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Assessing the damages caused by Papaya Mealybug (*Paracoccus Marginatus*) and model farmers' control strategies: A case study of Amach Sub County- Lira District

BY

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DECLARATION

I MORO DANIEL declare that, to the best of my knowledge, this dissertation is entirely my own creation, based solely on my own fieldwork and analysis of data I collected there, with the exception of the places where they are specifically acknowledged, and that it has never been submitted to a college, university, or other higher education institution for the purpose of conferring a degree.

Signature..... Date.....20/05/2023

MORO DANIEL

BU/UP/2019/1682

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APPROVAL

This is to certify that the research Study entitled **"Assessing the damages caused by Papaya Mealybug (*Paracoccus Marginatus*) and model farmers' control strategies: A case study of Amach subcounty -Lira district"** with specific reference to Amach Sub- County, Lira district has been submitted for examination with the approval of my supervisor.

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DEDICATION

This work is dedicated to my late father, Mr. Samuel Ocen, as well as to my family members, who have supported me throughout my academic career and in times of need throughout my school time. I ask the Almighty Father to provide you even greater blessings. Amen.

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LIST OF ACRONYMS

CABI-Centre for Agriculture and Bioscience International

NARO- National Agricultural Research Organization

PM-Papaya mealybug

IPM-Integrated Pest Management

ABSTRACT:

This study assessed the damages caused by papaya mealybug (*Paracoccus marginatus*) and model farmers' control strategies among the papaya farmers in Amach subcounty -Lira district. The objectives of this study were; main objective (to examine the damage caused by papaya mealybug (*paracoccus marginatus*) on papaya plant and control strategies used by farmers in Amach-Lira district.), specific objectives (to find out the damages caused by papaya mealybug on the leaves and fruits of papaya plant at different stages of growth and to find out model farmers' control strategies against the papaya mealybug in Amach Subcounty -Lira district).

A sample of 10 model farmers were chosen from the five different parishes using stratified and judgmental non probability sampling techniques. Data was collected using structured questionnaire, oral interviews and observation using a check list. The data obtained was presented in tables and charts. This study found out that the fruiting stage was most affected by the papaya mealybug whereby the fruits were found to be more damaged as compared to leaves and the most commonly used control strategy was chemical strategy.

Based on this study, I do recommend that; research should be done to identify the biological control agents of papaya mealybug, there is need to determine the extent of damage caused by papaya mealybug on papaya, there is need to sensitize farmers on the use of other control strategies such as the biological and integrated pest management strategies, and there is need to assess the effectiveness of different control measures of papaya mealybug.

Key Words: Papaya, *paracoccus marginatus*, infestation, control strategies, model farmers.

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CHAPTER ONE

1.0 INTRODUCTION

1.1 Background

Globally, the papaya is grown today in most countries of the inter-tropical area of the world, 13,158,575 tonnes of papaya are produced per year (Macharia et al., 2017). The papaya is thought to have originated from Mexico and South America and a native of tropical America (Macharia et al., 2017) and widely cultivated in other tropical regions of the world for its edible melon-like fruit, which is available throughout the year. The duration of papaya lifecycle ranges from 3 to 4 years and yield varies widely according to variety, soil, climate and management of the orchard. The yield of 75-100 tones /ha. is obtained in a season from a papaya orchard depending on spacing and cultural practices (Mwanauta, Ndakidemi, & Venkataramana, 2021).

India is the largest papaya producer in the world with 5,699,000 tonnes production volume per year, Brazil comes second with 1,424,650 tonnes yearly production (Mwanauta et al., 2021). In Africa, Nigeria is the main producer with 751,000 MT on a 90,000 ha's land coverage to the crop, and together with South Africa, Ghana, Mozambique and Congo are the most important producers (J. De La Cruz Medina & García, 2003).

In East Africa, Kenya is the largest producer of papaya with production of 118,924 tonnes in 2020 followed by Tanzania and Uganda (J. De La Cruz Medina & García, 2003).

In Uganda Luwero and Masaka are the leading producers of papaya together with Mbale, Lira and Oyam since they contribute the highest percentage of the papaya exported (CABI, 2022).

The papaya plant has a number of benefits which include the following; it boosts the immune system because it is a great source of vitamin C; lowers blood sugar levels ; fights inflammation due to the enzyme papain; improves digestion; its fruits are used as animal and poultry feeds; Its fruit and seed extracts have been reported of possessing pronounced bactericidal activity; and are also used as food for animals and poultry (Karunamoorthi, Kim, Jegajeevanram, Xavier, & Vijayalakshmi, 2014). Papayas are also important because they have anticancer properties in

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