



Waste Management of Biodung Composting

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Abstract

Organic waste poses a serious environmental problem globally. This can be solved by combination of effective technologies like Biodung composting and Vermitech (incorporating earthworms for the production of vermicompost). Cow horns (about 20-40) are collected, cleaned by removal of residues from within the horns. Fresh cattle dung is collected from a healthy female lactating cow. A pit of dimension 12x18x12 inches is dug in fertile land (shady area will be preferred). Soil dug out of the pit is mixed with dried cattle dung with little added moisture to make the soil enriched. Cow horns are then filled with fresh cow dung and place in upright position tip of horn pointing upwards, in the pit. The soil mixed with dried cattle dung and moisture is placed into the pit and covered with natural materials to prevent the soil from getting dry. The results indicated that the organic waste (grass clippings and water hyacinth) were successfully processed through partial biodung composting and vermicomposting during the period of 60 days. The temperature study during biodung composting showed two peak rise of temperature resulting in destruction of harmful microbes.

Key Words: Organic waste, biodung composting, vermitech, vermicompost, earthworms

I. Introduction

The soil is an important medium for plant growth, habitat for numerous organisms and function of nutrient cycling in the ecosystem. Soil microbial activities influence an ecosystem by contributing to plant nutrition and health together with better soil structure and fertility through composting. However, they also play a pivotal role in various biogeochemical cycles and cycling organic compounds. Plant growth and health improve when beneficial microbes increase nutrient availability and stimulate. Bio fertilizers systems use soil micro-organisms to increase the availability and uptake of mineral nutrients for plant and they are substance that may be added to the soil to enhance the density of microorganism to bolster soil nutrient

content. Bio dung compost and tank compost mechanisms are similar to that of vermi compost, except that earthworms is used to help in the degradation of organic materials, and cow dung slur is used to aid in the degradation of organic waste in tank and biodung compost. Biodynamic preparation 500, also known as cow horn manure, is fermented cow dung, which upon application can aid in basic fertility and renewal of damaged soil. Biodynamic agriculture an organic farming practice introduced because of concerns on the degradation of the food quality, under similar premonitions, it can be justifiable be introduced to improve food quality and to eradicate the large amounts of wastes being generated with ecological, economical and physical long-term sustainability of livelihood in the midst of global challenges. This technique helps to enhance and improve the structure of the soil quickly and effectively. Cow horns containing cow dung buried in the soil produces humus which characterises healthy soil with makes them highly suitable for plant growth and a habitat that entertain high organismal diversity thus promoting biogeochemical cycles. Organic agriculture and practices can have demonstrable benefits on land use and crop production globally with respect to disposal, economic loss, contributes to infectious diseases among others. One of the frontrunners in evading this difficulty is the novel idea of reduce, reuse and recycle. A combination of simple technologies can be used to effectively reuse and recycle organic wastes including bio dung composting and vermi technology including vermi wash and vermi compost in conjunction with biodynamic preparation.

II. Methodology

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was collected at primary sedimentation stage. The collected sample was air dried for moisture removal. Cattle Dung (CD) was collected from a local dairy farm The sludge was collected at primary sedimentation stage. The collected sample was air dried for



moisture removal. Cattle Dung (CD) was collected from a local dairy farm. In the present work, MPIS was mixed with CD at different ratios on dry weigh basis in two sets with earthworms (ME) and without earthworms (MW). The total weight of each tray was kept at 1 kg and according to the above mentioned proportions in Table 1, mixing of waste and cattle dung was done. The mixtures were turned over manually every 24 h for 14 days in order to eliminate the toxic gases. After 14 days, 20 young non-clitellated *E. fetida* with average weight

were released in trays. The moisture content was maintained to 60-70% throughout the study period by sprinkling of water. In ME sets earthworms, cocoons and hatchlings were counted manually at the interval of 15 days. At the end of the experiment (90 days), worms, cocoons and hatchlings were removed. The final product produced from all the concentrations were sieved, air dried and physico-chemical parameters were analyzed.

