laddus* are placed in the container and left for 25–30 minutes for steam cooking. Then it is eaten with *lassi*. **Keywords**: *krida*, traditional dish, maize flour, knead with jaggery, water, *laddu*, steam cooking	Shri Dev Kant Prakash, Bhajheog, Theog, Shimla (Himachal Pradesh) 171201
1028	*Kachaudi*- made of rice flour	*Kachaudi,* prepared by rice flour is a reputed food in Mandi district of Himachal Pradesh. Rice flour (1 kg) is kneaded with yeast. Washed ½ kg *bhash* is ground and a paste is made, and spices (cumin seed, coriander, chilli and asafoetida) are mixed in it. Then *chapati* is prepared by putting above mixture inside it and it is fried. This food is being taken and served by the most of the people of Himachal Pradesh for the last many years without any modification. **Keywords**: *kachaudi*, reputed food, rice flour, yeast, *bhash*, *chapati*	Shri Indra Thakur, C/o Shri K.L. Thakur, House No. 28, Type IV, Block Host, Shimla (Himachal Pradesh)

Code No.	Title of ITK	Discription of the ITK	Name and address of discloser/facilitaor
1030	*Chapati* made of colocasia and maize flour	*Chapati* made of colocasia and maize flour, which is known as *bidne-kadoi* is taken by most of the people of Theog Tehsil of Shimla district in Himachal Pradesh. They claim that it is beneficial against various diseases,caused by cold. For *bidne-kadoi* preparation, first colocasia is boiled and outer layer is removed. Then boiled colocasia is crushed. Salt, chilli, turmeric, cumin seed, coriander and ginger are crushed and mixed with crushed colocasia. A little quantity of this mixture is put inside the ball of dough of maize flour and chapati is prepared and eaten with *ghee*. **Keywords**: *chapati*, colocasia, maize flour, *bidne-kadoi*, boiled, crushed	Ms Krishna Hetta, Deorighat, Theog, Shimla (Himachal Pradesh)
1031	Traditional food-*radu*	*Radu* is a energetic traditional food of Himachal Pradesh and being used for the last several years. It has some medicinal values which cure cough and also improve the digestive system. For its preparation, cumin seeds, *methi* and aniseeds are fried in *ghee* till it becomes dark red, then nipped onion and ginger are added and fried till it becomes pink. After that spices, sugar and churned curd are added and left on low flame for a few minutes. **Keywords**: *radu*, energetic traditional food, medicinal values, cough, digestive system	Shri Shanta Thakur, C/o Shri K.L. Thakur, Grand Hotel, Shimla (Himachal Pradesh)
1042	Traditional vegetable dish	Vegetarian *momo* is prepared from vegetables like radish, cauliflower and potato. These vegetables are boiled and skin of potato is removed and it is cut into small pieces. About 50 g potato and vegetables are mixed with chilli, salt, spices (1/2 spoonful each) and then added in wheat flour to make *roti*. This *roti* is cooked over steam in a closed container. The *momo* is eaten with sauce or soup. Soup is prepared from the supernatant liquid left after boiling the vegetables. One spoonful salt, chilli and tomato are added in that water to make soup. This dish is highly hygienic and is eaten as fast food in hilly area of Lahaul and Spiti district of Himachal Pradesh. **Keywords**: *momo*, soup, wheat flour *roti*	Shri Dharan Chand, Tabo, Kaza, Lahaul and Spiti (Himachal Pradesh)
1727	Sweet of *mahua* (*Madhuca latifolia*) flower	*Mahua* flower is nutritive, tasty and energetic food. It is taken by the tribal people of Chanho block in Ranchi district of Jharkhand. Dried *mahua* flowers and tamarind seeds (seed-coat removed) are steamed	Ms Prabha Bara, Pathalkudwa, Church Lane, Ranchi (Jharkhand)

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		for 20 minutes and then it is served to eat. **Keywords**: *mahua* flower, nutritive, tasty, energetic, tamarind seed, steamed	
1728	Pickle of *phutkal* (*Ficus inpectoria*)	Nutritive and tasty pickle of phutkal is prepared from its buds. It has medicinal properties against stomach disease. Pickle of *phutkal* as well as its vegetable are used by the majority of the villagers of Jharkhand. For pickle preparation, buds of *phutkal* are boiled for 15–20 minutes and then sun dried for a day. Then it is fried in mustard oil and spices are well mixed and kept in a jar. **Keywords**: buds of *phutkal*, stomach diseases, pickle	Ms Prabha Bara, Pathelkudwa, Church Lane, Ranchi (Jharkhand) 834 001
1729	*Chatni* of *ber gundi* (*Zizyphus mauritiana*)	*Chatni* of *ber gundi* is prepared by using 100 g of *ber* (*Zizyphus mauritiana*) powder, 3 bulbs of garlic, 4–5 drops of mustard oil and salt. All these are wetted with water and taken as *chatni*. This has some medicinal properties to cure stomach pain and good appetizer. Leaves of *ber* are fed to animals. *Chatni* of *ber* is very popular and taken by majority of the villagers of Jharkhand state. **Keywords**: *ber*, garlic, mustard oil, salt, stomach pain, appetizer	Ms Prabha Bara Pathal Kudwa, Church lane, Ranchi (Jharkhand) 834 001
1732	Sunum *pitha*, sweet prepared from rice	This ethnic food is prepared by the tribe, made from rice, and is used on the occasion of *Bandana* festival. It is rich source of energy and delicious. *Sunum pitha* is prepared by using rice, sugar and *dori* oil. Rice is first made wet through use of water, then it is powdered. This powder is mixed with water along with sugar, which is fried in *dori* oil. This ethnic food is prepared in the villages of Dumka block by the Santhal tribe in Jharkhand. The dish is claimed to be nutritious, delicious and easily digestible. **Keywords**: rice, sugar, *dori* oil	Santhal Shri Devashish Murmu, C/o Agrarian Assistance Association, Bandarjori, Dumka (Jharkhand)
1733	Ethenic food *apitharu* or *banuwala* sweet	This is in practice to solve nutritional deficiency and liver ailment in Asua and Bagraisai villages of Saraikela district of Jharkhand. In this practice, outer layer of *apitharu* is removed and boiled for 20–25 minutes. Then it is soaked in cold water, after some time water is removed and tuber is mixed with *gur*. This is age-old practice, adopted by 60% of families in the village. **Keywords**: *apitharu*, *banuwala*, sweet, nutrition, liver, tuber	Ms Pano Murmu (Asua), C/o Sahyogi Mahila, Bagraisai, Saraikela (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilator
1735	*Genthi kand* an ethnic food	*Genthi kand* is a tuber crop found in Thetaitangar block of Simdega district (Jharkhand). It has some properties which clean the abdomen/stomach. *Genthi kand* is collected from forest and boiled for some time and then peeled and cut into pieces and again boiled. After that it is taken as alternative food. It is also eaten with *gur* (treacle). This is a traditional food and is in use for the last several years. **Keywords**: *genthi kand*, tuber crop, clean the abdomen/stomach, traditional food	Shri Sushila Tete, Kudpani Bhandar Toli, Latlakhamandan, Sindego (Jharkhand)
511	Grasshopper as food item	Grasshopper as food item is used by the people of Phek, Kohima and Dimapur districts of Nagaland. Grasshoppers are usually collected after the harvest of paddy, specially at night, with the help of torch light or lamp. This is a seasonal food item which can be collected only after the harvest of paddy. The wings and stomach of the insect are removed and it is washed with clean water. It is then fried in vegetable oil with the ingredients like ginger, garlic, chilli, salt, oil, onion, fermented bamboo shoot etc. Water is usually not added and it is cooked dry. It can be collected from field and also can be purchased from market. The risk factor is that, some people are allergic to grasshopper. This practice has been followed by almost all the people in the village since time immemorial. **Keywords**: grasshopper, paddy field, seasonal food	Shri Aloli Jishing, NRC on Mithun, Jharnapani, Medziphema (Nagaland) 797106
512	Snail as food item	Snail as a food item is consumed by almost all the Nagas but more popularly among the tribe of Chakhesang, Angami, Rengma and Zeliang. This is considered as a special food item and by some poor families as a substitute of meat. Not all the species of snails but only a few species, which are found in terrace fields and fishery ponds, are added. Usually two species are consumed, one has elongated shell and the other with round shell. The fleshy part is eaten. The snails are collected from ones own terrace fields and ponds or can be purchased from market. The materials used in the preparation of food item are snail, salt, chilli, tomato or fermented bamboo shoot, vegetable oil etc. The shell of the snail is washed properly with the help of a brush. The operculum is removed and the other pointed end is cut with a knife. After proper cleaning it is cooked	Shri Nukusa Vadeo, NRC on Mithun, Jharnapani, Medziphema (Nagaland) 797106

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513		according to desire. It can be cooked along with meat, especially pork or fried with vegetable oil. Another method of preparation is with fermented bamboo shoot. After cooking for about 45 minutes it can be served. Almost all the farmers, except a few who do not like it,consider snails as special food item and have been practicing this since time immemorial. **Keywords**: snail, fleshy, terrace/ponds, food item	Dr Kapenlo Thong, NRC on Mithun, Jharnapani, Medziphema (Nagaland) 797 106
513	Fermented *til* (sesame) seed and crab as food item	This ethnic food preparation is popular among the Rengma Naga community under Kohima district of Nagaland. In this practice *til* seeds are cleaned and pound into paste to which crabs are added in a proportionate quantity and crushed again. After proper pounding it is taken out and kept in a container for fermentation. It takes about 2 days to ferment in summer and a little longer period in winter. After proper fermentation, it is wrapped in banana leaves and placed over fire for drying or it can be buried under hot ash in the furnace for some time till it gets cooked. Now it can be used for preparing *chutni*/pickle. This preparation is used as taste maker in *chutni*/pickle.**Preparation o f *chutni*/pickle**: Green chillies and tomatoes are placed over the burning charcoal for sometime and then taken out and ground in a mortar with a pestle. A particular species of local onion, called *anasi* or *khuva* in Rengma and Tenyidi dialect, respectively is also added to it and crushed. Small quantity of fermented *til* seed and crab is added and mixed properly. Salt is added to taste and is ready to serve.*Til* seed is readily available in the house or can be purchased from the market. This has been practiced by almost all the people of Rengma Naga Community since time immemorial. **Keywords**: sesame seed, crab, fermentation, taste-maker, *chutni*/pickle	
1008	Preparation of *zuma*	Zuma *is of two types:* non-vegetarian *zuma* and *sattu-zuma. Non-vegetarian* Zuma: Non-vegetarian *zuma* is prepared from the intestine of the sheep or goat. Intestine is first cleared, washed and cut into 2–3 inches small pieces. Then the cavity of intestine is filled with the cooked mixture of small and soft pieces of meat along with onion, garlic, chilli, spices and salt according to the taste. This preparation is then fried in *ghee*. This dish is nutritionally better.	Shri Champaishi, Tabo, Kaza, Lahaul and Spiti (Himachal Pradesh)

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		Sattu-zuma: Method of preparation of *sattu-zuma* is similar to that of the non-veg *zuma*, but only the difference is that the intestine pieces are filled with the mixture of 200 g *sattu* (barley or gram flour), chilli, salt, spices, onion, garlic according to taste. It is then fried in *ghee* or mustard oil. Both these ethnic foods are nutritive, hygienic and provide resistance to cold. This is good source of energy and balanced diet in hilly area of Lahaul and Spiti district of Himachal Pradesh since time immemorial. **Keywords**: non-vegetarian *zuma*, *sattu-zuma*, intestine of sheep and goat, salt, chilli, spice, onion, garlic	
1012	Preparation of *donchha*	*Donchha* is a popular nutritive and hygienic dish prepared in most of the villages in the hilly area of Lahaul and Spiti district of Himachal Pradesh.This dish is prepared from kneaded wheat floor. *Donchha* is basically a *roti* or chapati prepared from wheat floor enclosing half fried eggs. Eggs are first mixed with onion and garlic. Also chilli, salt, spices and coriander pieces are added and fried in *ghee*/mustard oil. The half-fried egg with other materials is enclosed in circular *roti* and cooked over heat and eaten with milk, *lassi* or butter for obtaining instant energy, especially during heavy work. This is a good source of energy, as it contains most of the nutrients of balanced diet, i.e. carbohydrate, albumen protein, fat, minerals, vitamins etc. These nutrients provide instant energy for various activities of the body. **Keywords**: *donchha*, wheat flour, *roti*, half-fried egg, instant energy	Shri Chhering Taduk, Kibber, Kaza, Lahaul and Spiti (Himachal Pradesh)
1734	*Demta* (red ant): an ethnic food	*Demta* is a red ant found on the trees. They fold the leaf of tree and reside inside. They lay eggs also in the curled leaf. These eggs are eaten by the villagers of Pithra village of Simdega district of Jharkhand as an ethnic food. These eggs are collected from the trees and fried with salt, chilli, spices and mustard oil and taken as food. **Keywords**: *demta*, red ant, fold the leaf, egg	Shri Matu Pradhan, Pithra Jitiatoli, Pithra, Simdega (Jharkhand) 835 223
1740	Ethnic food *ghunghi* (small black apple snail)	Small black apple snail, *ghunghi* (*Pila globosa*) is available in rice fields, ponds and rivers. Apple snail is rich in protein, fat and vitamins, which is considered as body building food as well as energetic	Ms Prabha Bara, Pathalkudwa, Church Lane, Ranchi (Jharkhand) 834 001

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		and protective diet. Snails are boiled for 20–30 minutes. After that meat portion is removed from shell and meat is cooked with spices like other meat. It is consumed by all the family members including pregnant and lactating women in the Sinjusrenj, Saraitoli and Sogod villages of Ranchi district in Jharkhand. **Keywords**: *ghunghi*, small black apple snail, proteins, fat, vitamins, body-building food	
1744	Use of snail as food	Villagers of Jojohatk of the Saraikela Khaisawan district in Jharkhand use snail for making curry. Snails are fried with *mattadih, bagbera* mustard oil and salt is added in it for taste. This dried vegetable is useful for increasing the eye sight for longer period in human beings. All the farmers of the village use this age old practice. **Keywords**: snail, dried vegetable, eye sight, human being	Ms Geeta Kumari, C/o Shri K.N. Singh Munda, (Totanagar), East Singhbhum (Jharkhand) 833 201
992	Preparation of sauce/*chatni* from *bichhu butty* (*Urtica indica*)	The sauce or *chatni* is eaten with *chapati* and rice. Majority of the local people use it as a supplement to *dal* or vegetable. It also purifies the blood, which is given regularly to pregnant women and anaemic persons. It is made from the green leaves of *Urtica indica*, particularly the young leaves of the plant. The leaves are cleaned and washed with water. Then it is crushed on the thick flat stone (*sheel*) having a small round stone called *batta*. Green leaves of garlic and coriander are also mixed to increase its flavour and nutrient. A pinch of common salt is also put in it. The *chatni* is put in some iron pot and is served to the family members at the time of dinner and lunch. This is used throughout Kullu district of Himachal Pradesh since time immemorial. **Keywords**: sauce, *bichhu butty*, medicinal value, nutritive	Dr O.S. Shad and Shri T.N. Lalchaupal, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
993	Traditional recipes for *guchhi* and other mushrooms	For mushroom dishes traditional recipes are used by local inhabitants for their preparation, which retain their aroma and flavour. Mushrooms are rich in proteins and minerals. This practice is adopted by all the families in the village Eutu of Himachal Pradesh. **Keywords**: *guchhi*, mushroom, recipe, protein and minerals	Dr O.S. Shad, Departmrnt of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005

