

**HYDROPONIC PRODUCTION OF LETTUCE (*Lactuca sativa* L.) IN A
RECIRCULATING NUTRIENT FILM TECHNIQUE WITH
IN-GROUND PASSIVE COOLING SYSTEM
USING SELECTED GROWING MEDIA**

JAN JAMES P. GRAZA

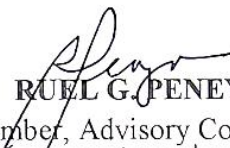
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(Land and Water Resources Engineering)**

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ACCEPTANCE SHEET

This undergraduate thesis outline entitled, “**HYDROPONIC PRODUCTION OF LETTUCE (*Lactuca sativa* L.) IN A RECIRCULATING NUTRIENT FILM TECHNIQUE WITH IN-GROUND PASSIVE COOLING SYSTEM USING SELECTED GROWING MEDIA**”, prepared and submitted by **JAN JAMES P. GRAZA**, in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (Land and Water Resources Engineering)**, is hereby approved:


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ABSTRACT

GRAZA, JAN JAMES P., Department of Agricultural and Biosystems Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **JUNE 2019, HYDROPONIC PRODUCTION OF LETTUCE (*Lactuca sativa* L.) IN A RECIRCULATING NUTRIENT FILM TECHNIQUE WITH IN-GROUND PASSIVE COOLING SYSTEM USING SELECTED GROWING MEDIA.**

Adviser: CHITO F. SACE, Ph.D.

Hydroponic system in greenhouses is an innovation in the agricultural technology. It is a method in which plants may grow without the utilization of soil or soilless culture. Hydroponics is the great solution to develop an agriculture in the other country which lacks of arable lands. And by utilizing the in-ground cooling system to hydroponic production of lettuce, an alternative way of cooling has been done.

The study aimed to evaluate the performance of an existing in-ground passive cooling system (IGPCS) in lowering the nutrient solution temperature for lettuce production. The performance of the IGPCS system was compared with no nutrient cooling system. The study also determined the growth and yield of lettuce grown in different growing media.

The evaluated IGPCS was not able to attain the optimal temperature of the nutrient solution for growing lettuce. Results showed no significant difference on the resulting plant height, width, yield and water productivity between systems with and without IGPCS.

Results showed that the temperature differences in the two systems vary throughout the day but IGPCS was able to lower the temperature by 2-3° C at 2 pm. The average yield

of lettuce planted on rice hull mixed with and without cooling system has higher yield compared to coco peat mixed.

Keywords: hydroponics; in-ground passive cooling; nutrient film technique

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