Feed Mixture Concentrations with Earthworms Without Earthworms	Milk Processing Industry Sludge (MPIS)	Cattle Dung (CD)
ME ₁₀₀ MW ₀	0	100
ME ₇₅ MW ₂₅	25	75
ME ₅₀ MW ₅₀	50	50
ME ₂₅ MW ₇₅	75	25
ME ₀ MW ₁₀₀	100	0

Worm Farm Composting for many, is the most common and preferred choice of composting because of their capabilities to grow worms, produce compost and compost tea and keep rats out of your compost. The worms produce castings concentrated with nutrients lower in nitrogen compared to other composting methods.

III. Result & Discussion

Many investigations have been carried out on industrial level large scale composting of organic waste in municipal setting. Present study conclusively proves that large scale recycling of organic waste by the application of biodung composting followed by vermicomposting is a feasible technology. The combination of grass

clippings, water hyacinth and cattle dung was used as organic waste for the process of biodung cum vermicomposting. The results indicated that the organic waste (grass clippings and water hyacinth) were successfully processed through partial biodung composting and vermicomposting during the period of 60 days. Biodung composting of grass which was carried out for the period of 8 weeks during which it was turned twice. The temperature increase brings about killing of harmful microbes. The process of biodung composting involves partially aerobic and partially anaerobic process. This reduces the bulk of organic waste to one third of the volume. The cattle dung solution serves the purpose of providing inoculum of microbes which carry out degradation of organic waste.

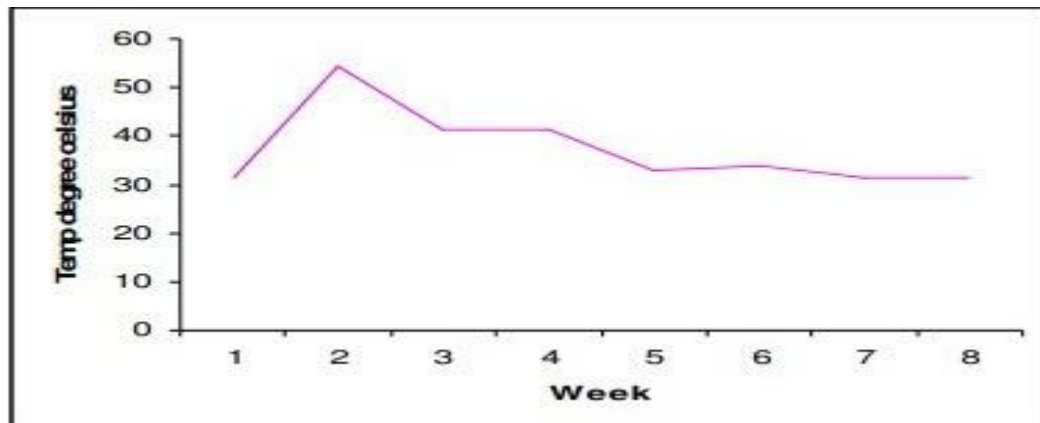


Fig: Temperature changes during biodung composting

IV. Conclusion

Soils are critical to productivity of both agriculture and natural ecosystems. Soil is an integral system, which is to be maintained through the sustainability of nutrient resources. The continuous worldwide soil degradation by erosion, chemicals, acidification, and physical abuse requires management in terms of soil quality. The use of organic amendments augmented with vermiculture could be adopted as a means for crop production and soil stability. The use of combinations of organic amendments such as vermiwash, and vermicompost can effectively bring about an improvement in soil quality; enhance microbial population and impact crop productivity, thereby bringing about long term sustainability. Considering all aspects, such as studies on soil health, the yield of crops, and the cost-effectiveness of vermiculture as a means of microbial innovation, it is concluded such technology could be applied for sustainable soil enrichment and crop productivity.

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