

Compost Making Machine

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Abstract

Compost making machines are an important tool for reducing the amount of waste that is sent to landfills. By composting organic waste such as food scraps and yard trimmings, composting machines can create a nutrient-rich soil amendment that can be used to fertilize garden beds, lawns, and houseplants. Composting also helps reduce pollution from methane emissions, which are generated when organic waste decomposes in landfills. Additionally, composting can help preserve vital topsoil, which is being depleted due to intensive farming practices and urbanization. Composting machines are a cost-effective and sustainable way to reduce environmental impacts and create a valuable soil amendment. The present work deals with a composting machine that can help us preparing the manure and at the same time the waste being treated effectively maintaining the environmental friendliness.

Keywords: Compost, Waste, Biodegradable, Environmental Friendliness.

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1. INTRODUCTION

Composting is an age-old method of recycling organic waste and is considered to be one of the most sustainable routes for processing biodegradable waste in India. Composting is an efficient and economical way to reduce the amount of organic waste that ends up in landfills. The process of composting involves breaking down organic material such as food scraps, yard clippings, and other biodegradable waste into a nutrient-rich soil amendment. Composting helps to reduce the amount of organic matter in landfills and also provides an ideal environment for beneficial microorganisms to thrive. Composting can be conducted in both small and large scales to manage biodegradable waste. At the household level, composting can be conducted using a compost bin or other composting equipment. Commercial composting facilities are also available in India where larger volumes of organic waste can be processed. Composting is also beneficial for farmers as it can be used to enrich soil and increase crop yields. Composting is a sustainable way to manage biodegradable waste and can help to reduce the amount of waste that is sent to landfills. Furthermore, composting can help to reduce greenhouse gas emissions and improve air quality [1]. Composting is a

process used to convert organic matter into a form that is more useful for gardening and soil amendment. The process involves the breakdown of organic matter by microorganisms, resulting in the production of a nutrient-rich material that can be used to fertilize soil and improve plant growth. Composting technologies have come a long way since the traditional static heap composting method.

The current range of composting technologies includes a variety of advanced systems such as aerobic composting, vermicomposting, anaerobic digestion, and in-vessel composting. Static heap composting is the simplest and most inexpensive method of composting. It involves piling organic matter in a heap and allowing it to decompose over time. This method is not very efficient, as it relies on natural processes to produce compost. The main benefit of this method is that it does not require additional energy or equipment to operate. However, it can be slow and may result in an inconsistent quality of compost. Vermicomposting is an advanced form of composting that uses worms to break down organic matter. The worms consume organic matter and excrete a nutrient-rich material that can be used to fertilize soil [2].

The potential for on-farm composting and compost-based tea application to improve soil quality and plant health in horticultural intensive farming systems. The authors review the literature on the effects of compost tea application on soil fertility, crop yield and quality, and consider the potential of on-farm composting to reduce agricultural waste and promote a circular economy. The authors find that compost tea application has the potential to improve soil fertility, increase crop yield and quality, and reduce the use of chemical fertilizers. The authors also note that on-farm composting has the potential to reduce agricultural waste and promote a circular economy. The authors conclude that on-farm composting and compost-based tea application can be effective strategies for improving soil quality and plant health, reducing agricultural waste, and promoting a circular economy. They suggest that further research is needed to better understand the long-term effects of compost tea application in horticultural intensive farming systems. Overall, this review provides a comprehensive overview of the potential of on-farm composting and compost-based tea application for improving soil quality and plant health in horticultural intensive farming systems [3].

A combined assessment of the energy, economic and environmental issues associated with on-farm manure composting processes in two case studies in the south of Italy. The authors conducted two case studies, one in Foggia and one in Potenza, in order to gather data on the energy, economic, and environmental impact of on-farm composting of animal waste. The authors found that the energy, economic and environmental performance of the two case studies vary significantly due to differences in the composting system, size of the farm, and local environmental conditions. The authors concluded that on-farm composting of animal waste can provide a viable solution to reducing the environmental impact of livestock production.

The authors suggest that further research is needed to identify the most effective and cost-effective composting systems for different farm sizes and environmental conditions. Overall, this paper provides a comprehensive analysis of the energy, economic and environmental issues associated with on-farm composting processes. The authors have presented a thorough picture of the energy, economic and environmental performance of two case studies in the south of Italy. The authors have also made several key recommendations for improving the efficiency of on-farm composting of animal waste. This paper provides an important contribution to the literature on energy [4].

Moringa oleifera is a multipurpose tropical plant native to India, Pakistan, Bangladesh and Afghanistan. Its leaves and seeds have many nutritional

and medicinal advantages. This plant is also known as drumstick tree or horseradish tree due to its long, slender seedpods. The leaves are rich in iron, calcium, amino acids, vitamins A, B, and C, and other nutritional components. The antioxidant properties of *Moringa oleifera* help to protect against oxidative stress and damage from free radicals.

