

# **ROLE OF VERMICOMPOST IN AGRO BASED AND PLANT GROWTH**

Submitted in partial fulfilment of the requirements for the award of  
Bachelor of Science degree in Microbiology

By

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## **DEPARTMENT OF BIOTECHNOLOGY**

### **BONAFIDE CERTIFICATE**

This is to certify that this Project Report is the bonafide work of **Keerthana. R (38300009)** who carried out the project entitled "ROLE OF VERMICOMPOST IN AGRO BASED AND PLANT GROWTH" under our supervision from November 2020 to March 2021.

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## DECLARATION

**KEERTHANA.R(38300009)** here by declare that the Project Report entitled **“ROLE OF VERMICOMPOST IN AGRO BASED AND PLANT GROWTH’** done by me under the guidance of **Dr V Ramesh kumar** at **Sathyabama institute of Science and Technology, Chennai** is submitted in partial fulfilment of the requirements for the award of Bachelor of Technology degree in Microbiology.

**DATE: 04/04/2021**



**PLACE:**

**SIGNATURE OF THE CANDIDATE**

## **ACKNOWLEDGEMENT**

I am pleased to acknowledge my sincere thanks to Board of Management of SATHYABAMA for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to Dr.V.Ramesh kumar, Head of the Department, Dept of Biotechnology for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide Dr. V Ramesh kumar for his valuable guidance, suggestions and constant encouragement paved way for the successful completion of my project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the Department of Biotechnology who were helpful in many ways for the completion of the project.

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## **ABSTRACT**

Vermicomposting is an Eco-biotechnology that employs earthworms in the process of organic matter, vermicompost is considered as a high nutrient bio fertilizer with diverse microbial communities, it plays a major role improving growth and yield off different field crops, vegetables, flower and fruit crops. Vermicomposting is the process of conversion of organic wastes into finely degraded peat like substances using earthworms, it is an alternative method for waste management through which vermicompost is produced with relatively high nutrient content than compost and manures. Vermicomposting of sugarcane waste (SW), fruit waste(FW) and vegetable waste(VW) to generate a nutrient rich organic fertilizer using *Eisenia fetida* earthworms. The study concludes that a compost mixture of the ratio 25SW; 30FW; 45VW will give an optimized vermicompost for plant nutrition after about 8 to 10 weeks of vermicomposting.

## LIST OF ABBREVIATIONS AND SYMBOLS:

|     |   |                 |
|-----|---|-----------------|
| gms | - | Grams           |
| ml  | - | Milliliter      |
| min | - | Minute          |
| %   | - | Percentage      |
| sw  | - | Sugarcane waste |
| fw  | - | Fruit waste     |
| vw  | - | Vegetable waste |

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## CHAPTER 1: INTRODUCTON

### 1.1 What isVERMICOMPOSTING

Vermicomposting is a process in which earthworms are used to convert organic materials into hums-like material known as VERMICOMPOST. Vermicompost is a process that relies on earthworms and microorganisms to help stabilize active organic materials and convert them to a valuable soil Amendment and source of plant nutrients Vermicomposting is a mesophilic process utilizing microorganisms and earthworms. Earthworms feeds the organic waste materials and passes it through their digestive system and gives out in a granular form which is known as *vermicompost*.

Vermicomposting is an eco-friendly process that involves accelerated conversion of organic matter from waste materials into nutrient rich humus through the interaction of earthworms and microorganisms. Vermicompost are being promoted in integrated soil fertility management as they feed the soil fertility the crop, providing not only crop nutrients but also humic acids, plant growth hormones, N-fixing and P- solubilizing microbes, enzymes and vitamins.

### 1.2 EISENIA FETIDA

Eisenia fetida worms are used for vermicomposting of both domestic and industrial organic waste. Eisenia fetida, known under various common names such as manure worm, red worm, branding worm, pan fish worm, trout worm, tiger worm, red wiggler worm, etc., is a species of earthworm adapted to decaying organic material.these worms thrive in rotting vegetation, compost, and manure.

#### 1.2.1 CHARACTERISTICS (Eisenia fetida)

| Characters  | Eisenia fetida |
|-------------|----------------|
| Body length | - 3-10cm       |
| Body weight | - 0.4-0.6      |
| Maturity    | - 50-55 days   |

They have groups of bristles(called setae) on each segment that move in and out to grip nearby surfaces as the worms stretch and contract their muscles to push themselves forward or backward.

Earthworms are known as farmer's friends because of the multitude of service they provide that improve soil health and consequently plant health. They convert biodegradable waste into manure.

