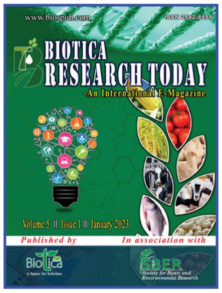
Journal Home: www.biospub.com

Popular Article

Article: RT1188



Biotica Research Today
Vol 5:1
2023
8/9

How to cite this article?
Prabakaran, 2023. Large Scale Vermi-Composting Systems. Biotica Research Today 5(1):08-09.

Large Scale Vermi-Composting Systems

C. Prabakaran

Dept. of Natural Resource Management, Horticultural College and Research Institute for Women, Tamil Nadu Agricultural University, Tiruchcirapalli, Tamil Nadu (620 027), India

Corresponding Author

C. Prabakaran

e-mail: prabakaran.c@tnau.ac.in

Keywords

Continuous flow system, Vermicasting, Vermicomposting systems, Windrow system

Article History

Received on: 24th December 2022

Revised on: 01st January 2023

Accepted on: 02nd January 2023

E-mail: *bioticapublications@gmail.com*

Abstract

There are two methods of large scale vermi-composting systems. One is wind row system and another is continuous flow system. By adopting the continuous flow through system reactor technology, several problems can be solved, at the same time to process more material faster. It offers a unique blend of technical, economic and environmental benefits (Minimal dust, odour and noise emissions; reduced greenhouse gas emissions compared to landfill). The windrow system took eight months (180 days) to a year to make high-quality castings. Nearly 40 to 60 days are required by the reactor to process material. The flow through reactor has the potential to revolutionize the production of vermicasting.

Introduction

Vermicompost is the product or process of composting using epigeous earthworms (usually red wigglers (John, 2014), white worms, and other earthworms to create a heterogeneous mixture of decomposing vegetable or food waste, bedding materials, and vermicast). Vermicomposting results in vermicastings that have been shown to contain reduced levels of contaminants (Pathma and Sakthivel, 2012) and a higher saturation water-soluble nutrients and beneficial organisms (Prabakaran *et al.*, 2010). Hence, vermicompost is considered as excellent, nutrient-rich bio-fertilizer and soil conditioner.

Depending on quantity of organic material available for composting large scale and small scale composting systems can be practiced (Prabakaran, 2022a,b). Dairy cow manure, pig manure, agricultural residues, municipal waste, food processing waste, cafeteria waste, grass clippings and wood chips, pressmud *etc.,* are available at voluminous amount and are vermicomposted at large scale composting systems.

There are two methods of large-scale vermiculture. One is windrow and other is continuous flow through system. In wind row system, a row of pre-composted organic material is laid on a concrete surface to prevent predators from gaining access to the worm population. In this method, bedding materials for the earthworms to live in and acts as a large bin; organic material is added to it. The windrow has no physical barriers to prevent worms from escaping, because of abundance of organic matter for them to feed on.

In wind row system worm castings at the bottom of the windrow had some anaerobic conditions due to the high moisture content necessary to grow worms. High moisture content along with less or no aeration will cause toxic state called anaerobic condition.

The second type of large-scale vermicomposting system is the continuous flow-through system (Figure 1). This is based on the principle that epigeous earth worms like to process organic material in the top several inches of a compost bin. In continuous flow through system of vermicomposting system, the worms are fed at a depth of 1 inch (worm chow) across the top of the bed and castings are collected on large mesh screen at the base of the bed.

Red worms are surface dwellers moving constantly for new food source. In this the flow-through system there is no need to separate worms from the castings before harvesting and packaging. Flow-through systems are suited to both cold and hot regions.

By adopting the continuous flow through system reactor technology, several problems can be solved, at the same time to process more material faster. It offers a unique blend of technical, economic and environmental benefits (minimal dust, odour and noise emissions; reduced greenhouse gas emissions compared to landfill). The windrow system took eight months to a year to make high-quality castings. Nearly 40 to 60 days are required by the reactor to process material. The flow through reactor has the potential to revolutionize the production of vermicasting.

Vermicomposting system at home includes bins made of old plastic containers, wood, styrofoam, or metal containers.

Metallic containers are nor preferred for vermicomposting because of *is* toxicity problems. Red Cedar wood has excellent longevity in composting conditions.

Bins need holes or mesh for aeration. Worm compost bins made from recycled or semi-recycled plastic are ideal, but require more drainage than wooden ones because they are non-absorbent.

Figure 1: Large scale vermicomposting (continuous flow)

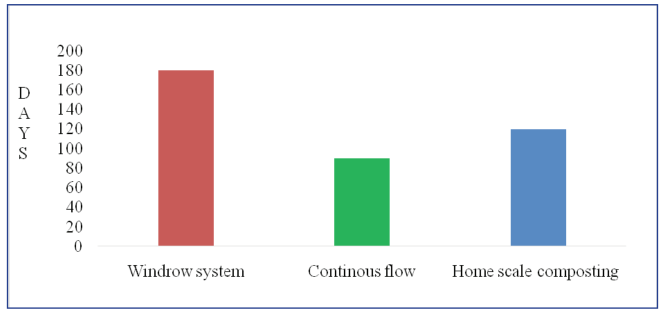


Figure 2: Effect of vermicoposting systems on days taken for complete vermicasting

Conclusion

Continuous flow system offers unique blend of technological, economic and environmental benefits. It can be designed for better operation and to get quick vermicasting of organic waste. Wind row system of vermicomposting takes about 180 days to complete the vermicasting process while continuous flow reactor takes nearly 40 to 60 days for complete vermicasting of organic material. Hence continuous flow through reactor has the potential to revolutionize the production of vermicompost production industry.

References

John, A.B., 2014. Vermicomposting: Biological, Environmental and Quality Parameters of Importance. *Birnbaum, Worm biology, Environment, Quality* 7(July), 1-13.

Pathma, J., Sakthivel, N., 2012 Microbial diversity of vermicompost bacteria that exhibit useful agricultural traits and waste management potential. *Springerplus* 1(26). DOI: https://doi.org/10.1186/2193-1801-1-26.

Prabakaran, C., Jayakumar, D., Masilamai, P., 2010. Water hyacinth vermicompost. *Spice India* 23(10), 19-21.

Prabakaran, C., 2022a. Recycling of CO_2 from Vegetable Market Waste Composting into Crop Produce for Circular Economy. *AgroScience Today* 3(10), 489-492.

Prabakaran, C., 2022b. Planning of vermicompost unit. *AgroScience Today* 3(11), 522-525.