Vermicomposting

OBJECTIVES

Solid Waste Management

Manufacture of Organic manure

Excess worm for fisheries

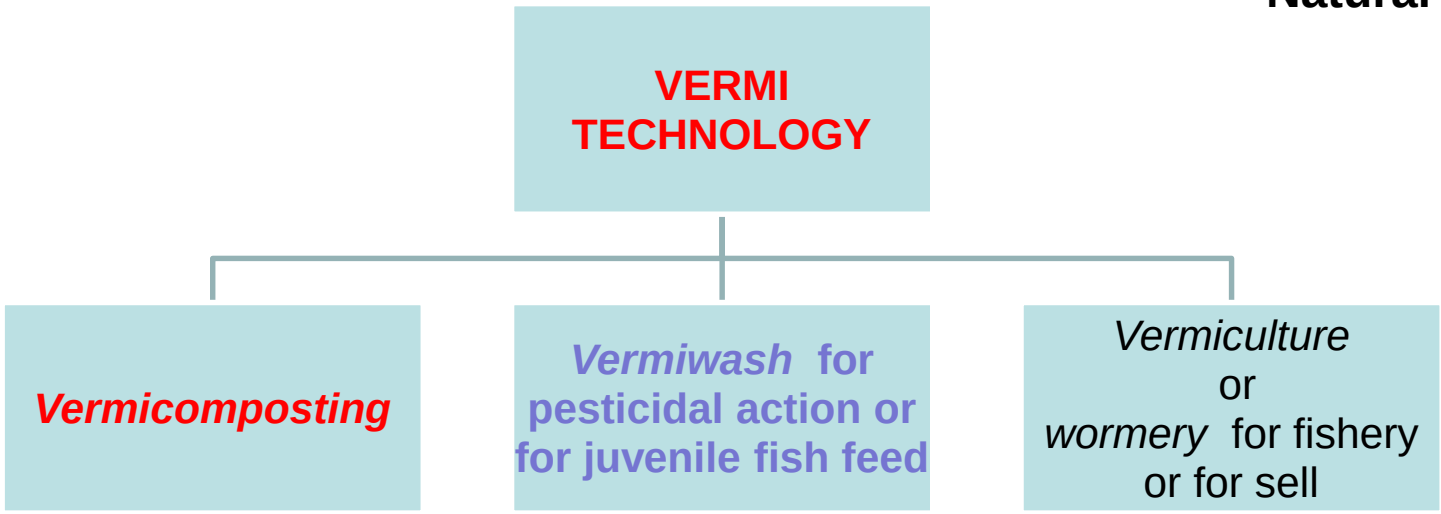
Improvement of Agriculture and Aquaculture

Introduction

- Vermicomposting is a technology of various forms of biodegradable wastes to make compost with the help of earthworms.
- This compost is balanced and good in plants nutrients and can be used in aquaculture.

Earthworms

Natural Bio-reactor



Benefits of vermicompost

Vermicompost is a nutrient rich compost which:

