

**EFFECT OF FERTILIZER COMBINATIONS ON SOIL CHEMICAL
PROPERTIES, GROWTH AND YIELD OF CASSAVA (*Manihot esculenta* Crantz)
IN OGUN STATE**

BY

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DECLARATION

I hereby declare that this Thesis was written by me and is a correct record of my own research work. It has not been presented in any previous application for any degree of this or any other University. All citations and sources of information are clearly acknowledged by means of references.

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Date

ABSTRACT

Cassava (*Manihot esculenta Crantz*) is a heavy feeder crop that exploits large volume of soil for nutrients, hence the continuous cultivation of cassava result in nutrient depletion, unless adequate fertilizer input such as inorganic fertilizer is used. This necessitated testing the effect of eleven different fertilizer types: Control (no fertilizer), recommended rate of nitrogen (N), phosphorus (P), potassium (K), half recommended rate of N, P, K, NPK + Micro-nutrients, NP, NK, PK, half N + P, K, half P + N, K, half K + N, P and half K + P on cassava growth and yield, and on the dynamics of soil chemical properties ($\text{NH}_4^+\text{-N}$, $\text{NO}_3^-\text{-N}$, electrical conductivity, pH and available phosphorus). Two locations used for the experiment were Directorate of University Farms of the Federal University of Agriculture, Abeokuta and farmer's field at Idi-olu, Ikenne Local Government of Ogun state. The experiment was a Randomized Complete Block Design consisting of the 11 fertilizer treatments in 2 locations replicated three times. Cassava variety TME 419 was planted at 1 m \times 0.8 m spacing. Data collected on soil chemical properties, plant height, stem girth, number of leaves and, yield components of cassava were subjected to Analyses of Variance (ANOVA) using Genstat Discovery Edition 9.2 and treatments means were separated using Duncan's Multiple Range Test ($p < 0.05$). Results showed that application of different fertilizer treatments improved soil ammonium with half NPK having the highest value of 80.95 mg kg⁻¹ compared to 35.09 mg kg⁻¹ on the control plots in both sites. Throughout the observation period, different fertilizer treatments improved soil nitrate having a percentage increment of about 10% over the control in both sites. Electrical conductivity was increased by the application of NPK + micro nutrient treatments having 13% increase in respect to the control in both sites. Soil pH was also increased with NK fertilizer having the highest value of 6.82 compared with the control (6.50) in both locations. Half N + PK treated plots had the highest P content in both locations. In

terms of cassava height and girth, application of full NPK performed better and NPK + Micro-nutrient treatments recorded the highest number of leaves per plant in both sites. Application of N, P and K fertilizer treatments resulted in higher root, stem and leaf yield compared with the control. In both locations, there was an increase (25.54%) in cassava yield as a result of the application of full NPK relative to the control. Soil pH, available P and Electrical conductivity had a positive correlation to root yield in both locations. This study concluded that application of N, P and K fertilizers resulted in higher growth and yield of cassava, improves soil chemical properties and therefore recommended for cassava production.

DEDICATION

This research work is dedicated to the Almighty God whose love never fails.

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