

PRODUCTION OF VERMICOMPOST

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PRODUCTION OF VERMICOMPOST

1. **Vermicomposting** is a natural method for producing compost using earthworms. Vermicomposting is also called composting with worms.
2. Vermicomposting is considered an eco-friendly method of utilizing organic wastes into compost that can be used as fertilizers.
3. The vermicomposting process utilizes various worm species, primarily red wigglers, white worms, and other earthworms.
4. Vermicomposting leads to the production of a mixture of bedding materials, decomposing food or vegetable waste, and vermicast.
5. A scientific process by which earthworms and microorganisms are used to help stabilize active organic waste and transform it into a useful soil supplement and source of plant nutrition is called **Vermicomposting**.
6. It is one of the simplest methods for turning agricultural waste into high-quality compost. Earthworms consume biomass and release the digested remnants as worm castings.
7. Worm casts are frequently called “Black gold.” The castings are rich in nutrients, contain compounds that encourage growth and have favourable soil microflora, all of which can limit dangerous germs.
8. Because vermicomposting treats organic wastes more quickly than traditional composting, it has become more popular in both industrial and household utilization of organic wastes.

Methods of Vermicomposting

There are many ways to create vermicompost, but the Bed and Pit procedures are the most popular.

- **Bed Method:** By constructing a bed of organic material measuring 6×2×2 feet, composting is done on the pucca or kachcha floor. This approach is simple to maintain and use.
- **Pit Method:** Composting in pits that are 5×5×3 feet in size and made of cement is the pit method. Thatch grass or any other native materials are used to cover the structure. This

method is not favoured since it produces more waste, has poor aeration, and costs more to produce.

Vermicomposting Materials

1. Animal waste, kitchen garbage, farm waste, and forest litter are all examples of decomposable organic waste that are frequently utilized as composting ingredients.
2. The main raw sources are typically dried chopped crop wastes and animal manure, primarily cow dung.
3. A mixture of both leguminous and non-leguminous crop leftovers improves the vermicompost's quality. There are several species of earthworms, including *Perionyx excavatus* (blue earthworm), *Eisenia foetida* (red earthworm), and *Eudrilus eugenia* (night crawler).
4. Because of its rapid reproduction rate and ability to turn organic matter into vermicompost in about 45 days, red earthworms are recommended. Since it is a surface feeder, vermicompost is created by the top conversion of organic resources.

Process of Vermicomposting

The following describes the full vermicomposting procedure:

Preparation of Vermi Bed

The process of preparation of vermi bed involves the following steps;

- A thin (5 cm) layer of shattered bricks and coarse sand is laid on top of a layer of moist, loamy soil called the vermi bed, which is roughly 15 to 20 cm thick.
- The loamy soil is added with earthworms, which will make it their home there.
- A compost pit measuring around 2 meters by 1 meter preferably by 0.75 meters with a vermi bed layer between 15 and 20 cm thick can accommodate 150 earthworms.
- After that, a few random lumps of fresh cow manure are scattered over the vermi bed.
- After that, dry leaves or, preferably, chopped hay, straw, or agricultural waste biomass are stacked into the compost pit to a depth of about 5 cm.
- The pit is kept wet for the following 30 days by watering it as required.
- The bed should neither be dry nor wet.
- The pit can then be covered with a jute bag to keep the birds away.
- Plastic sheets should not be used on the bed, since they trap heat.

- After the first 30 days, it is covered with moist, pre-digested organic waste of animal and/or plant origin from the kitchen, hotel, hostel, or farm, with a thickness of around 5 cm. Do this twice per week.
- To maintain the pits moist, regular watering should be done.
- If the weather is very dry, it should be examined regularly.
- All organic wastes should be turned over or mixed frequently.

Preparation of Compost Pit

The following steps should be taken for the preparation of the compost pit;

- A compost pit of any practical size can be built in a field, garden, or backyard.
- It could be a single pit, two pits, or a tank made of brick and mortar with the appropriate water outlets in any size (a reasonable size is 2 m by 1 m by 0.75 m).
- To counteract the ant problem, place a water column in the middle of the vermipits' parapet wall.
- The “four chambers” pit will make it simple for earthworms to go continuously from one chamber that has fully composted material to the chamber that contains the pre-processed trash.

Nutrient Content of Vermicompost

The origin of the raw material and the type of earthworm used determine the amount of nutrients in compost. Beyond other nutrients, a fine worm cast is a rich source of N, P, and K. Vermicompost contains nutrients that are immediately available and released one month after application.

Parameters	Content
pH	6.8
Organic Carbon %	11.88
Organic Matter %	20.46

Parameters	Content
C: N ratio	25-30
Total Nitrogen (%)	1.02
Available Nitrogen (%)	0.50
Available Phosphorous (%)	0.30
Available Potassium (%)	0.24
Ca (%)	0.17
Mg (%)	0.06

Application of Vermicomposting

Following are some of the most common applications of vermicomposting;

1. The worm castings can be used as an alternative for fish feed.
2. Extracts and fluids from earthworms can be used in therapeutic products.
3. Improvement of the soil quality degraded by chemical fertilizers and pesticides.
4. Used in agricultural studies.
5. Worm cultivation can be used for commercial purposes also.
6. Can be used widely in horticulture settings.