BUSITEMA UNIVERSITY

FACULTY OF ENGINEERING

DEPARTMENT OF AGRICULTURAL MECHANIZATION AND IRRIGATION ENGINEERING

DESIGN AND CONSTRUCTION OF A MANUALLY OPERATED ROTARY PADDY WEEDER FOR BUSITEMA COMMUNITY

BY

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ABSTRACT

Rice is the world's most important cereal considering the area under cultivation and the number of households that depend on it. Rice farmers are encountering several constraints that inhibit their ability to increase rice production one of which is high crop damage and loss caused by weeds.

Weed control methods such as chemical and hand weeding are viable alternatives but the impact of the herbicides on the environment and their cost has made the method unsustainable whereas the hand weeding is tedious and time consuming.

The design was done by first analyzing the forces acting on the parts of the weeder, determining the dimensions of the parts and then selecting the proper material to use. Mechanicalproperties were considered during the selection of the materials. The cost and availability of the material on the market were also considered. Wood and steel in different grades were the major materials used.

Engineering drawings of the components were done using AutoCADon which the construction of the prototype was based using manufacturing methods like cutting, drilling, turning and welding. The components were then assembled by bolting and welding.

The weeder was tested and found to be working well and its efficiency was found to be 79% which is above average so it could provide yield advantage to the farmers by reducing the crop loss due to weeds.

For the weeder to work effectivelythe rice has to be planted in rows and the fields have to be drained to 20mm depth of water.

DEDICATION

I dedicate this proposal report to my family and friends for the help and support they have given me during this period and throughout my studies.

ACKNOWLEDGEMENT

With the deepest gratitude, I wish to thank all the people who helped me in various ways making this proposal report a success. I appreciate the support and guidance they have given me both spiritually and physically especially my family and friends.

I would also like to express my gratitude to my supervisors Mr. Okirya Martin and Mr. Salanjaye for the support they gave and willingly sharing their knowledge, I will forever be indebted to you.

I would like to thank the Head of Agricultural Mechanization and Irrigation Engineering, Mr. Otim Daniel department for the support he gave me.

DECLARATION

I Nelima Anita do hereby declare that this report is my own compilation and no copy of it has been submitted by any student pursuing a Bachelor's degree in Agricultural Mechanization and Irrigation Engineering at Busitema University.

Signature: .....

Date: 25/05/2012

APPROVAL

This is to certify that Nelima Anita has been doing a project under the topic **DESIGN AND CONSTRUCTION OF A MANUALLY OPERATED PADDY WEEDER MACHINE FOR BUSITEMA COMMUNITY** under our supervision.

Main supervisor

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Date .....

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

This chapter includes the background to the study, statement of the problem, justification of the study, purpose of the study, study objectives

1.0 Background

Rice is the world's most important cereal considering the area under cultivation and the number of households that depend on it. The proceeds from rice farming are used for enhancing household food security and for social welfare. Very little of the income is used to pay for labor in the rice fields. This goes to show that the labor required is provided by the family. (Oonyu, 2011)

Rice in Busitema community is grown on a small scale and currently the weed control is done by use of hands. The farmers go around the rice fields plucking the weeds. This takes long and requires a great deal of labour. Due to the requirement of a great deal of labour some farmers gather their whole families to do the weeding hence keeping the children out of school during the school term.

Most of the farmers in this area plant their rice by broadcast method so the crop is scattered all over the place, this has made the possibility of mechanization hard. This would be otherwise if they were practicing row planting.

It is due to this background that this project seeks to address these problems and provide a solution through designing and constructing an easy to handle, affordable, portable, durable and efficient manually operated paddy rice weeder.

1.1 Statement of the problem

Currently the rice farmers in Busitema community hand pick the weeds from the rice fields. This is really hard work, takes a lot of time and requires a great deal of labour depending on the size of the field. This method is not efficient.

REFERENCES

Bhandari V.B., (2007), Design of Machine Elements, Second Edition, ISBN 0-07-061141-6,978-0-07-061141-2, Published by McGraw-Hill Companies

BudynasNisbett, (2006), Shigley's Mechanical Engineering Design, Eighth Edition, McGraw-Hill Primis.

Hearn E.J (1997), Mechanics of Materials1, Third Edition, Butterworth Heinemann.

Joseph Oonyu, (2011), Africa Journal of Agricultural Research, Vol 6(12), PP, 2774-2783

OdogolaR.Wilfred, (2006), Final Survey Report on the status of Rice Production, Processing and Marketing in Uganda.

Ojiha T.P., Michael A.M., (1998), Principles of agricultural engineering: Farm Buildings and Post-harvest Technology, Volume one, ISBN-81-86321-03-9, Published by SHM.L.JAIN (JAIN BROTHERS, New Delhi)

Olaoye J.O, Adekanye T.A, Development and evaluation of a rotary power weeder.

T. Ravi (2006), Weeders, A Reference Compendium, First Edition, Watershed Support Services and Activities Network.

Yadav R, Pund.S, Development and Ergonomic Evaluation of a manual weeder