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FACULTY OF AGRICULTURE AND ANIMAL SCIENCES

DEPARTEMENT OF CROP PRODUCTION AND MANAGEMENT

EFFICT OF GIBB-FORCE ON THE GROWTH AND YIELD OF TOMATOES

BY

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(BU/UP/2018/1898)

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DECLARATION

I, **Akujo Agnes** do hereby declare that this special project report is my original work and has not been submitted to any other University for the award of an academic qualification. A reasonable care has been taken to ensure that the work is original, and to the best of my knowledge, does not breach copyright law, so I present it without any reservations for examination considerations.

Sign: ..... Date: 31st/07/2023

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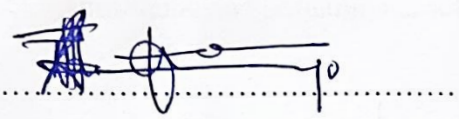
APPROVAL

This special project report has been submitted for examination consideration with my approval as the university supervisor.



8/8/2023

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DEDICATION

With great pleasure, I dedicate this special project report to my beloved husband Mr. Ocen Habbib, daughter Saaleh shimran and my mother Mrs. Adebo Marsalina for their prayers, patience, love and support during the entire period of my studies. In special way, this book is dedicated to my beloved Uncle and his wife, Mr Ekou Moses and Ms Saaleh Ketrah. I am really proud of you two. Thanks for working tirelessly to shape me to be where I am today May the good Lord grant you long life

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LIST OF ACRONYMNS

ANOVA = Analysis of Variance.

CCRP = Collaborative Crops Research Project.

CMV = Cucumber Mosaic Virus.

CV = Coefficient of Variation.

DAP = Days after planting.

FAO = Food, Agricultural Organisation.

IITA = International Institute of Tropical Agriculture.

LSD = Least Significant Differences.

NaSARRI = National Semi-Arid Resources Research institute.

SSA = Sub Saharan Africa.

ABSTRACT

Tomato (*Solanum lycopersicum* L.) is worldwide known as "No. 1 processing vegetable" because of its demand not only in processing sector but also as a vegetable and protective food. It contains different essential nutrients and vitamins such as A, C and E; about 20 mg of vitamin C per 100 grams of edible product also contain lycopene; a red pigment serving as a natural anti-oxidant, calcium, water and niacin which are important in metabolism. In Uganda, tomatoes are intensively grown and contributes to farmers' income and food, however, its yield has remained low and this is mainly attributed to biotic and abiotic factors, especially low soil fertility constrains. A number of fertilizers exist on the market however, they are expensive and not easily available to farmers. It is against this that a study was conducted in two different agro ecological zones that is Serere, NaSARRI and Bulegeni satellite station of BugiZARDI, Bulambuli district to test the efficacy of the new foliar fertilizer (GIBB FORCE) with a different active ingredient and mode of action. The study aimed to determine the effect of the new foliar fertilizer in improving the growth and yield of tomatoes (Commando F1 variety). Experiments were set in a randomized complete block design with 6 treatments at rates of ¼ tablet, ½ tablet, ¾ tablet, and 1 tablet of the Gibb FORCE dissolved in 4 litres of water; in a 20 litters napsuck sprayer, DAP (applied at planting) used as positive control; and untreated plots used as negative control. The test chemical was applied thrice i.e. at vegetative stage, flowering stage and fruit development stage. The results showed that Gibb force rates of 1, ½, and ¾ tablets were better and improved performance in the mean plant height (21.28 cm) and yield (127.2) except for the days to 50% flowering. There was no statistical difference in both the growth and yield parameters across locations as the response was similar. From the observations of the research, rates of 1, ½, and ¾ the Gibb-force foliar tablet fertilizer can be recommended for application to supply nutrients for the tomatoes depending on the soil fertility. However, to avoid wastage and expense, the Gibb force rate of ½ tablet can be recommended.

CHAPTER ONE

1.0 INTRODUCTION

1.1 Background of the study

Tomato (*Solanum lycopersicum* L.), is the greatest commonly grown vegetable crop worldwide. It is a herbaceous fruiting vegetable plant belonging to the family *Solanaceae* (Panno *at el.,* 2021). The top five tomato producing countries in the world that include China, India, Turkey, United States of America and Egypt account for 170 million tons of the crop, with China producing over a quarter of the total produce (FAO, 2013).

In Uganda, tomatoes are intensively grown and contribute to farmers income and food in most of the tomato growing areas (Tusiime *et al*., 2019), however, its yield has remained low and this is mainly attributed to biotic and abiotic factors (Gabriel, 2021). The soils in Uganda are highly weathered with depleted nutrients that are paramount in the growth of food and cash crops (Bekunda *et al.*, 2015). Good agronomic practices including fertilizer application, pests and disease management, and irrigation have been put in place in order to increase the production of the crop. One of the practices used to manage nutrients in plants is the application of foliar fertilizers and plant growth regulators (PGRs) which is proving to be effective especially on herbaceous plants (Noor *et al*., 2017).

Recently, the production and marketing of foliar fertilizers has increased and this is owed to foliar fertilization ability to enhance crop yield and quality (Akasairi & Mohammed, 2022). Scientifically, foliar fertilization has many positive sides, such as, friendliness to environment, rapid supply of nutrients to crops at critical stages and faster correction of deficiency symptoms. Besides, balanced plant nutrition with micro nutrients has been more possible through use of blended foliar fertilizers (Atuhaire *et al.,* 2016). Effectiveness of foliar fertilizers depends on whether they are used solely or in combination with soil application keeping other factors constant (Tusiime *et al*., 2010).

Plant growth regulators are essential for growth the scientists and farmers for commercial application of and development of plants and play an important role in flowering, fruit setting, changes ripening and physiochemical during storage (Choudhury *et al*., 2013). An example of the foliar fertilizers is Gibb force fertilizer a new fertilizer that is intended to be introduced in the Ugandan market. The fertilizer is a foliar type having gibberellins as the active hormones which

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