

**DESIGN OF MODULAR GROWING CABINET FOR MICROGREENS  
WITH SEMI-AUTOMATED CONTROL**

**PRINCESS KAYE I. FRANCISCO  
MARY JOY F. SERADOY  
RICO M. ZOMIL**

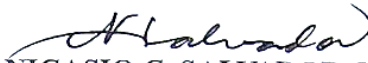
An Undergraduate Thesis Submitted to the Faculty of the Department of Agricultural  
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(AB Structures and Environment Engineering)

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ACCEPTANCE SHEET

This undergraduate thesis entitled “**DESIGN OF MODULAR GROWING CABINET FOR MICROGREENS WITH SEMI-AUTOMATED CONTROL**”, prepared and submitted by **PRINCESS KAYE I. FRANCISCO, MARY JOY F. SERADOY** and **RICO M. ZOMIL**, in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (AB STRUCTURES AND ENVIRONMENT ENGINEERING)** is hereby accepted:

  
**NICASIO C. SALVADOR, M.Sc.**  
Member, Advisory Committee

  
**NOVALYN G. DELOS SANTOS, M.Sc.**  
Member, Advisory Committee

06-21-24

Date Signed

06-21-24

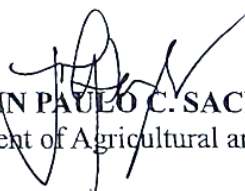
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**RUEL G. PENEYRA, M.Sc.**  
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06-21-24

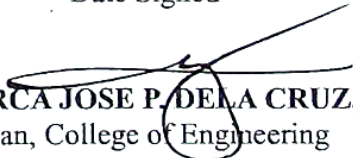
Date Signed

Accepted as partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (AB Structures and Environment Engineering)**:

  
**JOHN PAULO C. SACDALAN, Ph.D.**  
Head, Department of Agricultural and Biosystems Engineering

06-21-24

Date Signed

  
**ROY SEARCA JOSE P. DELA CRUZ, Ph.D.**  
Dean, College of Engineering

06-21-24

Date Signed

## **BIOGRAPHICAL SKETCH**

The author, Princess Kaye I. Francisco, a 4th-year Agricultural and Biosystems Engineering student at Central Luzon State University, is the second daughter of Romelio T. Francisco and Amelita I. Francisco from the province of Nueva Ecija. She finished her primary level in Guimba West Central School with the highest rank in her class, and secondary level in Bartolome Sangalang National High School with Honors where she received a certificate of recognition as a role model student in her batch given by their high school department, and bagged achievements as topnotcher in different subjects in her enrolled academic track in Senior High School. In 2024, she acquired the position as a Former Deputy Head of the CLSU-USSC Gender Committee and a Managing Editor (executive staff) of *The Mechanics*. Aside from excelling in academics, she got a chance to published online her first fictional story while receiving different recognitions as a representative of her joined student organization (CLSU-MSCS) as a Microsoft Learner Student Ambassador, a representative for journalism competitions, Ladies Dorm 3 Vice President, and a chosen ABE student contributor for ANIHAN Magazine of PhilMech. Now, she envisages all of her experience with a forward-looking goal to achieve her quintessential goal and prowess.

**PRINCESS KAYE I. FRANCISCO**

## **BIOGRAPHICAL SKETCH**

The author, Mary Joy F. Seradoy, was born on January 07, 2000, in Baler, Aurora. She is the eldest child of Mr. Joey P. Seradoy and Mrs. Mary Ann F. Seradoy. She entered Baler Central School in 2006 for her primary education. In 2013, she entered Baler National High School under the Science, Technology, and Engineering (STE) class at her Junior High School level and finished with honors. As a science class student, she had attended several seminars lecturing about science investigatory projects and research. In 2017, she studied at Baler Stand-Alone Senior High School under General Academic Strand (GAS) for her Senior high school level and graduated with honors. She took her higher education at Central Luzon State University in 2019, where she pursued a Bachelor of Science in Agricultural and Biosystems Engineering.

**MARY JOY F. SERADOY**

## **BIOGRAPHICAL SKETCH**

The author, Rico M. Zomil was born on October 02, 2000, in Guimba, Nueva Ecija. He is the third child among the four children of Mr. Teody V. Zomil and Mrs. Annabel M. Zomil. He is currently residing in Guimba, Nueva Ecija. He completed his junior high school at Bartolome Sangalang National High School in April 2017 and also enrolled in the academic track of Science Technology and Engineering Mathematics (STEM) from June 2017 to April 2019. In August 2019, he chose to take a Bachelor of Science in Agricultural and Biosystems Engineering (BSABE) as his undergraduate program at Central Luzon State University, continuing his academic journey.

**RICO M. ZOMIL**

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## ABSTRACT

**FRANCISCO, PRINCESS KAYE I., SERADOY, MARY JOY F. AND ZOMIL, RICO M.**, Department of Agricultural and Biosystems Engineering College of Engineering, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2024, DESIGN OF MODULAR GROWING CABINET FOR MICROGREENS WITH SEMI-AUTOMATED CONTROL**

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Urban farming offers an opportunity to provide urban communities with fresh and local produce products. The main objective of this study is to design a modular growing cabinet for microgreens using hydroponics and indoor farming concepts. The specific objectives included the design and fabrication of a modular growing cabinet, equipped irrigation, and artificial lights. Also, the study aimed to evaluate the performance of the growing cabinet in terms of temperature regulation, plant growth, and yield.

The performance of the cabinet was evaluated using arugula, bokchoy, and radish microgreens as affected by irrigation frequency and artificial light recipes. Irrigation frequencies of 2x,3x, and 4x a day in combination with red LED alone, blue LED alone and combined red and blue LED as artificial lighting were analyzed as their effect on microgreens using 3x3 factorial experiment in CRD.

Results showed that the two (2) factors (light recipe (red and blue combined light, blue light only, and blue light only) and irrigation frequencies (2x,3x, and 4x) were effective in sufficiently supplying the growth needs of the microgreens in terms of growth and yield. In addition, increasing the irrigation frequency and using the red and blue combined light increases the plant's height and yield.

Keywords: modular growing cabinet; microgreens; light recipe; irrigation frequency

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