

**DESIGN, FABRICATION AND PERFORMANCE EVALUATION
OF SMALL TRAILER FOR ROW CROPS APPLICATION**

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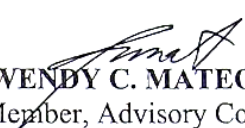
An undergraduate Thesis Submitted to the Faculty of the Department of Agricultural
and Biosystems Engineering, College of Engineering, Central Luzon State
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in Partial Fulfillment of the Requirements
for the Degree of

**BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS
ENGINEERING
(AB MACHINERY AND POWER ENGINEERING)**

JULY 2024


ACCEPTANCE SHEET

This undergraduate thesis entitled “**DESIGN, FABRICATION AND PERFORMANCE EVALUATION OF SMALL TRAILER FOR ROW CROPS APPLICATION**” prepared and submitted by **CHRISTIAN L. MARTIN, AND CEE-JAY ANGELO L. SANTIAGO** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURAL AND BIOSYSTEMS ENGINEERING (AB MACHINERY AND POWER ENGINEERING)**, is hereby accepted:


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BIOGRAPHICAL SKETCH

Christian L. Martin was born in Bitas, Cabanatuan City, Nueva Ecija, on February 13, 2002. He is the youngest of the three children of Mr. Cirilo P. Martin and Mrs. Gina L. Martin. He finished his primary education at General Ricarte Elementary School with an academic award. Then he took his secondary education at General Luna National High School for his junior high school with an award of honor and other recognition for being an active student at the school. Christian transferred to another school to pursue the academic strand he wanted: Science, Technology, Engineering, and Mathematics (STEM). He took his senior high school at PHINMA Araullo University, where he graduated with honors, therefore finishing his secondary education. As he moved to tertiary education, he then took the entrance exam at Central Luzon State University (CLSU) and at Nueva Ecija University of Science and Technology (NEUST). He passed the entrance exam at both universities, one with the BSABE program and the other with the BSEE program. He chose to take the Bachelor of Science in Agricultural and Biosystems Engineering program at Central Luzon State University because of the love and passion he has for the agricultural sector.

As he progressed in his college education, he took the major of AB Machinery and Power Engineering. Despite his busy college life, Christian values time spent with his loved ones and friends. He enjoys reading books, playing basketball, playing online games, and playing with his pet.

Cee-Jay Angelo L. Santiago was born in Brgy. Abar 1st, San Jose City, Nueva Ecija, on May 13, 2001. He is the only child of Mr. Celedonio P. Santiago and Mrs. Jesusa L. Santiago. He finished his primary education at Core Gateway College with an academic award. When he was in elementary school, he represented his school at the city meet that every year happened. He played basketball and volleyball back then. Then he also took his secondary education at Core Gateway College for his junior high school. Cee-Jay transferred to another school to pursue the academic strand he wanted: Science, Technology, Engineering, and Mathematics (STEM). He took his 11th grade at St. Joseph School of San Jose City, Nueva Ecija, and then finished his 12th at San Jose City National High School, where he graduated with honors. As he moved to tertiary education, he then took the entrance exam at Central Luzon State University (CLSU) and at the University of the Philippines (UP). He passed the entrance exam at CLSU with the BSABE program. He chose this program because when he was in grade ten, that's when he decided to take the course he is now taking because he saw that the government's support for farmers at that time was lacking. That's what impacted him greatly to pursue his bachelor's degree in Agricultural and Biosystems Engineering at Central Luzon State University.

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ABSTRACT

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Adviser: MARLON T. DELOS SANTOS, M.Sc

This thesis aimed to design, fabricate, and perform a performance evaluation of a small trailer for row crop applications that is fit for small farms in the Philippines. Conventional methods of hauling used in the Philippines are inefficient, time-consuming, and physically demanding, leading to increased cost and labor requirements. A small trailer for row crops was designed to address these challenges. The small trailer for row crops was designed using 3D Sketchup and AutoCAD software, and it was fabricated locally. Its performance was evaluated in terms of theoretical machine field capacity, actual machine field capacity, machine field efficiency, and fuel consumption. Evaluation included functional testing, preliminary testing, and final testing of the machine. The machine traveled 20 meters for the testing, according to PAES 137:2004. "Agricultural Trailer: Methods of Testing" It is shown that the machine achieved its optimal theoretical field hauling performance at a speed of 1.80 km/h with a 200 kg load. In addition, it is also shown that the machine achieved its optimal actual machine hauling performance at a speed of 1.00 km/h with a 200 kg load. With a mean fuel consumption of 1.64 l/hr at high speed. This study successfully developed a functional small trailer for row crops. Further research can optimize the design of the machine for further adaptation by different vegetable farms.

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