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994	Preparation of *shari*	The dry fruits of *shari* or *chuli* are used as a dry fruit throughout the year. It is very sweet and delicious. The seeds are eaten like the apricot. The dry fruits are also used to prepare *shari ki dary* (local wine). *Shari* is made of *chuli* (*Prunus armeniaca*). It grows wild and is cultivated on the corner of the field by the local people. Local people extract oil from its seed for domestic purpose and it has also medicinal value. The fruits of the *chuli* are sun dried during the summer season in Kullu and Kinnaur districts of Himachal Pradesh. After complete drying, the fruits are stored and preserved for later use. *Chuli* is also used for local wine preparation. This is used throughout hilly areas of Himachal Pradesh since time immemorial. **Keywords**: *chuli*, *shari*, oil, medicinal value	Dr O.S. Shad, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
996	Traditional preparation of *shakori* (apple chips)	*Shakori* is dried chips of apple. It is delicious and off-season supplement for apple. The origin of *shakori* is since the coming of apple in the area is 1920 and 1930. It is prepared during apple season, generally in late July to November, according to the altitude of the area. The non-marketable apples are cut into small chips and sun dried. These are also dried near wood stoves. After drying these are ready for consumption. Shelf-life of the chips is very long. The purposes of making these chips are to use as supplementary food, to make local wine out of it and to preserve apple for off season. This is prepared by people of Shagagi village, Amni block of Kullu district in Himachal Pradesh. About 20, 000 families are following the practice. **Keywords**: *shakori*, dried chips of apple, supplementary food	Dr O.S. Shad and Shri T.N. Lalchaupal, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
999	*Modi*	*Modi* is an ethnic food which is taken by majority of farmers of Shimla region, during winter season, when there is scarcity of food materials. Dried grains of wheat, *bhang*, *gur* and *akhrot* are used for *modi* preparation. First grains of wheat and *bhang* are fried separately at the ratio of 3: 1 and kept in separate container. Then *gur* and *akharot* are cut into small pieces. After that all above materials are mixed together, heated in a *karai*. By this way tasty and nutritive food (*modi*) is prepared. Materials used for preparation of *modi* are easily available at home	Shri Dev Kant Prakash, Rajan Tyre Service, Rahighat, Thoeg, Shimla (Himachal Pradesh)

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		except *gur*, which is to be purchased from market. **Keywords**: *modi*, wheat, *bhang*, *gur*, *akhrot*, *karai*	
1019	*Chatni* from *bitchu buti* (*Urtica indica* Linn).	*Bristles of bitchu buti leaves have fumaric acid, which gets inactivated during grinding. The chatni is said to have curative value against joint pains. Thin paste of bitchu buti* leaves is prepared by grinding. Chopped onion (50 g), chillies (1–2 g), ground spices (10 g), salt (5 g), pomegranate powder (5 g) and sugar (25 g) are added and ground to a fine slurry to prepare the *chatni*. The product so prepared is consumed with maize chapati (roti). This ITK is used in many districts of Himachal Pradesh, specially in Kinnour. **Keywords**: *chatni*, *bitchu buti*, fumaric acid, joint pains, pomegranate	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173230
1022	*Chatni* of wild apricot (*chulli*) kernel	*Chatni* is considered to be a good appetizer. *Chatni*, prepared from wild apricot (*Prunus armeniaca*) is believed to be a brain tonic. It is used mostly during rainy season. Kernel of wild apricot is bitter in taste, may be due to the presence of volatile oil or some specific component which get either evaporated during grinding with aeration or degraded due to the action of endogenous enzymes, activated on soaking. Normally the *chulli* kernels are bitter in taste and are not edible. Hence the kernels are de-bittered and made edible by soaking them in water overnight and then ground to a fine slurry with little aeration. To this slurry, chopped onion, spices and salt are added to taste and mixed thoroughly before serving. Wild apricots are found in abundance in Shimla and Kinnour districts of Himachal Pradesh making best use of kernels of the wild apricot, which are bitter in taste. **Keywords**: kernel, *chatni*, wild apricot, aeration, evaporation, grinding	Dr P.C. Sharma, Department of Post Harvest Technology, Y.S. Parmar University, Solan (Himachal Pradesh) 173230
1023	Preparation of *warian* from pulses	*Warian* are reported to be delicious and are used in home cooking as a special dish. Pulses are a rich source of protein. *Warian* is a traditional product made from blackgram (*Phaseolus mungo*). Pulse grains are soaked overnight and crushed to a fine paste (gravy) in a pestle and mortar. For each kg of crushed blackgram, 50 g ground spices (*zeera*, *methi*, *dhania*, black pepper and cardamon @ 10 g each, red chilli powder 15–20 g and salt are added	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173230

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		according to taste and the contents are mixed thoroughly to prepare the dough. Small lumps of this mixture are then spread by hand on a clean cloth and kept in open sun for drying. The dried product is kept in earthen pots for its later use in home cooking. This ITK is used throughout Himachal Pradesh since time immemorial. **Keywords**: *warian*, blackgram, nutritive, hygienic,sun drying, earthen pot	
1035	*Laphi* -a common food of the villgers in winter or snowy days	*Laphi* is a popular food in snowy region of Shimla, which is prepared from maize and *chenopoduim*. This is an ideal food for the people of this region because it is easily prepared, keeps body warm during cool season and is easily digestible. For preparation, maize and *chenopodium* are heated in an open vessel separately and ground in hand driven mill at home. The two ingredients are then mixed in a fixed proportion and stored in bag. At the time of need, the mixture is boiled in water for some time for consumption. Salt is added to taste. *Lassi* is also added to food. The consumption rate of this food is declining due to availability of different food items. **Keywords**: *laphi*, maize, chenopodium, *lassi*, salt	Shri Devkant Prakash, Bhajneog, Theog, Shimla (Himachal Pradesh)
1041	Preparation of *laphi*	*Laphi* is prepared from *chulli* fruits. *Chulli* fruits (*Prunus armeniaca*) are first washed, dried and cut into small pieces and then mixed with *sattu*. About 200 g *sattu* is sufficient for 1 kg *chulli* fruit. The above ingredients are cooked for about 20 minutes in approximately 1 litre of water. *Laphi* dish is considered good for improving digestive ailments in human. This has been practised in most of the villages in Lahaul and Spiti district of Himachal Pradesh since time immemorial. **Keywords**: *laphi*, *chulli* fruit, mixed with *sattu*, cooked	Shri Dorgi Padama, Khurik, Rangrik, Kaza, Lahaul and Spiti (Himachal Pradesh)
1046	*Rangmuto* (*gucchi*) preparation method	*Rangmuto* (*gucchi*) is found during March–May in most of the villages in Kinnaur district (Himachal Pradesh). It is dried for storage and mostly prepared during winter season Fresh *gucchi* is washed in water and cut into small pieces. Then 20 g each of onion and garlic is added after adequately heating *ghee* or mustard oil. One spoonful of chilli, spices and salt according to the taste is added. Then *gucchi* is added	Shri Dharam Lal Negi, Roghi (Near Kalpa), Rekangpeo, Kinnaur (Himachal Pradesh)

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		and allowed for cooking for about 15–20 minutes. This dish is purely vegetarian and is eaten with rice or chapati. This dish is highly nutritive, hygienic and a good source of energy. *Gucchi* is considered to be a good source of protein. This has been practised since time immemorial in most of the villages in Kinnaur district. **Keywords**: *rangmuto*, winter, onion, garlic, *ghee*, mustard oil, rice, chapati	
1047	Preparation of *bhaley* (ethnic food)	*Bhaley* is prepared on special occasions like *Diwali* and birthday. *Bhaley* contains certain nutrients like carbohydrates, protein, lipids, minerals and vitamins that provide energy. It is considered as good appetizer and overcome garlic ailments to improve the health, as it is quite hygienic food. *Bhaley* is prepared from *mah* (*Phaselus mungo*). About ½ kg *mah* is soaked in water overnight. It is ground properly in grinding stones and spices (*bhabri*, *jhau* leaves, salt, chilli) are added accordingly, and then mixed properly. Now chapatis or *rotis* are prepared from it with 1"–2" diameter and fried in refined oil/ mustard oil or *ghee* until it turns brownish. After properly frying, it is ready for eating.This is practiced in most of the villages in district Mandi of Himachal Pradesh. *Bhabri* are good appetizer and *jhau* leaves overcomes gastric ailments in human beings. **Keywords**: *bhaley*, *mah*, soaking in water, ground, spices, fried	Shri Amar Nath, Mera-Kushri, Nawahi, Sarkaghat, Mandi (Himachal Pradesh)
1738	Food management through *mahua* (*Madhua indica*) Latha	It is rich source of energy and found easily in the forest areas. Under scarcity of foodgrain, this is an alternative food. The flower of *mahua* and seeds of tamarind (2–3 kg) are mixed, then boiled and used as food. In the period of food scarcity, mostly the tribal people prepare this food product and take as food. It is cheap and easily available. **Keywords**: *mahua*, tamarind seeds food scarcity	Shri Dharma Oraon Olmunda, PS Sisai, Gumla (Jharkhand) 835 224
1029	*Halad*- made of turmeric powder	*Halad* is a tasty nutrious and blood purifier product of Himachal Pradesh. It is prepared by turmeric. Raw turmeric (1/2 kg) is crushed and fried in *ghee* (250 g) for 15–20 minutes followed by addition of dry fruits such as soaked date palm, almond, crushed coconut, ginger powder, fenugreek powder and sugar. These are cooked till it becomes thick solution and then	Ms Durgo Devi, Madapur, Theog, Shimla (Himachal Pradesh) 171201

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		served with milk. **Keywords**: *halad*, tasty, nutrious, blood purifier	
1730	Use of *chakod* (*Cassia tora*) as vegetable and medicine	*Chakod* is a common plant in Jharkhand and is used as vegetable as well as medicine for treatment of diabetes. Garlic, tomato and chilli with some salt are fried and then powder of *chakod* leaves is added to it and cooked. *Chatni* of *chakod* is also taken by the villagers. **Keywords**: *chakod*, vegetable, medicine, *chatni*	Shri Ranjit Bara, Pathakudwa, Church Lane, Ranchi (Jharkhand) 834 001
1737	*Kappu kand* used as food material and also as medicine against constipation	*Kappu kand* may have some nutrient and medicinal value against constipation. *Kappu kand* is dipped in water for a night and then next day it is boiled and taken with salt. The practice is followed in the tribal dominated village Bikrampur of Jama Block in Dumka district (Jharkhand). Success for the remedy of constipation has been observed in 100% of the cases. Almost 100% of the villagers use it as food material. **Keywords**: constipation, *kappu kand*	Shri Devashish Murmu, Agrarian Assistance Association, Bunderjori, Dumka (Jharkhand)
1741	Vegetable of *munga* (*Moringa olerifera*) leaves and fruits	*Munga/sahajan* has high qualitative medicinal properties. Fresh dried leaves and fruits are used for making vegetable and also used as *dal*. Every part of the plant, i.e. root, shoot, flower, fruit and leaf are used. It controls blood circulation of the body and the paste of roots is used as a medicine, when snake bites a person. It is very useful for women because of presence of rich iron in the plant. Maximum number of people in the district of Ranchi (Jharkhand) use this age-old practice. **Keywords**: *munga/sahajan*, vegetable/*dal*, women, blood circulation, snake bite	Ms Prabha Bara,Pathalkadwa,church lane, Ranchi(jharkkhand) 834001  Drumstick-a multipurpose plant
1742	Vegetable of *sanai* flower (*Crotalaria juncea*)	Flowers of *sanai* (*Crotalaria juncea*) are used for making vegetable by tribals of Ranchi district in Jharkhand. Yellow flowers of *sanai* also have medicinal properties. It is used as a medicine against cancer and bark of the plant is used for making ropes. The vegetable is prepared by frying the flowers with mustard oil then adding tomato and chilli powder in it. All the tribal farmers in the district use this age-old practice. **Keywords**: *sanai*, flowers, cancer, vegetable, rope	Shri Ranjit Bara, Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834 001

Code No.	Title of ITK	Discription of the ITK	Name and address of discloser/facilitaor
1743	Use of *beng saag* (*Castella asiatica*) as vegetable and medicine	*Beng saag* (*Castella asiatica*) has qualitative medicinal properties and is used for making vegetable. Fresh and dried leaves of *beng saag* are used for making vegetable. Its roots are used for treatment of jaundice. Minced root water is given to the affected person twice or thrice a day for 12–15 days and paste of roots is also placed on legs and hands of that person. The rate of success in jaundice disease is 99%. People of Ranchi district in Jharkhand use this age-old practice. **Keywords**: *beng saag*, fresh and dried leaves, root,jaundice, paste and vegetable	Shri Ranjit Bara, Pathalkadwa, Church Lane, Ranchi (Jharkhand) 834001
313 and 2318	Weaning food	Weaning food, fed to the infants as breast milk supplement, is used by 10% families in Palayapatti village of Thanjavur district in Tamil Nadu. This food is prepared by soaking cereal overnight and hand removal of water by tying in a moist cloth and keeping in a warm place. After 48 hours when the cereal grains are sprouted, it is dried in sun after removing the sprouts. It is made in to flour, mixed with pulses and jaggery, and half a tumbler of the mixture is given to the children daily. Health of the children is improved with this food. **Keywords**: sprouted cereal, pulse, jaggery	Ms R. Kalai, Training Associate, Usilampatti village, Manayeripathi, Sengipatti, Thanjavar (Tamil Nadu) 613 402
314	Preparation of *Ragi Kazhi* and *ragi kanchi*	Preparations of *ragi kazhi* and *ragi kanchi* as traditional food are still considered rich and nutritious. *Ragi* grains are dried and made into fine powder or flour. To prepare *ragi kazhi*, flour is cooked over medium fire. After cooking, these are made into small balls and kept separately. Whenever needed this can be consumed along with buttermilk or meat sauce. Sometime it is dissolved in plain water and consumed as drink. For preparing *ragi kanchi*, flour is boiled in water. Water and flour are mixed well in a required proportion and placed on fire. This liquid concentrate is consumed by sometimes adding salt or sugar or milk as per the taste. The practice can be encouraged to keep traditional crops being cultivated. Now there are several *ragi* products in the market such as *ragi* rice and powder. Farmers use their own produce for making *ragi kazhi* as well as *ragi kanchi*. **Keywords**: *ragi kanchi*, *ragi kazhi*, health care	Shri Marappan, Betamugalam, Galigattum, Dharmapuri (Tamil Nadu)

Code No.	Title of ITK	Discription of the ITK	Name and address of discloser/facilitaor
446	Food habits of tribal people during scarcity season	Villagers of Bediguba (tribal groups) consume dried seed kernels of different crops such as mango, tamarind (roasted), jackfruit seeds and fingermillet as their staple food during the lean period. These are sufficiently available in the hilly areas to meet the daily requirement of foodstuff. As the food contains all the essential nutrients, it will provide daily requirement as substitute of cereals if consumed @ 400 g per day. **Keywords**: food habit, tribal, seed kernel, jackfruit seed	Ms Saraswati Parichha, Training Associate (Home Science), Kuk Colony, Qr No. 3, Ghai Road, Bhanjanagar Ganjam (Orissa) 761126
990	*Chelede* of *ogle*	*Salty or sweaty chelede of ogle is occasionally taken or taken after fasting. For preparation of chelede, flour of ogle is plaited with water. Salt or sugar is added to make salty or sweaty chelede. Plaited flour of ogle is then spread on the oily hot pan with the help of hand. Both sides are cooked by turning it simultaneously. This ethnic food is being taken by the all age and sex groups in Shimla. Materials used for preparation of chelede of ogle are easily available in home.* ***Keywords**: chelede of ogle, plait*	Ms Jamuna Naeghi, W/o Khashi Roy Thakur, Dawarach, Sarahan, Rampur, Shimla (Himachal Pradesh)
991	Ethnic food prepared from *Bithu* Festival-based ethnic food	*Bithu* is a kind of crop which is grown by the farmers of Shimla region. For preparation of ethnic food of *bithu*, it is first boiled in less quantity of water, the flour of wheat or rice is added and again cooked. After completion of cooking, *laddus* (spherical pill) are prepared. Then it is taken with *dal* or *sabji* (vegetable). It is being taken by all age and sex groups for the last several years. **Keywords**: *bithu*, *laddu*	Ms Ganga Devi, Manjhgaon, Sarahan, Rampur, Shimla (Himachal Pradesh) 172102
1002	Festival-based ethnic food	Special ethnic foods are prepared and consumed by the local people on each specific festival. These are as follows: ***Lohari**:* On this day *khichari* is prepared with rice and *mah*. Cow *ghee* is mixed with it. This food is given to all married girls of the village who visit as guests. It continues till 7th of *Sankranti.* ***Shivratri**:* After *vrat* (fast), in the evening people take *mah* (*bhalle*) *roti* fried in oil, banana, sweets and bread. Non-vegetarians take meat. *Rotis* are also given to relations. ***Holi**:* Dishes like sour, sweet *roti* fried in oil, rice, local sweets are made. **Other dishes**: *Chilra+kuwasthi*, maize roti+green leafy vegetable, *hassi* (*kahri*), *bitta lafi*, *shahali* (cooked with rice and	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi(Himachal Pradesh)

