Starter's guide

Vermicompost

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Introduction:

Vermiculture means artificial rearing or cultivation of worms (Earthworms) and the technology is the scientific process of using them for the betterment of human beings. vermicompost is the excreta of earthworm, which is rich in humus. Earthworms eat cow dung or farm yard manure along with other farm wastes and pass it through their body and in the process convert it into vermicompost. The municipal wastes, non-toxic solid, liquid waste of the industries and household garbage's can also be converted into vermicompost in the same manner. Earthworms not only convert garbage into valuable manure but keep the environment healthy & get multiply. This multiplication of earthworms is a simple process and can be easily handled by the farmers. Further, the dairy farmers can also produce vermicompost and increase their revenue generation.

Market Snapshot:

Vermi compost is a valuable input for sustainable agriculture and wasteland development. This can also be used widely in pot culture and in home gardens. Several farmers are successfully using Vermicompost. Studies in Jammu and Kashmir have shown that usage of Vermi compost has improved the production and quality of Apples and other Horticulture Products. There are several success stories of using vermicompost from different climatic zones of the country. There will be a lot of demand for vermicompost in future for developing cultivable land subjected to some form of degradation. Government agencies and NGOs are popularizing organic agriculture using Vermi compost by organizing awareness campaigns and film show in rural and urban areas.

Methods of Vermicomposting:

Vermicomposting is done by various methods, among them bed and pit methods are more common:

Bed method: Composting is done on the pucca / kachcha floor by making bed of organic mixture.

Pit method: Composting is done in the cemented pits. The unit is covered with thatch grass or any other locally available materials.

Selection of earthworm species for vermicomposting process:

For composting, the African species of earthworms namely Eisenia fetida and Eudrilus eugenae which are efficient to maintain vermicomposting process in India are selected. Eisenia fetida has a wide range of temperature tolerance and has very high reproductive potential. It is less sensitive to density pressure & Eudrilus eugeniae is found to be a very efficient species for culture maintenance in India.

Multiplication of worms in large scale:

Prepare a mixture of cow dung and dried leaves in 1:1 proportion. Release earthworm @ 50 numbers/10 kg of mixture and mix dried grass/leaves or husk and keep it in shade. Sprinkle water over it time to time to maintain moisture level. By this process, earthworms multiply 300 times within one to two months. These earthworms can be used to prepare vermicompost.

Process of Vermicomposting:

Vermicomposting should be done 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 for 15 – 20 days. A layer of 15-20cm of chopped dried leaves/grasses should be kept as bedding material at the bottom of the Pit/Bed. Partially decomposed material should be made available as per capacity of the pit/bed size. Depending upon the availability & quantity of raw material, the number of pits can be increased further in order to increase the compost production. Earthworms should be released on the upper layer of pit/bed. Water should be sprinkled immediately after the release of worms and kept moist by sprinkling of water on daily basis. The covering has to be done with gunny/ polythene bags and turning of vermicompost is to be done 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.

Harvesting:

When raw material is completely decomposed it appears black and granular. Watering should be stopped as compost gets 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.

Financial Breakup:

Fixed Cost	8.00 Lakhs
a) Land	Owned/Leased
b) Pits (5 No.)	5.00 Lakhs
c) Building	2.50 Lakhs
d) Machinery/Equipment	0.50 Lakhs
Operational Cost (per cycle/quarter)	4.00 Lakhs
Total Cost	12.00 Lakhs

The above calculations are based on the following assumptions:

- 125 kg of worms (Eisenia fetida) are required for 5 pits with 25 kg/pit.
- Cost of 1 kg of worms is taken as Rs 2000.
- Total cow dung required for 5 pits is 2000 cft with 400 cft per pit.
- One tractor is assumed to contain 40 cft.
- 10 tractors of cow dung fill one pit.
- 1 tractor costs Rs 2500 on an average.
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Annual Revenue Generation:

By Sale of 90 Metric Tonnes of Vermicompost	11.25 Lakhs

The above calculation is based on the following assumptions:

- Selling Price of Vermicompost per MT @ Rs 12500.
- 4 Cycles have been considered annually.
- Production of vermicompost per cycle is taken as 45 MT.

Dos & Don'ts:

Do's:

- Vermicompost pit should be protected from direct sun light.
- The floor of the unit should be compact to prevent earthworms' migration into the soil.
- Aeration should be maintained for proper growth and multiplication of earthworms.
- To maintain moisture level, spray water on the pit/bed as and when required.
- Optimum moisture level (30-40 %) should be maintained.
- 18-25 Degree Celsius temperature should be maintained for proper decomposition.
- Protect the worms from ant, rat and bird.

Don't:

- Don't use polythene, plastic chemicals, pesticides etc.
- Don't use 15-20 days old cow dung so that excess heat is avoided.
- Don't start vermicompost unit in low temperature and low rainfall areas.

Check List:

1. Land:
   - *Area*: One Kanal (owned/leased)
   - *Nature*: Non-residential area
2. Structure:
   - Concrete Pits : Length =30 ft Breadth=8 ft Height=2.75ft.
   - Store : 15 X 12 sq ft.
3. Machinery & Equipment:
   - Water Motor and Fitting Equipments.
   - Shovels, Spades, Crowbars, Iron Baskets.
   - Dung fork, Buckets, Bamboo baskets, Trowel.
   - Packing Machine and Weighing Scale
4. Finance:
   - Check various financial schemes at JKEDI District Centers
5. Suppliers:
   - Earthworms (from registered dealers)
6. Buyers:
   - Farmers
   - Retailers
   - Wholesale dealers
7. Relevant Government Departments:
   - Agriculture Department, J&K Government
   - SKAUST (K&J)