

Management of organic solid waste using work composting technique

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ABSTRACT

Present study deals with the management of organic solid waste with the help of worm composting and explains the advantages of worm composting over Farm Yard Manure (FYM). In the present agricultural scenario throughout the world, the need for vermiculture and vermicomposting has been felt as an important aspect in organic farming for sustainable agricultural production. Besides dumping or sanitary land filling the final disposal of solid waste can be carried out by other methods like incineration and composting. Earthworm farming is another bio-technique for converting the solid organic waste into compost. Vermicompost has generic properties that make it suitable soil amendment of potential benefit to organic production. This paper discusses issue of stabilization of organic wastes using particular earthworm species *Eisenia foetida* as well as the advantages and features of the worm compost, which is considered an important ecological manure due to its high enrichment value.

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Solid waste is defined as the organic and inorganic waste materials produced by different sources which have lost worth in the eyes of their owner. It has been computed that India, as a whole, generates as much as 25 million tonnes of urban solid waste of diverse composition per year. But per capita waste production in India is miniscule compared to the per capita production of waste in the industrialized countries. It is estimated that the per capita waste generated in India is about 0.4 kg/day with compostable matter approximately 50-60%. In this scenario the breeding and propagation of earth worms and the use of its castings has become an important tool of waste recycling the world over. Vermiculture is another bio-technique for composting the solid organic waste into compost (Ghosh, 2004). Vermicompost contains not only worm castings but also bedding materials and organic wastes at various stages of development and other micro-organism associated with the composting processing.

Earth worm castings in the home garden often contains 5 to 11 times more nitrogen, phosphorus and potassium as the surrounding soil. Secretions in the intestinal tracts of earthworms include micronutrients along with the soil that are available for plant uptake. Nutrients in vermi-compost are often much higher than traditional organic manure farm yard compost micronutrients.

Worm composting may be considered as an artificial process of humus formation due to the activity of worms. They feed on organic substances that subsequently suffer several chemical, biochemical and microbiological transformation to form, eventually a product (worm compost) with a high content of humus. The usefulness

of worm composting in solving problems in neutralization and conservation is discussed. Worms are hugely important in our ecosystem. They can help to decompose literally tons of organic material each year.

Charles Darwin states, "all the fertile areas of this planet have at least once passed through the bodies of earthworms".

MATERIALS AND METHODS

The experiment was conducted in Sardar Ballabh Bhai Patel University of Agricultural and Technology, Modipuram, Meerut by using epigenic earthworm species *Eisenia foetida*. The nutrient contents of FYM and vermicompost were checked experimentally. For the investigation 1000 live and mature earthworms of the species *Eisenia foetida* were taken, Brick-walled pit of dimension 10x1x0.15 (LxWxD) M was made for this species to be cultured. Large quantities of organic waste were collected and allowed to decompose with fresh cow dung slurry for 5 days to produce biomass slurry after 5 days of composting they were spread in the pits with a thickness of about 4 inches: 1000 worms then introduced in to the pits. Once again, the compost was spread over the worms in layer of 5 cm thickness. The layers were then covered with gunny clothes and moistened by sprinkling water. Regular moistening was done twice a day. The appearance of black granular crumbly powder on top of vermibeds indicates harvest stage of the compost. Watering is stopped for at least 5 days at this stage. The earthworms go down and the compost is collected from the top without disturbing the lower layers (vermibed). The first lot of vermicompost is ready for harvesting after 65 days This compost has high porosity,