### **1.3 AGRO BASED WASTE**

Agro-waste is defined as waste which is produced from various agriculture activities. These agro - wastes include manures, bedding, plant stalks, hulls, leaves, and vegetable matter. Agro-waste is usually produced through farming activities.

#### **1.3.1 SUGARCANE WASTE**

Vermicomposting is a feasible method for disposing of lignocellulosic waste while generating a useful product. The current study assessed the potential of vermicomposting green waste mixed with sugarcane bagasse in proportions of 25% (dry weight). The addition of sugarcane bagasse to green waste significantly increased the content of total humic substance, humic acid and urease activity, acid and alkaline phosphatase activity, and *Eisenia fetida* reproduction. The addition of 25% sugarcane bagasse to green waste decreased the toxicity to germinating seeds.



(figure 1.3.1)

### 1.3.2 FRUIT AND VEGETABLE WASTE

Fruit waste(FW) 35% and vegetable waste (VW) 40% is generated in large quantities during production, processing, and consumption. Several conventional methods are used for treating the (FW)(VW), such as incineration, landfill, anaerobic digestion, and composting. Compared to these methods, vermicomposting has the advantages of effective stabilization of the organic wastes like (FW)(VW) through joint action of earthworms and microorganisms in decomposition of the easily decaying organic constituents and of higher reuse value for its final product as organic fertilizer.



fruit waste (figure 1.3.2)

vegetable waste (figure 1.3.2)

### 1.4 USES OF VERMICOMPOST

organic fertilizer and soil conditioner. It is used in farming and small scale sustainable, organic farming. Vermicomposting can also be applied for treatment of sewage.

### 1.5 BENEFITS OF VERMICOMPOST

- The use of vermicompost plants remain lush green

- The use of Vermicompost in the immune system of plants increases
- Use of Vermicompost fertilizer in plants produced quality fruit and flowers.
- Vermicompost is easy to use in lawns, it keeps the lawns whole year green.
- Vermicompost is easy to store and easy to use.
- Vermicompost is best fertilizer for kitchen garden, terrace garden, pot/ container plants.
- Soil moisture storage capacity increase and increase the number of beneficial bacteria.
- All minor and major element involved, which plant required are available in this fertilizer

## **2 . REVIEW OF LITERATURE**

Usman Ali et al. (2015) In this study, Vermicomposting may be the viable option to handle solid waste in an environmentally friendly way. It provides a general overview of viability of vermicomposting processes as an eco-friendly approach. The integrated approach of composting and vermicomposting processes provides better results. Further, to optimize the process of vermicomposting, codigestion of organic wastes provides better opportunity for both microorganisms and earthworms to convert the organic fraction of solid waste under controlled environmental conditions. Hence, the management of solid waste and energy production can be achieved at the same time with no further costs.

Su Lin Lim et al. (2015) In justify, Vermicomposting is a process in which earthworms are used to convert organic materials into humus-like material known as vermicompost. A number of researchers throughout the world have found that the nutrient profile in vermicompost generally higher than traditional compost. In fact, vermicompost can enhance soil fertility physically, chemically and biologically. Physically, vermicompost -treated soil has better aeration, porosity, bulk density and water retention. Chemical properties such as pH, electrical conductivity and organic matter content are also improved for better crop yield.

Hamidreza Pourzamani et al. (2016) In this present study was carried out to evaluate the production of eco-friendly and environmentally bio-fertilizer from a mixture of food waste and rice bran. Materials and methods; The various mixtures of RB and FW (1:1,1:2,1:3, and 1:5) were prepared and spread in dry beds for 20 days. The obtained results showed that at the first of composting process , the temperature was sharply increased and after that dropped and reached to the ambient temperature.

Katheem Kiyasudeen et al. (2016) In justify, Vermicomposting and composting are the most efficient way for converting sludge into useful products. These two well-established processes have been adopted for solid organic waste reclamation- and the final products, composts and vermicomposts, can be used as sources of organic matter for soil amendment, as source of nutrients for soil fertilization or as growing media constituents for soil less cultivation (Gonzalez et al. Bioresour Technol 101:8897-8901,2010). This low cost technology uses earthworms as bio-agents to treat waste materials (Alidadi et al. J Environ Health Sci Eng 2(4):251-254,2005). Reduction of particle size and increased nutrient availability in the vermicomposted outputs are reported by many researchers (Ndegwa and Thompson. Bioresource Technol 76:107-112,2001).

