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Vermicomposting

*Ms. Jeevitha T and Dr. B. Guna

Nalanda College of Agriculture, M.R. Palayam, Trichy, Tamil Nadu, India

*Corresponding Author's email: baluguna8789@gmail.com

Vermicompost (vermi-compost) is the product of the decomposition process using various species of worms, usually red wigglers, white worms, and other earthworms, to create a mixture of decomposing vegetable or food waste, bedding materials, and vermicast. This process is called vermicomposting, with the rearing of worms for this purpose is called vermiculture. Vermicomposting uses worms to decompose waste and make nutrient-rich "worm manure". Vermicast (also called worm castings, worm humus, worm poop, worm manure, or worm faeces) is the end-product of the breakdown of organic matter by earthworms. These excreta have been shown to contain reduced levels of contaminants and a higher saturation of nutrients than the organic materials before vermicomposting. Vermicompost contains water-soluble nutrients which may be extracted as **vermiwash** and is an excellent, nutrient-rich organic fertilizer and soil conditioner. It is used in gardening and sustainable, organic farming. Vermicomposting has gained popularity in both industrial and domestic settings because, as compared with conventional composting, it provides a way to treat organic wastes more quickly. In manure composting, the use of vermicomposting generates products that have lower salinity levels.

The earthworm species

- *Eisenia-foetida*,
- *Eudrilus-euginiae*,
- *Dravida-Willsii*
- *Perionyx-Excavatus*.

Composting methods

- Bin method
- Bed method
- Pit method
- Heap method



Materials Required in Vermicomposting

- Land
- Water
- Sand/soil
- Biodegradable Agricultural wastes.

- Shredded Papers/Cardboards
- Cow Dung
- Poultry Litters
- Shade
- Straw and dried leaves
- Pit/container
- Gunny Bags
- Earthworms

Process of Vermicomposting

The method of vermicomposting may vary but the process involved in all of them are the same as follows:

Vermicomposting Site Selection

- Selecting a site that is free or protected from the harsh weather
- The site should have enough space for the feedstock.
- A dependable source of water must be there.
- The environment of the site must encourage the survival and propagation of worms.

Manure Stockpiles Preparation

- Dried manure is placed in the designated site or area.
- The unwanted matter like stones, thorns, weeds, etc is removed.
- Ensure everything is chopped or ground (less than 10mm) so it can be handled efficiently with manure for organic matter.

Pre-decomposition of Feedstock

- The stockpiles prepared need to be pre-decomposed before introducing them to the earthworms.

Preparation of Vermicomposting Beds

- Raised windows of 1.2m-1.5m wide x 0.3m high were constructed on the brick beds along with the drainage holes.
- Then the soil or ground surface is moistened thoroughly.
- The bed is layered with dry plant products like wood chops, dry leaves, or grass along with the 20mm layer of neem leaves followed by 0.3mm manure for better air circulation.

Materials Moistening

- Sprinkling the water after each layering is a very important role that activates the initial decomposition of the materials.
- If the materials are too dried, they are soaked in 100-200 liters of water before bedding.



Earthworm Introduction

- The earthworms are introduced 5-10cm below the bed surface.
- Then they are covered with straw, broad leaves plants, or gunny bags which will block the sunlight and provide the cooling effect on the Vermin bed.

Maintenance of Vermicompost System

- The Vermi bed prepared must be watered two to three times a week.
- Also turning the materials of the bed, every two to three times a month is necessary for the maturation of compost.

Harvesting Vermicompost

- In 2-3 months depending upon on the size of the area and the number of worms introduced in the vermicomposting.

- Before Harvesting the compost, watering must be stopped to allow the top part of the manure to dry.
- The un-decomposed materials and worms must be removed and, then the end product must be dried separately for a few days.



Benefits of vermicompost

- Vermicompost has a profound effect on plants. It boosts the nutrients available to plants, helping seeds to germinate more quickly, grow faster, develop better root systems and produce higher yields.
- That means more flowers or fresh fruits and vegetables. Improves the physical structure of the soil. Vermicomposting increases the fertility and water-resistance of the soil.
- Helps in germination, plant growth, and crop yield. Nurtures soil with plant growth hormones such as auxins, gibberellic acid, etc.

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