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		lassi) , *rotu* (fried roti+jaggery in *ghee*) or *rotu* (wheat flour+*ghee*+salt), *samosa* with *desi ghee.* **Keywords**: *lohari*, *khichari*, *mah* (*bhalle*), *chilra*, *kuwasthi*, *kahri*, *bitta lafi*, *shahali*, *roti*, *rotu*, *shivratri*, *holi*	
1003	*Thar per ka louta*	This is one of the food items that is prepared occasionally in festivals for serving to guests in hilly region of Shimla. Flour, soda (sodium bicarbonate), *aphimdana* or *til* (sesame) or *akhrot* (walnut) or any dried vegetable are taken for its preparation. Flour is emulsified with water and small quantity of soda is also added. Then solution is spread on the frying pan. When it gets half fried, spices or *aphimdana*, or *til* or *akhrot* or dried vegetable are put on it. Sometimes another loaf is prepared and upset on the first loaf. Then it is steam cooked by putting sticks and grasses below the loaf. All materials used for preparing *thar per ka louta* are easily available in house and this food is being used for last several years. It is considered very tasty and nutritive. **Keywords**: flour, soda, *aphimdana*, *akhrot*	Ms Krishna Hetta, P. Bag No. 4, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1004	*Pachola* (*pahari*)	*Pachola* is a traditional food taken by the majority of the farmers in Shimla region. They consider that it is very energetic and tasty food. It is prepared by grains of maize, spices, broad leaves of *bhiol* and *ghee.* First a paste prepared from young maize, and spices are mixed in it. Then a cooking pot is taken and sticks are arranged at the bottom. Some grasses are kept above the sticks and some water is poured. Globules of maize are kept on the leaves of *bhiol* and arrange them one upon another in pot and cooked under medium flame. *Pachola* can be eaten as such or after being fried in *ghee.* All materials are available at home and surroundings. This ethnic food is being used by them for last several years. **Keywords**: *pachola*, energetic, tasty, leaves of *bhoil*	Shri Chandan Singh Jogi, President, Jogi Sports Club, Near Civil Hospital, Theog, Shimla (Himachal Pradesh) 171 201
1006	Preparation of *gulgule*	*Gulgule* is a traditional food and used during festivals and as a gift when they visit their relations. This practice involves following procedure. Little amount of sugar is added in wheat flour, mix it with warm water and knead it properly. Now clarified butter and a pinch of yeast is added. This mixture is fried in pan in clarified butter. This is adopted for last several	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		years by the maximum number of farmers and having socio-culture values. **Keywords**: *gulgule*, sugar, wheat flour, butter and yeast	Shri Bongchuk Yangampa, Gojang, Kardung, Keylong, Lahaul and Spiti (Himachal Pradesh)
1010	Preparation of salted tea	*Namkeen* (salted) tea is prepared by boiling water (4–5 cups) in *domo* container (kettle) and with one spoon (5 g) of salt, 4–5 spoonful sugar and *namkeen* tea (wooden pieces purchased from the lower Himachal, especially from Kangra district). When it is mixed properly, 100 ml milk and 100 ml butter are added to it. Now tea is ready after stirring with handle. This is practised in most of the villages in the hilly areas of Lahaul and Spiti since time immemorial. **Keywords**: *namkeen* tea, *domo*, salt, sugar, butter	
1032	*Chapati rotu*-made of cannabis seeds	Seeds of cannabis are used in preparing *chapati*/ *rotu* by the people of Janjali village of Mandi district in Himachal Pradesh. The wheat flour is made to dough by adding water. Cannabis seeds are crushed on *seel-bata* (made of stone to crush) and little amount of salt according to taste is added to it. Then some dough flour is taken and chapati is made by placing crushed cannabis seeds with salt inside the chapati. Then it is placed in burning charcoal for 8–10 minutes for cooking and then served to eat. *Rotu* is being taken by the majority of the villagers for the last several years. **Keywords**: cannabis seed, chapati, rotu, chushed on *seel-bata*, burning charcoal	Shri Indra Thakur, C/o Shri K.L. Thakur, House No. 28, Type IV, Block Host, Shimla (Himachal Pradesh)
1033	*Sepu bariya*-made of *mash*, spinach, curd and spices	This dish is being used by all categories and all types of persons of Mandi district in Himachal Pradesh. This tasty dish is prepared in very short time. The method of preparation of this dish is as follows. *Mash* is dipped into water for some time and skin of the *mash* is removed. It is ground, then cut into square pieces and vaporized. The pieces of *mash* are dried through sun drying. It is kept in boxes. When required for cooking, square pieces of *mash* are mixed with ½ kg curd and ½ kg spinach and fried. Some spices also can be mixed according to taste. Salt and chilli are also mixed while frying. It is ready for serving within 5–8 minutes. One kg of prepared *sepu bariya* is sufficient for 4–5 persons for 7–8 times. **Keywords**: *mash*, spinach, curd, spices, *sepu bariya*	Shri Indra Thakur, C/o Shri K.L. Thakur, House No. 28, Type IV, Block Host, Shimla (Himachal Pradesh)

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1034	*Jhol*- made of *lassi*, turmeric and ice	*This ethnic food is being used in village Janjali of Mandi district in Himachal Pradesh to make a person healthy. This practice is to improve the keeping quality of lassi used in winter season. In this method lassi is kept in earthen pot for 5–6 days for sour taste and 50 g ice in 1 kg lassi and some quantity of turmeric are added and boiled before using. This practice is widely used by all categories and all types of people of the village for several years.* **Keywords:** *jhol, lassi, keeping quality*	Shri Indra Thakur, C/o Shri K.L. Thkur, House No. 28, Type IV, Block Host, Shimla (Himachal Pradesh)
1036	Ethnic food- *laute*	*Laute* is an ethnic food used by the majority of the people in Shimla region. It is prepared from flour, sugar or salt, soda (sodium bicarbonate) and *saunf*. Mixture of flour and little bit of soda and *saunf* is emulsified with the solution of sugar or salt and hot water so that it becomes paste. Then this solution is spread over the oily hot frying pan. It is cooked both side by turning back. Materials used for preparation of laute are availables at home. It is eaten by all age groups with eagerness. **Keywords**: *laute*, soda, flour, sugar, salt, *saunf*	Ms Durga Devi, Devrighat, Theog, Shimla (Himachal Pradesh)
1037	Preparation of *Badi*	*Salty or sweet, badi is considered as fast preparing, good food for human beings by the people of Shimla. For its preparation first water is boiled with sugar or salt (according to taste). Then ¼ of this is kept out and flour is put in left over (3/4 of solution) solution and left as such for a few minutes and then it is propelled with the help of handle (specially prepared for this purpose) till full dissolution of flour. After that kept out ¼ solution is poured in it and propelling is continued till gas bubbles appear. Then ghee is added and again propelling is continued till solution leaves the wall of pan. All materials used for preparing badi are locally available and this practice is being followed for the last several years.* **Keywords**: *badi, propelling*	Ms Sushma Hetta, Devrighal, Theog, Shimla (Himachal Pradesh)
1038	Traditional preparation of *seira* from seeds of *khanor*	*Khanor* (*Aesculus indica*), the Indian horse chestnut is a wild species. It is abundantly found in Banjar and Anni sub division of Kullu district (Himachal Pradesh). Its seed is traditionally used by the local people for preparation of *seira*. The seeds, collected from wild, are soaked in water and the outer shell is removed. The inner portion of the seed is ground into	Dr O.S. Shad and Shri T.N. Lalchanpal, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005

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		powder and dried. The dried powder is again soaked in water and then cooked in *ghee*. Jaggery is added to make the taste better. About 20, 000 families in the area use it. **Keywords**: *siera*, *khanor*, *ghee*, jaggery	
1039	Use of *rakhal* tea (*Taxas baccata*)	*Rakhal* (*Taxas baccata*) is one of the most important trees of the Himalayas. Local people have been using various parts of the plant since centuries. Its bark is used for making tea. The bark pieces are boiled in water. Then honey, sugar or jaggery is put into this mixture. The flavour and colour is like tea.Traditionally people use it to cure stomachache. It has been also established that plant leaves contain taxol, which is anti-cancerous. This is used by Shagagi village in Kullu district of Himachal Pradesh. **Keywords**: *rakhal*, tea, bark, anti-cancerous	Dr O.S. Shad and Shri T.N. Lalchanpal, Department of Bio Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
1040	Preparation of *malhadi*	*Farmers of Sarkaghat village of Mandi district of Himachal Pradesh prepare this traditional dish, malhadi. Malhadi is basically a fermented food. Half kg of wheat flour is added in half liter tap water. Khamir (20 g) yeast is added in kneaded wheat flour and mixed properly with 200 g sugar for a sweet taste. Then circular rotis are prepared having 1–2 inch radius by hand containing some oil for easy preparation of roti. The rotis are covered with cloth and kept for 2–3 hours. These rotis are fried in ghee or mustard oil and taken as food along with tea or milk.* **Keywords**: *fermented food, khamir (yeast), wheat flour, sugar, roti, cloth, ghee, mustard oil*	Ms Goga Devi, Mera Kushri, Narvani, Sarkaghat, Mandi (Himachal Pradesh)
1043	Preparation of traditional dish, *timo-septon*	*Timo* is fermented *roti*/ *chapati* prepared from wheat flour (1/2 kg) with *lassi* (100 ml) and kneaded with baking power (5–10 g) and by adding water as per requirement. The *roti*/ *chapati* is prepared (having diameter 1–2 inches) and cooked properly over heat after fermentation. *Septon* is prepared from yak meat. The yak meat is cut into small pieces of desirable sizes and fried in *ghee* till it is cooked. Onion, garlic, chilli, spices and *brahmi* leaves are added according to taste. Then 200 g *sattu* (made from wheat or barley) is added to the above ingredients. This is heated for 10–15 minutes. Now *septon* (soup) is ready for serving with *timo* (*rotis*/chapatis). This has been	Ms Tehshik Chhering, Chheechum, Kibber, Kaza, Lahul and Spiti (Himachal Pradesh)

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		practised in most of the villages of Lahaul and Spiti district since time immemorial. **Keywords**: *timo*, fermented *roti*, wheat flour, *septon*, yak meat, fried, onion, garlic, chilli, spices, *brahmi* leaves, *sattu*	
1044	Preparation of *zara*	*Zara* is prepared from *sattu* mixed with one spoon each of salt, chilli and spices and then fried in *ghee* or mustard oil till its colour turns reddish. About 500 ml water is added to it and is cooked with continuous stirring. This dish is like *halwa* and is eaten with *lassi*. This is an ethnic food of tribal people in Lahaul and Spiti district of Himachal Pradesh, which is being practised since time immemorial. **Keywords**: *zara*, *sattu*, salt, chilli, spices, fried, *lassi*	Shri Champaishi, Lari, Tabo, Kaza, Lahul and Spiti (Himachal Pradesh)
1045	Preparation of squash from *brash* (Rhododendron)	I n the forests of Chamba, Shimla, Solan and Sirmour, brash are available in plenty. People collect flowers from tree during flowering period and prepare squash. *Brash* flowers are collected from the forests and petals are separated. These petals are then filled into glass bottle followed by filling sugar in the bottle. The bottle after placing lid is kept in sun for 6–7 days, when all sugar turns into syrup. In off-season, the syrup is diluted with appropriate quantity of water and is served. This product is of red colour and tasty to drink. *Brash* squash has pharmaceutical properties. **Keywords**: *brash*, petels, sugar, squash, sun drying	Dr P.C. Sharma, Department of Post Harvest Technology, YS Parmar University, Solan (Himachal Pradesh) 173230
1726	Dry *kand-mool*, *sag-pat*, *phal-phool*	Tribal people of Jharkhand generally depend on *kand-mool* (root and tuber), *sag-pat* (leafy vegetable) and *phal-phool* (fruit and flower) is means of subsistence. They collect these from forest. They preserve these materials by sun drying and use then later. They preserve fish also in same manner. This method of preservation is being used by the majority of tribes of Jharkhand. **Keywords**: tribal, *kand-mool*, *sag-pat*, *phal-phool*, means of subsistence, preservation, sun-drying	Ms Sarojni Kishku, Programme Co-ordinator Jan Jagran Kendra, Hazaribagh, Near Police Training College, Kanhari Hill Road, Hazaribagh (Jharkhand) 825301
1736	Ethnic foods of tribals	There are many kind of locally available traditional and ethnic foods which are being used by the tribals of Tomar block in Ranchi district of Jharkhand. They are enlisted here 1. *Phal-phul: piyar-chirogi*, *kend*, *padu*, *kotang dumar*, *aadi*, *vanber ber*, *bel*, *mahua*, *wild mango*, *jamun*, *tut*, *vankela*, *bhelwa*, *aonla*,	Shri Krishna Singh Munda, Zonal Coordinator-cum-Convener Secretary, Parvartiya Durgam Shiksha Vikas, South-East Zone, Pavasi, Tomar, Ranchi (Jharkhand) 835225

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		harad, *bahera*, *kusum*, *sethabili*, *budilae* fruit, *nan kundri*, *budaj* flower, *jihud* flower, *fruil* and flower of *munga*, *dhat* fruit, *pajan* flower, *august* phool *badh*, *pipal* fruit, *sakhua* fruit, guava, tamarind. *Saag-sabji: munga saag*, *kaniyar saag*, *gudri*, *kanagadi saag*, *mata saag*, *katai saag*, *matnati saag*, *van pethki saag*, *harlu saag*, *buj saag*, *futkal saag*, *neem saag*, *kalmi saag*, *kena saag*, *bhjhi*, *kapra saag*, *chimti saag*, *dhru saag*, *sitgiti saag*, *chostavar saag*, *dhru saag*, *sigiti saag*, *chostavar saag*, *delka saag*, *susni saag*, *pui saag*, *karil*, *hadua*, *gudye*, *baingan* (brinjal), *kohra* (pumpkin), *karela* (bitter guard), *jhingha* (ridge guard), *sem* (bean), *mirch* (chilli), *tamatar* (tomato), *bodi* (bean), *paat saag*, *mudua saag* *Kand-mool: piska kand*, *van kanda*, *chagrut kanda*, *banaas*, *van oal*, *nir virsa*, *kewa*, *oal*, *bhan*, *aaru*, *saaru*, *pitchki*, *sakarkand* (sweet potato), *samar kand*, *simar kand* *Seed grains: goradhan* (upland rice), *kala ujla gova*, *maize*, *bajra*, *jowar*, *jane*, *gundli*, *madua* (finger millet), *dedi*, *sawa* *Mushroom: pulka*, *rungra*, *tumba*, *katain*, *badghati*, *pual ghati*, *bati ghatim digil kabhar* *Spices: tirla basi*, *dhania* (coriander), *chilli* *Pulses: arhar* (pigeonpea), *kesari*, *kulthi*, *moong*, *urd*, *sulri*, *bodi*, *gagra* *Oilseeds: guja* mustard, *mahua* oil, *redi* oil, *kusum* oil *neem*, *karani*, *kujri*, *radi* *Non-vegetable food:* chicken, duck, fish, tortoise, frog, snail, oyster, crab, goat, sheep, dear, rabbit, *daman* snake, *goi surajmakhi*, *porcupine*, fox,, tiger, bear, monkey, *kutkut* (a type of ant), *tetenga*, *kuchai* (a kind of fish), and all kinds of birds. *Drinks:* honey, *haria* (rice beer), local wine	
2240	Traditional food *tenka ambali* (fingermillet porridge)	Fingermillet porridge is very rich in iron and is used for aneamic patients. It is low cost, nutritive food suitable for all type of income groups. Tribal people prepare the porridge daily and they also add mango flower and jaggery to that for enhancing carbohydrate and iron. This type of food is recommended for the pregnant and lactating mothers and also to adolescent girls. Porridge is easily prepared and it is in semi-	Ms Biddiki Saraswathi, Gunjareda, G.L. Puram, Vizianagaram (Andhra Pradesh)

