REPORT ON INVENTIONS AND INNOVATIONS OF TRAPPING AND FERMENTING

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ABSTRACT

Food waste Crisis is a major challenge for humanity, especially due to the greenhouse gases produced by discarded food. If we continue to generate food waste, how can we manage and resolve this issue to prevent further climate impacts? The consequences of excessive waste contribute to global boiling, leading to extreme weather patterns such as El Niño, which has caused the Northern Hemisphere to experience its hottest temperatures in 170 years and accelerated ice melting by 6-7 times. Additionally, La Niña has triggered flash floods and unusual cold spells in many countries, including Thailand. This is just one part of a growing crisis that affects the environment, economy, and all life on Earth.

INTRODUCTION

As part of this effort, our team is committed to contributing to a low-carbon society. One of our initiatives is to repurpose leftover food waste from students at Varee Chiang Mai School into compost. This has led us to develop an innovative solution called "Trapping and Fermenting." This innovation combines technological and scientific knowledge to create a sustainable solution.

Trapping and Fermenting is an innovative process that filters food waste, captures fats, and ferments organic matter into compost. The fats collected through the filtration system are mixed with food waste for fermentation, while the filtered water is directed to a wastewater treatment facility before being safely released into the environment.

OBJECTIVES OF THE INNOVATION

1. To help reduce carbon dioxide emissions from food waste by converting it into compost, promoting reuse and sustainability. This aligns with the Sustainable Development Goals (SDGs), specifically Goal 13, which calls for urgent action to combat climate change and its impacts.

2. To extract fats from food waste and repurpose them as fertilizer for soil and plant enrichment

QUESTION

Does compost from food scraps increase the nutrients in the soil?

HYPOTHESIS

Adding compost from food scraps to the soil increases the soil's nutritional content.

ACKNOWLEDGEMENT

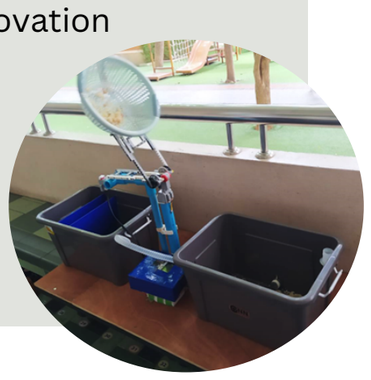
Food Waste Compost is a process of transforming food scraps from consumption or meal preparation such as leftover vegetables, fruit peels, coffee grounds, and other organic waste into valuable organic fertilizer. This compost can be used in agriculture to improve soil quality and support plant growth.

MATERIALS AND EQUIPMENT

1. Two plastic containers 2. Food waste filter basket
3. Motor 4. Control unit 5. Water faucet
6. Plastic pipes and recycled water pipes
7. Touch sensor 8. Acrylic sheet 9. Old LEGO parts

IMPLEMENTATION STEPS (DESIGN THINKING PROCESS)

1. Problem Identification and Understanding : The team analyzes environmental issues starting from local concerns.
2. Defining the Problem: } Creating an innovation
3. Exploring Various Solutions: }
4. Prototype Development : Make an innovation to solve the identified issue.
5. Prototype Testing: Evaluating the invention's effectiveness and making improvements.



FINDING

1. Testing the Food Waste Lifting Lever : Accuracy Result 100%
2. Testing the Compost Fermentation Bin: Oxygen was able to enter through the oxygen inlet of the bin.
3. The grease trap effectively captured fat from food waste and water was able to flow through the drainage outlet.

1. Soil that has not been mixed with food waste compost:
Nitrogen: Low level
Phosphorus: Moderate level
Potassium: Low level
2. Soil that has been mixed with food waste compost:
Nitrogen: Low level
Phosphorus: Fairly high level
Potassium: Fairly high level

CONCLUSION AND DISCUSSION

The Trapping and Fermenting system functions as intended according to the project plan. The testing process confirmed that:

1.The lifting mechanism effectively transfers food waste from the filtering basket to the composting bin.

2. The composting bin successfully accommodates and processes up to 5 kilograms of food waste.

3. The grease trap efficiently separates grease from food waste, allowing water to flow through the drainage system properly.

Summary of Soil Nutrient Test

The test results for nitrogen, phosphorus, and potassium in the soil indicate that the vegetable plot behind the school initially had low levels of essential nutrients for plant growth. However, after adding food waste compost and allowing it to decompose for 10 days, the soil's fertility improved. The levels of nitrogen, phosphorus, and potassium increased to a more suitable range for plant cultivation.

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