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EARTHWORM ECOSYSTEM: UNVEILING THE BENEFITS OF VERMICOMPOSTING

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Vermicomposting is a specialized form of composting that uses earthworms to break down organic materials into nutrient-rich compost. It's a biological process where earthworms consume organic matter, such as kitchen and plant waste and transform it into a valuable soil amendment called vermicompost. This type of composting is an effective way to recycle organic waste and used as an organic manure.

According to Dr. P.K. Mishra an Indian soil scientist who was also a pioneer in the field of vermicomposting states that "Vermicompost is a humus-like product obtained by the bioconversion of organic wastes by earthworms". A Dutch soil scientist Dr. W.J.M. van Rhee states that "Vermicompost is a product obtained by the biological decomposition of organic matter by earthworms and their associated microorganisms". Vermicompost is same as compost except that here earthworms are used to decompose the organic matter which accelerate the process of decomposition resulting ready in less time period in compare to compost. The process of making vermicompost is known as vermicomposting. Earthworm acts physically an aerator, crusher and mixer, chemically a degrader and biologically a stimulator in the process of decomposition. Vermicompost acts as an organic soil amendment- improves three-dimensional soil health's (physical, chemical & biological properties). On application of vermicompost, it enhances the soil quality by improving its Physicochemical and Biological Properties.

Enterprises Associate with It

Vermiwash

It is drain out extract of vermicompost. The vermicomposting unit is set up with water trickling system to collect vermiwash. Water drops down over the vermicompost pit slowly and slowly. It contains more nutrients than vermicompost.

Vermiculture

It is simply defined as the rearing of earthworms by artificial means in order to use them in vermicomposting.

Advantages of Vermicompost

- Nutrient – rich compost
- Improved soil structure
- Enhanced plant growth
- Waste reduction
- Balance the pH level of the soil
- Safe for plants and environment
- Carbon sequestration
- Promotes beneficial microorganisms
- Cost – effective

Disadvantages of Vermicompost

- Odor issues
- Temperature and moisture control
- Slow process
- Pest attraction
- Initial investment
- Maintenance

Basic Requirements

Earthworms

Earthworm plays a key role in vermicomposting. The surface feeder earthworms, Epigeics are important for vermicomposting. The Epigeics used for vermicomposting are such as *Eisenia Foetida*, *Eudrilus eugeniae*.

Organic Substrates

Organic waste materials which are bio-degradable in nature which are not harmful for the earthworm are used as organic substrates. E.g., cow dung, kitchen wastes etc. Different organic substrates are used in vermicomposting. These may be classified as follows:

Table 1. Different sources of feedstocks for earthworm

Sources	Wastes
Agriculture wastes	Paddy straw, rice husk, wheat bran, wheat straw etc.
Food processing wastes	Sugar industry wastes, wine industry wastes, oil industry wastes etc.
Wood processing wastes	Wood chips, wood shavings, saw dust
Fruits and vegetable processing wastes	Peels, banana stems, rinds and unused pulp

Site Selection

Vermicompost production can be done in any place which is having shades, high humidity and cool. If it is to be produced in the open area, artificial shading should be provided. The waste heaped for vermicompost production should be covered with moist gunny bags

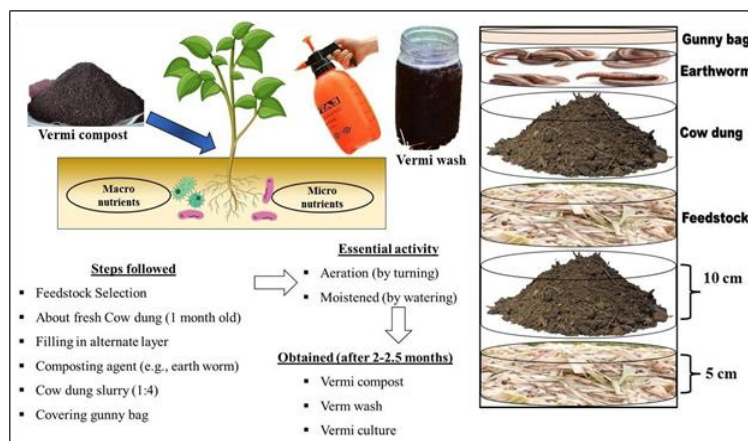


Plate 1. Steps followed in Vermicomposting

Procedure

There are different methods of vermicomposting but the most commonly used methods are pit method. Procedure followed in the vermicomposting:

Table 2. Recommended quantity and time of application of Vermicompost

Crop	Quantity to apply per acre	Time to apply
Rice	1 tonne	After transplanting
Sugarcane	1 ½ tonnes	Last ploughing
Chili	1 tonne	Last ploughing
Groundnut	½ tonne	Last ploughing
Maize	1 tonne	Last ploughing
Turmeric	1 tonne	Last ploughing
Citrus, Ber, Guava, Pomegranate	2 kg per tree	At planting time and before flowering 1-2 years old tree
Mango, Coconut	2kg per tree 5 kg per tree 10 kg per tree 20 kg per tree	At planting time 1-5 years old trees 6-9 years old trees Trees older than 10 years
Onion, Garlic, Tomato,	1-1 & 1/2 tonnes	Last ploughing

Potato, brinjal, Okra, Cabbage, Cauliflower		
Grape	1 tonne	June-July
Sunflower	1 ½ tonne	Last ploughing

Problem Faced During The Process

- In the procurement of cow dung
- Excess moisture content due to rain in the pit
- High cost of earthworm
- Increase in millipedes population in the pit

Conclusion

Vermicomposting is a sustainable and environmentally friendly way to manage organic waste. It is a valuable product that can be used to improve soil quality, increase plant growth, and reduce the need for synthetic fertilizers. It is a simple and easy way to manage organic waste and improve your soil quality. As compared to other methods of waste management like waste disposal into landfills, vermicomposting causes no or less pollution and more benefits to the environment and economy of the country. If vermicompost can be used as a substitute to inorganic fertilizer for organic food production, it will be a major move towards achieving economic, social and environmental sustainability throughout the globe. The popularity of organic food is growing throughout the world, so the demand for vermicompost will also be great in the future.



Plate 2. Working during vermicompost unit.

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