Sataj Ahmad Bhat et al. (2017) In this study,instrumental analysis of vermicompost with the help of modern technology provides essential information on its maturity, before it can be used for agriculture application. Nowadays, vermicompost is considered as a promising organic alternative to chemical fertilizers in agriculture and horticulture.

Ales Hanc et al. (2017) The aim of this work was to determine the influence of aeration and time of extraction on the agrochemical properties of aqueous extracts from vermicomposts made from horse manure and apple pomace waste. There were two extract treatments: stirring without aeration, and stirring with aeration for 48h. Aeration significantly increased the levels of electrical conductivity and the concentration of and macro-elements in the extracts.

Rahman A'ali et al. (2017) In this study, effects of raw materials on qualitative and quantitative characteristics of vermicompost are discussed. To do so, sheep

manure, pomegranate peels, spent mushroom compost either singly or double -, triple-, or four- fold chopped corn, sugar beet pulp, and sawdust were used.

SelcukJournal of Agriculture and Food Science 32(3), 607-615, (2018) In this review, Vermicompost products confer plant nutrient elements, various hormones, enzymes, humic substances and especially organic matter to the soil. Thus it improve the soil structure while preparing a suitable environment for plant growth as well. It is a material with high water holding capacity and cation exchange capacity. It also has a positive effect on the ventilation of the soil. It also helps plants to more efficiently utilize plant nutrients in the soil. The average organic matter content of our country's soils is quite low (2% or less).

Leong Hwee Lee et al. (2018) In this study, industrial sludge is generated in large amounts. Industrial sludge is a solid or semi solid material consisting of all compounds removed from wastewater, as well as any substances added to the biological and chemical operation units during the treatment process. Vermicomposting is an alternative for biological stabilization of organic wastes, with the addition of earthworms. This work reviewed the recent literature on utilizing the vermicomposting process to manage industrial sludge in order to assess the feasibility of this technology. The present review also provides a brief overview of the production and treatment methods of industrial sludge.

Kavita Sharma, VK Garg (2018) The present study was undertaken to investigate the vermicomposting of two different organic wastes employing, *Eisenia fetida*. Nine feed stocks were prepared with different ratios of wastes using cow dung as bulking substrate. After pre-composting, worms were allowed to feed on different feed stocks for 105 days under laboratory conditions. The results showed that NPK content was higher in the vermicompost. Heavy metal content was also higher in the vermicompost. Whereas total organic carbon and C:N ratio were lower after vermicomposting, by 17.38-58.04% and 19-102% respectively.

Maria Gomez-Brandon et al. (2019) In this study dealing with changes in microbial communities during vermicomposting were mostly performed at lab-scale conditions and by using low-throughput techniques. Together, the findings support the use of grape marc vermicompost for sustainable practices in the wine industry by disposing of this high-volume winery by-product and capturing its value to improve soil fertility.

Mauel Blouin et al. (2019) In this review , we found significant effects of vermicompost on plant biomass production. As compared with a meta-analysis on the effects of earthworms on plant growth. Adding vermicompost led to similar (+26% for yield), or higher (+78% for shoot biomass and +57% for root biomass) increase in biomass values.

Tamanreet Kaur (2019) In this study, Chemical fertilizers are produced from “vanishing resources” of earth and crops grown on chemical fertilizers have low and contaminated nutrient value in comparison to grown naturally or organic way. To preserve the agro- ecosystem and protect human health from the harmful chemical fertilizer “Ecological Agriculture and Organic Farming” has to be promoted as the new emerging concept of “Organic Farming” focuses mainly on production of chemical free foods. Organic farming with use of organic fertilizers like “vermicompost” could substitute the chemical fertilizers and can reduce the economic cost and may also lead to organic products which fetches higher price in the market.

Margit Olle (2019) In this study, described as “biooxidation and stabilization of organic material involving the joint action of earthworms and mesophilic micro-organisms”. Under appropriate conditions, worms eat agricultural waste and reduce the volume by 40 to 60%. Vermicompost produced by the activity of earthworms is rich in macro and micro nutrients, vitamins, growth hormones, enzymes such as proteases, amylases, lipase, cellulase and chitinase and immobilized micro-flora. The enzymes continue to disintegrate organic matter even after they have been ejected from the worms.

Ananthanarayanan Yuvaraj et al. (2020) The current review reports the importance and significance of cattle solid waste in vermicomposting technology concerning bio-waste pollution in the environment. Needy increasing population in the evokes livestock production resulting in the massive generation of livestock wastes, especially cattle dung. Improper disposal and handling of biowastes originating from agriculture, industries, forests, rural and urban areas lead to nutrient loss, environmental pollution and health risks.

