



FERTILIZER INGREDIENTS MAKER BY BIODEGRADABLE WASTE

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ABSTRACT:

The type and quantity of Fertilizer Balancing Ingredients Maker By Biodegradable Waste are important factors for determining how these wastes should be handled, managed, and used. This paper investigates the effect of different living styles on the type of generated municipal solid waste (MSW). The forecasting model by using along short-term memory (LSTM) along with deep learning time series forecasting (DLTSF) network was used for AI-basaten MSW. The forecasting model was trained, validated, and tested on the real-life data set of the sorted and weighted waste from each zone.

Recent research has started to show the key role of daily food provision practices in affecting house hold food waste. Building on and extending these previous contributions, the objective of this paper is to investigate how individuals' every day practices regarding food (e.g., shopping, cooking, eating, etc.) lead to food waste, and how policy makers and the food industry can implement effective strategies to influence such practices and ultimately help consumers reduce food waste.

This part of the thesis will be the most widely published and most read because it will be published in Dissertation Abstracts International. When a reference is necessary, its details should be included in the text of the abstract.

Keywords: Waste, Micron, Blade

INTRODUCTION :

In the quest for sustainable agriculture and environmental stewardship, the utilization of biodegradable waste as a source of fertilizer ingredients represents a promising avenue. This innovative approach not only addresses the pressing issue of waste management but also offers a valuable resource for enhancing soil fertility and crop productivity. In this context, the development of a "Fertilizer Ingredients Maker" specifically designed to process biodegradable waste into high-quality fertilizers emerges as a transformative solution. Fertilizers play a pivotal role in modern agriculture by providing essential nutrients to crops, thereby optimizing their growth and yield. Traditionally, fertilizers are categorized into three main types: organic, inorganic, and mineral. Organic fertilizers, derived from natural sources such as animal manure, compost, and plant residues, are esteemed for their ability to improve soil structure and nutrient retention while promoting microbial activity. In contrast, inorganic fertilizers consist of synthetic compounds manufactured through chemical processes, offering precise nutrient concentrations tailored to crop requirements. Mineral fertilizers, comprising naturally occurring minerals like phosphate rock and potassium salts, provide essential elements essential for plant growth.

The ingredients used in fertilizer production vary depending on the type of fertilizer being manufactured. Organic fertilizers typically incorporate biodegradable waste materials such as food scraps, yard trimmings, and agricultural residues. These organic inputs undergo decomposition, yielding nutrient-rich compost or liquid extracts that serve as potent fertilizers. Inorganic and mineral fertilizers, on the other hand, are synthesized from chemical compounds containing nitrogen, phosphorus, potassium, and other essential elements. These ingredients are carefully formulated to ensure optimal nutrient availability and plant uptake.

The process of producing fertilizers from biodegradable waste involves several key steps. Initially, the waste materials are collected and sorted to remove contaminants and non-biodegradable components. Subsequently, the organic matter undergoes decomposition through composting or anaerobic digestion, facilitated by microbial activity. This biological breakdown transforms the waste into a nutrient-rich substrate suitable for fertilizer production. Depending on the desired fertilizer type, additional ingredients such as mineral additives or microbial inoculants may be incorporated to enhance nutrient content and efficacy.

The "Fertilizer Ingredients Maker" represents a compact and efficient system designed to streamline the conversion of biodegradable waste into high-quality fertilizers. By harnessing advanced technologies such as composting, enzymatic digestion, and nutrient enrichment, this innovative device enables the sustainable utilization of organic waste streams while generating valuable resources for agricultural use. With its scalable design, the "Fertilizer Ingredients Maker" can accommodate varying volumes of waste inputs, offering flexibility for small-scale farms, urban gardens, and larger agricultural operations alike.

In summary, the integration of biodegradable waste into fertilizer production holds immense potential for promoting agricultural sustainability and resource efficiency. Through the development of innovative technologies like the "Fertilizer Ingredients Maker," we can harness the inherent value of organic waste to nourish soils, support crop growth, and foster a more resilient food system for future generations.

METHODOLOGY :

Different Type Of Blade: - The three types of blades we used helped us understand how much variation in garbage material would occur when we change the design of the blade.

Type of Blade is as follow:

- I. knife edge blade
- II. Teeth blade
- III. Combination of blade, knife and teeth together

Material Use :-

In this, we used steel in material form because steel has good strength and it never gets as hard as iron, and there is no problem of rusting in this material. You'll need more than your green thumbs and gardening gloves for managing your compost heap. Choose your preferred tools for working through your compost heap as it develops. A spade or digging fork in a size that suits your compost size advised.



