

# Study of Organic Farming Using Vermicompost as a Fertilizer

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**ABSTRACT:** The method of farming system uses to keep the soil alive and in good health by use of organic waste and other biological materials along with the beneficial microbes. The chemicals which used to give more yield is too harmful for both the plants, animals and for human being also. To overcome this harmful effects, organic farming techniques are used. Normally the plants need nutrients to give yield, in this organic farming technique the nutrients which required for the plants is to give by the organic fertilizer called vermicompost. Vermicomposting is a technique of producing of fertilizer with the help of earth worms, its nothing but the excreta of the earth worm. Being economically sustainable is one of the benefits of organic farming. This study deals with the attaining more yield by using natural fertilizers like vermicompost and natural pesticide like fly ash. This is the real time project carrying out inside our college campus.

**KEYWORDS:** Vermicomposting, Natural fertilizer, economically sustainable.

## I. INTRODUCTION

Vermicomposting is a method of preparing enriched compost with the use of earthworms. It is one of the easiest methods to recycle agricultural wastes and to produce quality compost. Earthworms consume biomass and excrete it in digested form called worm casts. Worm casts are popularly called as Black gold. The casts are rich in nutrients, growth promoting substances, beneficial soil micro flora and having properties of inhibiting pathogenic microbes.

Vermicompost is stable, fine granular organic manure, which enriches soil quality by improving its physicochemical and biological properties. It is highly useful in raising seedlings and for crop production. Vermicompost is becoming popular as a major component of organic farming system.

Decomposable organic wastes such as animal excreta, kitchen waste, farm residues and forest litter are commonly used as composting materials. In general, animal dung mostly cow dung and dried chopped crop residues are the key raw materials. Mixture of leguminous and non-leguminous crop residues enriches the quality of vermicompost.

Vermicompost contains water-soluble nutrients and is an excellent, nutrient-rich organic fertilizer and soil conditioner. It is used in farming and small scale sustainable, organic farming.

### 1.1.OBJECTIVE

- To study the process of vermin composting
- To explain the change in the farming towards organic farming

### 1.2. SCOPE

- Provides an efficient conversion of organic waste
- Provides stable and enriched soil conditioner
- Reducing the toxicity of heavy metals
- Reducing the population of pathogenic microbes

## II. TYPES OF VERMICOMPOSTING

The types of vermicomposting depend upon the amount of production and composting structures. Small scale vermicomposting is done to acquire the personal requirement, whereas, large scale vermicomposting is done for the commercial uses.

## III. METHODS OF VERMICOMPOSTING

Vermicomposting can be done by various methods, among them bed and pit are commonly used.

Bed method: Composting is done on the pucca floor by making a bed (6×2×2) in feet of organic mixture.

Pit method: Composting is done here by using cemented pits, this method is not preferred for the poor aeration.

## IV. MATERIALS REQUIRED

- Neem leaves
- Cow dung
- Containers
- Worms

## V. PROCESS OF VERMICOMPOSTING

- Vermicomposting unit should be in a cool, moist and shady site.
- Cow dung and chopped dried leafy materials are mixed in the proportion of 3:1 and are kept for partial decomposition.
- A layer of 15-20cm of chopped dried leaves/grasses should be kept as bedding material at the bottom of the bed.
- Red earthworm (1500-2000) should be released on the upper layer of bed.
- Water should be sprinkled with care immediately after the release of worms.
- Beds should be kept moist by sprinkling of water (daily) and by covering with gunny bags / polythene.
- Bed should be turned once after 30 days for maintaining aeration and for proper decomposition.
- Compost gets ready in 45-50 days.
- The finished product is 3/4th of the raw materials used.



Fig.1 materials for vermicomposting

## VI .HARVESTING

When raw material is completely decomposed it appears black and granular. Watering should be stopped as compost get ready. The compost should be kept over a heap of partially decomposed cow dung so that earthworms could migrate to cow dung from compost .After two days compost can be separated and sieved for use.



Fig.2 compost without sieving



Fig.3 Compost after sieving

- The floor unit should be compact to prevent earthworm's migration into soil
- 15-20 days old cow dung should be used to avoid excess heat
- The organic wastes should be free from plastics,chemicals,pesticides and metals etc.
- Aeration should be maintained for the proper growth and multiplication of earth worms.
- Optimum moisture level should be maintained
- Room temperature should be maintained for the proper decomposition
- Curd should be added to the wastes for the nutrients to the earthworm ,it helps earthworms to be healthy
- Cow dung which is used should be powdered
- Green leaves should be used at the bottom of the pit ,it acts as a bed for earthworm

## VII. NUTRIENTS CONTENT OF EARTHWORM

The level of nutrients in compost depends upon the source of the raw material and the species of earth worm. A fine worm cast is rich in N P K besides other nutrients. Nutrients in vermicompost are released within a month of application.

Table 1 Nutrients of vermicompost

parameters	content
Ph	6.8
OM	20.46%
OC	11.88%
C/N ration	11.64
N	0.50%
P	0.30%
K	0.24%
Ca	0.17%
Mg	0.06%
Total nitrogen	1.02%

## VIII. ADVANTAGES

There are many advantages in the vermicomposting

- It provides efficient conversion of organic wastes.
- It leads to the new organic farming technique called organic farming using vermicompost as a fertilizer
- It helps in reducing the toxicity of heavy metals
- It is economically viable
- It gives more yield than the other chemical and organic fertilizer
- It is an easily adoptable low cost technology.

## **IX . DOSES**

The doses of vermicompost application depend upon the type of crop grown in the field/nursery. For fruit crops ,it is applied in the tree basin. It is added in the pot mixture for potted ornamental plants and for raising seedlings .

Field crops – 5 to 6 tonnes/hectare

Fruit crops – 3 to 5 kg/plant

Pots - 100 to 200 grams/pot

## **X.CONCLUSION**

Vermicomposting is a highly profitable venture for those who manufacturing for the commercial uses . If the vermicompost used in the farming techniques as a fertilizer , there is no need to use the chemical fertilizer,hence the farming techniques will go on as organic . The food we acquire from the organic farming will keeps up healthy .If the chemical fertilizers are not used the soil nutrients should be enriched . It will keeps the environment healthy.

## **REFERENCES**

- [1] A. C. Gaur, S. Nilkantan, and K. S. Dargan, "ORGANIC MANURES", ICAR, New Delhi, India, 2002.
- [2] S.Chandra and S.K.Chauhan "PROSPECTS OF ORGANIC FARMING IN INDIA",indian farming, vol-52