Vertical Multilayer Vermicomposting Unit

RuTAG IIT Delhi/2019-20/Vertical Multilayer Vermicomposting Unit

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Vermicomposting Unit is an organized system for the decomposition of the animal dung (Cow, Horse, Mule dung), and kitchen waste. The most common method of waste disposal is its dumping in the low-lying areas on the outskirts, which is very haphazard and unsanitary and raises deep significant concerns with regard to safety, property value, and quality of life in the habitat and nearby colonies.

Salient Features of Vertical Multilayer Vermicomposting Unit

- Eco-friendly
- Easy to operate and assemble
- Large storage area (Approx. 720 Kg.) with 18 carate
- Ventilated chamber for proper aeration
- Inbuilt sprinkler system for proper sprayed water on the manure
- Metallic robust structure with GI coating to resist corrosion
- Integrated water collecting tray

Dissemination Potential

Hilly Area, Residential Complex, Public Markets, Hotels and Restaurants, etc.

Tentative cost of the prototype: ₹ 125000 (Incl. GST) which excludes freight, installation, other levies

Demand Driven Technology: Sri Mata Vaishno Devi Shrine is visited on an average every day by about 40 thousand pilgrims and the numbers are growing every year. As the Shrine is located in quite steep hilly region, about 5 to 10% of the pilgrims use local horses and mules for visiting the Shrine. For transporting all the material to the lodges existing near Shrine a caravan of Mules are used. It is a rough estimate that about 1000 horses and mules are in service in this area. The dumping of the dung along the path to the Shrine is spreading bad odour in the area, causing inconvenience to the pilgrims. To tackle this ecological challenge of solid waste management, RuTAG IIT Delhi took this project.
Collaborated NGO: Centre for Technology and Development, A unit of Society for Economic and Social Studies (SESS), New Delhi.

Major Drawbacks of Existing Bead Method Composting

- Pit composting requires more space and maintenance
- Composting cycle as time taking (Approx. 3-4 months)
- Open systems cause bad odor in the surrounding area
- Not portable
- Lower life span of earthworms due to lack of aeration

Impact of the Improved Technology

- Requires less space in comparison to the existing vermicomposting method.
- It is easily movable one place to other place.
- Modular structure is easy to transportation and installation.
- Can be used to compost cow dung, horse dung, kitchen waste, etc.

Feedback from the user

Very useful in the plain as well as Hilly areas (especially for Mule and Horse dung, and Organic waste), Residential Complexes (Kitchen waste), Weekly Public Markets (Vegetable waste), etc.

Relevant Research Publications

- Raj Kumar Gupta, Dr. Kalpana Arora, Prof. Satyawati Sharma, Dr. Ketaki Bapat, Prof. S. K. Saha, 2022, "Decentralized Vertical Multilayer Vermicomposting System for Organic Waste Management." A paper presented on 3rd International Conference of Rural Technology Action Group (RuTAG), RTDD 2022, IIT Jodhpur, Rajasthan.

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