



Effective Separation of Vermicast from Earthworms: A REVIEW STUDY

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Abstract

In India, major quantity of people, about 70% of people are engaged with agriculture & its related fields. So the income to our country is from agriculture products. Hence, there are various methods are utilized for improving the agricultural processes & also their yielding capacity. So, fertilizer plays an important role in improving the product quality & quantity. A poor farmer cannot afford the costly & environment polluting fertilizer such as urea etc. so he turned for natural fertilizer which is enriched with nitrogen oxides & ecofriendly. Which is product by earthworm from household wastage, & industrial wastage, animal dung, spoiled food, biogas slurry, etc?

1. INTRODUCTION

Vermicomposts is the product or process of composting using various worms, usually red wigglers, white worms, & other worms to create a heterogeneous mixture decomposing vegetables or food wastages, bedding material, & vermicast. Vermicast is also called worm casting, worm humus or worm manure, is the end-product of the breakdown of organic matter of earthworm. This

A] VERMICOPOST PROCESS

General Vermicomposting Process

The 2 kg material was filled in the set of six plastic tubs (in triplicate) and kept in dark for five weeks by adding two earthworms / pot. Every week the weight of earthworm biomass / pot and count of cocoons / pot was taken after thorough washing and blotting of earthworms and cocoons and then they were reinnoculated in the respective pots. This procedure was followed for every week.

casting have been show to contain reduced level of contaminants & a higher saturations & nutrients then do organic material before Vermicomposting Containing water –soluble nutrients, vermicompost is an excellent, nutrients-rich organic fertilizer & soil conditioner. This process of producing vermicompost is called Vermicomposting.

1 Effect of Temperature on Vermicomposting:

The temperature range selected for experiment was 15, 20, 25, 30, 35 and 40°C taking into account average minimum and maximum temperatures found in the Single area and in the seasonal variations in the year. For every temperature selected, the three plastic tubs / pots were used and were incubated for five weeks in BOD incubators and biomass weight of earthworm pots and cocoons count was taken as above.



2 Effect of pH of Material on the Vermicomposting:

The PH of Vermicomposting material was adjusted with 1 N HCL / 1 N NaOH to 2,3,4,5,6,7,8,9 and 10. The pH values adjusted materials were filled in 2kg amount in three pots (in triplicate) and inoculated with two earthworms per pot and incubated in dark at 25°C for five weeks. The average biomass of worms and cocoon count.



Fig. A



B) SEPERATION PROCESS VERMICOMPOST

LITERATURE REVIEW: 1

- 1) SIMPLE PROCESS- The simple process used in separation of verm and compost. The finished castings must be separated from the worms and bedding to create a uniform quality product.



Fig.B1



LITERATURE REVIEW: 2

2) EARTHWORM TROMMEL SEPRATOR- These Vermicasts can be used as solid bio-fertilizers; however there are challenges of separating the earthworms from thevermicasts after vermicomposting. Pilot studies were therefore done using a cylindrical rotary trommel screen separator prototype toefficiently separate the earthworms from the vermicasts.



Fig. 2

LITERATURE REVIEW: 3

3) EASY ROTA 1000&2000 VERMICULTURE WORM HARVESTER-

The Easy Rota 1000 worm harvester (hand driven version) & the Easy Rota 2000 worm harvester (electric drive version) have been specifically designed to harvest compost worms from worm castings.

The Easy Rota 1000 is suitable for the hobby worm farmer, schools & bait suppliers etc.

The Easy Rota 2000 model is for industrial use with a much higher throughput available. Throughput depends on the moisture content of the worm castings & the angle in which the machine is setup



HAND DRIVE

ELECTRIC DRIVE

The unique design of these machines is the way the many hundreds of pins located inside the drum pickup the worms as the drum rotates. The worm's normally only progress half a turn then fall into 1 of the 3 collection trays located on the rails inside the machine. These pins have been located & angled in a way which allows for maximum effectiveness for the harvesting of the compost worm.



Fig.3

4) VERMICOMPOST SEPERATION MACHINE-

This machine is totally different than the traditionally way of separating the worm from compost. The worm of separated by reciprocating movment of the mesh. Therefore, the worm get injured due to rubbing of their soft body opposing to the rough mesh surface. but can using the machine we can separation earthworm from the compost and utilize the worm for further production of composite

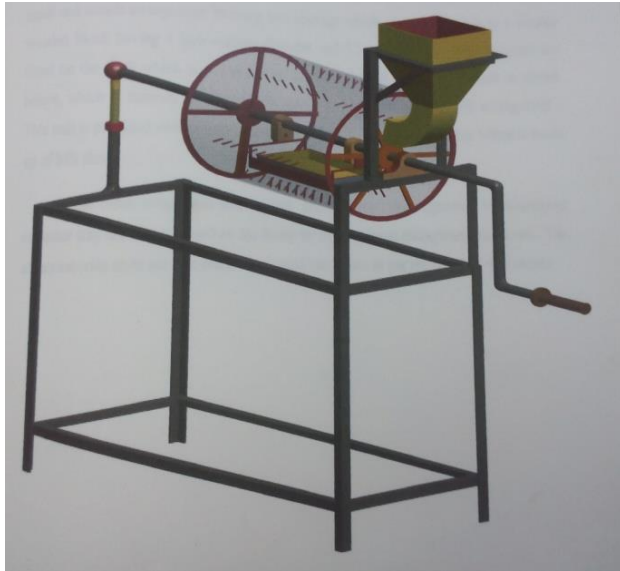


Fig.4 VERMICOMPOST SEPERATION MACHINE

ADVANTAGES

- 1) Easy feed shoot that can shovel to tip lug trays,
- 2) Output of m/c is 5-7 kg per min of separated manure
- 3) Multiple back angled spikes ensure near 100% hook up
- 7) One man operated only two trays needed, one fore cast & one for worm
- 8) Easily driven hand crank feed shoot end.
- 9) No worm death or loss from stress. Falling or light worm recovered in drum.
- 10) Worm collecting trays are easily slid able in the angle frame.
- 11) Can be used on dry & wet cast
- 12) Drum simple lift off

FUTURE SCOPE & DEVELOPMENT

- 1) The m/c presently is hand operated which modified into power drive by installing motor for driven in drum
- 2) Feeding of manure is done by the labor; we can also make the system for automatic feeding the manure
- 3) The weight of the m/c can be reduced for the same capacity.
- 4) For adjusting indication, adjusting size of the drum. Capacity of the m/c can be increased.

CONCLUSION

The vermicompost separator makes easy separation of worm from manure without hurting & injuring them. The

m/c is very economical & hence affordable to any vermicompost producing unit & farmer who produce vermicompost. It is easy to fabricate the m/c has less no. of moving parts & less maintenance is required & m/c is more durable. A successful attempt was made to make an m/c which would help separate the worms. m/c gives satisfactory results. Still there is a wide scope for further development.

REFERENCE

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