Compost is a combination of organic materials that are broken down by bacteria and fungi to create a nutrient-rich soil amendment. Compost improves soil structure, increases water-holding capacity and adds organic matter to the soil. It can also aid in weed suppression and pest control. NPK fertilizer is a combination of nitrogen, phosphorus and potassium. These three nutrients are essential for healthy plant growth. Nitrogen helps plants produce proteins and chlorophyll, which are necessary for photosynthesis. Phosphorus helps plants absorb energy from the sun and encourages root growth. Potassium helps plants absorb and use water and nutrients, and it also helps regulate the growth of plants [5].

The physical contaminants present in soil that has been treated with mixed waste organic outputs and garden waste compost can have a wide variety of sources. The most common physical contaminants found in this type of soil include plastics, metals, glass, and other debris. The presence of these contaminants is often due to the improper management of the waste material, as well as the soil itself. Additionally, the presence of these contaminants can be caused by the application of excessive amounts of fertilizer, pesticides, or other chemicals.

The physical contaminants found in soil that has been treated with mixed waste organic outputs and garden waste compost can vary greatly depending on the specific source of the contaminants. Generally, plastics are the most common type of physical contaminant found in this type of soil. Plastics are often introduced into the soil through the improper disposal of plastic packaging, such as bottles and containers. In addition, plastics can be introduced into the soil through the leaching of chemicals from agricultural operations or other industrial activities.

Metals are also commonly found in soil that has been treated with mixed waste organic outputs and garden waste compost. Metals can be introduced into the soil from the leaching of chemicals from industrial processes, such as mining and smelting operations [6]. Urban soils are often subject to soil compaction due to the large amount of traffic and other human activities. This soil compaction can lead to various problems such as reduced water infiltration, increased runoff, and decreased soil fertility. The use of compost is one potential solution for these issues. Compost is a form of organic matter that has been decomposed and can

provide many benefits to soils, including improved soil structure, increased water infiltration, improved nutrient cycling, and improved soil fertility. This review focuses on the effects of compost incorporation on soil physical properties in urban soils.

Studies being conducted in Europe and North America. The results of these studies show that compost incorporation can have a positive effect on soil physical properties such as bulk density, porosity, aggregate stability, and soil water retention. Compost incorporation also appears to increase the levels of organic matter in the soil and can improve soil fertility. Overall, this review suggests that compost incorporation can have a positive effect on soil physical properties in urban soils. However, there is a need for further research to fully understand the effects of compost incorporation on different soil types and in different climates [7]. Microbes are becoming increasingly important in the composting of solid waste. They are responsible for the breakdown of organic materials, which can be used to produce nutrients for plants.

Composting is an effective way to reduce the amount of solid waste that is sent to landfills, as well as to produce valuable fertilizer for crops. Microbes play an essential role in this process, as they are responsible for breaking down the organic material and releasing nutrients that are beneficial for plant growth. Microbes also help reduce the amount of greenhouse gases produced during composting, as they produce carbon dioxide, which can be used to trap heat in the atmosphere and prevent it from entering the environment. By using microbes as an additive to compost, the process can be made more efficient and beneficial. Microbes help to speed up the breakdown of organic material, allowing the compost to be produced faster.

This can help to reduce the amount of time required to create a usable compost product. Additionally, the use of microbes can help to reduce the amount of odor produced during composting, as the microbes can break down the organic matter more quickly. Overall, the use of microbes as an additive for solid waste composting is a great way to make the process more efficient and beneficial [8].

Making a compost making machine is a great way to reduce waste and create a more sustainable lifestyle. There are many different designs and styles available, ranging from simple hand-cranked machines to complex automated systems. The most important factor when selecting a machine is how it will be used and how much compost you want to produce. If you only need a small amount of compost, then a hand-cranked machine is probably the best option. If you want to produce large amounts of compost, then you

may want to invest in an automated composting system. The benefits of a composting machine are numerous. Composting helps reduce the amount of organic waste that goes into landfills and can help you create nutrient-rich soil for your garden. It can also reduce the amount of water and energy used to create compost and helps to reduce the amount of methane gas released into the atmosphere. Overall, attempting to make a compost making machine can be a rewarding endeavor. With the right design and use, you can produce large amounts of compost and reduce the amount of organic waste that goes into landfills.

2. PROBLEM STATEMENT

We need a compost making machine that can quickly and efficiently convert organic waste into compost. This machine should have the capacity to process a high volume of organic waste on a regular basis and produce a large amount of compost for use in gardens and farms. Additionally, the machine should be user-friendly, easy to operate, and require minimal maintenance. It should also have features that make it energy efficient, cost-effective, and efficient in its composting process.