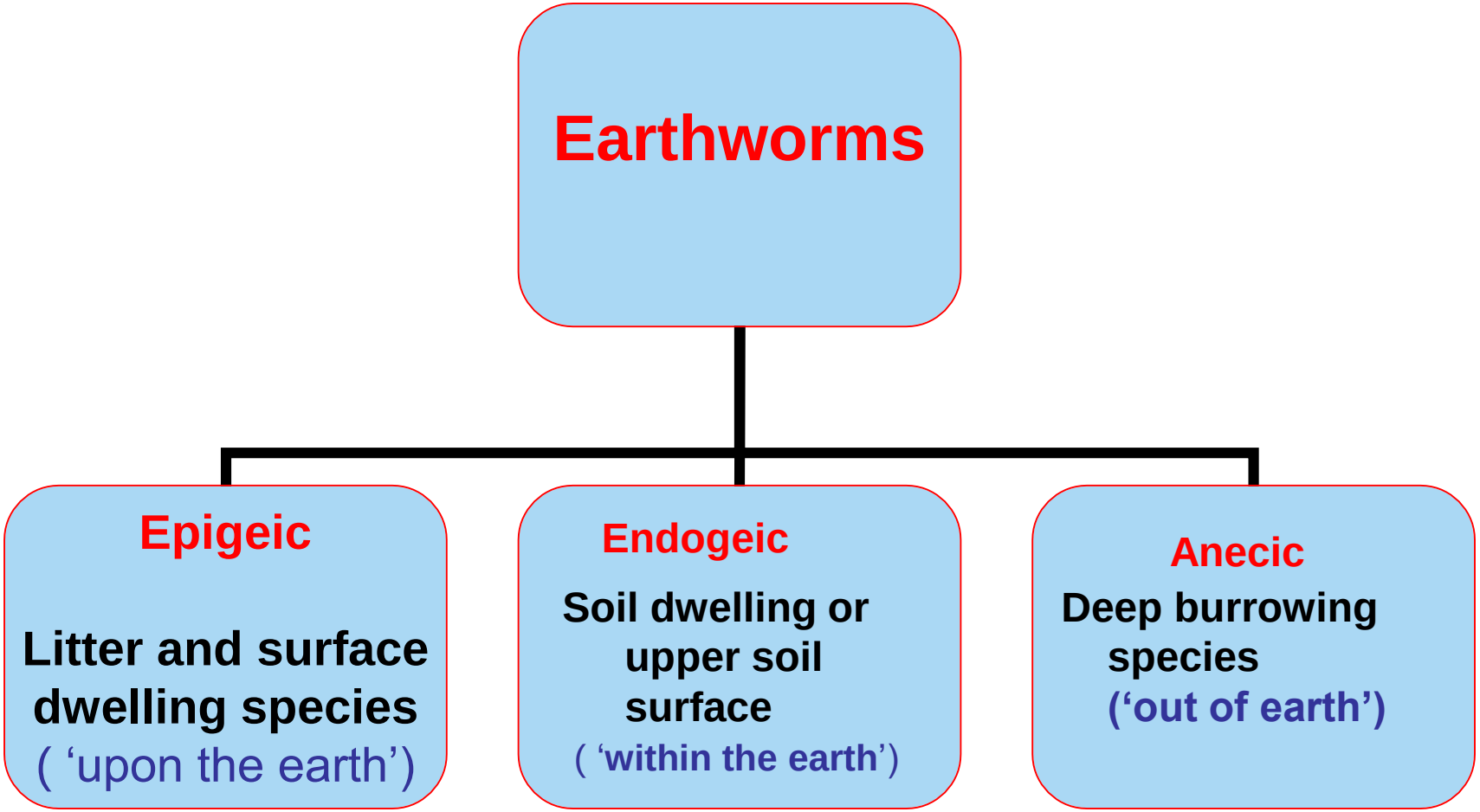
- helps better plant growth and crop yield and improves physical structure of soil and increase water holding capacity of soil.
- deep-burrowing earthworms already present in the soil which,indirectly improves fertility of soil.enriches in tern soil with micro-organisms.
- improves root growth of plants.enhances germination, plant growth, and crop yield.
- enriches sediment of pond with nutrients
- it is helpful in elimination of biowastes .

Nutrient profile of vermicompost

Vermicompost contains :

1.2- 1.6% Nitrogen;
0.6- 0.7% Phosphorus;
0.7- 0.8% Potash;
.04- 0.5% Calcium;
.015- 0.2% Magnesium;
155- 175 ppm Iron;
94- 96.5 ppm Manganese;
24- 24.5 ppm Zinc
15- 15.5 C:N ratio.

Requirements



Ex. *Eisenia foetida*

Ex. *Octochaetona thrustoni*

Ex. *Lampito mauritii*

Pictures of different earth worm

Earthworms:

Commonly following varities are used for vermicomposting

Eisenia foetida

Eisenia foetida

Eudrilus eugeniae

Eudrilus eugeniae

Perionyx excavatus

Perionyx excavatus

substrates

Pre digested or partially decomposed organic wastes, cowdung,some selected sludges.

