Vermicompost as a Means of Income Generation for Annadatas (Food Provider)

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Abstract

Vermicomposting is a mesophilic bioxidation and stabilization process of organic materials that involves the joint action of earthworm and micro-organism. Compared with composting, vermicomposting has high rate of stabilization and it is greatly modifying its physical and biochemical properties, with low C:N ratio and homogenous end product. It is also cost effective and ecofriendly waste management. Composting is the process of aerobic decomposition of organic waste through micro-organisms whereas vermicomposting involves the combination of both the micro-organisms and the earthworms. Vermicomposting is a chemical and biological process for recycling nutrients with the aid of earthworms and micro-organisms. Thus ,vermicompost is considered as a high nutrient biofertilizer with diverse microbial communities.

Introduction

Vermicomposting is the process of conversion of organic wastes into finely degraded peat like substances using earthworms. All composting methods can be used for the vermicomposting instead earthworms are used in vermicomposting after partial decomposition of the waste materials (Pathma and Sakthivel, 2013).Vermicompost biofertilizer enriched with all beneficial soil microbes and also contains all the essential plant nutrients like N, P and K. Vermicompost that is prepared through conventional method has standard values of total nitrogen (1.94 %), phosphorus (0.47 %) and potassium (0.70 %).It is also enriched with various micronutrients such as Mg (0.46 %),Fe (7563 ppm) ,Zn (278 ppm), Mn(475 ppm), Bo(34ppm), Cu (27 ppm).Thus, eliminate usage of any further artificial chemical inputs. Further, nutrients in vermicompost are often much higher than traditional garden compost (Alam *et al*., 2007). Vermicompost plays a major role in improving growth and yield of different field crops, vegetables, flower and fruit crops. It is a natural organic fertilizer prepared using earthworms that convert organic compounds into manure. Earthworms help to decompose complex organic matter by reducing the C:N ratio into manure. They enhance the soil exposed to the micro-organisms,making it favourable for microbial activity and improving soil properties.

Simplest Steps of Vermicomposting

Collection of waste materials

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Pre-digestion

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Earthworm bed preparation and composting

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Harvesting of vermicompost and Earthworm

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Packing and storing of vermicompost

Methods: Two most commonly followed are bed method and pit method

Bed method: Composting is done on the pucca/kachcha floor by making a bed (dimension:6x2x2 feet) of organic mixture.This method is easy to maintain and to practice.

for maintaining aeration and for proper decomposition

Pit method: Composting is done in the cemented pits, wooden boxes, plastic buckets, silpaulin bag, baskets etc. The unit is covered with thatch grass or any other locally available materials (ICAR, Umiam)

Preventive measures

- The floor of the unit should be compact to prevent earth worms migration into the soil.
- 15 to 20 days old cow dung should be used to avoid excess heat.
- The organic wastes should be free from plastics, chemicals, pesticides and metal.
- Aeration should be maintained for proper growth and multiplication of earthworms.
- Optimum moisture level (3- to 40 %) should be maintained.
- 18-25^{0}C Temperature should be maintained for proper decomposition.

The specific **species of earthworms** used for vermicomposting includes:

- ✓ *Eisenia foetida*
- ✓ *Eudrillus euginiae*
- ✓ *Perionyx excavates*

(Joymati *et al*., 2019)

Advantages

- Pathogen suppression
- Nutrient delivery
- Water retention
- Increased microorganism populations
- Pest suppression
- Plant growth regulation and higher yields
- Polluted soil remediation.

Disadvantages

- Odour: If not done properly, it releases a bad odour. Filling the compost bin with green plants forms ammonia and produces the smell. Adding carbon sources like paper helps to neutralize the smell
- Time: It is a time-consuming process and usually takes 2-3 months for completing the process.
- Maintenance- Temperature needs to be maintained for better action by earthworms. The bad odour attracts rodents and flies. So, the bin should be covered properly (Kiran *et al*., 2019)

Conclusion

Vermicompost is a process based on earthworms and micro-organisms, whose joint action provides degradation and detoxification of organic waste as well as conversion into a product to be used for crop purposes. This eco-friendly method is cost effective and is the best among other remediation processes. Therefore, Fertilizers feeds the plant while vermicompost feeds the soil.

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