

Vermicompost

1. **Name of demonstration unit:**Vermicompost Production Unit
2. **Year of establishment** :1996
3. **Dimensions &Area** :10X4X2.5sqft&7.3X12X2sqft
4. **Capacity of Production** :3tonnes/3months and 2tonnes/3months
5. **Species of earthworm** : Eisenia fetida (Red worm)

What is Vermicompost / Vermicomposting?

- Vermicomposting is the type of composting in which certain species of earth worms are used to enhance the process of organic waste conversion and produce a better end product. The product is called vermicompost. The rearing of earthworms for vermicomposting purpose is called vermiculture.
- A wide range of organic residues available in the farm and home such as straw, husk, leaves, stalk, weeds, vegetable waste etc can be converted in to vermicompost. live stock waste, poultry litter, food processing waste, bagasse, byproduct from bio gas units etc are used as potential feed stock for vermicompost production.

Steps in Vermicomposting

PIT METHOD

- Pit should be any convenient size, but at our KVK the pit size is of 10X4X2.5sqft of total 6 pits &and another one is of 7.3X12X2sqft of 3 pits.
- Farmers can build vermicompost unit, could be of thatched roof supported by bamboo rafters and purlins, wooden or steel trusses and stone or RCC pillars. Locally available roofing material or HDPE sheet may also be used in roofing to keep the capital investment at reasonably lower level. Permanent sheds are constructed using cement bricks or bricks or using Kadapa slabs. The size of the shed is chosen in such a way that wetting of beds due to rain on a windy day should be prevented. While designing the sheds adequate room/pathways has to be left around the beds for easy movement of the labourers attending to the filling and harvesting the beds.
- Materials required: farm residues or waste @ 1400-1500kg, cow dung @ 90-100kg, water according to season (less during rainy season and more during summer season)

- Fill the beds in layer with organic residues as explained below: -

Before filling the tank, cow dung slurry should be sprinkled on the floor and the wall.

First layer: Decomposable plant material (Crop residues, leafy material, paddy straw, Groundnut husk, Greengram, blackgram husk etc.) are spread evenly in layers to a thickness of 6 inches (100-4100kg)

Second layer: Cow dung or bio gas slurry @ 4-5 kg in 100-125 lt of water on the first layer of the residues.

Likewise total tank is filled in this way layer by layer and it is filled till the material is 1.5ft above ground/brick level. Whole tank is filled within 1 or 2 days. 10-12 layers are required for filling the tank to its capacity.

- Release about 1000-2000 earthworms/m² over the mixture. Cover the compost mixture with dry straw (or) Gunny bag. Sprinkle water as & when necessary to maintain 50-70% moisture content.
- Provide shade over the compost mixture to protect from rain water & direct sunlight.
- Stop sprinkling of water when 80-98% biowaste is decomposed. Maturity could be judged usually by observing the formation of granular structure. (After 3 months)
- Collect the vermicompost by scrapping layerwise from the top of the tank & keep it under shade.

Nutrient composition of Vermicompost

Variable	Percentage in vermicompost
Organic matter	86.42%
Nitrogen	0.50 - 1.50%
Phosphorous	0.10 - 3.00%
Potassium	0.15 - 0.56%
C/N ratio	29.20
Sulphur	128 - 548ppm
Sodium	0.60 - 0.30ppm
Iron	2 - 9.30ppm
Inc	5.70 - 11.50ppm
Copper	2.00 - 9.50ppm
Ca&Mg	22.60 - 47.60meq/100gm

RECOMMENDED DOSAGE IN DIFFERENT CROPS

Crop	Dosage (acre)
Fruit crops	3-5kg/plant
Vegetables	4-4.5 tonnes/acre
Flowers	100-200g/pot
Rice	1 tonne/acre
Cotton	1 tonne/ acre
Groundnut	0.5 tonne/ acre

7. Vermicompost

1. Application of FYM



2. Filling of tank with crop residues



3. Sprinkling of Water



6. Release of earth worms



4. Application of FYM

5. Sprinkling of water

Different methods of vermicompost preparation

Bed method: Composting is done on pucca or kachha floor by constructing organic mixture bed size of 6X2X2 feet. This method is simple to maintain and use by the farmers.



Vermibed: Composting is done by making a bed size, 12X4X2 feet can be prepared by placing husk,sugarcane trash,cow dung layer by layer. All layers must be moistened with water. This strategy is simple to follow and put into practice.



Heap method: Heap method involves dumping organic materials to decompose. After piling them for a while, should turn them over from time to time preferably every other week, to follow for the free circulation of air and add water to keep it moist.



Advantage of Vermicompost

- Vermicompost is rich in all essential plant nutrients and neutralizes the Soil pH.
- Provides excellent effect on overall plant growth, encourages the growth of new shoots/leaves and improves the quality and shelf life of the produce.
- It is free flowing, easy to apply, handle and store and does not have any bad odour.
- It improves soil structure, texture, aeration, water holding capacity & prevent soil erosion.
- It is rich in beneficial micro-flora such N-fixers, Phosphorus solubilizers, cellulose decomposing micro-flora, etc., and free from pathogens, toxic elements, weed seeds, etc.
- It prevents nutrient losses and increases the use efficiency of chemical fertilizers.
- It minimizes the incidence of pest and diseases.
- It enhances the decomposition of organic matter in soil and contains valuable vitamins, enzymes and hormones like auxins, gibberellins etc.
- It contains earthworm cocoons and increases the population and activity of earthworm in the soil.