Water requirement

- Dechlorinated **Ground water should be sprayed so that 75% moisture content remains in the substrates**

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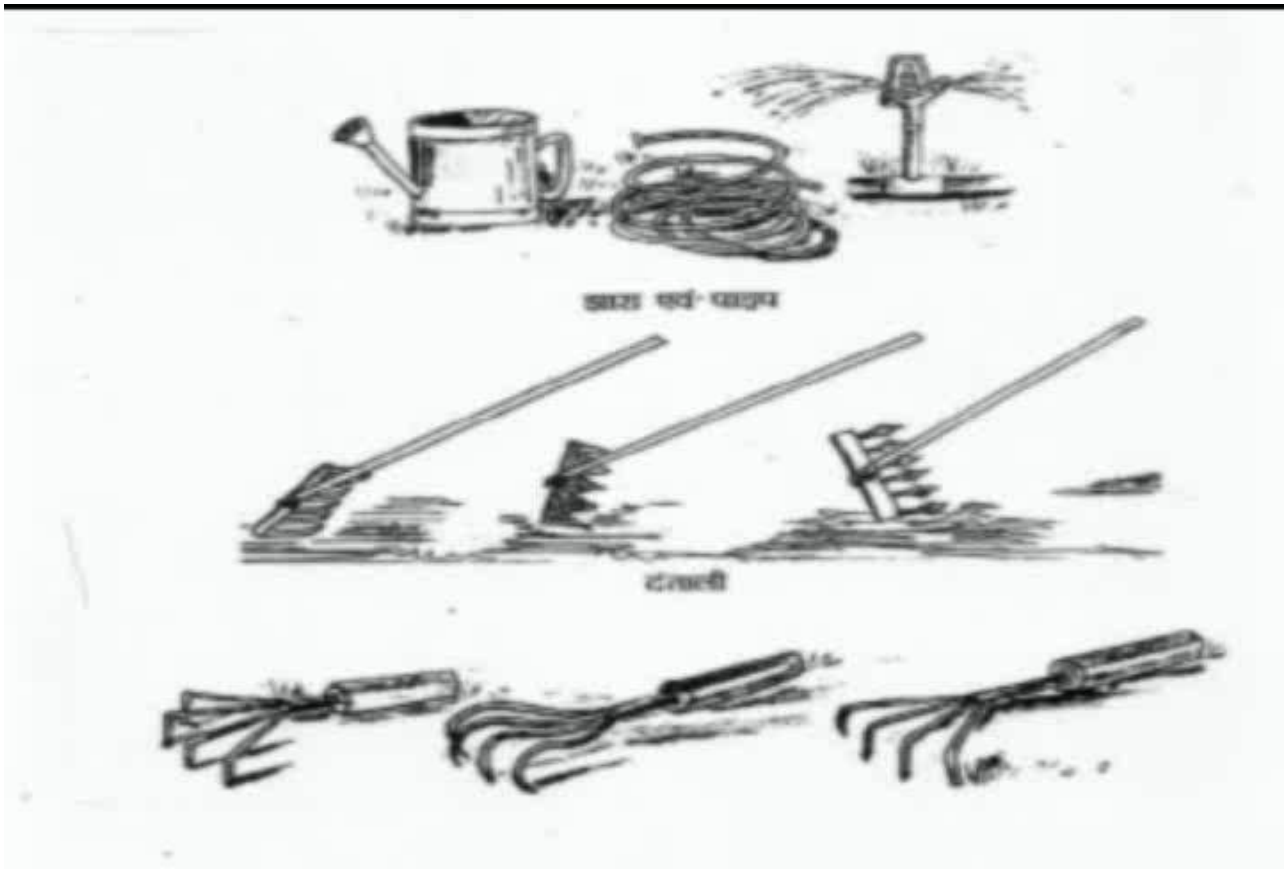
Tools commomly used for vermicast collection



Requirements Cont'd….