3. OBJECTIVE OF THE PROJECT

The following are the objectives of the project in compost making machine:

- To develop a machine this prepares the manure within 24 hours.
- The volume of weight of waste treated.
- Selecting and recovering dry materials to be send for recycling.
- Make the machine as energy efficient as possible.
- To develop a machine that is economically affordable by the formers.
- To make user friendly machine.

4. METHODOLOGY

The methodology of this project is divided into four main phases is as follows:

- **Phase I: Literature Survey:** Tasks: Collecting research papers, Journals. (We collected the details of the papers and journals as per our requirement of the project).
- **Phase II: Problem Description:** Tasks: Problem Description, Project Approach. (We have to identify the problem and list the objectives of the project).
- **Phase III: Machine Design:** Tasks: Designing, CAD Model, Design Calculations. (We have designed the model using the software Auto CAD and CATIA and 3D model is prepared according to the dimensions).
- **Phase IV: Outcomes & Conclusions:** Tasks: Advantages and disadvantages of the machine, checking the performances, report writing. (We

have looked out for the pros and cons of the machine, and check its performance, and finally report writing is done)

5. Concept Generation & Selection – Compost Making

A compost making machine can help make composting easier and more efficient by automating the process. This can reduce the labor involved, as well as the time it takes to produce compost. Additionally, this type of machine can help to ensure that all the necessary components of a successful compost pile are present, and that the compost is produced in a consistent,

uniform way. This can make it easier to use the compost in gardening and farming projects. Composting with a machine can also help to reduce odors from the compost pile and can help to discourage pests from gathering in the compost pile. Ultimately, a compost making machine can help to make the composting process easier and more efficient, leading to a healthier environment and better soil for gardening and farming. The block diagram of Compost Machine is shown in the figure 1, these shows how machine works, and it also shows the main component of the machine and the parameters controlling the machine.