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		liquid state and easily digestable. Farmers of Gunjareda village of Vizianagaram district in Andhra Pradesh are adopting this practice since long period. **Keywords**: nutritive food, fingermillet, carbohydrate, iron, pregnant and lactating mothers, digestable	
1739	Use of *sarla* leaves or *katai* leaves or *sarla sag* against cancer	*Sarla* or *katai* leaves may have some medicinal properties which prevent cancer in human beings. The leaves of *sarla* or *katai* are cooked and eaten as *sag*. The Hatia, practice is followed in tribal villages of Ranchi district. **Keywords**: *sarla* leaves, *sag*	Ms Rashmi Kandulna, Hawai Nagar (Merina X-ray clinic) Ranchi (Jharkhand) 834 003
303	Preparation of flattened rice and extraction of mustard oil using *ghani*	Two food items as described below, which are prepared by all the families in village Bahirchard, district Midnapore of West Bengal. 1. 1. Flattened rice: Flattened rice (*chinra*) is made from paddy using *dhenki*. *Dhenki* is a kind of de-husking, pedal-operated device in a sea-saw manner, by which farmers get rice out of paddy. The advantage of using the method is that it retains the red layer over the rice, which is a good source of vitamins. **Keywords**: flattened rice, *chinra*, *dhenki*, vitamin 2. Mustard oil derived from *ghani: Ghani* is a large block of wood used in grinding oilseeds to extract oils. It is driven by bullocks. Mustard oil, extracted by *ghani* is believed to be better in terms of quality, which fetches higher price in the market than the oil extracted mechanically by crushing of mustard seeds. Villagers also rub it on the body of the small babies before keeping them in morning sunlight for production of vitamin D. **Keywords**: *ghani*, mustard oil, higher price, vitamin D	Dr R K Manna, CICFRI (ICAR), 22, (1031), 80 feet Road, Rajajinagar, Bahirchard, Banglore (Karnataka) 560 010
441	*Indur pora* (mouse *kabab*)	Mouse, birds, *varanus* etc. are taken as food after burning, which is locally called *indur pora* (mouse *kabab*). These are being eaten by tribals for the last 100 years in the Shibiloon village of Burdwan district in West Bengal. **Keywords**: mouse, burning	Shri Tapomony Ghosh, Shibiloon, Burdwan (West Bengal) 713 130

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565	Ethnic food - soup of *timur* (*Zanthoxylum alatum*)	Seeds of *timur* are dried and the seed coat is separated. The soup is prepared from the seed coats. This is fried after and then boiled in water. This is good for cold, cough, stomach-ache and bone pain. **Keywords**: *timur*, cold, cough, stomach-ache, bone pain	Shri Naveen Singh, Dhapa, Dumar, Pithoragarh (Uttaranchal)
581	*Bhatt*- an ethenic food	*Bhatt* is a nutricious pulse used to prepare many dishes. This is believed to contain medicinal properties. Two hundred fifty gram pulse is soaked overnight. Coarsly ground pulse is then cooked with two litre water for 40 minutes. Then 250 g rice is added and cooked for an hour in low flame. **Keywords**: *bhatt*, food	Shri Tribhuvan Singh, Jhinjhodi, Narainbagad, Chamoli (Uttaranchal)
958	Butter preparation	Butter preparation is a very common practice among farming community. In this practice, about 2–5 kg milk is stored in a large container (about 6 litres capacity). Then 50 g curd is added into it. Container is placed in a clean and hot place, until it gets fermented. The curd thus prepared is poured in a 10 litre container, which is normally made of earthen material (called locally *mently*). The curd is shaken with shaking article (locally called *mathani*) for about 25 to 30 minutes as the women generally do for extracting butter from curd. As a result, butter floats as supernatant over *lassi* (whey). Butter is taken out with hands and is stored in a cool place for various domestic purposes. Supernatant *lassi* is used for *karhi*, *jhol* preparation. It has certain medicinal values as well. This is very common in villages of Himachal Pradesh. **Keywords**: butter, milk, curd, hot place, fermentation, shaking with mently, floating of butter, *lassi*, *karhi*	Ms Goga Devi, Merra Kushr, Nawahi, Mandi (Himachal Pradesh)
962	*Sheera* as a nutrient food for pregnant women	*Sheera* is prepared from wheat. Wheat grains (3 kg) are first soaked for 4–5 days in water in a large container (about 10 kg capacity), so that wheat imbibes water and this water is changed daily. Wheat grains are then grinded adequately and the wheat juice is filtered with cotton cloth. *Method of preparation:* About 200 g *sheera* is mixed in 0.5 litre water and 100 g sugar is added to it. It is then fried in *ghee* for approx 30 minutes till it change to light brown colour and water is added	Shri Yesh Paul, Gopalpur, Tehsil Sarkaghat, Mandi (Himachal Pradesh) 175007

Code No.	Title of ITK	Discription of the ITK	Name and address of discloser/facilitaor
		accordingly until it gets separated into small pieces. *Sheera* is orally taken to avoid abortion in pregnant women. It also acts as a source of instant energy. This is practised in most of the villages in Tehsil Sarkaghat of Mandi district as well as in other parts of Himachal Pradesh. **Keywords**: *sheera*, wheat, soaking in water, wheat juice, sun-dried, sugar, pregnant women, abortion	
1013	Traditional food - *pak*	*Pak* is a fermented fast food. It is prepared from wheat flour *roti*. Mixture of 200 g *sattu*, 50 g butter, 50 ml *lassi*, 50 ml *chhaney*-local beverage, 20 g onion, 20 g garlic, one spoon spices, turmeric powder, chilli and salt are added inside the roti and cooked properly and taken with tea or milk. This food is not given to pregnant women. Farmers of Kaza block in Lahul and Spiti district of Himachal Pradesh are taking this traditional food since several years. **Keywords**: *pak*, wheat flour, *roti*, fermented food	Shri Dorgi Puduma, Khurik, Raugrik, Kaza, Lahul and Spiti (Himachal Pradesh)
1642	*Haria*/*daiangs* - a drink for certain minerals in tribal community	After decomposition, *desi* rice contains more minerals and vitamins. It also becomes alcoholic to some extent. *Desi* rice is boiled and left for 3 to 4 days for decomposition with *ranu* (a medicine). After diluting by water, they used it as drink. The practice is followed in villages Tutihara, Chenay, Rajaulihatu of Namkum Block in Ranchi district (Jharkhand). It has been observed that 90% of tribal community takes *haria/diang*. **Keywords**: *haria*, *daiangs*, *desi* rice, tribal community, alcoholic content	Shri Ranjay Kumar Singh, Research Associate, Department of Extension Education, BAU, Kanke, Ranchi (Jharkhand)834006
1665	Ethnic food (curry of stem of lotus and snail)	Curry prepared with stem of lotus and snail are considered nutritious. Snails are boiled and meat portion is taken and the inner part of lotus stem is cooked with oil, onion and other spices. The practice is generally followed in Jamdih village of Rajnagar Block of Saraikela district (Jharkhand). About 75% people consider it cheap and nutritious. **Keywords**: curry, lotus, snail	Ms Kalpna Hembrome, C/o Sahyogi Mahila, Bagraisai Rajnagar, Saraikela (Jharkhand)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
99	Use of agricultural products to cure human disease by villagers	Some agricultural products used to cure various disease are as follows: **(A)** ***Neem leaves*** 1. Boiled neem leaves are used to prevent malaria 2. To prevent skin disease ***(B) Ajawain (thymol)*** 1. To prevent worms, cold and cough 2. To reduce joint and stomach pain (C) ***Tulsi (holy basil plant)*** 1. To reduce stomach worms, cold and cough 2. To prevent skin diseases and heal wounds **(D)** ***Hing (asafoetida)*** 1. Gives relief in constipation 2. Reduces stomach pain **(E)** ***Datura (thorn apple)*** 1. Smell of burned leaves helps reduce dhamma **(F)** ***Pudina (mint)*** 1. For stomach pain, vomiting, nausea, headache **(G)** ***Guava leaves*** 1. For tooth and throat pain **(H)** ***Garlic*** 1. Removes headache, cold, cough **(I)** ***Lemon*** 1. For stomach pain, cold, cough **(J)** ***Honey***1. Honey mixed with ginger is used to cure cold and cough 2. Salt along with honey is used to get rid of joint pain	Krishi Vigyan Kendra Chomu, Tamkarda, Jaipur (Rajasthan) 303 108

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Keywords: agricultural products, human disease, cure	
100.	*Birani badi* practice for raising summer cucurbits under limited water use	*Birani badi* is the practice of cultivation of summer cucurbits (watermelon; muskmelon) with the use of limited water in sandy soils of Bikaner district of Rajasthan. In this practice there are components of soil and water conservation, moisture preservation and water management. For the cultivation of summer cucurbits, field preparation is done during the rainy season. Just after the rain, field is ploughed twice and planker is given. During the winter if there are rains, field is ploughed with cultivator and *pata* is given. In December-January, micro windbreaks are prepared from the locally available material at a distance of 1 m against the south-west wind direction by using local bushes, so that hot wind during summer may not disturb the creepers and the sands spreads on them. *Thala* (*koreas*) is prepared along the rows at a distance of 1 m. Soil is pulverized in these *thalas*. Seed sowing is done around *Maha Shiva Ratri*, giving seed treatment. Seeds are kept in wet gunny bag and buried in 1 to 1.5 feet deep pit for 2 to 3 days. One *lota* (approx. 1 litre) water is poured in each *thala*. Wet soil is removed up to the depth of 6 inches and korea is made. In each korea, 6 to 10 germinated seeds are put. These small pits are closed with wet soil, which was taken out, and thin layer of dry sand is spread. Germinated seeds come out after 8–10 days. Only 4–6 plants are kept in each pit. The soil around each plants is pressed with foot. After 60 days of sowing, watering is done, if needed. For this purpose, a ring is prepared around the creepers in each *thala* and 1 *lota* water is given. Flowering on creepers starts after 2 months of sowing and fruiting starts after 75–90 days (*Akshya tritiya*). Picking of muskmelon (*kakri*) is done in evening and of watermelon early morning. Fruiting continues up to October. Thus with the use of about 25, 000 to 50, 000 litres of water in 1 acre, farmer can raise the cucurbits in sandy tract. There is earning of Rs 40, 000 /ha with an investment of Rs 22, 380. **Keywords**: seed treatment, seeding in pit, watermelon, muskmelon, sandy soil	Shri Shive Lal Mali, Choraya Police Line, Bikaner (Rajasthan)

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1053	Hollow log here hive (bahan)	A wooden log structure, locally called *bahan* of about 3–5 feet length and 1–2 feet width is used for keeping honey bee *Apis cerana indica* (*desi makhi*). The wooden log, usually of *Pinus wallichiana* (*kail*) /*Quercus semecarffolia* (*khanru*) /*Aeseulus indica* (*khanoor*), is made hollow from one side and a small entrance hole is made towards other end. On its back side a wooden lid, of the size of wooden hollow, is fixed with nails and cracks are sealed by cowdung and soil paste so as to regulate the entry of bees only through entrance. Honey is collected in October which yields about 5–10 kg/colony in a year. This is practised by Diudi and Pekha villages of chirgaon block is Shimla district of Himachal Pradesh. **Keywords**: wooden log, keeping bee, *bahan*, extraction of honey	Scientist I/C, KVK, Rohru, Shimla (Himachal Pradesh) 171 207
804	Bee Keeping in wall hives	Farmers build wall hive for the domestication of Indian hive bee (*Apis cerana*) to harvest honey and bees wax in middle and high hills of north-west Himalayan region. The wall hive provides environment close to natural nesting sites of honey bee. This ITK is used to domesticate native bee for apple pollination and for honey harvesting. Basically wall hive is a cavity left in the wall when the house is under construction. It is located at a height of about 150 cm from the floor in kitchen, store, living rooms and sheds. The wall hive has an entrance hole of about 2 cm diameter towards the outside and the inside is covered usually with wood plastered with mud. A swarm of bees descend naturally and settles in this hive, making parallel combs. The wall hive is opened only at the time of harvesting the honey. Comb can be lifted from the hive for harvesting without destruction or disturbing the combs containing brood. The colony is therefore not harmed. The bees can continue to gather honey to replace that which has been harvested. This ITK is in practice for harvesting good quality honey, free of contaminating pollen and brood, in most of the villages in hilly areas of Himachal Pradesh since time immemorial. **Keywords**: bee keeping, wall hive, *Apis cerana*, honey-bee, wax, pollinator	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1054	Wall and log hive apiculture in backward areas of Chamba district  Wall hive apiculture (outer view)	Villagers of Khundhel panchayat in Chamba district of Himachal Pradesh use wall and log hive apiculture. This is in practice for last several years and farmers get 13–15 kg honey per season. Honey is extracted twice a year during June/July and November/December. This practice is locally known as *dhrol* and very useful in pollination of plants like apple, prunus, apricot, pulses, mustard and natural vegetation. **Keywords**: apiculture, log hive, honey, *dhrol*, pollination	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005  Wall hive apiculture (inner view)
805	Traditional bee keeping in log hive	Traditional hive is made from hollowed out logs for nesting the native bee species *Apis cerana* for harvesting the honey. These log hives are suspended from tree trunk as it gives protection from the predators. It is easier to harvest honey from the log hives than from the natural nesting sites. The honey harvested is used both for domestic consumption as well as sold in the market. The traditional log hives are used commonly at a higher altitude from about 2,000 m above sea level. The log hive is a simple structure without any frames, separate brood chamber or superchamber. It is basically made by hollowing out a piece of tree trunk, closing both its sides and boring a small hole of suitable size along its length to serve as an entrance for the bees. Among the most traditional log hives are horizontal and vertical log hives. The length of a hollowed horizontal log hive varies from 60 to 75 cm, and the entrance hole of 6 mm diameter or of pencil thickness is made in the middle of the log. The two open ends of the log are closed with a piece of tin or wooden plank or stone fixed with a mixture of cowdung and clay. In these horizontal log hives, strips of old combs at two ends are fixed with melted wax or candle dripping. The space between the old combs from centre to centre is 3 cm which provides enough space for the free movement of bees. Each comb strip and the central ones are left empty for the bees to build new combs parallel to the ends of the log. While harvesting honey,	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171005

