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"Design & Development of Organic Fertilizer Machine for Processing Food Waste"

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Abstract - *This paper reviews utilizations of food waste for composting. Increasing of food waste causes lose of resources and increase environment risk in this condition composting is most appropriate solution to overcome the problem due to food waste. From research around 1.54 billion tons food waste per year (2013). If we can't control this problem then it may break and forms methane gas which is 25 times more dangerous than carbon dioxide, which cause to greenhouse effect and produce global warming therefore transforming food waste into organic fertilizer we mitigate this problem. This paper shows the methodology for design and fabrication of organic waste composting machine to obtain organic fertilizer, easy to use, odorless and the production of organic fertilizer was only within one day or less with low cost.*

Key Words: Food waste, Organic fertilizer, Composting machine, Powders, Chemical fertilizer

1. INTRODUCTION

The presence of food waste in large quantities create burden on environment. Food waste cause energy losses and many environmental Impacts. On average in India Rs 244 crore food waste per day and Percentage of total food wasted a year 40% hence reducing the amount of food waste its send to the landfills is best way to overcome this problem. Food is an additional material in the production of fertilizer, which gives benefits to environment, economy and waste stabilization. This can be achieve through composting. composting is one of the best technology to recycling food waste into organic fertilizer. organic fertilizer improves soil fertility and maintain moisture content off the soil [1].organic fertilizer produce gases like nitrogen, potassium and phosphorus which is beneficial for plantations and provide nutrients roots.

Food wastes are mostly generated in homes, institutions(e.g. schools, camps, industries e.t.c) these waste must be removed to provide a clean and healthy environment. These can be achieved through use of composting to manage the food waste problem[2]. fruits ,vegetables, dairy product meats and news paper can be composted .thus composed is well decomposed organic waste like plant residues[3]

2. LITERATURE REVIEW

Vivek Saini Based on literature review, composting is the best way to reduced or recycle the municipal waste and it causes less pollution and more beneficial to the environment as well on the economy when compared to current strategies of waste disposal into open dumps. The compost has a lot of benefits like:, reduce surface and water leachates, minimize landfill space, methane emissions, air pollution from burning waste, transportation costs etc. Compost will be used as plant food organic fertilizer plant food in agriculture field in situ of chemical fertilizer. However, the composting method and compost quality will be improved by adding poultry manure, cow manure, yard waste etc. Finally, it's ended that composting is that the best methodology to cut back or recycle the Municipal Waste and conjointly helps in agricultural field wherever the compost is beneficial for growing crops and vegetables with the assistance of compost and it conjointly increase the use. It also decreases the rate of pollution from landfills and opens dumping.

Oladapo T. Okareh Based on literature review Production of organic fertilizer from food wastes is an effective environmental sanitation and appropriate resource recovery strategy. The developed technique created thrice gas content of the compost created by alternative ways (1% to 2%) and this is often economically useful to farmers.
The technology may be applicable in numerous food handling premises, restaurants, institutions, religious camps and sporting camps such as Olympic and commonwealth games camps. Organic fertilizer created from waste matter or organic wastes at industrial level could be a live of promoting waste to wealth program in Federal Republic of Nigeria and alternative developing countries.

Ajinkya S. Hande Based on literature review, methodology for design and fabrication of portable organic waste chopping machine to obtain compost with the related search. The study specifies factors influencing the organic waste chopping process and recommends a number of design options for chopping machine. These are based on a systematic study of the organic waste chopping process and testing of a portable model of chopping machine. For which we have a tendency to take into account literatures reviews them area unit explained. The main conclusion are drawn decide whether or

not it's potential to automatize a talented manual method which might avoid employee fatigue. Also the long run scope for developing the generalized mechanism for any profile will be known.

Ijagbemichristiana.o Based on the design, and fabrication of an effective composting machine for small-scale agricultural processes is achievable using local content materials and indigenous technology. The efficiency of the machine is at a value above average, further research can be carried out to improve the existing design. Furthermore, the design aim and objectives were achieved. The machine can thus be said to have appropriate technology for efficiency in output, and if further research is carried out on the study, the quantity of output and time of operation can be improved upon. With the machine, composting time and cost of purchasing manure will be saved on a long term basis, while agricultural practices and machine fabrications using indigenous technology will be encouraged.

Abira Mukherjee based on the present studies suggest a comparative study of different approaches taken so far for kitchen waste management. Here different degradation techniques are highlighted where the parameters are controlled effectively in order to have a useful by-product. The major challenges in bio-gas, H2, organic acids etc. produced from wastes are their low yield rates. Large volumes of reactors area unit required for manufacturing them to beat their low production rates. By choosing and applying a lot of competent organisms, finding improved process strategies, optimizing the ecological conditions and rigorous management of experimental parameters results in improved yields and production rates.

Swapnesh H. Bhaisare study based on the The organic compost machine helps to improve composting and decreases the cost required for degradation, segregation, and transportation etc. of the waste. The flexibility is increased and the total volume of organic waste is minimized. Also the quality of the compost is depends upon factors such as moisture content, pH, temperature, time etc.The study is done to evaluate the performance of compost machine. The proper management of temperature and humidity is important. The aim is to decrease unscientific land filling, segregation of waste and to increase quality of compost or manure

3. CONCEPTUAL DESIGN

Functions of the machine:-

1.Provide warning labels to ensure that customers are using the machine safely.

2.Have an attractive design to encourage recycling

Fig .1 The conceptual design

Two powders are used in this process

1. Sanitreat :-
This powders help the converters to do composting easily Sanitreat is free flowing light brown powder . it is non-hazardous mixture of Minerals and herbal components that control the putrefaction process of Organic waste materials.

2. Bioculum:-
It is another mixture of micro organism cultures that accelerates the aerobic composting of bio degradable organic waste . it treats the waste and makes it free from pathogens , foul smells and weed seeds. Bioculum free from any toxic or hazardous components

4. CONCLUSIONS

We conclude that atomize machine is better option to shred the organic waste instead of using manual operated shredder. In this we designed the machine by considering the various factors into consideration. The machine is made for small businessman, therefore the work carried out by these machine is less.

The following are the important points drawn from our work

1. Machine cost is less compared to other shredder machine.
2. Blades can be easily removable.
3. Easy to assemble and disassemble.
4. Highly skilled labors are not required.

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