



**BUSITEMA
UNIVERSITY**
Pursuing Excellence

FACULTY OF ENGINEERING

DEPARTMENT OF AGRICULTURAL MECHANIZATION AND IRRIGATION
ENGINEERING

INVESTIGATING EFFECTS OF VARYING IRRIGATION WATER AMOUNTS ON
TOMATO GROWTH AND YIELD AT BUSITEMA UNIVERSITY DEMONSTRATION PLOT.

BY

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BU/UP/2014/177

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A final year project report submitted to the faculty of Engineering as a partial fulfillment for the
ward of Bachelor's degree in Agricultural Mechanization and irrigation Engineering of Busitema
university



ABSTRACT

Tomato growing is one of the major economic activities carried out in Uganda. Most farmers depend on rain fall in areas where it is sufficient however, few farmers practice irrigation to carry out the activity throughout the year due to erratic whether. With water in agricultural production being a limiting factor, irrigation with water deficit index provides a greater economic return than total irrigation. The amounts of water applied to a tomato crop with other factors allow changes in growth and yields. The deficit irrigation could be used for tomatoes to give yields with negligible loss and also fruit quality such as sugar content (glucose and Fructose) and other antioxidants (titrable acids, odour active aroma volatiles, and vitamin C).

Key words: lycopersicum esculantum, Drip irrigation, Treatments and Measurements

ACKNOWLEDGEMENT

I am so thankful to the Almighty God for His love and protection in all aspects of my life.

I extend grate thanks to my supervisors MR. MUGISHA MOSES and MADAMNAKABUYE HOPE NJUKI for their time and advice.

DEDICATION

I dedicate this report to all my family members for the love and efforts they render to me more so to the father MR. MAKHONJE DAVID and my sister MUYAMA JULIET. May the almighty God bless and reward them abundantly.

DECLARATION

I **WAMALE JULIUS**, declare to the best of my knowledge that this report project proposal is as result of my research and efforts.

Student's signature:

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APPROVAL.

This is to certify that **WAMALE JULIUS** is the one who has written this report under the supervision of;

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List of acronyms

FAO-Food Agricultural Organization

ETc- Evapotranspiration.

ETo-Reference evapotranspiration.

Kc-Crop Coefficient.

IS-initial stage.

DS-development stage.

MD- mid stage.

LS-late stage

LAI- leaf area index

CHAPTER ONE

1.0 Introduction.

This chapter gives briefly general information about the research and clearly shows the problem of interest research intends to solve. It shows ideas which will help reduce the problem through the fulfillment of a number of objectives listed therein.

1.1 Background of study.

Tomato is the edible fruit of family *Solanum lycopersicum*, commonly known as a tomato plant, belongs to the nightshade family (Coassin *et al.*, 2017). Many varieties of tomato are widely grown in temperate climates across the world, with greenhouses allowing its production throughout the year and in cooler areas. The plant grows to 1–3 meters (3–10 ft) in height and has a weak stem that often need to be supported off the ground with sticks or strings. It is a perennial crop but it can be grown as an annual in temperate climates. Tomato is consumed in diverse ways, including raw, as spice in dishes, sauces, salads, and drinks.

The tomatoes are widely grown in countries like China, USA, Italy, Turkey, India, and Egypt among others. Total area under tomato is 4,582,438 thousand ha with production of 150,513,813 thousand tons and with productivity of 32.8 tons/ha (Scenario, 2011). In 2014, Uganda was ranked 96th in the whole world with production quantity of 35,579 tons, china being the leading with 170,750,767 tons. In Uganda, areas where tomatoes are mainly grown are Kabale, Kasese, Mbale, Kapchorwa, Mubende, Masaka, and Wakiso district.

Tomato plant is highly sensitive to water stress, so for good productivity requires availability of water throughout its growth cycle (Monte *et al.*, 2013). Tomatoes can be rain fed where rainfall ranges in an area is enough and well distributed throughout the growing cycle. However, low rainfall makes the crop dependent on irrigation, as lack of water affects the quality and quantity of production. Among the different irrigation systems used for growing tomatoes in Uganda, drip irrigation is ranked the best option because of many advantages such as the possibility to grow in areas of low water availability, high levels of efficiency and low incidence of diseases of plant aerial parts leading to high yield and fruit quality. As compared to sprinkler irrigation, drip irrigation can distribute water uniformly, increases plant yield, reduces evapotranspiration rate and decreases the use of water and fertilizer (Monte *et al.*, 2013).

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