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		only the combs at the two ends of the log are removed and the central combs with the brood and honey are kept intact. The vertical log hive i s very similar to the horizontal one except that it is placed in an upright position instead of horizontal position. The hive is generally placed on a piece of tin or flat stone with 5–6 entrance holes of pencil thickness above the base. The top of the vertical log hive is closed with a wooden or tin plank, in which 8–10 holes of 1 cm diameter are made through which the bees can freely move to the superbox placed on the top of the vertical log. The superchamber may be in the form of a box or mud pot. From the vertical top bar hive, honey is harvested from the super combs during the second year after bees have inhabited the hives. In the first year, bees will fill the vertical log with brood, pollen and honey. This ITK has been practised in high hills of north-west Himalayas since time immoral. **Keywords**: bee-keeping, log hive, *Apis cerana*, bee wax	
1055	Method for making household articles	The household articles are made from wooden sticks of *nagal.* It is easy in making and handling. People attend workshop programme or course on handicrafts to enhance the skill. This technique is highly beneficial, effective and eco-friendly. It is adopted in almost every house of the area. The articles are used for carrying cattle dung, manure, maize, wheat, pulses, fodder etc. **Keywords**: household articles, *nagal*, wooden sticks, handicrafts	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1056	Energy-producing roots	Roots o f *sanjiwani karan* provide good energy. Little amount of powder of the *sanjiwani karan*'s root is mixed with milk. This provide more energy and refreshment to the human body once a day to the all age groups. This practice is being followed for last several years by maximum number of farmers in the village. It is easily available in rainy season and easy to practice and involves little cost. **Keywords**: *sanjiwani karan*, energetic, milk	Shri Surat Ram, Karyali, Theog, Majhar, Shimla (Himachal Pradesh)
1057	Kilta, a bamboo basket	*Kilta* is a multiple purpose structure used for carrying farm produce and transportation of FYM to fields, which is carried at the back with the support of 3–4 metres rope. This is used by the people in upper parts of Himachal Pradesh throughout the year. It is made	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		by skilled persons only and costs about Rs 100–150 per *kilta*. All the farmers of this region are using this basket for several years. **Keywords**: *kilta*, multipurpose structure, carrying FYM and farm produce	
1058	Bamboo basket	*okri*, a bamboo basket is a multipurpose structure for both carrying as well as storing farm produces. This basket is made by skilled persons in the village and its weight is about ½ to 1 kg, costing Rs 40–50 per basket. This is used throughout the year in all parts of Himachal Pradesh for several years. **Keywords**: *tokri*, bamboo basket, carrying and storing, farm produce	Prof. L. R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 0
1059	Medicinal use of mushrooms	Mushrooms have been used for the treatment of various types of ailments including cancer. Some of these hypotheses have been proved to be true by modern scientific investigation. Many puffball (*Lycoperdon* spp.) and *giderpiri* (*Polymerus* spp.) mushrooms have been found to be anti cancerous in nature. Some of these mushrooms are aphrodiasics, antimaleria, antiprotozoa and helpful to overcome various ailments. This ITK has been practised throughout north-Himalayas since time immemorial. **Keywords**: mushrooms, anti-cancerous, anti-malaria, anti-protozoa	Dr O.S. Shad, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1060	Traditional practices in marketing of *guchhi* mushrooms (*Morchella* spp.)	*Guchhi* mushroom is a highly priced and delicious dish in the (*Morchella* spp.) Himalayan region. So far all attempts to domesticate this wild mushroom species have failed all over the world. It is collected form pine forest during spring and rainy season and is often found under pine trees in moist black soil. *Guchhi* mushrooms are collected by local people in the Himalayan region. They are contracted by local shopkeepers or other middle men from the plain areas. These people sell the produce to wholesalers. After collection from the forests, the mushrooms are woven into garlands, hung in the kitchen and allowed to dry over smoke or fire. This prevents decomposition. The local people sell the produce at Rs 400–500 /kg, whereas through middlemen and wholesale produce ultimately is sold to the consumers at a price of Rs 6, 000–7, 000 /kg. In international market, it is sold at three to four times the price in India. The above stated	Dr O.S. Shad, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		traditional marketing practice is common throughout the Himalayan region. So far no attempt has been made to regulate the marketing of this ethnic, precious and energy rich wild food resource on scientific lines. **Keywords**: *Morchella* spp., *guchhi*, pine forest, high priced	
1061	Use of *bijia* (*Cannabis sativa*)	Farmers of Kullu district in Himachal cultivate *bijia* or *bhang* (*Cannabis sativa*) plant since several years. Bijia is ethno-botanically a very important plant. Most of its parts are used for various purposes which are indicated below. *Fibre:* Making ropes, foot wear, local cultural instruments and religious ceremonies *Seed:* Use as a food. Traditionally it is used in *moori* which is a dried food of wheat, barley and *saivara*. The boiled seeds are also used as cattle feed. *Oil:* Seed oil is used for cooking in winter. *Medicinal value:* The oil prepared by churning the seeds is used as medicine to cure earache. *Crop protection:* It is used to protect maize crop from birds and animals by sowing in the boundaries of the field. **Keywords**: *bijia* (*Cannabis sativa*), fibre, seed oil, medicinal value	Dr. O.S.Shad, Pradesh Department of Bio-Sciences, Himachal Pradesh University, Shimla(Himachal Pradesh) 171 005
1062	Extracting walnut bark for medicinal use	The bark of walnut tree (locally called *akhrot*) is used by the people in upper parts of Himachal Pradesh for cleaning of teeth. It is believed that the use of this of bark prevent decaying of teeth. The bark is collected by sharp tool and this tree is available in plenty in this region. This has been used for several years but only a few people are using it today due to availability of better medicines in the market. **Keywords**: walnut tree bark, cleaning teeth, human being	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005
1064	Use of straw hive for beekeeping	In order to provide a micro-environment matching natural habitat nesting sites, straw hives are ideally suited. It provides insulation during severe cold in winter to the honeybees. Straw hives are made using locally available material. The rice straw fibres are tied in to 5 cm thick sheets with the help of strings and wooden strips. These sheets are cut to size and joined to form a wood chamber of 310 mm×320	Prof. L.R. Verma, Department of Bio-Sciences, Himachal Pradesh University, Shimla (Himachal Pradesh) 171 005

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		mm×204 mm in accordance with the standard for *Apis cerana* frame hive. A hollow raised bamboo is placed in one of the lengths to provide entrance to bees. A 5 cm thick crown/inner cover is similarly made from rice straw. The top cover is made in the form of a slopping roof from straw of *sarkanda* grass held in place with sticks. Projection beyond the brood chamber is left to drain off water. Care is taken to ensure that no crevasses are left. In addition, no loose straw should project into the brood chamber, as it would interfere with bee activity. Straw hives are commonly used in all parts of north-west Himalayas for domestication of Asian hive bee *Apis cerana*. Since Asian hive bee frequently abscond in other types of frame hive, straw hives are becoming popular amongst the beekeepers. **Keywords**: asian hive bee, *Apis cerana*, straw hive, micro-environment, north-west Himalayas.	
1065	Monastic ethos for use of sand against empty barley seeds	To overcome the problem of empty seed in barley, sand, sanctified by the *lamas* is spread in the field. This practice is generally adopted by farmers in Ladakh region of Himachal Pradesh, where majority of the people are using it for several years. **Keywords**: empty seed, barley, sanctified soil, *lamas*	Prof. L.R. Verma, Department of Bio-Sciences,Himachal Pradesh University, Shimla (Himachal Pradesh) 171005
2007	Non-conventional energy equipment for agriculture and irrigation	Modern Technical Centre at Pune, Maharashtra has developed non-conventional energy equipments for agriculture and irrigation. These equipments include  Frame mounted water purification system	Shri C.V Pathak, Modern Technical Centre, 144 Narayan Peth, Kasat Chowk, Pune (Maharashtra) 411 030

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		frame-mounted water pump, frame-mounted *su-jal* water filteration system, frame-mounted cutter/drier, hand operated cutter, bicycle mounted cutter/drier, spray pump, brake and light system for bullock cart, process attachment for bullock cart and animal-driven modern energy machine. **Keywords**: fuel saving, manpower, animal power	
2008	Various indigenous practices of agriculture	Shri Deepak Deshpande has disclosed ITK's from ancient Indian science literature, which are as follows. *Production of coloured cotton:* Cotton saplings should be watered at roots with a paste containing mixture of barley powder, powdered bark of *palash* (*kimshuka*) tree, *manjistha*, turmeric and sesame (*til*). Cotton seeds should also be smeared with the same paste before sowing. This will produce red cotton. **Keywords**: red colour cotton, barley, *palash*, *manjistha*, turmeric, sesame. *Productions of green /yellow cotton:* For production of green /yellow cotton, cotton saplings are watered and smeared at the roots with a paste of the barks of *salmali* (silk cotton tree), turmeric, indigo, triphala, (*amala*, *harada* and *baheda*) , *kushtha* and liquor (rum). The same treatment is to be given to the seeds before sowing. **Keywords**: *salmali*, turmeric, indigo, *triphala*, *kustha*, liquor, green or yellow cotton *Production of blue cotton:* If *manjistha*, sesame, barley, *pitasara* (yellow chandan), leaves of *jivanti* (a creeper) and powdered *manshila* are made into a paste in milk (boiled with sugar and cooled) of either goat or cow and applied to the root of a cotton plant, it produces fibres as blue as sky. **Keyword**: blue cotton *Pungent to sweet fruit:* A tree which normally produces pungent fruits, starts producing fruits, sweet like nectar if thickly smeared at the root with a paste of mixture made out of *bidanga*, *yashti* (sweet stick), barley, cow milk and jaggery. **Keywords**: sweet fruits, *bidanga*, *yashti*, barley, milk, jaggery *Production of seedless fruit:* If *yasthi madhu*	Shri Deepak Deshpande, Anand Vilas, Chitala Road, Dhantoli, Nagpur (Maharashtra) 440 012

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		(sweet stick), sugar *kushtha*, flowers of *madhuca* (*mahua*) are made into a paste and applied to the root of a tree, it produces fruits without seeds within. **Keyword**: seedless fruit *Stoneless fruits:* A big disc of bark is cut from the trunk of a tree so as to make a hole fit enough for inserting medicine. The hole is filled up with flowers of mahua, gunja, sugar, ripe *udumbara* and honey, the disc is replaced and the affected part is smeared with the dung of calves. If any sweet liquid is applied. If this is done, the tree is sure to bear stoneless fruits. **Keywords**: seedless fruit, cut bark, sweet liquid *Use of* adulsa (Adhatoda vasica) *as soil purifier:* It is observed and said that planting of *adulsa* (*Adhatoda vasica*) tree purifies the nearby soil. Leaf fall of *adulsa* also act as natural insecticide. **Keywords**: *adulsa*, soil purifier *Use of animal /human urine as manure and pesticide:* Animal/human urine diluted 10 times with water acts as good pesticide. Same urine diluted with 15 times water and given to the roots of crops/trees acts as good organic manure. **Keywords**: animal/human urine, manure, pesticide *Production of sweet chilli:* The seeds of fresh red chilli are taken and put in good quality honey and kept in it till the time of next sowing (4–5 months). The plants that will grow from these seeds will have sweet chilli. **Keywords**: sweet chilli, honey	
2009	Rain water management in irrigated and rainfed areas	In Shahpur revneue circle of East Nimar district in Madhya Pradesh, rain water management and soil conservation practices are followed by the farmers. They harvest rain water in check dams of ponds. Soil, stones, bricks, limestone and cement are used as sealing materials. Cost of medium size embankment is about Rs 5000. Pipe lines and *desi* canals are constructed to replace the irrigation water. *Desi* wells and tube wells are also used to irrigate crops by the farmers of this region. **Keywords**: rain water management, soil	Shir Randhir Singh Bais, Shahpur, Burhanpur, East Nimar (Madhya Pradesh)

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		onservation, harvest rain water, check dams, ponds, embankment, *desi* wells, tube wells	
2010	Innovative agricultural practices of Madhya Pradesh	Innovative agricultural reported by ZARS, Morena, Madhya Pradesh 1. The farmers, whether small, medium or large, mostly adopt mustard sowing by tractor drawn seed drill. Since mustard seed is small in size and the seed rate is small (about 5 kg/ha) the farmers face problem in its seeding using seed drill. To increase the volume of seed material, roasted pearlmillet seed is mixed with mustard seed in the ratio of 1: 1 and this method was found to have the desired results as compared to mixing of sand or FYM. By this method, desired plant (mustard) population is achieved in the field. **Keywords**: small seed, mixing with roasted pearlmillet seed 2. To have high returns per unit area and for efficient utilization of land and irrigation water, the farmers grow mustard at the normal spacing of 30 cm. When the crop is about 35–40 days old, berseem seed is broadcast in the whole field and then irrigation is applied. Thus, income from berseem is an additional gain to farmers without losing the normal return from the mustard crop. **Keywords**: mixed cropping, mustard, berseem 3. By the adoption of *toria*-wheat cropping system in the regular mustard growing fields, the problem of wild onion (*Asphodelus tenuifolius*) is minimized **Keywords**: *toria*-wheat, mustard field, wild onion. 4. The problem of phalaris minor weed is minimized in wheat field by taking mustard in rotation. **Keywords**: wheat-mustard crop rotation, *phalaris minor*. 5. In general, pearl millet is sown by broadcasting. When the crop attains an age of 20–25 days, intercultural operation is done which helps in thinning, weeding, earthing, drainage/aeration and mixing of top dressed nitrogen. This singleoperation increases yield by 40–50%. Such practices are adopted in northern part of Madhya	Zonal Agricultural Reaearch Station, Jawaharlal Nehru Krishi Viswa Vidlayala, Morena (Madhya Pradesh)

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		Pradesh where rainfall is scanty and irregular and the problem of crust formation is severe. **Keywords**: broadcasting, pearl millet, interculture	
2012	Charcoal water filter	The charcoal water filter is an effective technique for removing solids, suspended materials and other harmful bacteria. It can filter sufficient water for one family. A clay pot (42 cm diameter and 100 cm height) is fitted with a tap at the bottom. Gravel, sand and charcoal are first thoroughly washed. Then gravel is put into the pot up to the height of 25 cm. This layer removes the dust and dirt. Above this coarse sand is filled for a thickness of 25 cm. This layer is covered with a 15 cm bed of charcoal which is again covered with a 5–10 cm thin layer of gravel. The latter prevents the charcoal pieces from floating and keeps them stationary. All the different layers would occupy roughly two thirds of the pot. Water is poured into the pot and filtered water is drawn through the tap at the bottom. If a tap is not available, a few holes are made at the bottom of the pot, which should be placed on the empty domestic container. In this way filtered water is collected from the container for drinking. It is advisable to add a few drops of chlorine solution to a jug of water as a disinfectant. The filter requires cleaning or renewal of the beds when these become clogged and this could occur every 3 months in case of unclean water. Larger clay pots may be used to avoid frequent washing. All the materials are locally available in the village. **Keywords**: gravel, charcoal, sand, earthen pot, water filtration	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444606
2013	Chlorination pot for wells	This pot effectively chlorinates water in open dug wells up to 3 weeks. A pot of 7–8 litres capacity is taken and 6–8 holes of 5 mm diameter are made at the bottom. The holes are covered with stones or pebbles of 2–4 cm size. This layer is covered with pea gravel of smaller sizes. A dry mixture of 1.5 kg bleaching powder and 3 kg coarse sand is prepared and spread over the pea gravel. Finally, the pot is filled with pebbles or stones up to the neck. The pot is lowered in a well with the help of a rope about 1 m below water level. One pot is enough for a community well where 900–1300 litres are drawn per day. This gives adequate chlorination for 10–15 days. Wells	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444606

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		with higher drawn-off rates need two chlorination pots. The above system, suited to community wells, would excessively chlorinate the smaller household wells. Hence for a smaller unit for wells containing about 4000 litres or less having a withdrawal rate of 360–450 litres water per day, a unit consisting of two cylindrical pots-one inside the other-may be employed. The inner pot is filled with a moist mixture of 1 kg bleaching powder and 2 kg sand and is placed in the outer pot. A hole of 1 cm diameter is provided in the inner pot at the level of the mixture placed in it. Similarly 1 cm diameter hole is made 3–4 cm above the bottom of the outer pot. The mouths of both the pots are tied with polythene sheets. The entire unit is lowered into the well which chlorinates the water for 2–3 weeks. However, wells with hard water may not yield the expected results. **Keywords**: coarse sand, pea gravel, stone, pebble, bleaching powder	
2014	Improved potter's wheel	The traditional potters wheel is heavy to operate and wobbles on the pivot. The improved wheel is safer and lighter to operate and rotates steadily. As a result the potter can increase production and enhance the quality of his products. The improved potter's wheel has a tripod stand with a compact housing provision for two ball-bearings, MS rod and iron flange for the central part of the wheel. Wooden or iron spokes are provided for making the fly-wheel in the traditional way, either with clay or with cement concretes. **Keywords**: potter's wheel, safer, lighter, increased production	Shri Nilesh Vinaykrao Kakde,Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444 606
2016	Defluoridation of drinking water	Water containing excessive fluorides consumed over a period of 8–10 years, leads to a disease known fluorosis in human beings as well as in animals. Fluoride is a causative agent in dental fluorosis or mottled enamel. A high concentration of fluoride in drinking water also results in bone deformities and permanent crippling. Fluoride belts have been identified in Andhra Pradesh, Tamil Nadu, Karnataka, Maharashtra, Madhya Pradesh, Gujarat and Rajasthan. The presence of fluoride ion in drinking water is beneficial up to a concentration of 1 mg per litre. Beyond this limit, it is detrimental to health, causing fluorosis of teeth and bones. The National	Shri Nilesh Vinaykrao Kakde, Sushil Nagar, Cotton Mill Road, Rajapeth, Amravati (Maharashtra) 444 606

