

Project Reference Number: 46S_BE_3921

EVALUATING THE SEMI -AUTOMATIC OF ORAGNIC MANURE COMPOSTING MACHINE



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(APPROVED BY AICTE, NEW DELHI)**



Department of Mechanical Engineering
Project Synopsis on

SEMI -AUTOMATIC OF ORAGNIC MANURE COMPOSTING MACHINE

Mechanical Engineering

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Guide

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2022 – 2023

Introduction

The management of agricultural waste is a challenge for sustainable farming. Cow dung, a byproduct of livestock farming, can be converted into organic manure through composting. Traditional methods are labor-intensive and lack control, hindering widespread adoption. However, specialized composting machines have emerged, addressing these limitations. These machines provide controlled conditions for decomposition, automate turning and mixing, and reduce odors. They produce high-quality compost, rich in nutrients, improving soil fertility and water retention. Farmers can reduce reliance on synthetic fertilizers and promote sustainable practices. Overall, these machines enhance waste management, agriculture, and environmental sustainability.

Literature review

The Composting methods has been received more attention due to pollution and in organic plantation. Dumping in fertile land may cause permanently infertility in land. The paper reviews information on the composting techniques for conserving environmental factor

Tom. L. Richard :- the idle way to produced compost is by proper mixing. The step-by-step process has to been done to make good system of composting.

Santosh More :- this describes the composting process explains how decide various compost mixes

Objectives

The primary objective of the cow dung to organic manure composting machine is to provide a highly efficient and effective system for converting cow dung into nutrient-rich compost. The aim is to enhance microbial activity, accelerate decomposition, and promote the efficient breakdown of organic matter. Automated turning and mixing mechanisms, aim to simplify the composting process and minimize labour requirements. The composting machine is to contribute to waste management practices by efficiently utilizing cow dung, reducing the environmental impact of waste disposal. Machine aims to be scalable and adaptable to varying farm sizes and requirements. The objective is to encourage farmers and waste management systems to adopt sustainable waste management practices and realize the potential of cow dung as a valuable organic resource.

Methodology

Materials -

Screw Conveyor & Housing-Sheet metal,

Shaft-mild steel,

Frame-mild steel,

Bearing-Stainless Steel,

Gear-Alloy steel,

Motor-dc motor

Methods –

1) Dewatering Section: Using a hopper, cow dung will be added to the dewatering section. Dewatering will take place in a housing where a rotating screw conveyor will remove the water from the cow dung.

2) Cow dung will be sent to the next section once the water content has been removed from it using a screw conveyor.

3) Mixing Chamber- Once the cow dung has entered the mixing chamber, all other trash, including household, garden, and agricultural waste, as well as a small amount of soil, will be added, and it will be mixed thoroughly with the aid of a stirrer.

Details of Work progress

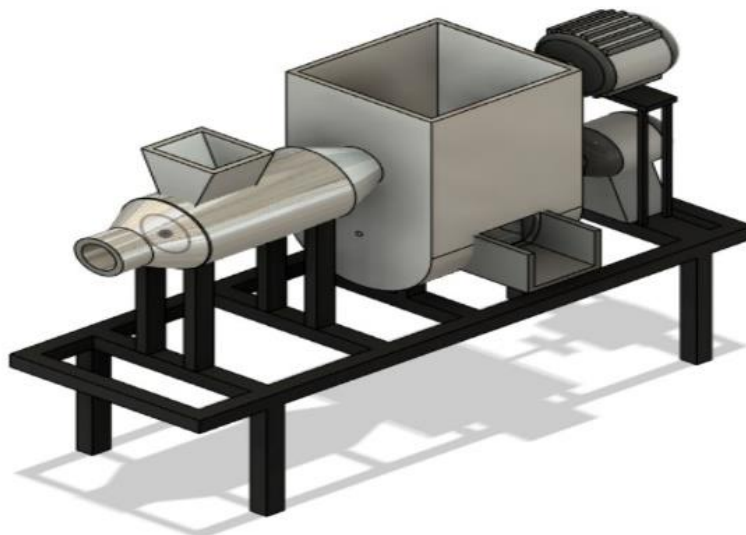


Figure 1 ISOMETRIC VIEW

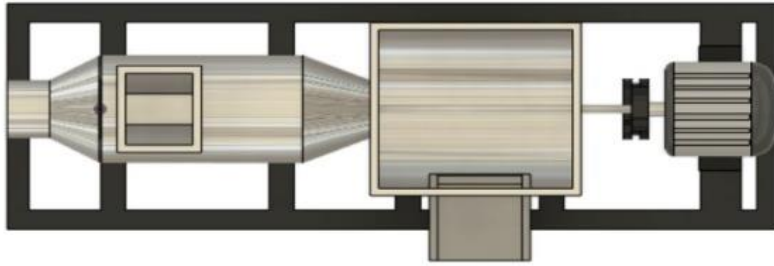


Figure 2 TOP VIEW

1. Design calculations for machine is completed
2. Designed the model in CAD.
3. After that market survey and cost estimation is done
4. Fabrication is under process which is about to complete. Where below images shows the components of machine used to fabrication.



Figure 3 Screw conveyer



Figure 4 Bearing and Bracket



Figure 5 Bearing



Figure 6 Dewatering Housing

Results

Semi-automatic manure composting machines utilizing cow dung offer several benefits. They streamline the composting process, reducing labor requirements. These machines provide controlled conditions, optimizing decomposition and accelerating compost production. Odor control mechanisms minimize unpleasant smells. They contribute to efficient waste management by converting cow dung into valuable compost. The nutrient-rich compost improves soil fertility and agricultural productivity. Semi-automatic machines save time and effort, automating turning and mixing. They promote environmentally friendly practices by repurposing waste. The resulting compost enhances soil structure, water retention, and crop yields. Overall, these machines offer labor savings, optimized conditions, waste reduction, and improved soil health.

Conclusion

In conclusion, semi-automatic manure composting machines utilizing cow dung offer a viable solution for efficient waste management and sustainable agriculture. These machines streamline the composting process, reducing labor requirements and optimizing decomposition conditions. They contribute to waste reduction, producing nutrient-rich compost that enhances soil fertility and agricultural productivity. With their odor control mechanisms and automated features, these machines promote environmentally friendly practices. Overall, they provide a practical and effective solution for converting cow dung into valuable compost, supporting sustainable farming practices and environmental preservation.

Scope for future work

The future scope of work for semi-automatic manure composting machines using cow dung is promising. Further advancements can be made to enhance automation and control systems, improving efficiency and optimizing composting conditions. Research and development efforts can focus on developing compact and scalable machines suitable for various farm sizes. Integration of renewable energy sources can reduce operational costs and environmental impact. Additionally, exploring innovative techniques to capture and utilize byproducts, such as biogas generation, can maximize the value and sustainability of the composting process.