

Bio-recycling (vermicompost)

KVKs: Korea, Bastar, Narayanpur, Rajnandgaon, Gariyaband, Bhatapara, Dantewada, Dhamtari, Janjgir Champa, Bilaspur, Mahasamund, Kanker, Chhatarpur, Umaria, Tikamgarh, Panna, Damoh, Rewa, Shahdol, Betul, Dindori, Jabalpur, Katni, Sagar, Seoni, Mandla, Indore, Khandwa, Ratlam, Gwalior, Sehore, Morena, Rajgarh, Badwani, Burhanpur, Jhabua, Neemuch, Shajapur, Datia, Guna, Ashoknagar, Shivpuri

Description of Technology adopted:

Vermicomposting is one of the advance recycling method of organic waste. It is very easy to understand and faster to convert organic waste in high value compost.

- ▶ Earth warm *Eisenia fetida* @ 1kg/m³ bio waste.
- ▶ Vermicompost is bio-waste recycle through Earthworm to reduce the cost of nutrient management.
- ▶ Vermicompost helps in improve plant growth, increase crop yield and sustain soil health.
- ▶ Improve Physical, Chemical & Biological properties of Soils.

Principle of Vermicomposting:-

- ▶ Cow/Buffalo dung and chopped dried straw/leaves /grasses (3:1) are kept 15-20 days for partial decomposed.
- ▶ Number of warms (2000-2500) are required for proper decomposition of same unit.
- ▶ Optimum moisture 30-40 percent should be maintained.
- ▶ 18-25 °C temperature should be maintained for proper decomposition with in time.

Promising Characteristics of Technology

Objective:

1. Recycling of crop residues, weed biomass, vegetable, agro-industry wastes and leaf litter into superior quality manure to feed our “nutrient/organic hungry” soils.
2. Improvement of physical, chemical and biological health of soil to increase sustainability and quality produce for life.
3. Livelihood generation and job opportunity for rural youth through production and marketing of vermicompost/worms.

S. No.	Characteristics	Observation (Unit)
1	Recover percentage of dug (cow/buffalo) and agri-waste material	45-48%
2	Production of vermi compost/unit (2.0×3×12feet)/cycle	1 ton
3	Reduction of dry matter during partially decomposed	24%
4	Production cost/ton vermi-compost	1800

Nutrient Status in Vermicompost

S.No	Characteristics	Observation (Unit)
1	Organic Carbon	7.5-11 %
2	Nitrogen	1.5-2.3%
3	Phosphorus	1.0-1.5%
4	Potassium	0.6-0.8 %

Name of schemes supported by Central/State Govt. in large scale dissemination under convergence

S.No.	Central Govt.	State Govt.
1	Tribal Sub-plan (TSP), IWMP, ATMA, NHM, RKVY, NIDH, NVI	MNREGA, BRGF, IAP, DMFT,

Economics of adopted technology:

Cost of production (Rs./ton)	Gross return (Rs./ton)	Net return (Rs./ton)	B:C ratio
1800	5000	3200	2.77



Economics of Bio recycling technology IGKV in Chhatisgarh

No. of KVKs	Quantity			Total Savings	
	Biomass recycled (ton)	Vermicompost (ton)	Nutrients Supplemented (ton)	Fertilizer (ton)	In Terms of Money (Rs) in lakh
12	498	5382	N-102.26 P-67.28 K-37.67	Urea-222 SSP- 420 MOP-62	12.60 35.95 6.82
Total					55.37

Economics of Bio recycling technology JNKVV in Madhya Pradesh

No. of KVKs	Quantity of			Total savings	
	Biomass recycled (ton)	Vermicompost	Nutrients Supplemented	Nutrients (q)	In terms of money (Rs)
14	344394.3 ton	1,18,413 ton (587.4 ton carbon sequestered)	N-2022.9 ton P-1762.2 ton K-2114 ton	Urea-4369.5 ton DAP-3806.4 ton MOP-3509.2	2630417 9135360 3158100
Total					1,49,23,877

Economics of Bio recycling technology RVSKVV in Madhya Pradesh

No. of KVKs	Quantity			Total Savings	
	Biomass recycled (ton)	Vermicompost (ton)	Nutrients Supplemented (ton)	Fertilizer (ton)	In Terms of Money (Rs) in lakh
16	170320	85160	N-1533 P-1362 K-1192	Urea-2174 DAP-2960 MOP-1986	130.44 740.44 265.44
Total					1135.88

* Return in terms of money in lakhs (Rs).-1340.49

Income generated through by product of Vermicompost

S.No.	Byproduct	Production per year	Value (Rs/year)
1	Vermicompostwash	80730 litre	12,10,950
2.	Vermiwash	2800 litre	1,40,000
3.	Worms	16,146 kg	64,58,400
Total			78,09,350

- ▶ **Vermicompost bed preparation** – Length 12 feet, Depth 2 feet, Width 3 feet

Vermicompost wash preparation 150 ml./day

- ▶ Cost of 1.0 liter Vermicompost wash Rs. 15/lit.

