

VERMICOMPOST PREPARATION

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INTRODUCTION

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, while the rearing of worms for this purpose is called vermiculture. Vermicompost contains water-soluble nutrients and is an excellent, nutrient-rich organic fertilizer and soil conditioner. It is used in farming and small scale sustainable, organic farming.

MATERIALS FOR PREPARATION OF VERMICOMPOST –

Any types of biodegradable wastes-Crop residue, Weed biomass, Vegetable waste, Leaf litter, Hotel refuse, Waste from agro-industries, Biodegradable portion of urban and rural wastes.

PHASE OF VERMICOMPOSTING

- A. Phase 1: Processing involving collection of wastes, shredding, mechanical separation of the metal, glass and ceramics and storage of organic wastes.
- B. Phase 2: Pre digestion of organic waste for twenty days by heaping the material along with cattle dung slurry. This process partially digests the material and fit for earthworm consumption. Cattle dung and biogas slurry may be used after drying. Wet dung should not be used for vermicompost production.
- C. Phase 3: Preparation of earthworm bed. A concrete base is required to put the waste for vermicompost preparation. Loose soil will allow the worms to go into

soil and also while watering; all the dissolvable nutrients go into the soil along with water.

- D. Phase 4: Collection of earthworm after vermicompost collection. Sieving the composted material to separate fully composted material. The partially composted material will be again put into vermicompost bed.
- E. Phase 5: Storing the vermicompost in proper place to maintain moisture and allow the beneficial microorganisms to grow.

The Five Essential Compost worms need:

1. A hospitable living environment, usually called “bedding”
2. A food source
3. Adequate moisture (greater than 50% water content by weight)
4. Adequate aeration
5. Protection from temperature extremes

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 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 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. 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.

ADVANTAGES OF VERMICOMPOST

1. Vermicompost is rich in all essential plant nutrients.
2. Provides excellent effect on overall plant growth, encourages the growth of new
3. Shoots / leaves and improves the quality and shelf life of the produce.
4. Vermicompost is free flowing, easy to apply, handle and store and does not have bad odour.
5. It improves soil structure, texture, aeration, and waterholding capacity and prevent soil erosion.
6. Vermicompost is rich in beneficial micro flora such as a fixers, P-solubilizers, cellulose decomposing micro-flora etc in addition to improve soil environment.
7. Vermicompost contains earthworm cocoons and increases the population and activity of earthworm in the soil.
8. It neutralizes the soil protection.
9. It prevents nutrient losses and increases the use efficiency of chemical fertilizers.
10. Vermicompost is free from pathogens, toxic elements, weed seeds etc.
11. Vermicompost minimizes the incidence of pest and diseases.
12. It enhances the decomposition of organic matter in soil.
13. It contains valuable vitamins, enzymes and hormones like auxins, gibberellins etc.

PESTS AND DISEASES OF VERMICOMPOST

Compost worms are not subject to diseases caused by micro-organisms, but they are subject to predation by certain animals and insects (red mites are the worst) and to a disease known as “sour crop” caused by environmental conditions.

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.

CONCLUSION

The vermicomposting of dry grass clippings, rice straw and cow manure using *Eisenia foetida* was successful. The produced vermicompost had a dark color, a mull-like soil odor and was homogeneous. It had all essential macro- and micro-plant nutrients like N, P, K, Ca, Mg, Mn, Cu, Zn and Fe, indicating the achievement of getting an environment friendly nutrient-rich fertilizer for the agriculture sector.