SOMESHWAR SCIENCE COLLEGE

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(Affilliated to Savitribai Phule Pune University, Pune)
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SOMESHWAR SHIKSHAN PRASARAK MANDALS

SOMESHWAR SCIENCE COLLEGE, SOMESHWARNAGAR

TAL- BARAMATI DIST – PUNE

DEPARTMENT OF ZOOLOGY

ESTBLISHMENT YEAR 2023-24

VERMICOMPOST PROJECT

VERMICOMPOSTING

Vermicomposting is in practice in the college started from Academic year 2023-24 . The campus area of the college is full of greenery with wild, ornamental and medicinal plants. Foliage collected daily is properly disposed in the vermin-composting pits constructed for the same purpose. Before using foliage for compost it is crushed with the help of foliage cutter machine and then gets stored in the pits. Earth worm species Eisenia foetida is selected for this purpose.

Daily sprinkling of water maintains proper moisture in the pits. Mixing of 25% cattle dung in the foliage gives best result. Period of 2-3 month is required for the proper conversion of the foliage into bio-fertilizer vermin-composting depending on population of the worms.

Produced vermi compost is used as a bio-fertilizer for campus plantation and excess vermin compost is sold to the students in minimum rate. In this way this is an attempt for self funding to the college and at the same time students are also provided knowledge about the project and guided to use such type of project in the farming also. This is an attempt to minimize the pollution create environmental awareness among the students.

Objectives -

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

Introduction

Vermiculture is the culture of earthworms. Vermicomposting is a method of preparing compost in which earthworms are used to convert organic materials (usually wastes) into a humus-like compost.

Earthworms consume biomass and excrete it in digested form called worm-casts. The casts are rich in nutrients, growth promoting substances, beneficial soil micro flora and having properties of inhibiting pathogenic microbes.

Vermi-compost is a measure produced by composting waste materials by using earthworm. Earthworm digest as low as two percent of the food consumed by it and hence excrete about ninety eight percent of food consumed. The excreta of earthworm is always considered as a natural manure. The modern method of controlled feeding and collection of excreta is known as vermin-composting. It has already become a popular process of manufacturing Bio-fertilizer

Earthworm species

There are nearly 3600 types of earthworms in the world and they are mainly divided into two types: (1) burrowing; and (2) non-burrowing. The burrowing types live deep in the soil. On the other hand, the non-burrowing typesconvert the organic waste into vermicompost faster. The earthworm species commonly used for vermicomposting are:

Eisenia foetida(Red earthworm)
Eudrilus eugeniae(African earthworm or night crawler)
Perionyx excavatus (Composting earthworm)

N P K Content in Vermicompost, Farmyard manure and bacterial compostElement Vermicompost Farmyard manure Bacterial compost

N (%) 2.1 – 2.6 1.1 – 1.5 1.2 – 1.5
P (%) 1.5 – 1.7 0.7 – 0.8 0.7 – 0.9
K (%) 1.4 – 1.6 0.6 – 0.7 0.6 – 0.7

Other nutrient Contents
Organic carbon 9.15 to 17.98 %. Iron 1800 ppm
Available S 128 to 548 ppm Zinc 50 ppm
Copper 100 ppm. Ca and Mg

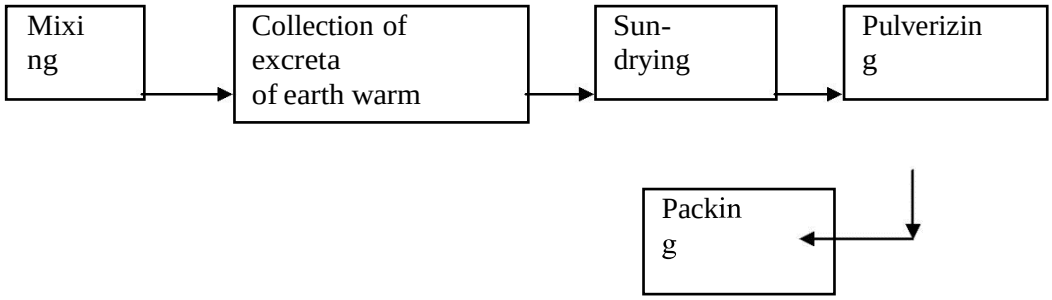
Procedure of vermicomposting

A. ***Preparation of organic wastes for vermicomposting***

- Breaking of large lumps
- Cutting of bigger plant parts into smaller ones
- Exposing to sun to reduce excess moisture content
- Application of 4% aqueous solution of neem pesticides to kill insects, if any
- Treatment with lime dust to reduce pH

Half decomposition of these materials is done by heaping the above mixture with sufficient moisture content for 21 days.