Fig.1 Grind Garbage

Use Of Compost :-

- It can be used to seedling/sapling and plants of fruit crop, flower plants an vegetables.
- It can be used to vegetable seedbed for seedling production. Creating compost from domestic waste is a fantastic way to recycle organic matter and enrich your soil. Here's a simple experiment you can conduct to make compost using domestic Waste.

Materials Make To Use Compost Heap :-

- Meat or fish scraps (attracts rats)
- Dairy products
- Potato leaves (often contain diseases)
- Weeds that have gone to seed
- Cooked kitchen scraps (this attracts vermin)
- Thick branches(unless shredded)
- Diseased or insect infested plants
- Plants or wood treated with pesticides or preservatives
- Pet waste (although dog waste can be composted in a separate process)

Start Layering Your Gathered Materials :-

Begin with a layer of browns such as twigs and wood chips, followed by a layer of your nitrogen- rich materials. Make a lasagna of the carbon-rich and nitrogen-rich materials. If needed, add a little water to dampen the pile. Make sure your food scraps are covered by a good layer of dry leaves or other browns.



Fig .2: Use Of Garbage

EXPERIMENT :

Method of Compost Making:-

It sounds like you're interested in composting household waste to create fertilizer. Composting can be a great way to reduce waste and create nutrient rich soil. To get started, you'll need a large container or bin to hold the composting materials. You'll also need a mix of green materials (like food scraps and yard waste) and brown materials (like paper and cardboard) to create a balanced compost pile. For non-biodegradable waste, you'll need to be cautious and ensure that only Biodegradable materials are added to the compost pile. It's important to avoid adding materials like plastics, metals, and glass, as these will not break down and can contaminate the compost. To compost, you'll need to regularly turn the pile to aerate it and ensure that it stays moist but not waterlogged. Over time, the materials will break down into compost that can be used to fertilize plants. It's a great way to reduce waste and create a valuable resource for your garden.

Define Project Scope and Objectives :-

Project Scope: The project scope for the compost maker by domestic waste includes defining the boundaries and deliverables of the initiative. This involves outlining the specific tasks, activities, resources, and timelines required to develop and implement the composting system. The scope should encompass aspects such as the type and quantity of domestic waste to be composted, the technology or methodology to be employed, the scale of the operation (e.g., household, community), and any regulatory or environmental considerations.

Material Selection and Procurement:-

Selecting and procuring materials for composting can vary based on the composting method and the type of waste you're managing. For composting non-biodegradable waste into fertilizer, consider. Collect biodegradable waste such as kitchen scraps (fruit and vegetable peels, coffee grounds, etc.), yard waste (leaves, grass clippings), and other organic materials Choose a composting bin suitable for your space and needs. There are various options, including tumblers, bins, or even DIY setups using pallets or containers.

Table – 1: Specification Of Project

Component	Material	Dimensions	Cost(in Rupee)
Motor	AC	750rpm	1400
Bucket	Steel	10ltr	500
Blade sheet	Steel	19.05cm	150
Nut and Bolt	Iron	11mm	120
Shaft	Steel	17.78cm	450

Fabrication Process: -

To make the blade, first, we measured it. Then, we cut the blade using a grinder. After that, we performed the drilling process on it. Finally, we ground it for surface finish. Material we use steel, the strength is good. Then, we used a grinder to cut the teeth on it. After that, we drilled into the blade, and finally, we used a grinding machine to achieve the desired surface finish.

Assembly and Integration :-

First, we fixed the coupler in the jar of the mixer, with the rotation facing in the anti clockwise . Then, we attached the shaft to it using nuts and bolts. Next, we attached blades to the shaft, each fixed with a nut and bolt. We then fixed this assembly into a bucket. After that, we mounted the bucket and mixer together, partially fixing them with nuts and bolts on a steel plate. Now, our compost maker is ready.

Table-2 : Equipment's Used To Compost

Sr. No.	Different type of Parts and Components	Fig. No.
1	Use of Blade Material	Fig:3
2	Knife Edge Blade	Fig:4
3	Teeth Edge Blade	Fig:5
4	Combination of Knife and Teeth Edge Blade	Fig:6
5	Used of Shaft	Fig:7
6	Shaft in operation	Fig:8
7	Set of manure maker and Tilting Arrangement	Fig:9

**Fig 3: Blade Material****Fig 4: Knife Edge Blade****Fig 5 :Teeth Edge Blade**

Fig 6 : Combined Knife and Teeth Blade



Fig 7 : Blade making in process



Fig 8 :Shaft Used



Fig 9 : Set of manure maker and Tilting Arrangement

RESULT :**Table - 3: Different Case For Varying Time for1kg.**

Time(min)	Garbage Quantity(kg)	Material after grinding (mm)	Material size(micron)
1	1	0.1	100
2	1	0.05	300

3	1	0.03	400
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Table - 4: Different Case For Varying Time for Half kg.

