

**EFFECT OF PHOSPHATE FERTILIZER RATES ON COWPEA PLANTED
AT THREE DIFFERENT SPACING INTERVALS IN TANA RIVER
COUNTY, KENYA**



MILTON SUNGUTI MUNIALO

**A Thesis Submitted in Partial Fulfilment for the Degree of Masters of Science in
Agricultural and Rural Development of Kenya Methodist University**

July, 2016

ABSTRACT

Cowpea (*Vigna unguiculata*) is a major source of dietary protein for both humans and animals in many parts of the world along tropical and sub-tropical belt. Annual world production was estimated at 3.3 million tons of grain from 12.5 million ha. In Kenya it is mainly grown marginal drought prone areas. Cowpea production in Tana River is highly constrained by poor agronomic practices, prevalence of pests and diseases, frequent droughts, erratic rainfall patterns and poor soil fertility. There has been inconsistent and variable information on cowpea spacing and Phosphorus application. A field experiment was carried out to study the effect of Triple Super Phosphate fertilizer application and spacing interval on growth and yield of seed cowpea (K80) under irrigation. The treatment consisted of three spacing intervals of 60x30 cm, 60x20 cm and 60x15 cm and four different rates of Triple Super Phosphate fertilizer (TSP) i.e. 30 kg P/ha, 25 kg P/ha, 20 kg P/ha and 0 kg P/ha. The experiment was arranged in Randomized Complete Block Design with three replicates. The results revealed that there was significant difference ($p < 0.05$) in growth and yield of seed cowpea (K80) due to spacing and Triple Super Phosphate application. The highest results obtained at 60x30 cm and at 30 kg P/ha Triple Super Phosphate level. It can be concluded that 60x30 cm and 30 kg P/ha are appropriate for better growth and yield of seed cowpea. It is therefore recommended to apply triple super phosphate fertilizer and adopt 60x30 cm spacing interval for improved cowpea production. Additionally, regular soil testing is recommended so as apply Triple Super Phosphate in appropriate rates. More research work should be done using different spacing intervals and different fertilizer application rates to determine the most appropriate spacing interval and fertilizer application rate for improved cowpea production.