Process Flow:



Raw Materials: Though bio-degradable solid wastes of kitchen, farm, etc. enable one to produce vermicompost, these become rich in N but slightly deficient in P & K. Therefore, mixing of materials rich in P & K helps. Also to enhance porosity of the raw materials use of Saw dust/cut hay are done.

Capital Cost estimate:

1	Land admeasuring 1728 sq.ft.	**Own**
2	Shed and vermicomposting tanks	**Rs.35750/-**
3	Water installation	**Rs. 2,500/-**
4	Culture	**Rs. 1600/-**
5	manure	**45000/-**
6	shade net	**800/-**
7	Transport	**1500/-**
8	Labour Charge	**6000/-**

B. Preparation of vermi bed

Vermi bed is prepared by putting pebbles, sand and loamy soil one above the other is having 2 inches of thickness each at the bottom of the unit. Alternatively coir or any plant refuse which does not decompose easily can also be used. This should be watered followed by putting well decomposed FYM of 4 inches thickness over it.

Putting the substrates and composting

- Above the layer of FYM the half decomposed materials are to be kept to fill up the pit. Then the worms are released.
- When there are more number of pits, half decomposition can be done in some of them in which different materials can be put in layers till the pit is filled up and worms are to be released after the thermophillic stage of half decomposition is over.
- For a 2m X 1m X 0.6m (= 1.2 m^3) tank 2 kg earthworms (2000 to 2500) are to be released.
- The number worms may be doubled when they are available in more quantities and compost is necessary to prepare within a month instead of normal time of 2 months.
- After filling up of the unit, it is to be covered preferably with an old wet gunny bag to reduce loss of moisture and encourage the activities of the worms at the surface. Intermediately the unit is to be watered to maintain moisture content of 40-50%

D. Harvesting and post-harvest technologies

- Harvesting of vermicompost is done when the compost looks dark brown and soft.
- The compost is piled for 3-4 hours so that the worms go down and form a ball which can be separated for further use or selling the worms at premium price.
- After separation of worm balls, the compost should be dried under shed for reducing

its moisture content to around 30%.

- The compost is passed through a sieve of 2-3 mm diameter so that the earthworm cocoons and the undecomposed materials could be separated for further use.
- Packaging and labelling can be done to attract the consumers for commercial production and at farmers' level it can be kept in gunny bags.
- After completion of the process, the vermicompost should be removed from the bed at regular intervals and replaced by fresh partially decomposed organic materials.

E. Precautions during the process

The following precautions should be taken during vermicomposting:

- The floor of the unit should be compact to prevent migration of earthworms into the soil.
- Only plant-based materials such as grass, leaves or vegetable peelings should be utilized in preparing vermicompost.
- Materials of animal origin such as eggshells, meat, bone, etc are not suitable for preparing vermicompost.
- *Gliricidia* loppings and tobacco leaves are not suitable for rearing earthworms.
- The organic wastes should be free from plastics, chemicals, pesticides and metals etc.
- 15-20 days old cow dung should be used to avoid excess heat.
- The earthworms should be protected against birds, termites, ants and rats.
- Adequate moisture should be maintained during the process. Optimum moisture level (30-40 %) and 18-25^{o}C temperature should be maintained.

Advantage : vermicompost product which is about the organic fertilizer made from the worm dropping.: Advantage 1. repair soil PH 2. cheaper than chemical fertilizer 3. Save environment
4. fasten the plant growth 5. give good quality and organic product price

Market: With massive propagation of Chemical fertilizer and pesticides in last few decades demerits of such fertilizer and pesticides came into focus of the world. It was found that such fertilizers and pesticides harm not only human health but also the environment and the very soil on which agriculture is done. Alternatives like manure and compost are therefore found to be better fertilizer.

Capacity: The unit shall need to work 365 days for three shifts. Worker shall however work for single shift per day, where they will mix the feed in tank, collect and pack vermicompost. As care need not be taken every-day all unskilled workers shall be employed on daily contract basis. The annual installed capacity is estimated at 30 Tonnes of vermicompost.

Someshwar Science College
COLLEGE CODE 827

Principal
Someshwar Science College,Someshwarnagar