## CHAPTER 3: AIM AND SCOPE

### **3.1 AIM:**

To identify the vermicompost in agriculture based and plant growth.

### **3.2 OBJECTIVES:**

1. To be able to know what vermicomposting.
2. To quantify the amounts of sugarcane waste, fruit waste and vegetable waste.
3. To determine the factors that affects vermicomposting.
4. To know the processes in vermicomposting.
5. How can vermicompost be used in seeds.
6. What are the benefits of vermicompost.
7. To analyse the plant growth.

## CHAPTER 4: MATERIALS AND METHODS

### 4.1 MATERIALS

1. Wooden box/ concrete pit
2. Net
3. Soil
4. Earthworm (*Eisenia fetida*)
5. Sugarcane waste
6. Fruit waste
7. Vegetable waste
8. Water
9. Mustard seeds
10. Corriander seeds
11. Fenugreek seeds

Vermicompost: manure going to use in this seeds.

### 4.2 METHODOLOGY

They are three types of vermicompost methods

#### 4.2.1 SUGARCANE WASTE:

Sugarcane waste compost is a good source of nutrients. We used the enriched compost that applied at the percentage of 25.

#### 4.2.2 FRUIT WASTE:

Fruit waste improves soil structure, texture and prevents the soil erosion. It is a rich source of nutrients. We used the enriched compost that applied at the percentage of 35.

#### 4.2.3 VEGITABLE WAST:

The natural decomposition of vegetable waste by microbes generate products with high humus content in the soil and it helps to add nutrients. We used the enriched compost that applied at the percentage off 40.

#### 4.3 PROCESS

**Step 1:** Dig pit

(Use wooden box and concrete pit)

**Step 2:** Add mesh or net

**Step 3:** Add thin layer of sand

**Step 4:** Add organic waste (bio degradable wastes)

Should not add any non degradable waste like plastic

**Step 5:** keep the pit moist, so sprinkle some water over the waste

**Step 6:** add earthworms (*Eisenia fetida*)

**Step 7:** cover pit (dry straw)

**Step 8:** frequency sprinkle water (keep bed moist)

**Step 9:** gently mix and move the top layer of bed

**Step 10:** Vermicomposting increases the fertility and water resistance of the soil.

**Step 11:** added three different seeds.

-Sugarcane waste used in coriander seeds

-Fruit waste used in mustard seeds

-vegetable waste used in fenugreek seeds

In couple of weeks the earthworms increased in numbers and by the end of 7 to 8 weeks, the compost is ready. The vermicomposting process takes two months. The majority of vermicompost has deep, rich colour. Vermicompost is a nutrient-rich organic fertilizer and soil conditioner in a form that is relatively easy for plants to absorb. Worm castings are sometimes used as an organic fertilizer. In organic

farming, it has shown the best results among all other fertilizers. Earthworms will work for the short term, but will not be very beneficial since worms are needed all season. Earthworm manure encouraging earthworms naturally is the best way. Earthworms speed up the composting process, aerate the organic material in the bin, and enhance the finished compost with nutrients and enzymes from their digestive tracts. Even a small bin of red worms will yield pounds of rich compost, also known as worm castings. Nutrient content of vermicompost is higher than traditional composts and It is a valuable soil amendment. Vermicompost is a very rich source of nutrient, vitamins, enzymes, antibiotics and growth hormones. So it gives disease resistance to plants. Vermicompost harbors certain microbial populations that helps in N fixation and P solublization. It can be applied in any crops that any stage, but it would be more beneficial if fixed in soil after broadcasting.



Vermicomposting ( Fig 4.3)

#### 4.4 PLANT GROWTH

##### **Mustard seeds**

##### FRUIT WASTE- MUSTED SEEDS

Fruit waste vermicompost used in mustard seeds, it helps to add nutrient and organic content to the soil.

##### **Stage 1**



(fig 4.4.1)

**DAY 1-** Seeds are above the earthworm manure (vermicompost). These seeds can easily grown in a pot/ container broadcast seed over the soil surface and cover lightly with soil.

