



To Find the Rapid Method of Vermicomposting

Dr. Deepak Kholiya, Gobinda Poudel*

Graphic Era Hill University Clement Town, Dehradun Uttarakhand, India

Abstract

Vermicomposting is the scientific method of making compost by using earthworms. It is the cheap and effortless way for producing the organic compost. Vermicompost is a backbone for enhancing the organic movement. The research was carried out in the Kapilvastu district Nepal under the direction of Dr. Deepak Kholiya (A professor of Graphic Era Hill University). To see the rapid method of vermicomposting and to use animal waste such as cow dung in the effective manner. *Eisenia foetida* an species of earthworm was used for the conversion of animal waste into the compost. In research we used two methods of vermicomposting i.e., 1. Pit method of size 5*5*3 feet 2. Bed method of size 6*2*2 feet. 200 earthworms of same size were introduced in the both methods i.e., body length 3-10 cm body weight 0.4 to 0.6 g. The substrate used in vermicomposting is rice straw along with chopped vegetable waste are mixed with the cow dung. Vermicompost sample of both methods are collected. Compost from bed method was collected after 60 days (about 2 months) and pit method was collected after 30-35 days (about 1 month 4 and a half days). Both the vermicompost samples were high in nutrient content.

Keywords: Vermicomposting, Earthworms, Animal Waste.

1 Introduction

Vermicomposting is derived from Latin word (vermis meaning worm) is a best method for turning waste into the rich compost. It is becoming popular because it is an easy and less expensive to get started can be done in small place. Over the period food scraps and bedding will be digested by the earthworms. In the agricultural process economic part is only accepted and biological part is neglected which can be turned into the profitable way which can help the farmers to increase their income.

Nowadays due to urbanization and industrialization the volume of degradable waste are increasing rapidly. Its management has become one of the biggest problems nowadays. However, these wastes are not handled properly ultimately result in soil, water, and air pollution. If handled properly the organic waste

Copyright © 2021. The Author(s). This is an open access preprint (not peer-reviewed) article under [Creative Commons Attribution-NonCommercial 4.0 International](#) license, which permits any non-commercial use, distribution, adaptation, and reproduction in any medium, as long as the original work is properly cited. **However, caution and responsibility are required when reusing as the articles on preprint server are not peer-reviewed.** Readers are advised to click on URL/doi link for the possible availability of an updated or peer-reviewed version.

How to Cite:

Deepak Kholiya and Gobinda Poudel, "To Find the Rapid Method of Vermicomposting". *AIJR Preprints*, 342, Version 1, 2021.

can be used as the vermicomposting. It is an efficient and effective recycling technology that improves the nutritive value of the soil.

Due to the over use of chemical fertilizer these days one of the main goals is to build long term fertility of the soil. Since compost has already decomposed its impact are much more long lasting then the crop residue or animal waste. composting also help the farmers a manure and plant residue that otherwise might create environmental problems.

Vermicompost improves the soil physical properties such as soil structure, porosity, density thus help in the better plant growth.it also improves the water holding capacity of the soil.it contains the macro and micro nutrients help for the plant growth.it improves the cation exchange capacity of soils and growing media, thus improves their ability to hold nutrients for plant growth.it also help to stabilize the soil Ph.

The efficiency of vermicomposting is measure by the number of worms; time taken for the conversion. And the biomass produced by the vermicompost for the certain period or the moisture holding ability and aeration are characterized by of bedding or the choice of bedding material also determined the rate of vermicomposting.

2 Materials and methods

2.1 Experimental site

The research was carried out in 2021AD under the prime minister agriculture modernization project. project implementation zone 4 No kapilvastu district of Nepal.kapilvastu municipality ward no 09 in the poudel Agriculture farm.

2.2 Collection of substrate and earthworm

The substrate needed for vermicomposting were collected from the office of agriculture modernization project project implementation zone kapilvastu.and other material was collected from poudel Agriculture farm.

2.3 Substrates used

Cow dung

Cattle manure is a decent food for earthworm in vermicomposting. The cow dung was used in the experimental site because cows fed ultra-nutritious greens and soy a diet perfect for the voracious appetites of hard-working worms. Cow digest only 15% of its intake and the cow don't digest the worms will.10-15 days old cow dung was used for the vermicomposting process.

Rice straw

The rice straw will increase the microbial activity and thus increase the composting rate.it provides the hospital environment for the earthworms. paddy straw is commonly available agriculture waste and it the most widely cultivated crop .it has the high C; N ratio that's why we used it as a bedding material.

