HYDROPONICS SYSTEM FOR KALE (*Brassica oleracea*) PRODUCTION USING VERMICOMPOST TEA AS NUTRIENT SOLUTION

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An Undergraduate Thesis Manuscript Submitted to the Faculty of the Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines in Partial Fulfillment of the Requirements for the Degree of

BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING
(Land and Water Resources Engineering)

JUNE 2023

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ABSTRACT

RAMIREZ, FRANCISCO IGNACIO VIII M. and **MIYAZAKI, RYUJI G.**, Department of Agricultural and Biosystems Engineering, College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2023, HYDROPONICS SYSTEM FOR KALE (*Brassica oleracea*) USING VERMICOMPOST TEA AS NUTRIENT SOLUTION.**

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This study focuses on the cultivation of kale (Brassica Oleracca) in a hydroponics system using vermicompost tea as a nutrient solution. The background highlights the concept of hydroponics and its benefits for urban areas, as well as the nutritional value and health benefits of kale. The problem statement discusses the conversion of farmland into urban areas and the advantages of hydroponic farming for space-limited environments. It also mentions the availability and cost-effectiveness of vermicompost as an alternative nutrient solution. The objectives of the study include designing a hydroponics system, producing and analyzing vermicompost tea, evaluating its effect on kale production, and conducting a cost analysis. The significance of the study lies in introducing greenhouse cultivation of kale using an environmentally friendly nutrient solution and enabling high-volume production in limited land spaces. The study's scope is focused on Tuscan Kale variety, and it was conducted at Central Luzon State University Hydroponics and Aquaponics Technologies from December 2022 to February 2023.

Based on the result of the study, the 100% nutrient solution resulted in a greater number of leaves and taller plants compared to other treatments. However, the yield was

significantly lower in the 100% vermicompost tea treatment, with an average of 51.4 grams, while the 100% nutrient solution treatment had an average yield of 332.9 grams.

The hydroponics system used local materials and was cost-effective, with an investment cost of PHP 5110. The annual gross income was PHP 43938.40, fixed costs amounted to PHP 733.92. The annual total cost was calculated to be PHP 23743.92 for Yamasaki nutrient solution and PHP 37423.92 for Vermicompost.

The results indicate that Yamasaki's nutrient solution outperformed vermicompost tea in terms of nutrient content and plant growth. Furthermore, factors such as temperature and sunlight influenced the growth and color of leaves, potentially attracting white flies due to high temperatures and low humidity inside the greenhouse.

Keyword: kale; nutrient solution; vermicompost; hydroponics system

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