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FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

Lecture 3: Properties and method of preparation of vermicompost

Definition of vermicomposting:

Vermicomposting is a method of making com post, with the use of earthworms, which generally live, in soil eat biomass and excrete it in digested form. This compost is generally called vermicompost or Wormicompost.

Vermicompost preparation:

Basic raw material : Any organic material generated in the farm like bhusa ,leaf fall etc.,

Starter : Cow dung ,Biogas slurry , or urine of cattle

Soil animal: Earth worms (Species: *Eisenia foetida*)

Favorable conditions of earth worms in the composting material:

- pH : Range between 6.5 and 7.5
- Moisture : 60-70 % of the moisture below and above range moderately of worms taking place
- Aeration : 50 % aeration from the total pore space
- Temperature: Range between 18 ^{o}C to 35 ^{o}C

Procedure:

It is mostly prepared in either pit or heap method .The dimensions either heap or pit are 10 x 4 x 2 feet .The length and width can be increased or decreased depending on the availability of material but not the depth because the earth worms activity is confined to the 2 feet depth only .
1st layer : bedding material of 1" thick with soft leaves

2nd layer : 9" thick organic residue layer finely chaffed material

3rd layer : Dung + water equal mixture of 2" layer .

Continued the layer up to pile to ground level protect the worms against natural enemies like ants ,lizards ,snakes ,frogs ,toads etc., Maintain proper moisture and temperature by turnings and subsequent staking . At the day of 24th, 4000 worms are introduced in to the pit [1m^{2} =2000 worms] without disturbing the pit by regular watering the entire raw material will be turned into the vermicompost in the form of worm excreta .The turn over of the

compost is 75 % [the total material accommodated in the pit is 1000 kg ;The out turn will be 750 kg]4

Harvesting of the vermicompost from the pit:

Stop watering before one week of harvest . All the worms spread across the pit come in Close and penetrate each other in the form of ball in 2 or 3 locations .Heap the compost by removing the balls and place them in a bucket, then the material is sieved in 2 mm sieve, the material passed through the sieve is called as vermicompost which is stored in a polythene bags [Note

: Vermicomposting is done under thatched roof to protect worms against rain and sun]

Nutrient composition of vermicompost

S.No.	Nutrient	Content
1	Organic carbon	9.15 to 17.98 %
2	Total nitrogen	1.5 to 2.10 %
3	Total phosphorus	1.0 to 1.50 %
4	Total potassium	0.60 %
5	Ca and Mg	22.00 to 70.00 m.e / 100 g
6	Available S	128 to 548 ppm
7	Copper	100 ppm
8	Iron	1800 ppm
9	Zinc	50 ppm

- Besides the above nutrients the vermicompost also contains following enzymes
  Enzymes : Protease ,Lipase ,Amylase , Cellulose
- 1000 earth worms may convert 5 kg waste material per day
- 1000 worms weighs about a kilogram

Advantages of composting over direct application:

- There will be no immobilization in compost because of narrow C:N ratio
- Application is easy, because the compost is humified and have a structure of crumb and granular.
- It is hygienic, pathogens and weeds seeds are destroyed.
- No loss of nutrients
- It improves physical properties better than compost on soil application.