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		Environmental Engineering Research Institute (NEERI), Nagpur, has developed a simple method, known as Nalgonda Technique, for the removal of excess fluoride from potable water. Water drawn from wells with high fluoride content is taken in a container of, say, 20–60 litres capacity. If possible, a tap is fitted 3–5 cm above the bottom of the container to withdraw the treated water. However, this is not essential. Raw water in the container is mixed with adequate lime and alum depending on alkalinity, dissolved solids and fluorides in the raw water. The technique is very simple and could be adopted by rural people. **Keywords**: defluoridation, fluorosis, Nalgonda technique, lime, alum, potable water	
2017	Pyrolyser	A cylindrical drum-type pyrolyser with a capacity of 200 litres has been developed by Centre for Development of Rural Technology, Allahabad. About 40–45 kg dry waste can be fed and about 20 kg of charcoal can be obtained from the pyrolyser in a day. Agro-wastes, like dry leaves and sticks, which pose disposal problem can be converted into valuable smokeless fuel with good heat content. The briquettes made from the charcoal obtained from agro-wastes burn with a smokeless flame. **Keywords**: pyrolyser, dry waste, smokeless fuel, briquettes	Shri Swami Triptanandji, C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
2018	Indigenous method of saving the crops from frost	The field is irrigated with sufficient water to save the crop from frost. Cow dung cakes, straw, agricultural waste, tyres and tubes, etc. are collected and dried. These are burnt with fire in a pit in the middle of the field to produce dense smoke over the crop. This saves the crop from frost. **Keywords**: frost, standing water, burning of agricultural waste and producing dense smoke over the crop.	Shri Swami Triptanandji, C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005
2019	Method of predicting *gram* yield of watching *jharberi* plant	People of Jabalpur area have observed that the year when *jharberi* fruiting is more, the *gram* also yields more. **Keywords**: *jharberi* fruiting, *gram* yields more.	Shri Swami Triptanandji, C/o Shri R.K. Mehra, Tulsinagar, Ranjhi, Jabalpur (Madhya Pradesh) 482 005

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2242	*Kuradu* water	In an earthenware pot rice cleaned water and *ganji* are kept. Next day a part of the water from the pot is added to the cooking rice and again rice cleaned water and *ganji* are poured into the pot. Like this process continued for 10 days. Addition of fermented rice water and *ganji* to cooking rice helps in keeping quality of rice. **Keywords**: *kuradu water*	Shri Narasamma, Krishi Vigyan Kendra, Malyal, Warangal (Andhra Pradesh) 482 004
2243	preading of thin layer of sand below the rearing stand in sericulture	Spreading of sand as a thin layer and sprinkling of water frequently reduces the temperature by increasing relative humidity in the rearing room of silkworm. During summer this practice reduce the temperature to some extent. This practice is being followed by all the farmers who are practicing sericulture. **Keywords**: Spreading of sand sericulture rearing room	Shri KVS Rami Reddy, Krishi Vigyan Kendra, Anantapur (Andhra Pradesh)
2288	Indigenous knowledge on resource characterization	D r L.P. Bharara in his book Man in the Desert has described beliefs in relationships between rainfall and natural elements such as wind and its direction, cloud and month, zodiac period (*nakshatra*) , date (*tithi*), day and month, *nadshatra* wind-heat and wind-flame omen, moon-stars and their movements etc., comprising climatic indicators of drought prediction in Rajasthan. Predictions based on these natural elements sometimes come true but sometimes not. Farmers also cherish a hypothesis that blooming and fruiting of specific local trees, shrubs and grasses are closely associated with the rainfall of the area. Sometimes changes in fruiting are also the indicator of an even or odd season. Trees such as *khejri* (*Prosopis cineraria*) , *neem* (*Azadirachta indica*) , *bordi* (*Zizyphus nummularia*); shrubs such as *aakra* (*Calotropis procera*), *kair* (*Capparis decidua*) , *phog* (*Calligonim polygonoides*), *kheemp* (*Leptadenia pyrotechnica*) ; and grasses such as *sewan* (*Lasiurus sindicus*) and *mussa* (*Tephorosia purpurea*) are the major species whose vegetational behaviour is taken to predict the drought. The nature of year predicted on the basis of local indicators was compared with the actual nature of year calculated on the basis of rainfall and crop maturity over a period of 94 years of observations. On an average the validity of all the years predicted comes to be 55% true and 45% false,	Dr L.P. Bharara, Retired Principal Scientist of CAZRI, 17/399, Chopasni Housing Board, Jodhpur (Rajasthan) 342 003

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
		as reported by 61% and 39% of the sample respondents respectively. Climatic followed by vegetation behavioural changes reported by 79% and 71% of the households revealed maximum 78% and 68% true validity of the nature of the years predicted. Animal's and bird's behavioural changes and social behavioural activities reported by 48% and 46% of the households coincided only with 42% and 33% with the actual nature of the years predicted. Farmer's experiences have also led to evolution of local nomenclature for different types of lands and their characteristics. Traditional nomenclature is associated with the topography, quality and fertility of land, types of crops grown, vegetation available, water-harvesting structures, and the aspects of social structure. Based on this, the farmers have identified and classified four types of cultivable lands in terms of fertility. **Keywords**: rainfall/drought forecast, vegetational behaviour, land nomenclature	
569	Use of ritha powder as detergent	The seed coat of *ritha* (*Sapindus mukorossi*) possesses soap like property, which is used for washing hair and woollen clothes. The seed coat is removed and a fine powder is prepared. This powder is used as detergent for washing. *Ritha* is very good for washing woollen cloths and hair. The technique is very cost effective. **Keywords**: *Sapindus mukorossi*, *ritha*	Shri Mahesa Nand Sati, Kope, Chamoli (Uttaranchal)
954	Method of food grain production	Good farmer is one who is laborious, having high patience, educated, experienced, keen to learn and who loves the soil. Field should be ploughed three times. Properly decomposed manure should be used. Sowing of properly selected seed and timely weeding with judicial use of fertilizers and timely irrigation are required for good production. Proper drainage, control of pests and diseases at appropriate time, timely harvesting, proper threshing and proper drying of grain in sun and proper storage are needed to be done carefully. **Keywords**: ideal farming practices for high production	Shri Netra Singh Thakur, Kataru, Sangahwana, Mandi (Himachal Pradesh

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
1638	Use of ash for washing clothes	It is widely practised in rural areas of Chotanagpur and South Paraganas of Jharkhand state where wood is used for cooking. Ash of completely burned wood is collected in a trunk. The ash is used as detergent powder for washing the dirty clothes. It has alkaline nature, and hence it does not have any harmful effects on cloths and makes them even brighter, shiny than detergent. It is an age-old practice and is followed by maximum number of farmers **Keywords**: natural detergent, ash, wood, alkaline, clothes	Ms. Rashmi Kundulna, Hawai Nagar Ranchi (Jharkhand)
1078 1100 1101 1102 1103 1134 1135 1190 1191 1985	Indigenous practices in Mathura district of Uttar Pradesh	The practices disclosed by the Krishi Vigyan Kendra, Mathura are given below. 1. Use of ash to minimize the insect attack in vegetables: Farmers broadcast ash at the seedling stage as well as when tops of the plants are attacked by insects. 2. Mustard is generally sown in September. Farmers open furrows in the evening, and after sowing early in the morning planking is done. This practice is adopted due to brackish water condition in the district. 3. Use of neem leaves and ash is done during storage of grain to prevent pest attack. 4. Intercropping of marigold with chillies, brinjal and tomato is done to protect these crops from nematodes. 5. Dried chillies (10–15 g) are kept along with pulses in drum to prevent attack of insects. 6. Delinting of cotton seeds is done by cowdung. 7. Camphor, lime and tobacco mixture is used by the farmers to heal wounds in animals. 8. Garlic (fresh), tender ginger and hing 10 g each are mixed with 50 g jaggery and given to animals for protection against cold. 9. Jaiphal, javitri and keshar (saffron) are used for protection against cold. **Keywords**: plant protections, grain storage, veterinary treatment against cold and for healing wounds	Shri B.L. Yadav, Krishi Vigyan Kendra, Mathura (Uttar Pradesh) 281 001

Code No.	Title of ITK	Description of the ITK	Name and address of discloser/facilitator
2250	Stomachache medicine	The stomachache in calves of buffalo and cattle is cured by taking banana fruit pieces and dipping in *gingelly* oil for some time and administrating it to calves once daily for 2 days, as banana in oil helps in digestion and relieves the impact. **Keywords**: banana, *gingelly* oil, stomachache, calves	hri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakapatnam (Andhra Pradesh) 281 001
2251	Stomachache medicine	The stomachache in cattle and buffalo is cured by feeding extract prepared by following methods.Take *Holarrhena antidysentrica* (*pala konda*) roots, grind the roots and take the extract. Take some pieces of earthen pot, heat them and dip them in the juice extract and remove. Then take about 200 ml fed to cattle twice daily for 2 days. **Keywords**: stomachache, cattle	Shri Dorai Raj, Krishi Vigyan Kendra, Haripuram, Rambili, Visakapatnam (Andhra Pradesh) 281 001

Annexure

Guidelines and format for obtaining information on indigenous technical knowledge

1.0 What is Indigenous Technical Knowledge

Indigenous Technical Knowledge (ITK) is the knowledge that the people in a given community have developed over time, and continue to develop it. It is based on experience, often tested over a long period of use, adapted to local culture and environment, dynamic and changing, and lays emphasis on minimising the risks rather than maximising the profits. ITK covers a wide range of subjects such as crop production, livestock rearing, natural resource management, food preparation, health care and many other related topics. Various aspects of agriculture and allied activities have been included in this project such as soil, water and nutrient management; crop cultivation; plant protection; farm equipment, farm power, post-harvest preservation and management; pasture and fodder management; agro-forestry; bio-diversity conservation and exploitation; animal rearing and health care; animal products preservation and management; fisheries and fish preservation; and ethnic foods and homestead management.

Recording of ITK in Communities

Based on the information available1, the following general outline of activities, rules, and procedures for collecting, recording, and documenting ITK were prepared.

Preparation

1. Define study objective.
2. Determine the content and extent of the study: What do you need to know? How much do you need to know? Do not attempt to collect more data than necessary.
3. Select methods for recording and documentation. Methods should:

   (a) Yield the required information

   (b) Be low-cost

   (c) Be easily understood by the community

   members

   (d) Be fun to do

   (e) Place importance on local people rather than the researcher and other outsiders.
4. Prepare for each method thoroughly before going to the community. If several people are involved, divide the work and give specific assignment to each individual.
5. Collect all the relevant information about the community and related topics before you enter the community.
6. Obtain permission from the community before you start the study or project.

Entering the community

1. Introduce yourself and other outsiders to all the community members involved.
2. Explain to the community, in detail, the study or project objectives. Do not raise false expectations.
3. Let people know that you have come to learn from them.
4. Discuss with the community the possible benefits of the study.
5. Inform the community members the approximate time they shall have to devote for the study.
6. Learn the meaning of local terms.
7. If possible, learn to speak the local language. This makes field work much easier and is usually highly appreciated.

Note

Matching terms and concept: Many misunderstandings and mistakes occur, because outsiders and local people do not understand what each other mean when they use some particular words. Your definitions and the way you classify things such as soils and diseases are not necessarily the same as those of community members. You may need to work together with local people to translate and match your terms and concepts.

1IIRR, 1996. Recording and Using Indigenous Knowledge. A manual. International Institute of Rural Reconstruction, Silang, Cavite, Philippines.

Learning about ITK

1. A s k natural questions. Do not ask leading questions.

Example:

Yes : "What do you use this for ?"

No : "Do you use this for cooking ?"

2. Use these words and phrases often: What? How? Why? Who? When? Where? How often? Where did you learn this?
3. Listen and observe.
4. Be open; try to achieve an insider's perspective.
5. Keep alive the interest of local participants and know when to stop.
6. Follow the do's and don'ts of community work, as indicated below.

Note: Do's and don'ts of community work

(i) Do not force people to participate in the process.

i. Do not be impatient.
ii. Do not ask a lot of questions all at once.
iii. Let people finish what they have to say and then ask your questions.
iv. Listen attentively and learn.
v. Do not disturb on-going discussions.
vi. When people are discussing one subject, do not introduce another.
vii. Include fence-sitters (those who watch but do not actively participate).
viii. Be wary of people who dominate discussions. Deal with them diplomatically.
ix. When people discuss among themselves, do not try to influence them.
x. Do not show approval or disapproval.
xi. D o not exchange signs between team members during discussions.
xii. Learn and use the local language.

Recording of ITK

1. Record all information, even if it does not make sense from an outsider's

No : "Farmers know only two or three types of medicine."

The description of most of the methods may be organised as follows:

Definition. A brief characterization of the method.

Purpose. General usefulness of the method, not necessarily regarding ITK.

Materials. Things needed when using the method.

Possible approach. A step-by-step explanation of how the method can be used. To keep the manual short and to avoid overlap, general procedures such as "seek permission from the community" or "introduce yourself" are not repeated for each method.

Value. Usefulness of the method for recording ITK.

Dos and don'ts. What to do and not to do when using the method.

Modifications. Alternative approaches to or uses of the method.

There is no single approach for recording ITK. Similarly, the steps are not ready-to-use instructions, but just one of the many possible ways a method can be used. The methods must be modified and combined to suit each field of study. One must be creative and flexible to record and apply ITK successfully.

Sources of ITK

The following sources of ITK may be explored:

1. Farmers and community members, especially the elders, are the best sources of ITK. But, since ITK is unevenly distributed in communities, it is important to find out who knows what in order to tap the right sources. Otherwise, data will not truly reflect ITK in t h e community. For example, asking men about garden plants when women are in charge of home gardens, might lead one to conclude that villagers know little about gardening.
2. Folklore, songs, poetry, and theatre can reveal a great deal about people's values, history, and practices. These are often not written down and need to be recorded.
3. Regarding community records, although ITK is mostly transmitted by word of mouth, some indigenous forms or record keeping do exist. These include writings, paintings and carvings besides many other forms.
4. 4. People working with communities such as extension workers, can be a valuable source of ITK. Other resource persons are local school headmaster, credit cooperative society officials,

point of view.

2. Record as neutrally and value-free as possible.

Examples:

Yes : "Farmers use local breeds."

No : "Farmers still use local breeds."

N o : "The village appears less developed because farmers use only local breeds."

Yes : "Farmers use two or three types of medicine."

village milk cooperative members, men and women labourers, and village Panchayat Sarpanch.

5. Secondary sources include published and unpublished documents, databases, videos, photos, museums and exhibits.

2.0 General Guidelines

(To be obtained for each and every knowledge and technology)

1. Title of the ITK
2. Date and place of origin, and use of knowledge and technology with details about location, address and site description.
3. Details of farming situations where the specific knowledge and technology are being utilized.
4. Source of origin of the knowledge and technology (attach documentary evidence).
5. General description of the specific knowledge and technology.
6. Users of this knowledge and technology.
7. Appropriate season for using the knowledge (year, English month, lunar cycle, phonological stages, crisis period/normal period, pre/post-crisis period etc.).
8. Technical details of the knowledge and technology, indicating the manners of their utilization.
9. Details of resources required for the practice of knowledge and technology.
10. Compatibility of the practice with the internal resources in the farming situations pertaining to socio-eco-cultural and environmental aspects.
11. Details of benefits that may accrue, giving quantitative data, wherever applicable. Enumerate the cost and benefit.
12. Advantage of the specific knowledge and technology: economic, social, cultural, environmental etc.
13. Photograph, sketch, map, diagram etc. to describe the technology and its application.
14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers of the village?
16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc)
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address, including postal code (PIN) of the person to whom the incentive money is to be sent, if selected.
19. Certified that the discloser on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

3.0 Resource Conservation and Management

3.1 Rain Water Management

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:
   (i) Village
   (ii) Taluka/block
   (iii) District
   (iv) State
   (v) Postal code (PIN).
4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:
   (i) Major soil type and texture
   (ii) Major crops grown in the area
   (iii) Area irrigated (%)
   (iv) Area served (ha).
8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

i. Crop and its variety

ii. Method of rain-water harvesting/conservation in situ

iii. Method of rain-water diversion to specific area such as pond, drain (nallah) etc.

iv. Management of waterways

v. Water-harvesting structure: give details on sealing material, water-lifting device, application method of harvested water etc.

vi. Cost effectiveness of the method of rain-water harvesting and its use

(vii) Any other point

(viii) Future perspective of the practice.

10. Provide information on:

(i) Compatibility of the practice with the components of existing farming systems and internal resource of the household

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice.

11. Details of the users of the ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Education

(v) Vocation

(vi) Tribal/non-tribal

(vii) Any other.