- Concrete floor under shade.

Method of Production

Vermicompost can be produced by two methods :

Pit Method

Windrows Method

Click on photo to continue

Pit method

Pit method is commonly used for small scale production of vermicompost.

These steps can be followed :

- Construct a pit of 3 x 2 x 1 m size (L x W xD) over ground surface using bricks. Size of pit may vary as per availability of raw materials
- Fill the pit with following four layers:
  - 1st layer – sand or sandy soil of 5-6 cm. This layer helps to drain excess water from the pit.
  - 2nd layer - paddy straw or other crop residue of 30 cm above 1st layer which will be used for providing aeration to the pit.
  - 3rd layer - 15 to 30 days old dung over paddy straw layer at a thickness of 20-30 cm. This helps in initiating microbial activity.
  - 4th layer - pre-digested material about 50 cm
- Inoculate earthworm @ 1000 worms per square meter area or 10 kg earthworm in 100 kg of organic matter.
- Spray water on the bed and gunny bag. Maintain 50-60% moisture of the pit by periodical water spraying.

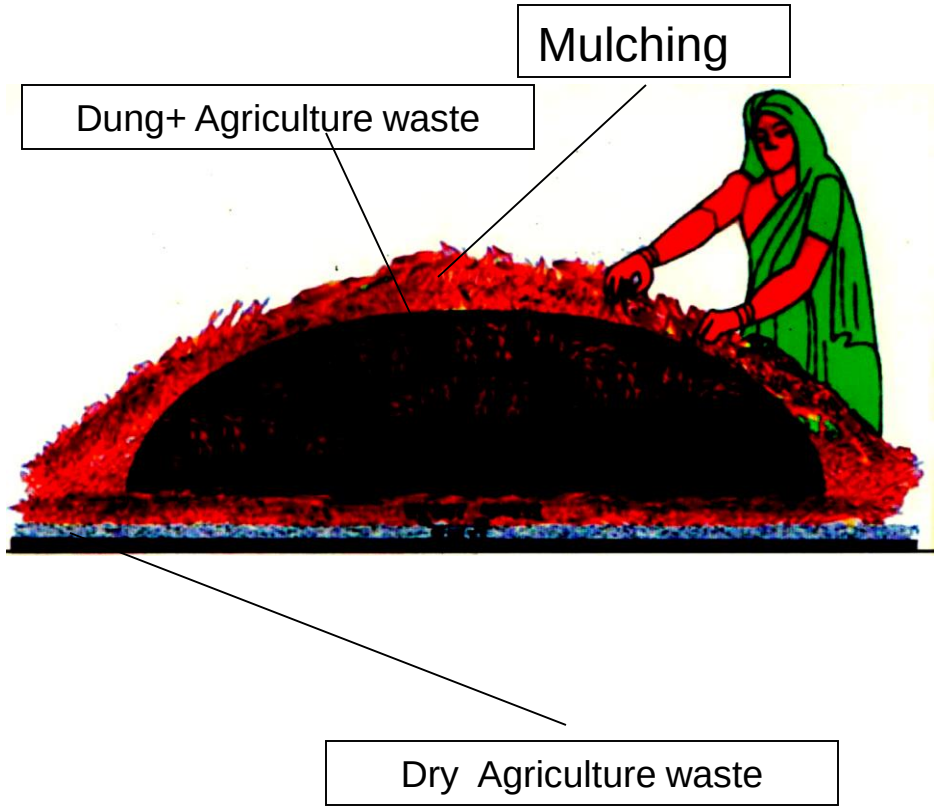
Pit method…

Windrows method

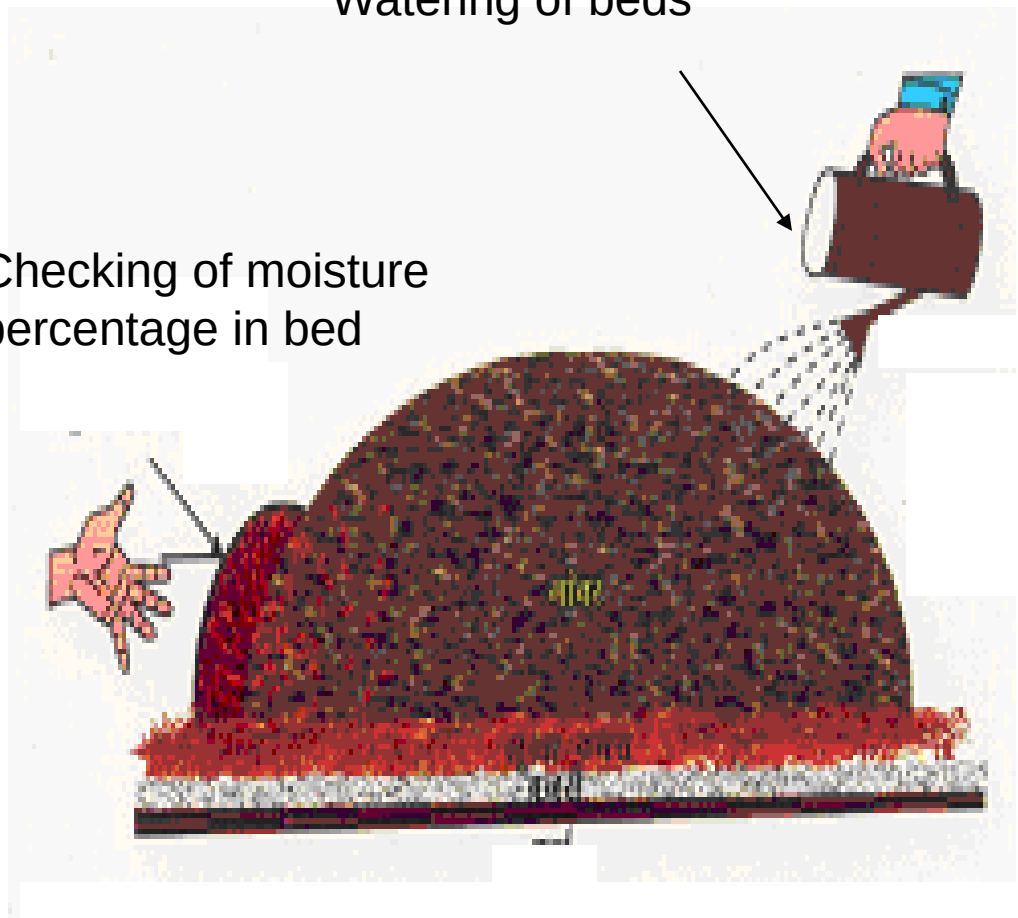
This method is widely used for large scale production of vermicompost. You may please follow these steps:

- Load the organic wastes in the form of bed (preferably 10 feet L x 3 feet W x 1.5 feet H). Size of bed may vary as per availability of organic waste.

- After loading, the fresh bed should be covered with jute mate or dry agriculture wastes such as rice-bran, banana-leaf, maize residue etc.



Windrows method



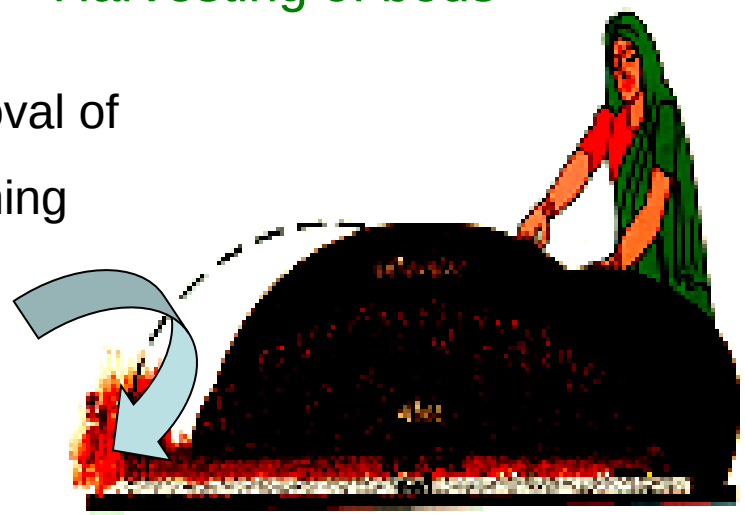
- Sprinkle water over the covered vermibed to maintain 40% moisture in bed.
- Moisture percent can be checked by forming lump of organic waste using hand. it should easily form lump.

