



**EFFECTS OF PARTIAL LEAF DEFOLIATION OF COWPEA (*Vigna unguiculata* (L)
Walp) ON GRAIN YIELD**

BY

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BACHELOR OF SCIENCE IN AGRICULTURE RESEARCH PROJECT REPORT

**A RESEARCH REPORT SUBMITTED TO THE DEPARTMENT OF CROP
SCIENCE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE
AWARD OF BACHELORS DEGREE OF SCIENCE IN AGRICULTURE OF
BUSITEMA UNIVERSITY**

MARCH, 2024

DECLARATION

I, **Ebayu Abraham** declare that this research proposal, which I submit to the department of crop production and management of Busitema University for examination in consideration of the award of degree of bachelor of science in agriculture is my original work and personal effort, and that to the best of my knowledge, the findings have never been previously presented to any higher institution for learning/University for the award of any academic qualification, I hereby affirm that except for references to other people's works, which have been duly cited. Furthermore, I took a reasonable care to ensure that the work is original, and to the best of my knowledge, does not breach copyright law, and has not been taken from any other sources, so I present it without any reservation for examination considerations.


Signature:  Date: 11/11/2024.....

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APPROVAL

This work was under the supervision of:

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DEDICATION

With sincere appreciation, I do dedicate this proposal to my sister; Mum Ms. Agwero Ann Grace (Rip), Grandpa Mzee Ebayu David, Grandma Agoe Joyce, Sis Ms. Alimo Eseza Constance, and World Vision International for the financial, spiritual support and guidance rendered to me during this academic struggle. My beloved wife Adongo Catherine, friends; Jorem Alipa, Andrew Opit, Christopher Ochoere, Andrew Benjamin Kella, Walter Olima, Kyakwaire Amida, William Olaun, Joshua Opejo, Mr. Oonyu SP, Mr. Buluma David who have always cooperated and worked together with me to see that this comes to success. May God bless you abundantly.

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LIST OF ACRONYMS

%	Per cent
ANOVA	Analysis of Variance
Cm	Centimetre
CV	Coefficient of Variation
DAP	Days after planting
FAO	Food and Agricultural Organisation.
Ha	Hectare
Ha ⁻¹	Per hectare
IDM	Integrated Disease Management
KG	Kilogram
LSD	Least Significant Differences.
M	Metre
M.a.s.l	Meter above sea level.
m ²	square meters
mm	millimeters
NaSARRI	National Semi-Arid Resources Research Institute
NARO	National Agricultural Research Organization
°C	Degree centigrade
PH	Potential of hydrogen
RCBD	Randomized Complete Block Design
T/yr.	Tonnes per year
WHO	World Health Organization
WAS	Week after sowing
OECD	Organisation for Economic Co-operation and Development

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ABSTRACT

Cowpea is the third most important legume food crop in Uganda. Low grain yield of about 400 Kg ha⁻¹ has been recorded in farmers' fields despite the grain yield potential of 3,000 Kg ha⁻¹. This has been attributed to several production constraints such as pests and diseases, soil infertility, drought and water logging. Dual-purpose production of cowpea is most common in subsistence farming systems. Despite the nutritional and economic importance of cowpea like providing both leaf vegetable and/or grain, much work has not been done in the effects of defoliation in cowpea production, largely, farmers harvest tender leaves for consumption. Therefore, the study aimed at determining the effects of leaf defoliation on the 3 selected cowpea varieties growth and yield at different levels of defoliation intensities. The 3 selected varieties of cowpea were studied for 2 seasons; 2021B and 2023B at the faculty of agriculture and animal sciences, Arapai campus-Busitema university using Randomized Complete Block Designs (RCBD) with 3 replications. The analysis of variance showed significant differences ($P < 0.05$) for grain yield and yield related components across all treatments, varieties, seasons, treatments by varieties. The mean grain yield of 937.9 Kg ha⁻¹ was recorded across the cowpea varieties in season 2021B. Cowpea varieties, Secow2w was ranked as the best performed variety with the grain yield (1346 Kg ha⁻¹), followed by variety, Narocowpea6 (787Kg ha⁻¹), lastly Echrikukwai variety (681 Kg ha⁻¹) respectively in season 2021B and the mean grain yield of 937 Kg ha⁻¹ was recorded across the cowpea varieties in season 2023B. Cowpea varieties, Secow2w was ranked as the best performed variety with the grain yield (1332 Kg ha⁻¹), followed by variety, Narocowpea6 (795Kg ha⁻¹), lastly Echrikukwai variety (682 Kg ha⁻¹) respectively in season 2023B. However, all varieties yielded dependent on the level of defoliation and high yields were recorded in season 2021B (938Kg ha⁻¹) as compared to 2023B (937 Kg ha⁻¹).

Keywords: Cowpea defoliation; Levels of defoliation intensities; Echirikukwai, Secow2W, Narocowpea 6, Uganda; Yield performance.

CHAPTER ONE

1.0 INTRODUCTION

Cowpea belongs to the botanical species *Vigna unguiculata* (L) Walp. (Peter, 2013), *Vigna unguiculata* is a member of the Order Leguminosales, Family Fabaceae and Tribe Phaseolae. (Kochhar, 1981; Singh and Rachie, 1985). It consists of one subspecies *Vigna unguiculata* with three cultivated cultigroups: unguiculata, biflora and sesquipedalis and two wild varieties (Maréchal *et al.*, 1978). Cultigroup unguiculata is the most diverse of the cultivated subspecies *unguiculata* and has the widest distribution (Singh and Rachie, 1985). It is commonly called cowpea and is widely grown in Africa, India and Brazil (Singh and Rachie, 1985).

Among all legumes, cowpea is the most widely cultivated throughout the world and is found practically in every market in Nigeria, Niger, Brazil, Burkina Faso, Ghana, Kenya, Uganda and Malawi. (Singh and Rachie, 1985).

It is widely distributed throughout the tropics and, the world cowpea production is estimated at 3 million tones grown on a global production area of 12.5 million hectares, with 64% (8 million hectares) of this total in West and Central Africa followed by about 2.4 million hectares in Central and South America, 1.3 million hectares in Asia, and about 0.8 million hectares in East and southern Africa (Zedadra *et al.*, 2019)

Therefore, Nigeria has for long been among the leading producers of cowpea in the world contributing about 70% of the world's cowpea production (Smiderle *et al.*, 2017), Blade *et al.*, 1997). Cowpea is grown primarily in the third world as a cheap source of dietary protein, lysine and as supplement for meat (Ibrahim *et al.*, 2010). The crop is also used for forage for farm animals, hay, silage, pasture (Saidi *et al.*, 2010); soil cover and green manure for maintaining the productivity of soils (Organisation for Economic Co-operation and Development, 2015). The young leaves and shoots are consumed as spinach and provide one of the most widely used potherbs in tropical Africa (Lucas & Asana, 1968), (Organisation for Economic Co-operation and Development, 2015)

In Uganda, cowpea is majorly grown in Northern and Eastern... for grain and leaves in the Northern and Eastern parts of the country. Although yields of 2500 kg ha^{-1} are achievable (Rusoke and Rubaihayo, 1994) yields at farm level average only 150-400 kg ha^{-1} (Sabiiti *et al.*, 1994). Farmers in Eastern Uganda commonly grow cowpea as an intercrop with sorghum and greengram (FAO *et*

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