

Vermicompost: A Supplement to Increase Growth of the Plant

Jeet Padodara¹ Pradnya Tikhe²

¹B.Tech Student ²Assistant Professor

^{1,2}Department of Civil Engineering

^{1,2}Indus University, Ahmedabad, Gujarat, India

Abstract— Vermicompost is described as an excellent soil amendment and a biocontrol agent which make it the best organic fertilizer and eco-friendlier as compared to chemical fertilizer. Vermicompost is an ideal organic manure for better growth and yield many plants. It can increase the production of crops and prevent them from harmful pest without polluting the environment. An experiment study was conducted to obtain the quality product of the plant using vermicompost. The species used helps to release organic nutrients from dead tissues back into the soil and make the nutrient available for living organism. This study suggests that treatment of plant growth promoting bacteria and vermicompost can be used for a sustainable agriculture instead of using chemical fertilizers.

Key words: Organic Agriculture, Conventional Agriculture, Vermicompost Leachate, Fruit Quality

I. INTRODUCTION

A. Vermicomposting

Biologically, it is defined as the process of turning organic debris into worm castings that play a crucial role in increasing the fertility of soil. These castings contain seven times more potash, five times more nitrogen and 1.5 times more calcium than what is found in the topsoil. In addition they have better moisture retention capacity, aeration, porosity and structure than the topsoil. The water absorption capacity of the soil is enhanced thanks to the burrowing action of the earthworm, and the organic content in the castings. Research has shown the castings to hold nine times their weight in water.

B. Objective of Vermicompost

The main objective of vermicompost is to produce organic manure of exceptional quality for the organically starved soil. Agricultural wastes, wastes from dairy and animal farms are usually dumped into at places resulting in a foul mess. By vermicomposting these wastes, they are not only utilized efficiently but also help in making a value-added product.

C. Types of Earthworm and Classification

Study of earthworms was pioneered by Charles Darwin. Taking the cue, Barrett and George Oliver carried out an extensive study and demonstrated the benefits of earthworms in agriculture. Batter was the first person to grow earthworms on a commercial scale. Totally there are 386 different varieties of earthworms that have been identified that are broadly classified into 3 categories, viz. epigeic,

endogeic and diageic. This classification is based on their feeding habits, habitat in soil strata, response to the soil conditions and defecation activities.

1) EPIGEIC

- Thriving on soil surface, they convert the organic waste into humus very quickly.
- They have a high metabolic activity but it lasts only for a limited period.

- They need a huge amount of organic content as a part of their feed.
- Although they have a short life span, their rate of reproduction is very high.

2) Endogenic

- Species belonging to this category live just below the topsoil surface where mineralized aluminum oxide, iron oxide and clay occur.
- They burrow into the soil making tunnels horizontally as well as obliquely thus increasing the aeration.
- They feed on organic matter that are undergoing degradation at different levels.
- They improve the soil texture and structure.

3) Diageic

- Diageic worms make permanent burrows and are deep dwelling in the soil.
- The organic litter is collected from the soil surface and stored in the burrows which are fed upon by the earthworms.
- The excrements are disposed on the outside of the burrows.
- Thus these are worms help in mixing the surface organic matter into the sub-terranean soil.
- They also help loosen the soil.

D. Vermicompost Production Requirement

The most essential production requirements in vermicomposting are the base material and the right species of earthworm. They are:

- Cow dung from dairy farm
- Goat and sheep dung
- Organic sludge
- Tree leaves
- Crop residues
- Saw dust
- Sugarcane trash
- Weeds
- Coir waste
- Slurry from the biogas plant
- Poultry droppings from poultry farming
- Vegetables wastes

Poultry droppings being high in nitrogen must be added in small quantities. Hotel refuse and organic wastes from agro or food industries can be also included in the compost material as feed for earthworms.

E. Vermicomposting Methods

There are different methods of vermicomposting. However, the bed and pit method are the most commonly followed among them. In the bed method, a bed of organic mixture is made on the floor. The dimensions of the bed are 6ft * 2ft * 2ft. It is an easy to practice and maintain method. In the pit method, cemented pits of 5ft * 5ft * 3ft are used for

composting. They are covered with local materials like thatched grass, dry leaves, twigs, etc. However, aeration and water logging is a major problem in this method. Therefore, most farmers do not prefer this method of composting.

F. Advantages of Vermicompost

- Enriching soil
- Increase plant growth and yield
- Free pest and pathogen

G. Disadvantages of Vermicompost

- Takes time for preparation
- Noticeable odor
- High maintenance
- Harvesting time

II. MATERIALS AND METHOD

- [1] Take a pot.
- [2] Add the mixture of soil and vermicompost fertilizer into the pot.
- [3] Also add some of the red worms inside the pot while adding the mixture of soil and vermicompost fertilizer.
- [4] Now after feeling the pot to the top put the seeds of brinjal plant and sunflower plant.
- [5] Firstly for the 1-1 ½ month pour the water from the periphery of the pot in weekdays.
- [6] After a month when the plant grow somewhat of bigger size start pouring the water in a gap of three days instead of weekdays.



Fig. 1: Brinjal Plant



Fig. 2: Sunflower Plant

III. CONCLUSION

Due to pre-summer season the brinjal plant the result was that only the plant height was increasing yet the fruit has not come because summer is not the season of brinjal. In sunflower plant the result was that due to supplement of vermicompost the plant grows faster than the composting. As sunflower plant grows in large quantity in summer.

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