Windrows method Cont'd…

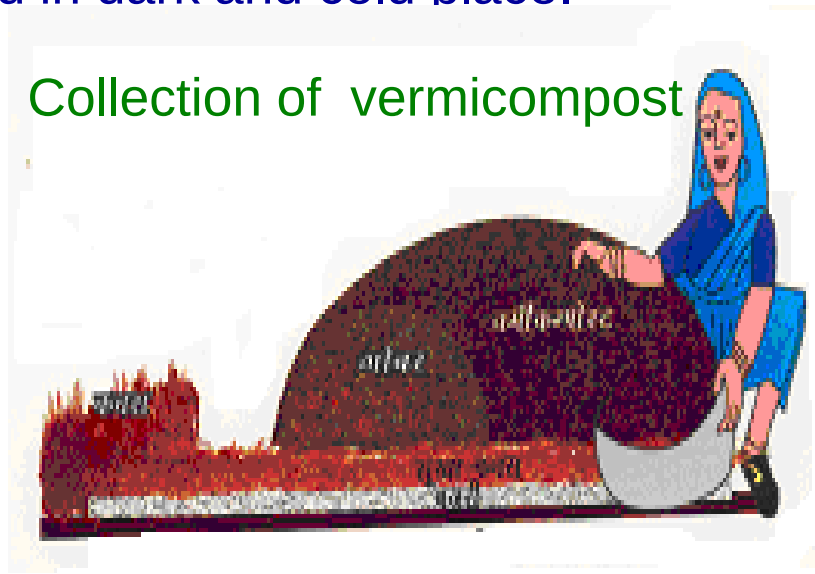
- The first lot of vermicompost is ready for harvesting after 2-21/2 months and the subsequent lots can be harvested after every six weeks of loading
- Watering of bed should be stopped for at least 2-3 days before harvesting. Earthworms go down in the moist soil and the compost is collected from the top without disturbing the lower layers of vermibed having earthworm. Vermicompost harvested will be of dark brown colour and free flowing.
- The harvested compost should be stored in dark and cold place.

Harvesting of beds

Removal of mulching



Collection of vermicompost



Precautions

- Only plant-based materials such as grass, leaves or vegetable peelings should be used for preparing vermicompost.
- Materials of animal origin such as egg-shells, meal, bone, chicken droppings etc., are not suitable for preparing vermicompost.
- Gliricidia lopping and tobacco leaves are not suitable for rearing earthworms.
- The earthworms should be protected against birds, termites, ants and rats.
- Adequate moisture should be maintained during the process. Either stagnant water or lack of moisture could kill the earthworms.
- The vermicompost should be removed from the bed at a regular interval and replaced by fresh waste materials.

LET US SUM UP

- **Vermitechnology**. Is a special technology which uses Vermicomposting, Vermiwash and Wormery are inter-linked and interdependent process.
- Vermicompost is prepared with various forms of biodegradable wastes with the help of earthworms.
- The earthworms eat the organic residues, digest it and excrete in the form of pellets. The earthworm excreta called **worm cast which is vermicompost.**

VERMITECHNOLOGY UNIT

- ,BARASAT GOVT COLLEGE HAVE ONE VERMICOMPOST UNIT.

ACKNOWLEDGEMENT

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FOR SOME OF THE SLIDES PRESENTED HERE