Vermicomposting

- The term vermiculture refers to the cultivation or production of earthworms.
- Vermicomposting is the method by which worms are used to turn organic materials (usually waste) into a humus-like substance known as Vermicast.
- The term vermicast is also termed as worm castings, worm manure, worm feces and worm humus
- **requirements**

- Breeder worms (Earthworms)

- Feeding materials: Any type of biodegradable waste: vegetable waste, crop residues, weed biomass, dead leaf litter, agro-industry waste, urban and rural biodegradable portion of waste

- Bedding materials

- Production systems (a container or pit in a

shady place)

Types of vermicomposting worms:

- On the basis of their feeding habits, they are classified as detrivores and geophages.
- Detrivores feed on plant litter or dead roots, and other plant debris or on mammalian dung on or near the soil surface.
- These worms are referred to as humus formers and comprise the epigeic and anecic forms.
- Some examples of detrivorous worms are ***Perionyx excavatus, Eisenia fetida, Eudrilus euginae, Lampito mauritii, Polypheretima elongata, Octochaetona serrata*** and ***Octochaetona curensis***.

Process of vermicomposting:

1. Feeding materials:

- Worms can eat dung from animals, agricultural waste, residues from vegetables, waste from the food market, waste from the flower market, agro-industrial waste, waste from the fruit market and all other bio-degradable waste.

- Before being used for vermicompost production, cattle dung should be dried in open sunlight.

2. Bedding materials:

- The bedding content should be varied to provide the earthworms with a variety of nutrients and to create richer compost.

- **Suitable bedding materials include:**
- 1. coir waste
- 2. cardboard
- 3. shredded fall leaves
- 4. sawdust
- 5. chopped straw
- 6. mulched paper such as newspaper
- 7. semi-composted solid manure

. Blending:

- To achieve a near optimal C/N ratio of 30:1-40:1, carbonaceous

substances such as sawdust, paper and straw can be combined with nitrogen-rich products such as sewage sludge, biogas slurry, and fish scraps.

. Pre-composting/Half digestion:

- In order to avoid worm systems from feeling so much sun, manure feedstocks and bedding should be pre-composted.

- When introduced into the worm systems, fresh manures produce a lot of energy that transfers into additional heat.

- Strong heat in the beds of worms can be deadly.

- The bedding and feeding materials are then combined, watered and allowed to ferment for approximately two to three weeks

. Moisture, temperature and pH:

- 50-60 percent is the optimal moisture level for maintaining aerobic conditions.

- The temperature should be within 25-30o C of the stacks.

- The raw material's pH should not be greater than 6.5 to 7.

Methods of vermicomposting:

- A 1 meter by 1 meter by 0.3 meter container carries about 30-40 kg of bedding and feeding materials.

- It is possible to prepare a vermiculture bed or worm bed (3 cm) by putting dust or husk or coir waste or sugar cane garbage in the bottom of the tub/container.

- The culture bed can be spread with a sheet of fine sand (3 cm) followed by a layer of garden soil (3 cm).

- A15-20 cm sheet of organic waste material (pre-composted/half digested) can be spread on the worm bed.

- It is sprinkled with rock phosphate

powder (to increase the content of phosphate) if required.

- Soil or cow dung is used to cover the organic layer with (sprinkle cow dung slurry).

- The selected earthworms are released through the cracks created (1000-1500).

Harvesting of vermicompost:

- In about 3 months, the vermicompost is ready (may vary depending on organic waste used as substrate).

- It will be black, granular, lightweight and humus-rich.

- Watering is stopped for two to three days before emptying the beds to facilitate the removal of the worms from the compost.

- The worms will be pushed to the bottom of the bed by this.

Storage and packing of vermicompost:

- The harvested vermicompost should be stored in dark, cool location.

- It should have moisture of at least 40 percent.

- Vermicompost may be preserved for a duration of one year without loss of quality if the moisture level is kept at

40%.

Advantages of Vermicompost

- Vermicompost is the best **replacement** for chemical fertilizers.
- Vermicompost is **eco-friendly** as it is produced by organic waste through vermiculture.
- Vermicompost is also a **natural fertilizer**.
- **Water holding capacity** increases due to the organic substances used in vermicompost.
- Improves plants growth and nutrients absorbing capacity.

- Vermicompost contains **antibiotic properties** that help to regulate compost.

- Crop yields and seed germination also improves