12. Since how many years has this practice been in use, and any modifications made over the years?
13. How many farmers use the practice (give the number of farmers/farm families who use the ITK out of the total number of families)?
14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers of the village?
16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
17. Name and complete address including postal code (PIN) of the discloser.
18. Name and complete address including postal code (PIN) of the person to whom the incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.2 Soil and Water Conservation

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

(i) Village

(ii) Taluka/block

(iii) District

5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:

(i) Major soil type and texture

(ii) Major crops grown in the area

(iii) Area irrigated (%)

(iv) Area served (ha).

8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

(i) Crop and its variety

(ii) Materials used

(iii) Dimension of the structure

(iv) Location/situation where the structure is formed and its frequency

(v) Cost effectiveness of the structure

(vi) Details of vegetative technology, if used, indicating the vegetation used, its planting technologies, cost effectiveness etc.

(vii) Any other

(viii) Future perspective of the practice.

10. Provide information on:

(i) Compatibility of the practice with the components of existing farming systems and internal resource of the households

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice

11. Details of the users of ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Tribal/non-tribal

(v) Education

(vi) Vocation

(vii) Any other.

(iv) State

(v) Postal code (PIN).

4. Purpose for which the ITK is used.

12. Since how many years has this practice been in use, and any modifications made over the years?

13. How many farmers use the practice (give the number of farmers/farm families who use the ITK out of the total number of families)?
14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers of the village?

16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address including postal code (PIN) of the person to whom the incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.3 Wind Erosion

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

   (i) Village

   (ii) Taluka/block

   (iii) District

   (iv) State

   (v) Postal code (PIN).
4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:

   (i) Major soil type and texture

   (ii) Major crops grown in the area

   (iii) Area irrigated (%)

   (iv) Area served (ha).
8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

   (i) Crop and its variety

   (ii) Species used as wind break

   (iii) Management of vegetative species used as wind break

   (iv) Details of mechanical methods used for wind break, if any

   (v) Any other

   (vi) Future perspective of the practice.
10. Provide information on:
11. Details of the users of the ITK:

    (i) Economic status (average annual income)

    (ii) Caste

    (iii) Religion

    (iv) Tribal/non-tribal

    (v) Education

    (vi) Vocation

    (vii) Any other.
12. Since how many years has this practice been in use, and any modifications made over the years?
13. How many farmers use the practice (give the number of farmers/farm families who use the ITK out of the total number of families)?
14. Provide information on the reasons for non-use of the ITK practice, if all farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers?
16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address including postal code (PIN) of the person to whom the incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.4 Tillage Practices

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

   (i) Village

   (ii) Taluka/block

   (iii) District

   (iv) State

   (v) Postal code (PIN).
4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by

(i) Compatibility of the practice with the components of existing farming systems and internal resource of the household

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice.

the users (provide quantitative information)?

7. General farming situation:

   (i) Major soil type and texture

   (ii) Major crops grown in the area

   (iii) Area irrigated (%)

   (iv) Area served (ha).

8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

    I. Tillage practices followed for seed bed preparation

    (a) Crop and its variety

    (b) Implement(s) used

    (c) Depth

    (d) Number of operations

    (e) Any other

    (f) Future perspective of the practice.

    (g) Provide information on:

    •Compatibility of the practice with the components of existing farming systems and internal resource of the household

    •Socio-cultural compatibility of the practice

    • Element of risk involved

    • Technical feasibility of the practice.

    (ii) Intercultural practices:

    (a) Crop and its variety

    (b) Implement(s) used

    (c) Depth

    (d) Purpose, indicate if for weed control, breaking of surface-soil crust, rain water conservation etc.

    (e) Any other relevant information

    (f) Future perspective of the practice

    (g) Provide information on:

    •Compatibility of the practice with the components of existing

    • farming systems and internal resource of the household

    • Socio-cultural compatibility of the practice

    • Element of risk involved

    • Technical feasibility of the practice.

10. Details of the users of the ITK:

    (i) Economic status (average annual income)

    (ii) Caste

    number of farmers/farm families who use the ITK out of the total number of families)?

13. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
14. What is the alternative practice of the ITK being followed by the farmers?
15. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.5 Crops and Cropping Systems

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

    (i) Village

    (ii) Taluka/block

    (iii) District

    (iv) State

    (v) Postal code (PIN)

4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:

    (i) Major soil type and texture

    (ii) Major crops grown in the area

    (iii) Area irrigated (%)

    (iv) Area served (ha).

8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

    (a) Crop and its variety

    (b) Time of sowing - dry seeding/seeding after receipt of rain

    (c) Method of sowing

    (d) Depth of sowing

(iii) Religion

(iv) Tribal/non-tribal

(v) Education

(vi) Vocation

(vii) Any other.

11. Since how many years has this practice been is in use, and any modifications made over the years?

12. How many farmers use the practice (give the

(e) Implement(s) used for sowing

(f) Cover management to reduce impact of rain drops

(g) Residue management

h. Drought - management practices followed for early season drought, mid season drought and terminal drought
i. Any other
j. Future perspective of the practice.

10. Provide information on:

i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
ii. Influence of the practice on cropping system
iii. (iii) Socio-cultural compatibility of the practice
iv. Element of risk involved
v. Technical feasibility of the practice.

11. Details of the users of the ITK:

i. Economic status (average annual income)
ii. Caste
iii. Religion
iv. Tribal/non-tribal
v. Education(vi) Vocation
vi. Any other relevant information.

12. Since how many years has this practice been in use, and any modifications made over the years?
13. How many farmers use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?
14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers?
16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.6 Pest and Disease Management

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

(i) Village

(ii) Taluka/block

(iii) District

(iv) State

(v) Postal code (PIN).

4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:

(i) Major soil type and texture

(ii) Major crops grown in the area

(iii) Area irrigated (%)

(iv) Area served (ha).

8. Details of farming situations where the practice is adopted.
9. Particulars of ITK (should include details on):

(i) Crop and its variety and season

(ii) Trap crop used and its planting geometry

(iii) Use of healthy seeds

(iv) Seed treatment

(v) Chemical control

(vi) Mechanical method

(vii) Other cultural method

(viii) Soil fumigation

(ix) Air purification through yagya

(x) Use of materials of plant/vegetative origin

(xi) If plant material is used in the ITK, provide information on:

(a) Name

• Local

• Botanical

(b) Habitat: aquatic/semi-aquatic/ mesophytic/xerophytic

(c) Occurrence

• Season: rainy/winter/summer/perennial

• Quantity available

(d) Habit: herb/shrub/climber/tree

(e) Method of collection of the utility part for use in ITK

(f) Part used: root/stem/bark/leaf/flower/fruit/seed/juice/latex etc.

(g) Method of use

• Raw or processed (give details)

• Use as pure or blended with other material

• Quantity, time and frequency of use

(h) Method of processing

(i) Alternative of the plant for the particular purpose

(xii) Any other

(xiii) Future perspective of the practice.

10. Provide information on:

(i) Compatibility of the practice with the components of existing farming systems and internal resource of the household

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice.

11. Details of the users of the ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Tribal/non-tribal

(v) Education

(vi) Vocation

(vii) Any other.

12. Since how many years has this practice been in use, and any modifications made over the years?

13. How many farmers in the village use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?

14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.

15. What is the alternative practice of the ITK being followed by the farmers of the village?

16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).

17. Name and complete address, including postal code (PIN) of the discloser.

18. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.

19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

3.7 Weather Forecasting

1. Title of the ITK.

2. General description of the ITK practice.

3. Location where the ITK is in practice:

(i) Village

(ii) Taluka/block

5. Rationale and hypothesis of the treatments used to solve the target problem.

6. What is the impact of the practice as experienced by the users (provide quantitative information)?

7. General farming situation:

(i) Major soil type and texture

(ii) Major crops grown in the area

(iii) Area irrigated (%)

(iv) Area served (ha).

8. Details of farming situations where the practice is adopted.

9. Particulars of ITK (should include details on):

(i) Crop and its variety

(ii) Forecasting the onset of rains

(iii) Forecasting the occurrence of rains

(iv) Forecasting the receipt of rains

(v) Land preparation

(vi) Residue management

(vii) Sowing

(viii) Pest/disease control

(ix) Intercultural operations

(x) Harvesting

(xi) Any other

(xii) Future perspective of the practice.

10. Provide information on:

(i) Compatibility of the practice with the components of existing farming systems and internal resource of the household

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice.

11. Details of the users of the ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Tribal/non-tribal

(v) Education

(vi) Vocation

(iii) District

(iv) State\

(v) Postal code (PIN).

4. Purpose for which the **ITK** is used.

(vii) Any other.

12. Since how many years has this practice been in use, and any modifications made over the years?

13. How many farmers use the practice (give the number of farmers/farm families who use the ITK out of the total number of families)?
14. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the farmers of the village

16. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).

17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address, including postal code (PIN) of the person to whom the incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

4.0 Horticultural Crops

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:

   (i) Village

   (ii) Taluka/block

   (iii) District

   (iv) State

   (v) Postal code (PIN).

4. Problem for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. General farming situation:

   (i) Major soil type and texture

   (ii) Major crops grown in the area

   (iii) Area irrigated (%)

   (iv) Area served (ha).

8. Details of farming situations where the practice is adopted.
9. Details of the use

   (i) Economic status (average annual income)

   (ii) Caste

   (iii) Religion

   (iv) Tribal/non-tribal

   (v) Education

   (vi) Vocation

   (vii) Any other.

   (iv) How and when it is used/applied

   (v) If the material is processed, please give details of processing and its subsequent use in the crop.

   (vi) Are there specific cultivation methods for specific crops

   (vii) Any other.

11. If plant material is used in the ITK, provide information on:

    (i) Name

    (a) Local

    (b) Botanical

    (ii) Habitat: aquatic/ semi-aquatic/mesophytic/ xerophytic

    (iii) Occurrence

    (a) Season: rainy/winter/summer/perennial

    (b) Quantity available.

    (iv) Habit: herb/shrub/climber/tree

    (v) Method of collection of the utility part for use in ITK

    (vi) Part used: root/stem/bark/leaf/flower/fruit/seed/juice/latex etc.

    (vii) Method of use:

    (a) Raw or processed (give details)

    (b) Use as pure or blended with other material

    (c) Quantity, time and frequency of use

    (viii) Method of processing

    (ix) Alternative of the plant for the particular purpose.

12. Advantages of the practice. Please give quantitative data wherever applicable: economic, social, cultural, environmental etc.
13. Details of benefit - cost analysis.
14. Provide information on:

    (i) Compatibility of the practice with the components of the existing farming systems and internal resource of the household

    (ii) Socio-cultural compatibility of the practice

    (iii) Element of risk involved

10. Particulars of ITK (should include details on):

    (i) Crop and its variety

    (ii) Material(s) used

    (iii) From where the material is obtained (is it locally available?)

    (iv) Technical feasibility of the practice.

15. Future perspective of the practice.

16. Since how many years has this practice been in use, and any modifications made over the years?

17. How many farmers in the village use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?

18. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.

19. What is the alternative practice of the ITK being followed by the farmers of the village?

20. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).

21. Name and complete address, including postal code (PIN) of the discloser.

22. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.

23. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

5.0 Veterinary and Animal Husbandry

1. Title of the ITK.

2. General description of the ITK practice.

3. Location where the ITK is in practice:

(i) Village

(ii) Taluka/block

(iii) District

(iv) State

(v) Postal code (PIN).

4. Purpose for which the ITK is used.

5. Rationale and hypothesis of the treatments used to solve the target problem.

6. What is the impact of the practice as experienced by the users (provide quantitative information)?

7. Details of the users of the ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Education

(v) Vocation

(vi) Tribal/non-tribal

(v) Post-harvest processing of animal and crop products

(vi) Marketing of livestock and livestock products

(vii) Infrastructure availability for animal husbandry and agriculture

(viii) Endangered breeds of animals in the area, if any.

9. ITK attributes/characteristics:

(i) Purpose for which the ITK used: disease problem/survivability/higher production/usual practice/other (please specify)

(ii) Type of ITK: material/method/technique/tool/equipment (give details)

(iii) Detailed report on methodology adopted in using the ITK

(iv) Species of animal in which the ITK is used

(v) If ITK is the breed, specify it

(vi) Cost involved per application or treatment (cost per animal)

(vii) Labour saving, if any, in terms of expenditure

(viii) Whether user friendly

(name if any poisonous or synthetic chemical/drug is used)

(ix) Does the ITK has any adverse effect on animal/product/society?

(x) Any other

(xi) Future perspective of the practice.

10. Source of ITK:

(i) Name the plant, mineral or other material used in ITK

(ii) If plant material in used in the ITK, provide information on:

(a) Name

- Local
- Botanical

(b) Habitat: aquatic/ semi-aquatic/mesophytic/ xerophytic.

(c) Occurrence

- Season: rainy/winter/summer/perennial
- Quantity available.

(d) Habit: herb/shrub/climber/tree

(e) Method of collection of the utility part

(vii) Any other.

8. Site specifications:

(i) Prominent animal species: cattle/buffalo/goat/sheep/others

(ii) Predominant breeds of the major animals

(iii) Feeding systems adopted for animals: grazing/stall-fed/mixed/others

(iv) Main source of water for animals: pond/canal/river/well/others

for use in the ITK

(f) Part used: root/stem/bark/ leaf/ flower /fruit/seed/juice/latex etc.

(g) Method of use:

- Raw or processed (give details)
- Use as pure or blended with other material
- Quantity, time and frequency of use.

(h) Method of processing

(i) Alternative of the plant for the particular purpose.

11. Provide information on:

(i) Compatibility of the practice with the components of the existing farming systems and internal resource of the household

(ii) Socio-cultural compatibility of the practice

(iii) Element of risk involved

(iv) Technical feasibility of the practice

12. Experiences of users of the ITK

13. Since how many years has this practice been in use, and any modifications made over the years?

14. How many farmers in the village use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?

15. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.

16. What is the alternative practice of the ITK being followed by the farmers of the village?

17. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).

18. Name and complete address, including postal code (PIN) of the discloser.

19. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.

20. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

6.0 Fishery

1. Title of the ITK.

2. General description of the ITK practice.

3. Location where the ITK is in practice:

(i) Village

(iv) State

(v) Postal code (PIN).

4. Purpose for which the ITK used.

5. Rationale and hypothesis of the treatments used to solve the target problem.

6. What is the impact of the practice as experienced by the users (provide quantitative information).

7. Details of the users of the ITK:

(i) Economic status (average annual income)

(ii) Caste

(iii) Religion

(iv) Tribal/non-tribal

(v) Education

(vi) Vocation

(vii) Any other.

8. Site specifications:

(i) Prominent fish species in the locality

(ii) Breeding habits of fish

(iii) Feeding systems adopted for fish farming

(iv) Information on availability of fish in ocean from traditional folklore

(v) Main source of water for fish rearing: annual/perennial ponds, lake, reservoir etc.

(vi) Integrated fish farming: details of the practice followed

(vii) Importance of traditional farming techniques

(viii) Marketing of fish catch products

(ix) Infrastructure availability for fisheries development.

9. ITK attributes/characteristics:

(i) Purpose for which the ITK is used: disease problem/survivability/higher production/usual practice/other (please specify)

(ii) Type of ITK: material/method/technique/tool/equipment (give details)

(iii) Detailed report on methodology

(ii) Taluka/bloc

(iii) District

adopted in using the ITK

(iv) Species of fish in which the ITK is used

(v) If the ITK is a breed, specify it

(vi) Cost involved per application or treatment (cost per unit of fish weight)

(vii) Labour saving, if any, in terms of expenditure

(viii) Whether user friendly (name if any poisonous or synthetic chemical/drug is used)

(ix) Name the fish species, feed and management strategies used

x. Does the ITK has any adverse effect on fish production/society

xi. Any other relevant information

xii. Future perspective of the practice.

10. Provide information on:

    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household

    ii. Socio-cultural compatibility of the practice

    iii. Element of risk involved

    iv. Technical feasibility of the practice.