## **Stage 2**



(fig4.4.2)

**DAY 3 -** Seeds will germinate with in 48 hrs

- mustard seeds will sprout quickly
- stem elongation

## **Stage 3**



(fig 4.4.3)

DAY 7 - Stem elongation

- Leaf development

#### Stage 4



(fig 4.4.4)

DAY 10 -Has grown like a nice bunch

- Slightly leaves enlarged

## Stage 5



(fig 4.4.5)

DAY 14 - Colourful green leafs  
- Fast and easy growth

## Stage 6



(fig 4.4.6)

DAY 18 - Plants are started to rotten

**Fenugreek seeds**

## VEGETABLE WASTE- FENUGREEK SEEDS

Vegetable waste vermicompost is used in fenugreek seeds. It improves soil structure, texture and water holding capacity. It is the rich manure.

### Stage 1



(fig 4.4.7)

DAY-1 Seeds are above the vermicompost. These seeds can easily grown in a pot. Broadcast seeds over the soil surface and cover lightly with soil.

### Stage 2



(fig 4.4.8)

DAY 3 - Seeds germinate with in 36 hrs.

- Stem elongation.

### Stage 3



(fig 4.4.9)

DAY 7 - Stem elongation.

- Leaf development

### Stage 4



(fig 4.4.10)

DAY 10 - Looks fresh and bunch

- Fast and easy growth.

## Stage 5



(fig 4.4.11)

DAY 14 - Leaves are ready to harvest.

- healthy growth

## Stage 6



(fig 4.4.12)

DAY 22 - Plants are rotten

## Coriander seeds

### SUGARCANE WASTE -CORIANDER SEEDS

Sugarcane waste vermicompost used in coriander seed, It is completely toxic free. This manure green waste decreased the toxicity to germinating seeds.

### Stage 1



(fig 4.4.13)

DAY 1 - Seeds are above the earthworm manure. These seeds can easily grown in a container. Broadcast seed over the soil surface and lightly with soil.

### Stage 2



(fig 4.4.14)

DAY 7 - Seeds did not germinate

### Stage 3



(fig 4.4.15)

DAY 10- Germination of coriander takes up 10 to 12 days.

#### Stage 4



( fig 4.4.16)

DAY 14 - Slightly stem has grown

- Leaf development

#### Stage 5



(fig4.4.17)

DAY 24 - It takes 24 days for leaf elongation.

- Colourful green leaves.

## Stage 6



(fig 4.4.18)

DAY 30 - Increases growth and flowering

- Colourful green leaves.
- it takes 30 days for plant growth.

- Leaves are ready to harvest.

#### 4.5 PLANT GROWTH TABLE

| NAME Of THE WASTE | NAME OF SEEDS   | GERMINATION   | DURATION |
|-------------------|-----------------|---------------|----------|
| Sugarcane waste   | Coriander seeds | 10 to 12 days | 30 days  |
| Fruit waste       | Mustard seeds   | 48 hrs        | 14 days  |
| Vegetable waste   | Fenugreek seeds | 36 hrs        | 14 days  |

#### 4.6 MEASURING EARTHWORM

Species of earthworm used for vermicomposting in India are *Eisenia fetida* and *Erudrilus evegeniae* . Earthworms are long and cylindrical in shape and size having large number of grooves. They belong to phylum annelids of animal kingdom. There are about 2500 to 3000 species of earthworm in the world with are adopted to range of environment. Morethan 350 species have been identified in India.



The length of earthworm is 4cm (fig 4.6.1)



The length earthworm is 7cm (fig 4.6.2)



The earthworm length is 9cm (fig 4.6.3)

## CHAPTER 5: RESULTS AND DISCUSSION

### 5.1 SUGARCANE WASTE VERMICOMPOST - CORIANDER SEEDS

- Using sugarcane waste vermicompost , it is completely non-toxic and free from pathogens.

- It helps add nutrients and organic content to the soil.

- Take few days to germinate, it germinate around 10-12 days.

- Sugarcane waste manure is a valuable soil amendment for home gardens

- Vermicompost helps the seeds to grow as plant with in 30 days.

- Without using manure, seeds will germinate in 3 weeks and grows with in 35 to 40 days.

- This Vermicompost is beneficial for sustainable organic agriculture and maintaining balanced ecosystem.

- These wastes represent a valuable organic resource,Which could be recycled and transformed into nutrient rich fertilizer and soil conditioner.

- Sugarcane waste product can break down even faster.

- This vermicomposting is a mesophilic process which involves a joint action of earthworms and mesophilic microbes for the conversion of organic wastes into a valuable end product.

- This process is faster than traditional composting as the material passes through the earthworm gut, whereby the resulting earthworm castings are rich in microbial activity and plant growth regulators, and fortified with pest repellence attributes as well.