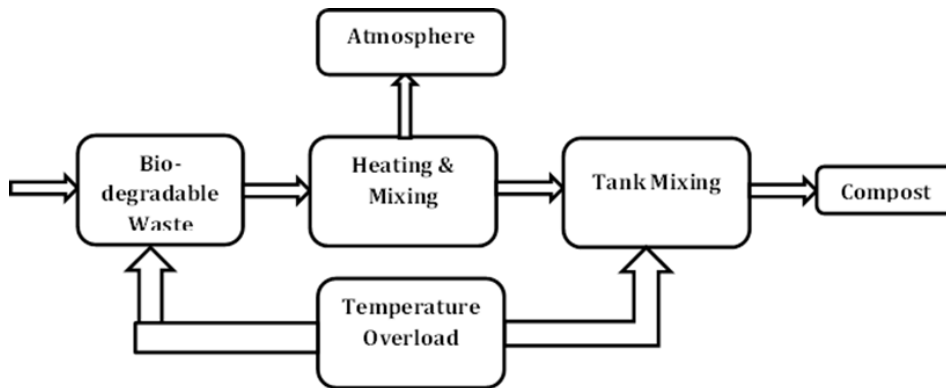


Figure 1: Concept of Compost Making Machine

6. Drafting Part

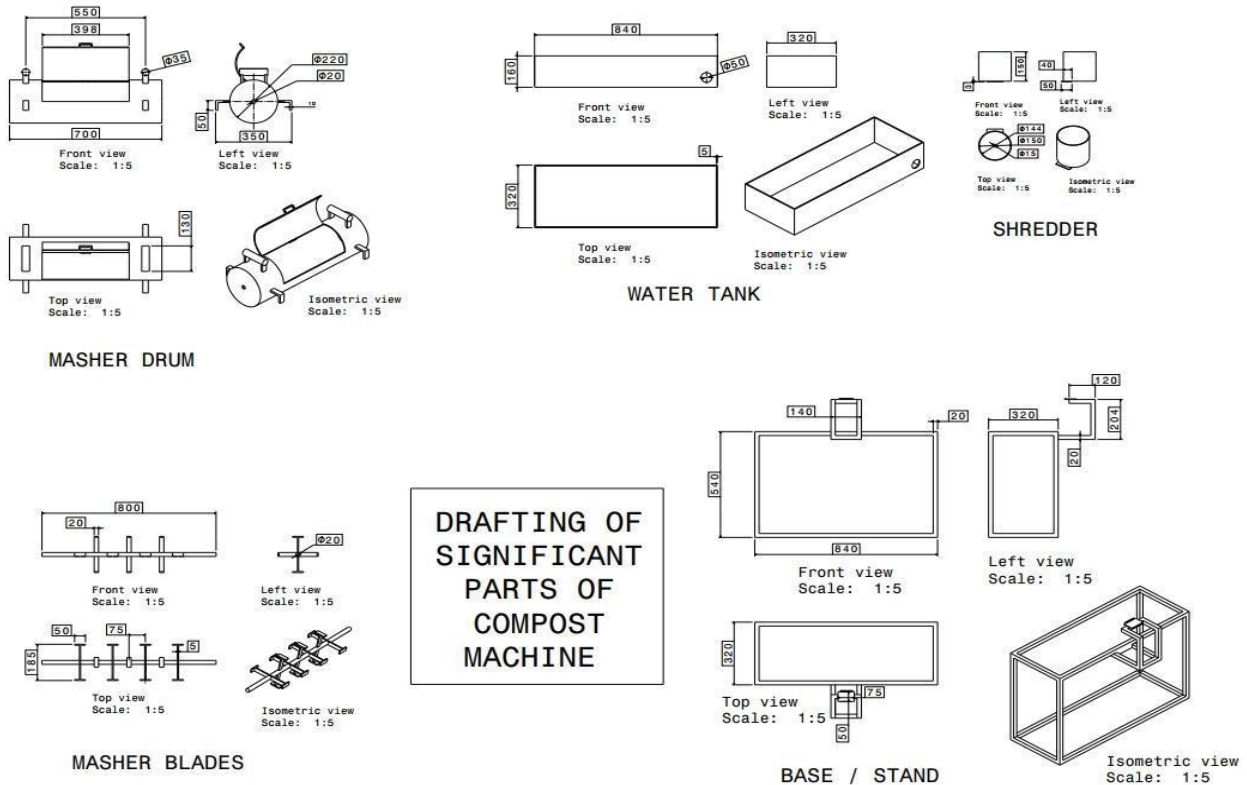


Figure 2: 2D Drafted Mode of Compost Machine

7. Working Process - Compost Making Machine

The organic compost machine is shown in the figure 3, different natural wastes are used convert it into organic manure quickly.

1. Composting machine consists of a composting drum is fabricated with in such a way that it has a cylinder mounted on a frame.
2. Inputs in the form of natural wastes with the known quantity of additive will be feed from outside into the shredder into the drum.
3. Cylinder (outer) holds a box at its sides. The heating coil is mounted along with it for processing.

4. The water in the tank is heated with the help of a coil and the temperature is regulated with the help thermostat and steam produced from it helps to dry moisture from the organic waste.
5. A central screwed shaft fitted in the centre of the drum is made to rotate inside the drum which is driven by the 0.5 geared motor (30 to 60 rpm).
6. The mixer helps to mix the organic wastes with in the inner casing of the drum.
7. Continuous shredding, mixing followed by drying activities over a period of time helps to achieve proper manure.

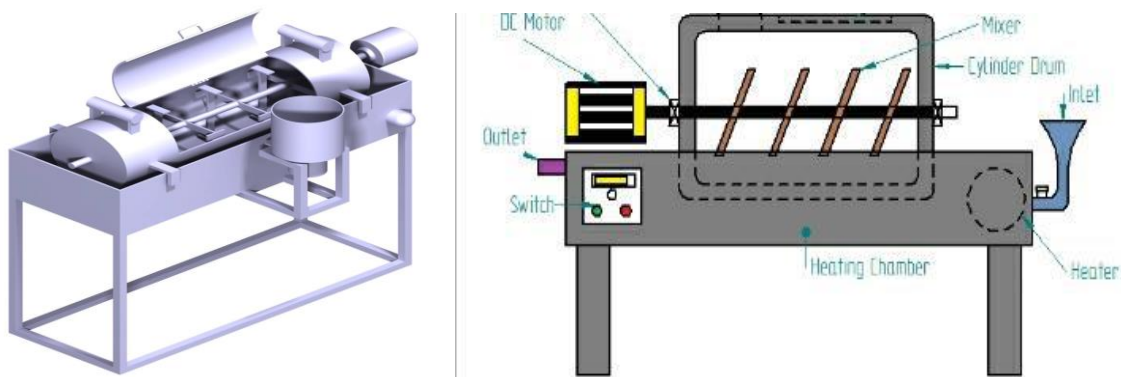


Figure 3: Compost Making Machine

8. Advantages

- Machine comes is user friendly and lot of time can be saved for the farmers.
- This machine can reduce the organic wastes which are easily being dumped.
- It increases the yield of the crops.

CONCLUSION

An attempt is made to develop a compost making machine that can help farmers in preparing the organic manure at very cheaper cost using the machine. The working of the machine is easy to understand, so that an unskilled labor can operate it minimal knowledge on the machines. Overall, the compost making machine will help to solve some problems of farmers in preparing organic manure out of unwanted organic wastes collected from various resources.

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