Vegetable waste

Residue of used kitchen vegetable such as cauliflower cabbage are used as the substrate of vermicomposting. such harvested residue were collected from the field where pesticide and insecticides were not used during the cropping period.

2.4 Tools used

- 1.Shovel
- 2.Gardening gloves
- 3.Spading fork
- 4.Black plastic of the 15 ft long

2.5 Experimental setup

The experimental set up consist of two beds of different method I.e.

1.pit method of size 5*5*3 feet was prepared.by at the bottom of the layer black plastic of 15 ft was used as the first layer and the layer of chopped rice straw were used and the bedding material decomposed cow dung was used for the pit method.

2.bed method the bed of size 6*2*2 feet was prepared and the layer are uses as the above pit method used process.

2.6 Maintenance of moisture and temperature

Moisture level was kept by the sprinkling water at the regular basis the temperature ranges in the experimental site was 25–30-degree Celsius during the research.

2.7 Collection of samples

The process of vermicomposting was carried out for 60days (about 2 months) the beds were analyzed in the regular basis.

3 Result and Discussion

A fine granular odorless black peat like structured compost was obtain after the 33 days (about 1 month) of composting in the pit method however in the bed method it takes 50 days (about 1 and a half months) for the final product of vermicompost. Thus, we can say that the pit method is the best method of composting however it has the several disadvantage. if we used pit method for the commercial purpose it will be benefited for higher source of income new entrepreneur can used pit method for the large-scale production. Bed method can be used by the garden lovers and it is also beneficial for the noncommercial purpose.



Fig: pit method of vermicomposting

<i>Nutrient</i>	<i>vermicompost</i>	<i>farmyard manure</i>
<i>N%</i>	<i>1.6</i>	<i>0.5</i>
<i>P%</i>	<i>0.7</i>	<i>0.2</i>
<i>K%</i>	<i>0.8</i>	<i>0.5</i>
<i>Ca%</i>	<i>0.5</i>	<i>0.9</i>
<i>Mg%</i>	<i>0.2</i>	<i>0.2</i>
<i>Fe ppm</i>	<i>175.0</i>	<i>146.5</i>
<i>Cu ppm</i>	<i>5.0</i>	<i>2.8</i>
<i>Zn ppm</i>	<i>24.5</i>	<i>14.5</i>
<i>Mn ppm</i>	<i>96.5</i>	<i>69.0</i>
<i>C:N ratio</i>	<i>15.5</i>	<i>31.3</i>

Source; research gate.com



Fig; bed method of vermicomposting

References

- Chaudary, A. K., & Suri, V. K. (2018). *Low-Cost Vermi-Composting Technology and Its Application in Bio-Conversion of Obnoxious Weed Flora of North-Western Himalayas into Vermi-Compost. Communication in Soil Science and Plant Analysis*,
- Dhital, B., Sharma, A., & Adhikari, S. (2016). *International Journal of Environment, Agriculture and Biotechnology (IJEAB)*, 1(4).
- Dominguez, J., & Edwards, C. A. (2004). *Vermicomposting organic wastes: A Review. In S. S. Hanna, & W.Z.A. Mikhael, Soil Zoology for Sustainable Development in the 21st Century*. Garg, P., Satya, S., & Gupta, A. (2006). *Vermicomposting of different types of waste using Eisenia Foetida: A comparative study. Bioresource Technology*, 97(3).
- Kavitha, P., Ravikumar, G., & Manivannan, S. (2010). *Vermicomposting of banana agro-waste using an epigeic earthworm Eudrilus eugeniae. International Journal of Recent Scientific Research*, 32-35. Retrieved from <http://www.recentscientific.com>
- Earth Sciences, 3(1), B8-B16. Mistry, J., Mukhopadhyay, A. P., & Baur, G. N. (2015). *STATUS OF N P K IN VERMICOMPOST PREPARED FROM TWO COMMON WEED*
- Mahanta, K., & Jha, D. K. (2009). *Nutritional Status of Vermicompost Produced from Weed Biomass and Rice Straw as Influenced by Earthworm Species and Seasons. Indian Journal of weed science*, 41(3&4), 211-215. Lazcano, C., &
- Domínguez, J. (2011). *THE USE OF VERMICOMPOST IN SUSTAINABLE AGRICULTURE: IMPACT ON PLANT GROWTH AND SOIL FERTILITY. In M. Miransari, Soil Nutrients. Nova Science Publishers*.