- This type of vermicompost gives good results.

## 5.2 FRUIT WASTE VERMICOMPOST - MUSTED SEEDS

- Using fruit waste vermicompost in mustard seeds, it helps to add nutrients and organic content to the soil.
  - Seeds germinate with in 48hrs and stems started elongated.
  - Earthworms manure helps the mustard seeds to grow as plant with in 14 days.
  - Normally without using vermicompost the mustard seeds will germinate in 3-4 days and grows with in 20-22 days.
  - Fruit waste vermicompost is high nutritional quality.
  - This waste maintain and increase the long term fertility of soil.
  - Fruit waste is the degradation of organic waste through earthworm consumption, which converts the material into worm castings.
  - This vermicompost is rich source of vitamins, nutrients, enzymes, antibiotics and growth hormones. So it gives disease resistance to plants.
  - This waste possibility of utilization of fruit wastes for vermiculture.
  - This waste, earthworms increase water holding capacity of soil.
  - It also helps in maintaining the soil pH in acidic soil.
  - It maintain proper moisture in pit.
  - Fruit vermicompost is rich in all essential plant nutrients, shoots/ leaves and improves the quality and shelf life of the produce.
  - Fruits are a great and inexpensive snack for both us and our worms.
  - This waste improves taste, good source and keeping quality of the produce.
  - Using fruit waste vermicompost in mustard seeds gives good results.

### 5.3 VEGETABLE WASTE VERMICOMPOST - FENUGREEK

- Vegetable waste vermicompost improves soil structure, texture and water holding capacity.
  - Vegetable waste vermicompost is an eco-friendly bio-fertilizer.
  - This manure rich in all plant nutrients.
  - Seeds germinate with in 36 hrs and stems started elongated.
  - This manure helps the fenugreek seeds to grow as plant with in 14 days.
  - Without using vermicompost, seeds will germinate with 2-3 days and grows within 17-19 days.
- Vegetable waste vermicompost helps to neutralize the pH of the soil.
- This waste is free from any pathogen or harmful materials.
- This vegetable waste manure for healthy and fast growth of plants.
- This waste improves physical structure of soil and it gives strong root growth.
  - It helps stem elongation for better uptake.
  - This manure releases nutrients slowly.
- Vegetable waste is one of the recycling technologies which will improve the quality of the products.
  - This earthworm manure is richer in micro-nutrients.
  - These wastes can be treated for bio-fuel production through fermentation under controlled conditions or else used for composting.
- The manure helps to enhance the germination and fast plant growth.
- Vegetable waste vermicompost gives good results.

## CHAPTER ; 6

### SUMMARY AND CONCLUSION

Vermicomposting is a process of breaking down of organic material through the use of worms. This is a nutrient rich organic substance that can be added to soil to increase its organic matter content and nutrients. Vermicomposting is a technology that focuses on conservation of resources and their sustainable utilization. Vermicompost can also be used for the treatment of food-waste, paper, cardboard, manures and bio-solids. It can be used in soil amendment. In addition, vermicomposting may also help in employment generation. Vermicompost can also be used in greenhouse application in establishing new plant such as root stock in vineyards. Vermicomposts can be used for both agricultural and horticulture production. Vermicompost are prepared earthworms. Earthworms possess diverse micro-flora, bacteria, fungi, actinomycetes in their gut. Earthworms and microorganisms show systemic relationship. The microbes carry out various enzymes activity and secrete organic acids which digest agrowastes to simpler compounds that can be easily taken up by earthworms to produce good quality vermicompost. Inoculation with such microbes enhance earthworms activity so as to get higher biomass of earthworms resulting in improved quality product. The vermicomposting activity is such a worthwhile and exciting venture, It is a substantial way of reducing wastes, production fertilizers and maintaining the balance of the ecological environment. Vermicomposting can produce high-quality fertilizers which are better compared to other commercial fertilizers in the market; converts farm wastes into organic fertilizer, making it an environment-friendly technology; Vermicompost increases crop yield and lessens dependence on chemical fertilizers thus mitigating climate change, can be made into a livelihood program and become a source of extra income through selling the vermicompost and also the vermiworms. Vermicomposting is a process based on earthworms and microorganisms, whose joint action provides degradation and detoxification of organic waste as well as conversion into a product to be used for agrobased purposes. The results of this study show that vermicompost has significant impact on some of soil biological and chemical properties and this effect was generally similar to farmyard manure in the absence of plant in the test soil.

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