Benefit : - No insect pest attack due to application of 30% spray of vermiwash saves Rs. 2000/ha.

Vermiwash Preparation

- ▶ Vermiwash preparation with worms.
- ▶ 1kg worms in one bed, multiply with 2.5 kg worms.
- ▶ 2.5 kg worms wash with 7.0 litre of luke worm (22 to 27°C) water for 5 to 7 minute.
- ▶ Cost of vermiwash – Rs. 50/lit.
- ▶ Variety of worms – *Eisenia foetida*.



Horizontal spread of technology in KVK - IGKV, Chhattisgarh :

S.No	Name of KVK's	No. of village	No. of farmers	No. of Units (12x3x2 ft)	Production (t/unit/yr)	Total Production	Value (Rs. In lakhs)
1	Korea	6	321	321	3	963	48.15
2	Bastar	22	176	176	3	528	26.4
3	Narayanpur	56	174	174	3	522	26.1
4	Rajnandgaon	42	120	124	3	372	18.6
5	Gariyaband	75	176	176	3	528	26.4
6	Bhatapara	18	56	56	3	168	8.4
7	Dantewada	33	42	58	3	174	8.7
8	Dhamtari	23	35	38	3	114	5.7
9	Janjgir-champa	72	104	176	3	528	26.4
10	Bilaspur	8	10	25	3	75	3.75
11	Mahasamund	4	52	220	3	660	33
12	Kanker	50	250	250	3	750	37.5
	Total	409	1516	1794		5382	269.1

Horizontal spread of technology KVK - JNKVV, Jabalpur

KVKs	No. of			Total prod. (ton)
	Villages	Farmers	Unit	
Chhatarpur	42	52	75	225
Umaria	20	30	30	90
Tikamgarh	4	704	704	2112
Panna	28	31	31	93
Damoh	585	3061	3061	9183
Rewa	16	115	115	345
Shahdol	325	1775	1775	5325
Betul	750	1680	2080	6240
Dindori	125	1575	1575	4725
Jabalpur	45	320	515	1545
Katni	524	2548	2548	7644
Sagar	85	280	300	900
Seoni	810	23213	26350	79050
Mandla	32	112	312	936
Total	3391	35496	41046	1,18,4413

Horizontal spread of bio-recycling technology in KVK - RVSKVV, Gwalior

Name of KVK	No of Village covered	No of Farmers/Unit benefitted	Production qt
Indore	280	890	4450
Khandwa	115	245	1225
Ratlam	55	535	2675
Gwalior	36	90	450
Sehore	260	7900	39500
Morena	22	132	660
Rajgarh	240	240	1200
Badwani	102	2250	11250
Burhanpur	2	125	625
Jhabua	50	2500	12500
Neemuch	50	1000	5000
Shajapur	3	150	750
Datia	52	245	1225
Aron	36	360	1800
Ashok Nagar	27	220	1100
Shivpuri	15	150	750
Total	1315	17032	85160

Name of State	Villages covered	Farmers covered	Unit established	Total prod. (ton)
CG	409	1516	1794	5382
MP	4706	20851	20851	49562
Total	5115	22367	22645	54944

Impact of adopted technology in economic and social terms

- ▶ Return in terms of money in lakhs (Rs). 1340.49 from the replacement of nutrients.
- ▶ Cost benefit ratio was 2.8 ; net benefit of Rs. 3200 from one ton vermi-compost production.
- ▶ It produced 59594 entrepreneurs in CG and MP under vermi-compost.
- ▶ Revenue generated from by products of vermi-compost Rs. 78.09 Lakh/year.
- ▶ Reduced migration of labour community, strengthen local economy and income security.

Glimpses of activities



Vermi compost production by the farmers

Published By :

**Director, ICAR-Agricultural Technology Application Research Institute,
Zone IX, Jabalpur, (M.P.)**

Compilation & Editing :

**pam Mishra, Director
Dr. S. R. K. Singh, Principal Scientist (AE)
Dr. A. A. Raut, Scientist (AE)**

