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VERMICOMPOSTING

A Technique for Organic Farming

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Introduction

Vermicomposting is a natural way of making compost with earthworms. Vermicomposting is also known as composting using worms. Vermicomposting is considered an environmentally benign way of converting organic waste into compost that may be used as fertilizer. Vermicomposting uses a variety of worm species, including red wigglers, white worms, and other earthworms. Vermicomposting produces a mixture of bedding materials, decomposed food or vegetable waste, and vermicast. Vermicompost is a nutrient-rich organic fertilizer and soil conditioner that is reasonably easy for plants to use due to its water-soluble components. Worm castings are sometimes used as an inorganic fertilizer. In this essay, we will go over the goals, types, methods, advantages, and disadvantages of vermicomposting.

Types of Vermicomposting

The many types of vermicomposting are determined by the amount of production and composting structures used. Small-Scale Vermicomposting: A farmer can collect 5-10 tones of vermicompost each year for personal use. Commercial-scale vermicomposting generates 50-100 tonnes of organic waste annually.

Earthworm species used in Vermicomposting

Eisenia fetida and ***Eudrilus eugeniae*** from the **Epigenic** Species of earthworms These are red wrigglers earthworms known as surface feeders. Both are potential agents that have been widely used in Vermicomposting technology because of their characteristics.

Methods of Vermicomposting

There are other techniques to make vermicompost, but the Bed and Pit procedures are the most common.

- Composting on the pucca or kachcha floor involves creating a bed of organic material measuring 6×2×2 feet. This strategy is easy to maintain and apply.
- The pit method involves composting in cement pits of 5 x 5 x 3 feet. The structure is covered with thatch grass or other native materials. This approach is not preferred since it generates more trash, provides poor aeration, and is more expensive to make.

Vermicomposting Materials

Decomposable organic waste, such as animal waste, kitchen garbage, farm waste, and forest litter, are commonly used as composting components. The primary basic materials are mainly dried chopped crop wastes and animal manure, particularly cow dung. A combination of

leguminous and non-leguminous crop residues increases vermicompost quality. There are various types of earthworms, including *Perionyx excavates* (blue earthworm), *Eisenia foetida* (red earthworm), and *Eudrilus eugenia* (night crawler). Red earthworms are recommended for their quick reproduction rate and capacity to convert organic materials into vermicompost in around 45 days. Because it is a surface feeder, vermicompost is produced through the top conversion of organic materials.

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 5 cm layer of shattered bricks and coarse sand is placed on top of a 15-20 cm deep layer of moist, loamy soil known as the vermi bed.
- Earthworms can create their home in the loamy soil.
- A compost pit measuring 2 meters by 1 meter, preferably 0.75 meters, with a vermi bed layer of 15-20 cm thick can house 150 earthworms.
- Spread new cow manure randomly over the vermi bed.
- Add dried leaves, chopped hay, straw, or agricultural waste biomass to the compost pit to a depth of about 5 cm.
- Water the pit every 30 days to keep it wet.
- The bed should not be dry or moist.
- To keep birds away, cover the pit with a jute bag.
- Do not use plastic sheets on the bed as they might trap heat.
- After 30 days, it is coated with pre-digested organic waste from kitchens, hotels, hostels, or farms, with a thickness of around 5 cm. Do this twice a week.
- Water the pits regularly to keep them wet.
- Conduct regular inspections in dry weather.
- Regularly flip over and mix organic garbage.

Nutrient Content of Vermicompost

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

Advantages of Vermicomposting

The principal advantages of vermicomposting are:

1. Promotes plant growth, germination, and agricultural yield.
2. Improves the soil's physical structure.
3. Using vermicompost improves soil fertility and water retention.
4. Grows the plant's roots.
5. Fertilize soil with auxins, gibberellic acid, and other plant growth hormones.
6. Provides important nutrients to soil, including nitrogen, phosphate, and potassium.
7. Promotes effective recycling of organic waste.
8. Composting can be done indoors or in tiny structures, ensuring year-round availability.