



Vermicompost Preparing Methods

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Earthworms recycle organic nutrients from dead tissues back to living organisms. They live in the soil and feed on decaying organic matter. After digestion, the undigested material moves through the alimentary canal of the earthworm. Here a thin layer of oil is deposited on the castings/excreta which erodes over a period of 2 months to release the nutrients slowly over longer time. These castings act as natural fertilizer to the soil. This process of turning organic debris into worm castings is called *Vermicomposting*. The pH of the castings is 7 (neutral) and is odorless containing bacterial population to promote microbiological activity. Hence, earthworm restores the fertility of soil. People rear earthworms artificially and sell their castings either for own farms or compost or fertilizer.

Benefits

- Rich in all essential plant nutrients, contains beneficial micro flora like P- solubilizers, cellulose, lignin decomposing etc.
- Easy handling and storage.
- Improves soil structure, texture, aeration, and water holding capacity and prevents soil erosion.
- Prevents nutrient losses and increases the use efficiency of chemical fertilizers.
- Free from pathogens, toxic elements, weed seeds etc.
- Minimizes the incidence of pest and diseases.
- Worms help in natural tillage through burrowing action which increases the permeability of water in the soil.

Nutritive Value

Organic carbon	: 9.5 – 17.98%
Nitrogen	: 0.5 – 1.5%
Phosphorous	: 0.1 – 0.3%
Potassium	: 0.15 – 0.56%

Compost Worms Need 5 Basic Things

- Bedding- Must be highly absorbing as earthworms breathe through skin & if their skin dries out, earthworms dies. Bedding must be able to absorb water.
- Food source- Any types of biodegradable wastes like Crop residues, Weed biomass, vegetable waste, Leaf litter, Biodegradable urban and rural wastes
- Shed- to protect the worms from excessive sunlight and rain; setup of units must be in shed
- Adequate moisture and aeration
- Containers: Cement tanks.

Vermicompost Preparation Steps

i) Selection of suitable species

For vermicompost, surface dwelling earthworms are promising. The African earthworm (*Eudrillus engenial*), Red worms (*Eisenia foetida*) and composting worm (*Peronyx excavatus*) are suitable for vermicompost preparation. Though the African worm (*Eudrillus eugenial*) is preferred over other two types, as it produces high quantity of vermicompost in short period of time and reproduces rapidly. Mix all the three together in soil.

ii) Site selection for vermicompost preparation

Vermicompost can be prepared at any place in shade, high humidity and cool. Abandoned cattle shed or poultry shed or garden backyards. The waste heaped for vermicomposting should be covered with moist gunny bags.

iii) Containers for vermicompost preparation

A cement tank of 2.5 x 3 feet may be constructed, length depending upon the size of the room. The bottom of the tub is made to slope like structure to drain the excess water from vermicompost unit. A small drainage is necessary to collect the drain water.

iv) Vermiculture bedding

Saw dust, husk, coir waste or sugarcane trash spread at bottom of tub / container upto 3 cm. then a layer of fine sand (3 cm) is spread over the culture bed followed by a layer of garden soil (3 cm). All layers must be moistened with water.

Importance of Good Bedding Material

The selection of bedding materials plays a key role in successful vermiculture or vermicomposting. Worms can be enormously reproductive if conditions are favourable to them; however, their efficiency drops off rapidly when their basic needs are not met. Good bedding mixtures provide protection from extreme temperatures, the necessary levels and consistency of moisture and an adequate supply of oxygen is maintained. If we are using straw and hay moisture absorbancy can be eased by mixing some aged or composted cattle or sheep manure.

Common Bedding Materials: Horse manure, peat moss, paper waste, corn silage, leaves (dry, loose), paper mill sludge, corn stalks, corn cobs, shrub trimmings, straw (wheat, oat). If available, shredded paper or cardboard makes excellent bedding, when combined with typical on-farm organic wastes such as straw and hay.

v) Worm Food sources

Compost worms are big eaters. Under ideal conditions, they are able to consume almost ½ of their body weight each day. They will eat almost anything organic (plant or animal origin). Manures are the most commonly used worm feedstock, with dairy and beef manures generally considered the best natural food for *Eisenia*

Common Worm Feed Sources

1. Fresh food waste (e.g., peels of vegetable and fruits, kitchen leftovers, egg shells): Excellent nutrition, good moisture content
2. Legume hays: Contains High N content that makes these feed fit for bedding.
3. Cattle manure: nutritive; natural food
4. Poultry manure: High N content results in good nutrition and a high-value product
5. Sheep/Goat manure: Good nutrition
6. Rabbit manure :N content second only to poultry manure, therefore good nutrition; contains very good mix of vitamins & minerals; ideal earth-worm feed
7. Biosolids (human waste): Excellent nutrition and excellent product; can be activated or non-activated sludge

8. Fish, blood wastes of animal: High N content provides good nutrition; opportunity to turn problematic wastes into high-quality product
9. Corrugated cardboard: Excellent nutrition (due to high-protein glue used to hold layers together); worms are quite fond of this material

vi) Selection for vermicompost production

The cattle dung should be dried in open sunlight before used for vermicompost production. All other waste should be predigested with cow dung for twenty days before put into vermibed for composting.

vii) Putting the waste in the container

The mixed waste is placed into the tub / container upto brim. The moisture level should be maintained at 60%. Over this material, the selected earthworm is placed uniformly. 1 kg of worm (1000 Nos.) is needed for 1x 1x1/2 m.

viii) Watering the vermibed

Daily watering is not required for vermibed. But 60% moisture should be maintained throughout the period. If necessity arises, water should be sprinkled over the bed rather than pouring the water. Watering should be stopped before the harvest of vermicompost.

ix) Harvesting vermicompost

In the tub method of composting, the castings formed on the top layer are collected periodically for free flow and maintaining compost quality. The collection may be carried out once in a week. With hand the casting will be scooped out and put in a shady place in heap. The harvesting of casting should be done up to where earthworm is seen on top layer. In small bed type of vermicomposting method, periodical harvesting is not required. Since the height of the waste material heaped is around 1 foot, the produced vermicompost will be harvested after the process is over.

x) Harvesting earthworm

After the vermicompost production, the earthworm present in the tub / small bed may be harvested by trapping method. In the vermibed, before harvesting the compost, small, fresh cow dung ball is made and inserted inside the bed in five or six places. After 24 hours, the cow dung ball is removed. All the worms will be adhered into the ball. Putting the cow dung ball in a bucket of water will separate this adhered worm. The collected worms will be used for next batch of composting. Worm harvesting is usually carried out in order to sell the worms. When worms are sold, they are usually separated, weighed, and then transported in a relatively sterile medium, such as peat moss. To accomplish this, the worms must first be separated from the bedding and vermicompost.

xi) Storing and packing of vermicompost

The harvested vermicompost should be stored in dark, cool place. It should have minimum 40% moisture. Sunlight should not fall over the composted material. It will lead to loss of moisture and nutrient content. It is advocated that the harvested composted material is openly stored rather than packed in over sac. Packing can be done at the time of selling. If it is stored in open place, periodical sprinkling of water may be done to maintain moisture level and also to maintain beneficial microbial population. This will minimize the moisture evaporation loss. Vermicompost can be stored for one year without loss of its quality, if the moisture is maintained at 40% level.

Reference

1. https://agritech.tnau.ac.in/org_farm/orgfarm_vermicompost.html