

DESIGN, CONSTRUCTION AND EVALUATION OF A  
SMALL-SCALE TIN CAN ROLLER COMPACTOR

THESIS

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# **DESIGN, CONSTRUCTION AND EVALUATION OF A SMALL-SCALE TIN CAN ROLLER COMPACTOR**

Undergraduate Thesis  
Submitted to the Faculty of the  
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**RENDALE B. VALDEZ**  
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## **ABSTRACT**

**VALDEZ, RENDALE B. Design, Construction and Evaluation of a Small-Scale Tin Can Roller Compactor.** Undergraduate Thesis. Bachelor of Science in Agricultural Engineering. Cavite State University, Indang, Cavite. May 2017. Adviser: Dr. Marilyn M. Escobar.

A tin can roller compactor was developed and evaluated at Cavite State University-Main Campus in Indang, Cavite. The principal components of the machine include the rollers, hopper, frame assembly, inclined plane, discharge chute, two-horsepower single phase induction motor as prime mover, belts and pulleys.

This study was experimental in nature and the fabricated machine was a prototype which will serve as a model for the construction of a larger machine for similar purposes. The technical performance of the machine was evaluated in terms of compacting rate and compacting efficiency.

The theoretical speed of the rollers ranged from 1,160-1,450 rpm but the actual speed ranged from 1,009-1,239 rpm. Highest compacting rate was recorded at 121.19 kg/hr. The compacting efficiency was highest at 89.39 percent. The average noise level of the machine observed was 92.8 db without load and 116.0 db with load. The volume reduction in compacted tin cans was 69.43 percent.

The total cost of the machine is P 35,343.00.

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## **INTRODUCTION**

Canned food is one of the items in the world that every person certainly consumes. Canned goods usually come in tin cans which most people throw away. In the Philippines, solid waste is the one serious problem due to the population and high consumption of goods with packaging that is made from toxic and non-biodegradable materials. The improper management of packaging wastes has serious environmental impacts such as water contamination, air pollution, flooding, toxicity, and disease spreading. Recyclable wastes such as tin can refer to any waste material recovered from the waste stream, free from contamination, and can still be converted into other materials with beneficial use or purposes.

With the increasing population, the quantity of wastes also increases over time. Coastal and urban areas suffer from the waste debris that contaminates and pollutes the natural resources. Among these wastes is tin can that is used to contain processed food, beverages, oil, chemicals, etc. While they can be recycled into new cans, airplane parts,