

**IMPACT OF SALINITY ON GROWTH, PHYSIOLOGICAL TRAITS AND  
YIELD OF BUTTERNUT SQUASH (*Cucurbita moschata* L. Mellonia)  
VARIETIES IN MWEA, KENYA**

**MARY NYAMBURA NJOROGE (B. Ed. SCIENCE)**

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**SEPTEMBER, 2023**

## DECLARATION

I declare that this thesis is my original work and has not been presented for award of a degree in any other university or for any other award.

Signature 

Date 13<sup>th</sup> August 2023

Njoroge Mary Nyambura, I56/CE/26022/2018

Department of Plant Sciences

## SUPERVISORS

We confirm that the work reported in this thesis was carried out by the student under our supervision

Signature 

Date 15<sup>th</sup> August 2023

**Dr. Moses P. Hungu Gathaara**

Department of Plant Sciences

Kenyatta University

Signature 

Date 15<sup>th</sup> August 2023

**Dr. Raphael K. Wanjogu**

National Irrigation Authority

## ABSTRACT

Kenya occupies approximately 60 million ha out of which 80% is cloaked by the arid and semi-arid lands (ASAL) which is susceptible to salinity as dryness aggravates salinity. Growth of non-staple food has been adopted by farmers in these areas with butternut squash being one of them. It is cultivated widely as it requires less rainfall and little labor yet it has a high nutritional value and a ready market contributing to the incomes of small holder farmers. Little research on butternut squash has been carried out despite its economic potential and information on growth, physiological response and yield of butternut squash varieties to salinity is scarce. This study was aimed at evaluating salinity effects on growth, selected physiological traits and yield of Waltham and Jupiter F1 hybrid butternut varieties. Waltham and Jupiter F1 hybrid were subjected to Sodium Chloride treatments of 0, 25, 50, 75 and 100 mM. A randomized complete block design was used with 3 replicates. Thirty plots each measuring 4.5 m long and 1.2 m wide were established. A net plot measuring 1.5 m long and 0.4 m wide, made of 4 plants was established in each plot from which data were collected. The data that was recorded include: germination percentage, number of leaves and leaf area, the height of plant at seedling stage and length at mature stages (vegetative stage and after harvesting), plant girth, transpiration rate, photosynthetic rate, stomatal conductance, chlorophyll concentration, fruit number per plant, fruits weight, shoots and roots fresh and dry weight. The data collected were subjected to ANOVA using SAS computer software. LSD was used to separate the means at 5 percent level ( $p < 0.05$ ). Salinity reduced significantly ( $p < 0.05$ ) the growth parameters, selected physiological traits and yield. The highest decrease was noted at 100 mM. Adverse effects of salt was low on Jupiter due to its high performance and yield hence it is more tolerant to salinity stress compared to Waltham. Jupiter may be recommended for saline affected areas. Further studies could also be done on Jupiter through future breeding programs as a source of salt tolerant genes.