11. Experience of the users of ITK.

12. Since how many years has this practice been in use, and any modifications made over the years?
13. How many fishers in the village use the practice (give the number of fishers/farm families who use the ITK out of the total number of fishers in the village)?
14. Provide information on the reasons for non-use of the ITK practice, if all the fishers/families do not use the practice.
15. What is the alternative practice of the ITK being followed by the fishers of the village?
16. Documentary evidence of the ITK: (photograph, sample, specimen, illustration, etc.).
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

7.0 Specific Format for Farm Implements

1. Title of the ITK (name in English and local language).
2. Provide information of the implement/tool on:

   (i) Name

   (ii) Origin

   (iii) Source of power needed for the operation.

3. Location where the ITK is in practice:

   (i) Village

   (ii) Taluka/block

   iii. District

   iv. State

   v. Postal code (PIN).

4. Purpose for which the ITK is used:

   i. Is it single purpose or multipurpose?

   ii. Method of application/use

   iii. Season in which it is used

   iv. Approximate number of days of use in a year.

5. Provide information of the implement/tool on:

   (i) Manufacturer and source of availability

   (ii) Material used and its availability

   (iii) Weight (kg) of the implement

   (iv) Cost (Rs)

   (v) Approximate life (years) of the implement

   (vi) Frequency of repair and maintenance

   (vii) Is the repair done locally or by sending to the manufacturer?

6. What is the impact of the practice as experienced by the users (provide quantitative information)?

7. General farming situation:

   i. Topographical feature

   ii. Major soil type and texture

   iii. Major crops grown in the area

   iv. Month and pattern of monsoon

   v. Area irrigated (%)

   vi. Area served (ha)

8. Details of the users of the ITK:

   i. Economic status (average annual income)

   ii. Caste

   iii. Religion

   iv. Tribal/non-tribal

   v. Education

   vi. Vocation

   vii. Any other.

9. Crop/enterprise for which the implement/tool is used.

10. Details of prototype with photograph, figure and diagram.

11. Field performance of the implement/tool:
    i. Draught requirement
    ii. Work rate (ha/hr, kg/hr, or any other unit)
    iii. Cost of operation per ha or per hour
    iv. Ease of operation
    v. Safety in operation: Is it safe or requires careful handling?
    vi. Quality of work done
    vii. For plough, harrow, cultivator: inversion, pulverization, burial of weed

viii. For seed and fertilizer drills: placement of seed and fertilizer, soil contact

(ix) For weeding tool: removal of weeds (%)

(x)For harvesting tool: harvesting losses etc.

(xi)For threshing equipment:

(a) Threshing efficiency (%)

(b) Cleaning efficiency (%)

(c) Breakage (%)

(d) Losses (%)

Any other.

12. Comparative strengths/weaknesses of the indigenous implement over the modern implement used for the same purpose designed by the workshop:

S.No. Parameter Indigenous Modern implement/tool Modern implement/ tool tool

(i) Cost of implement

(ii) Capacity

(iii) Cost of operation

(iv) Ease of operation

(v) Quality of work done

(vi) Compatibility with physical environment

(vii) Compatibility with household internal resources

(viii) Effect on productivity

(ix) Good and bad features

(x) Overall liking of the farmers

13. Modification, if any required for wider applicability/adoptability of the implement.

14. General remarks, if any.

15. Since how many years has this practice been in use, and any modifications made over the years?

16. How many farmers in the village use the implement (give the number of farmers/farm families do not use the practice out of the total number of families in the village)?

17. Provide information on the reasons for non-use of the implement, if all the farmers/families do not use the practice.

18. What is the alternative practice of ITK being followed by the farmers of the village?

19. Name and complete address, including postal code (PIN) of the discloser

20. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.

21. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

8.0 Ethno-botany and Agro-Biodiversity

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:
    1. Village
    2. Taluka/block
    3. District
    4. State
    5. Postal code (PIN)
4. Problem for which the ITK is used.
5. Rationale and hypothesis of the treatments used to solve the target problem.
6. What in the impact of the practice as experienced by the users (provide quantitative information).
7. General farming situation:
    1. Geography, climate and ecology of the area including features like forest, ponds etc.
    2. Major soil type and texture
    3. Major crops grown in the area
    4. Area irrigated (%)
    5. Area served (ha).
8. Details of the users of the ITK:
    1. Economic status (average annual income)
    2. Caste
    3. Religion
    4. Tribal/non-tribal
    5. Education
    6. Vocation
    7. Any other.
9. Details of farming situations where the practice is adopted.
10. Details of the practice:
    1. Material(s) used
    2. From where the material is obtained, is it locally available
    3. How and when it is used/applied
    4. If the material is processed, give details of processing and its subsequent use in the crop
    5. Any othe

11. Advantages of the practice; give quantitative data, wherever applicable: economic, social, cultural, environmental etc.
12. Details of benefit-cost analysis.
13. Name of the plant:
    i. Local
    ii. Botanical
14. Habitat: aquatic/semi-aquatic/mesophytic/xerophytic.
15. Occurrence:
    i. Season: rainy/winter/summer/perennial
    ii. Quantity available
16. Habit of the plant: herb/shrub/climber/tree.
17. Method of collection of the utility part for use in the ITK.
18. Method of storage.
19. Characteristics: germination, growth pattern, time of flowering, fruiting, ripening etc.
20. Part(s) used: root/stem/bark/leaf/flower/fruit/seed/juice /latex etc.
21. Method of use:
    i. Raw or processed (give details)
    ii. Use as pure or blended with other material
    iii. Quantity, time and frequency of use
22. Method of propagation/regeneration.
23. Alternative use of the ITK for the particular purpose.
24. To whom the plant is useful: man/women/child/adult/cattle/buffalo (young/adult)?
25. Whether the plant is used for own purpose or sold in the market for their livelihood?
26. Whether the plant is used elsewhere for the same purpose?
27. Use of the other parts of the plant (other than that used for the ITK).
28. Compatibility of the practice with internal resources.
29. Future perspective of the practice.
30. Any taboo or ritual relating to collection, uses, communication to outsiders about the ITK?
31. Documentary evidence of the ITK (photograph, sketch, diagram, map etc.).
32. Since how many years has this practice been in use, and any modifications made over the years?

the implement, if all the farmers/families do not use the practice.

35. Name and complete address, including postal code (PIN) of the discloser.
36. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
37. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

9.0 Grain/Seed Storage

1. Title of the ITK.
2. General description of the ITK practice.
3. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
4. Purpose for which the ITK is used.
5. Rationale and hypothesis of the treatments/practice used to solve the target problem.
6. What is the impact of the practice as experienced by the users (provide quantitative information)?
7. Details of the users of the ITK:
    i. Economic status (average annual income)
    ii. Caste
    iii. Religion
    iv. Tribal/non-tribal
    v. Education
    vi. Vocation
    vii. Any other.
8. Details of indigenous grain/seed storage system along with photographs/drawings/sketches etc.
    i. Structure and its capacity
    ii. Materials used for construction of the structure.
9. Actual practice followed:

33. How many farmers in the village use the implement (give the number of farmers/farm families do not use the practice out of the total number of families in the village)?

34. Provide information on the reasons for non-use of

i. Name of the crop

ii. Name of the produce and amount used for storage

iii. How the produce is processed before storage?

iv. What are the additives (plant leaves/

products/ plant extract/ powder etc.)?

v. From where the additives are obtained?

vi. How the additives are mixed with the produce, including its rate and time of application?

vii. How the storage structure is maintained?

viii. What is the duration of storage, month to month?

ix. Cost of the storage/ storage structure

x. Any other.

10. Is the raw material used for storage is available locally?
11. Are the repairing facilities of the storage structure are available within the locality?
12. Effectiveness of the practice (provide quantitative information, wherever applicable):
    i. Cost effectiveness
    ii. Compatibility with the components of existing farming systems
    iii. Socio-cultural compatibility
    iv. Compatibility with internal resource of the household
    v. Elements of risk involved
    vi. Technical feasibility.
13. Changes or modifications made by the farmers on the practice over the years (give details).
14. Future perspective of the practice.
15. Since how many years has this practice been in use, and its modifications made over the years?
16. How many in the village use the practice (give the number of users/farm families who use the ITK out of the total number of families in the village)?
17. Provide information on the reasons for non-use of the ITK practice (if all the users/families do not use the practice).
18. What is the alternative practice of the ITK being followed by the users of the village?
19. Name and complete address, including postal code (PIN) of the discloser.
20. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
21. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:

Date:

10.0 Homestead Management

10.1 Fuel Management

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. Particulars of ITK:
    i. Method of fuel preparation and storage, and season of its use
    ii. Method and conservation of fuel
    iii. Storage structure (give details on materials, diversions etc. for preventing from seasonal hazards)
    iv. Cost effectiveness of storage structure and its use
    v. Any other
    vi. Future perspective of the practice.
7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:
    i. Economic status (average annual income)
    ii. Caste
    iii. Religion
    iv. Tribal/non-tribal
    v. Education
    vi. Vocation
    vii. Any other.

9. Since how many years has this practice been in use, and its modifications made over the years?

10. How many families in the village use the practice (give the number of farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non-use of the ITK practice, if all the families do not use the practice.

12. What is the alternative practice of the ITK being followed by the farm families of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address including postal code (PIN) of the discloser.
17. Name and complete address including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.2 Thermal Efficiency

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. Particulars of the ITK:
    i. Methods and materials used in installation and use
    ii. Thermal efficiency and effectiveness
    iii. Smoke outlet provision and energy conservation
    iv. Cost effectiveness of the model
    v. Any other
    vi. Future perspective of the practice.
7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:
    i. Economic status (average annual income)
    v. Education
    vi. Vocation
    vii. Any other.
9. Since how many years has this practice been in use, and its modifications made over the years?
10. How many farmers in the village use the practice (give the number of farmers/ farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.3 Waste Water Management

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. 6. Particular of ITK:
    i. Methods and materials used in installation and use
    ii. Different types of soakage pits and techniques of recycling
    iii. Conservation and management of water
    iv. Cost effectiveness of the technique
    v. Impact on environment and health
    vi. Any other

ii. Caste

iii. Religion

iv. Tribal/non-tribal

(vii) Future perspective of the practice.

7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:
    i. Economic status (average annual income)
    ii. Caste
    iii. Religion
    iv. (iv) Tribal/non-tribal
    v. Education
    vi. Vocation
    vii. Any other.
9. Since how many years has this practice been in use, and its modifications made over the years?
10. How many farmers in the village use the practice (give the number of farmers/ farm families who use the ITK out of the total number of families in the village)
11. Provide information on the reasons for non-use of the ITK practice, if all the farmers/ families do not use the practice.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.4 Garbage Disposal And Management

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. Particulars of the ITK:
    i. Methods and material used
    ii. Technique in use
    iii. Management of garbage
    iv. Cost effectiveness of the technique
    v. Impact on environment and health
    vi. Any other
    vii. Future perspective of the practice.
7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:
    i. Economic status (average annual income)
    ii. Caste
    iii. Religion
    iv. Tribal/non-tribal
    v. Education
    vi. Vocation
    vii. Any other.
9. Since how many years has this practice been in use, and its modifications made over the years?
10. How many farmers in the village use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information).
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.

18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.5 Food Product Development

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. Particulars of ITK:
    i. Methods and processes involved
    ii. Impact on providing energy
    iii. Impact on preventing climatic hazards
    iv. Prevention from diseases and therapeutic value
    v. Value addition
    vi. Any other
    vii. Further perspective of the practice.
7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:
    i. Economic status (average annual income)
    ii. Caste
    iii. Religion
    iv. Tribal/non-tribal
    v. Education
    vi. Vocation
    vii. Any other.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.6 Natural yarns, dyes and weaves

1. Title of the ITK.
2. General description of the ITK practice.
3. Purpose for which the ITK is used.
4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.
5. Location where the ITK is in practice:
    i. Village
    ii. Taluka/block
    iii. District
    iv. State
    v. Postal code (PIN).
6. Particulars of the ITK:
    i. Methods and process involved in preparation and treatment of yarn/natural dyes.
    ii. Product development
    iii. Cost effectiveness
    iv. Value addition to different years/ natural dyes and weaves
    v. Any other
    vi. Future perspective of the practice.
7. Provide information on:
    i. Compatibility of the practice with the components of existing farming systems and internal resource of the household
    ii. Socio-cultural compatibility of the practice
    iii. Element of risk involved
    iv. Technical feasibility of the practice.
8. Details of the users of the ITK:

9. Since how many years has this practice been in use, and its modifications made over the years?
10. How many farmers in the village use the practice (give the number of farmers/ farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non-use of the ITK practice, if all the farmers/families do not use the practice

i. Economic status (average annual income)

ii. Caste

iii. Religion

iv. Tribal/non-tribal

v. Education

vi. Vocation

vii. Any other.

9. Since how many years has this practice been in use, and its modifications made over the years?

10. How many farmers in the village use the practice (give the number of farmers/farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non-use of the ITK practice, if all the farmers/ families of the village do not use the practice.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.7 Housing Materials

1. Title of the ITK.

2. General description of the ITK practice.

3. Purpose for which the ITK is used.

4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.

5. Location where the ITK is in practice:

   i. Village

   ii. Taluka/block

   iii. District

   iv. State

   v. Postal code (PIN).

6. Particulars of ITK:

   i. Methods and materials used for low cost housing purpose

   ii. Specific treatments to agro/animal waste to increase durability from natural hazards

   iii. Products developed (for door material, roofing, wall material, bricks, plastering etc.)

   iv. Value addition

   v. Any other

   vi. Future perspective of the practice.

7. Provide information on:

   i. Compatibility of the practice with the components of existing farming systems and internal resource of the household

   ii. Socio-cultural compatibility of the practice

   iii. Element of risk involved

   iv. Technical feasibility of the practice.

8. Details of the users of the ITK:

   i. Economic status (average annual income)

   ii. Caste

   iii. Religion

   iv. Tribal/non-tribal

   v. Education

   vi. Vocation

   vii. Any other.

9. Since how many years has this practice been in use, and its modifications made over the years?

10. How many farmers in the village use the practice (give the number of farmers/ farm families who use the ITK out of the total number of families in the village)?
11. Provide information on the reasons for non use of the ITK practice, if all the farmers/ families do not use the practice.
12. What is the alternative practice of the ITK being followed by the farmers of the village?
13. Any other information.
14. What is the impact of the practice as experienced by the users (provide quantitative information)?
15. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
16. Name and complete address, including postal code (PIN) of the discloser.
17. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
18. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

10.8 Ethnic Food

1. Title of the ITK.

2. General description of the ITK practice.

3. Purpose for which the ITK is used.

4. Rationale and hypothesis of the processes used to evolve a product/ solve a problem.

5. Location where the ITK is in practice:
   I. Village
   II. Taluka/block
   III. District
   IV. State
   V. Postal code (PIN).

6. Particulars of ITK:
   I. Name of the food product
   II. Materials used for preparation of the food item
   III. Method of preparation
   IV. If the materials are available at house or purchased from market
   V. Value addition of the product, if any (give details)
   VI. Any other
   VII. Future perspective of the practive.

7. Provide information on:
   I. Compatibility of the practice with the components of existing farming systems and internal resource of the household
   II. Socio-cultural compatibility of the practice
   III. Element of risk involved
   IV. Technical feasibility of the practice.

8. Details of the users of the ITK:
   I. Economic status (average annual income)
   II. Caste
   III. Religion
   IV. Tribal/non-tribal
   V. Education
   VI. Vocation
   VII. Any other.

9. Category of users:
   I. Men(adult)
   II. Children

   (a) Male

   (b) Female (indicate if the children are school going/school dropouts/any other)

(iii) Women

   (a) Pregnant

   (b) Lactating.

10. Since how many years has this practice been in use, and its modifications made over the years?
11. Any other information about the food item.
12. How many farmers in the village use the practice (give the number of farmers/ farm families who use the ITK out of the total number of families in the village)?
13. Provide information on the reasons for non use of the ITK practice, if all the farmers/ families do not use the practice.
14. What is the alternative practice of the ITK being followed by the farmers of the village?
15. What is the impact of the practice as experienced by the users (provide quantitative information)?
16. Documentary evidence of the ITK (photograph, sketch, diagram etc.).
17. Name and complete address, including postal code (PIN) of the discloser.
18. Name and complete address, including postal code (PIN) of the person to whom incentive money is to be sent, if selected.
19. Certified that disclosure on the ITK has been made in the knowledge of the local democratic institution.

(Signature of discloser)

Place:
Date: