



**BUSITEMA  
UNIVERSITY**  
*Pursuing Excellence*

**FACULTY OF ENGINEERING  
DEPARTMENT OF AGRICULTURAL MECHANISATION  
AND IRRIGATION ENGINEERING**

**FINAL YEAR PROJECT.**

DESIGN AND CONSTRUCTION OF A TRACTOR PTO DRIVEN HAMMER AND SPREADER  
FOR ORGANIC MANURE

BY

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*Project report submitted as a Partial fulfillment of the requirements for the award of  
Bachelor's Degree in Agricultural Mechanization and Irrigation Engineering at Busitema  
University*

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**DECLARATION**

I **NALEEBI ISAAC** declare to the best of my knowledge that the information contained in this report is as a result of my research and effort and it has never been presented or submitted to any institution or university for the award of the Bachelor's Degree in Agricultural Mechanization and Irrigation Engineering.

Signature

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Date

.....

**APPROVAL**

This project report has been submitted for examination with approval from:

SUPERVISOR MR: ASHABAHEBWA AMBROSE

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Date

.....

## **DEDICATION**

I dedicate this report to my beloved parents **MS NALEEBI JANET** and sister **MUDONDO SUSAN** from iki-iki budaka who supported me both morally and financially through my struggle since childhood, my sisters whose love, care, support, encouragement, patience and belief in me got me this far, May the almighty God reward you abundantly.

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## **ABSTRACT**

The organic manure hammer and spreader was designed and constructed from locally available materials for crushing the cow dung into small size particle enough to pass through the holes of the detachable concave sieve positioned beneath the hammer assembly. The crushing process is achieved by the use of swinging hammers in beating the material fed into fine particles. Based on the power ratings and output shaft speed of the existing grinding machines in industries; it was found that the rotor shaft speed of 1500rpm is suitable to crush the cow dung, a speed of around 50rpm is required to move the conveyor in respect to the ground wheels and the friction imposed by the ground.

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## CHAPTER ONE

### 1.0 INTRODUCTION

This chapter is about the background to the study, problem statement, justification, objectives and scope of study.

#### 1.1 Background

Agriculture is arguably the most important sector of the Ugandan economy. It contributes to nearly 25% of GDP, accounts for 48% of the exports and provides a large proportion of the raw materials for industry. Food processing alone accounts for 40% of total manufacturing.

The sector employs 73% of the population aged 10 years and older. Agriculture will be the key determinant in the country's efforts to reduce poverty in the immediate years ahead (Ministry of Agriculture 2014).

Declining soil fertility has been a major problem in Uganda for many years since agriculture for export was initiated. Improving and maintaining a high soil organic matter content can ameliorate this problem. Soil organic matter is the key to soil fertility and productivity. Organic matter plays a major role in the chemical, microbiological and physical aspects of soil fertility. Organic matter as a source of plant nutrients, primarily nitrogen, has received most attention and research.

The simplest method of adding organic matter is by green manuring. However, in practice, green manuring often fails to simultaneously satisfy the two main functions of supplying available nutrients and building up soil organic matter. Earlier trials conducted in Serere, Bukalasa and other farms in the northern and eastern regions, it was concluded that green manure did not maintain the soil fertility and were not worth the trouble involved.

The usual source of bulky organic manures is the dung and bedding of domestic animals. In Uganda, the partly decomposed accumulations of animals' manures were usually used. In very few cases was this supply sufficient to meet the crop nutrient requirements on most farms.

Previous to the introduction of commercial cotton, the native rotation of land and crops were quite sufficient to maintain the fertility of the land without use of any form of manures. Trials were conducted on farmyard manures from cattle housed in covered sheds and bedded down

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