Time(min)	Garbage Quantity(kg)	Material Size after grinding (mm)	Material Size (microns)
1	0.5	0.15	150
2	0.5	0.35	350
3	0.5	0.35	350

Table - 5: Different Cases for Variable of Blades

Serial no.	Quantity of Garbage (kg)	Type of Blade	Material Size (mm)	Material size (micron)
1	1	Knife edge Blade	0.05	50
2	1	Teeth edge Blade	0.1	100
3	1	Combination of Blade	0.3	300

1. As table 5.1 contains different case for different time for 1kg of Garbage. By taking the different time of 1, 2 and 3 min a fixed quantity 1kg of Garbage is grinded. By this the size of garbage we got is 0.1, 0.05 and 0.03 mm. or 100, 300 and 400 microns.
2. Similarly table 5.2 contains case for different time for ½ kg of Garbage. The similar time slot of 1 min difference is taken. The time of 1, 2 and 3 min were taken and fixed quantity of ½ kg garbage is used. The output of garbage size is 150, 350 and 350 microns or 0.15, 0.35 and 0.35 mm.
3. In table 5.3 the different set of blades were taken. It contains 3 set of blades which includes knife edge Blade, Teeth edge Blade and a combination of both the Blades. A fixed quantity 1 kg is taken for the all 3 set of blades the size of garbage obtained is 0.05, 0.1 and 0.3 mm or 50, 100 and 300 mm.

As the time increase for a fixed quantity of garbage a perfect size of material is obtained so the time is an important factor of mixing. By taking the small quantity of material does not effect to much it is almost similar rather much quantity gives good result in terms of size so the quantity garbage can be increased. The different types of blade plays a vital role in this mixing, the set of knife edge blade , teeth edge blade and combination of blade for a fixed quantity of garbage for a fixed time gives the different amount of size for garbage.

The fertilizer ingredients mechanism become popular and we have to been addition some substance and first of all we can used quantity of garbage and time consuming and grind a substance and resulting in time period to home composting . It is also applicable for, Hotels, Restaurants, Canteens, Stadiums, Parks, Hospitals, Schools, Only biodegradable waste used to fertilizer ingredients more faster within the consuming level . While feeding waste into the machine, you need to make sure you are not putting plastics, construction materials, coconut t shells, wooden objects, metals, etc. into it. This may damage the machine

The Changing blade verity to more particle grind and fine to used in microns level is high and small particle use in fertilizer easily. If you have not installed an organic waste composting machine, it is time to do so. We can get nature- friendly and turn waste into natural manure. The compost maker mechanism has become popular nowadays and is more preferred to home composting. It is also applicable for: Hotels, Restaurants, Canteens, Stadiums, Parks, and Hospitals. The fertilizer ingredients maker utilizing biodegradable waste would likely emphasize the benefits of this sustainable approach. It would highlight how such a process helps reduce waste, promotes environmental conservation, and creates a circular economy by turning waste into valuable resources for agriculture. Additionally, it would underscore the potential economic advantages, such as cost savings and market competitiveness, while also emphasizing the importance of continued research and innovation in this field to optimize processes and maximize benefits.

CONCLUSION :

It sounds like you're asking about composting or turning 1kg of garbage into fertilizer. As the compost the garbage is separated in biodegradable and non biodegradable waste. In biodegradable material contains food scrape, paper, yard waste etc. By doing so we get the best and sustainable quantity of garbage for making compost. By taking the different cross for different size of garbage as compost. But by increasing the time only we get the more fine size so time can be one of the important factor for mixing. By changing the blade type we can achieve drastic change. By knife edge blade we can achieve size up to 0.05 micron. As the size of garbage is reduced it is much easier to achieve good result of compost and in short open time so by changing the type of blade to teeth we have achieved good result.

They can be commonly found in municipal solid waste as green waste, food waste, paper waste, biodegradable plastics, etc. If not properly managed they could become sources of environmental pollution, resulting in sicknesses and diseases and possibly death to humans and other living organisms as well. There are various steps by which biodegradable waste could be managed such as the collection, transport, treatment, and eventually waste disposal. Biodegradable waste is not accumulated but is used up in a short time, they become part of biogeochemical cycles and give back rapid turnover. They can be used to produce renewable waste as a bio-energy resource (for instance biogas), manure, fertilizers, compost, and other substances after decomposition. every household self-sufficient, we can bet on an array of benefits. The growing awareness about sustainability and government initiatives push ordinary people to start composting at the ground level. Eco-friendly waste management is a reality today with waste composting machines and new technologies, making the future sustainable and clean. Biodegradable wastes can be described as those wastes, whose source is typically of plant or animal origin. Sustainability is essential to make a healthy future. Waste composting machines enable every citizen to contribute to it. With the biodegradable waste converter, we can start composting the waste even at the household level.

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