### For B Sc (Hons) Biotechnology 6 sem Vermi. By Dr Santosh Thakur

# Vermicomposting

## Vermicomposting Definition

*"Vermicomposting is a process in which the earthworms convert the organic waste into manure rich in high nutritional content."* 



## What is Vermicomposting?

Vermicomposting is the scientific method of making compost, by using of earthworms which are commonly found living in soil, feeding on biomass and excreting it in a digested form.

Vermiculture means "worm-farming". Earthworms feed on the organic waste materials and give out excreta in the form of "vermicasts" that are rich in nitrates and minerals such as phosphorus, magnesium, calcium and potassium. These are used as fertilizers and enhance soil quality.

Vermicomposting comprises two methods:

- Bed Method: This is an easy method in which beds of organic matter are prepared.
- **Pit Method:** In this method, the organic matter is collected in cemented pits. However, this method is not prominent as it involves problems of poor aeration and waterlogging.

# Process of Vermicomposting



The entire process of vermicomposting is mentioned below:

#### Aim

To prepare vermicompost using earthworms and other biodegradable wastes.

## Principle

This process is mainly prepared to add nutrients to the soil. Compost is a natural fertilizer that allows an easy flow of water and to the growing the plants. The earthworms are mainly used in this process as they eat the organic matter and produce castings through their digestive systems.

The nutrients profile of vermicomposts are:

- 1.6 per cent of Nitrogen.
- 0.7 per cent of Phosphorus.
- 0.8 per cent of Potassium.
- 0.5 per cent of Calcium.
- 0.2 per cent of Magnesium.
- 1.75 per cent of Iron.
- 96.5 per cent of Manganese.
- 24.5 per cent of Zinc.

## Plate. 1 Vermicomposting in Integrated Farming System



Vermicompost pits in the farmer's field



Healthy worms from the compost pits



Vermicompost

## Materials Required

• Water.

- Cow dung.
- Thatch Roof.
- Soil or Sand.
- Gunny bags.
- Earthworms.
- Weed biomass
- A large bin (plastic or cemented tank).
- Dry straw and leaves collected from paddy fields.
- Biodegradable wastes collected from fields and kitchen.

### Procedure

- 1. To prepare compost, either a plastic or a concrete tank can be used. The size of the tank depends upon the availability of raw materials.
- 2. Collect the biomass and place it under the sun for about 8-12 days. Now chop it to the required size using the cutter.
- 3. Prepare a cow dung slurry and sprinkle it on the heap for quick decomposition.
- 4. Add a layer (2 3 inch) of soil or sand at the bottom of the tank.
- 5. Now prepare a fine bedding by adding partially decomposed cow dung, dried leaves and other biodegradable wastes collected from fields and kitchen. Distribute them evenly on the sand layer.
- 6. Continue adding both the chopped bio-waste and partially decomposed cow dung layer-wise into the tank up to a depth of 0.5-1.0 ft.
- 7. Once, after adding all the bio-wastes, release the earthworm species over the mixture and cover the compost mixture with dry straw or gunny bags.
- 8. Sprinkle water on a regular basis to maintain the moisture content of the compost.
- 9. Cover the tank with a thatch roof to prevent the entry of ants, lizards, mouse, snakes, etc. and protect the compost from rainwater and direct sunshine.
- 10. Have a frequent check to avoid the compost from overheating. Maintain proper moisture and temperature.

### Result

After the 24th day, around 4000 to 5000 new worms are introduced and the entire raw material is turned into the vermicompost.

## Advantages Of Vermicomposting

The major benefits of vermicomposting are:

- 1. Develops roots of the plants.
- 2. Improves the physical structure of the soil.
- 3. Vermicomposting increases the fertility and water-resistance of the soil.
- 4. Helps in germination, plant growth, and crop yield.
- 5. Nurtures soil with plant growth hormones such as auxins, gibberellic acid, etc.

# Disadvantages of Vermicomposting

Following are the important disadvantages of vermicomposting:

- 1. It is a time-consuming process and takes as long as six months to convert the organic matter into usable forms.
- 2. It releases a very foul odour.
- 3. Vermicomposting is high maintenance. The feed has to be added periodically and care should be taken that the worms are not flooded with too much to eat.
- 4. The bin should not be too dry or too wet. The moisture levels need to be monitored periodically.
- 5. They nurture the growth of pests and pathogens such as fruit flies, centipede and flies.

Vermicomposting turns the kitchen waste and other green waste into dark, nutrient-rich soil. Due to the presence of microorganisms, it maintains a healthy soil.

Vermicomposting is an eco-friendly process that recycles organic waste into compost and produces valuable nutrients.