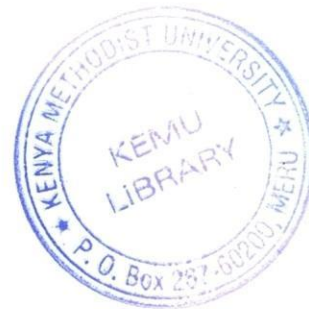


**THE EFFECTS OF TILLAGE METHODS ON THE GROWTH AND YIELD  
OF COMMON BEANS IN LAIKIPIA COUNTY, KENYA**

**PATRICIA WANGUI**



**A thesis submitted in partial fulfilment for the degree of Master of Science in  
agricultural and rural development of Kenya Methodist University.**

**September, 2017**

S  
51  
W36  
2017

MRCH 18010 283

## ABSTRACT

Common bean (*Phaseolus vulgaris* L.) is the most important food legume for direct consumption with a higher per capita consumption in Africa estimated at 31.4 kg year<sup>-1</sup> in Africa alone. In Laikipia, where the bean crop is listed as the second most important food crop in the fight against hunger after maize both for cash and consumption purposes, yields are generally low compared to other parts of Kenya. Bean production is constrained by among others, tillage methods, poor soil fertility, insufficient soil moisture, low yielding varieties and weather changes. Manual land preparation which is the preferred methods of tillage for most famrers in Laikipia limits water conservation measures, is tedious and time consuming. To improve yields, an integrated approach is required to address these limiting factors. The objective of the study was to determine the effect tillage methods had on the growth and yield of different common bean varieties and to determine whether there was any interaction between the tillage methods and bean varieities. The experiment was carried out at two sites in Tigithi location in Laikipia county, an area characterised as semi-arid with average annual rainfall of 400 – 750 mm, mean temperature of 16 – 26° C and having vertisol tyoe of soils. The experiment was laid out in a randomized completed block design with three replicates. Three tillage methods; zero tillage, minimum tillage and conventional tillage and three bean varieties; Mwitmania, KAT B9 and Mwezi were investigated. A probability of 5% or less ( $p < 0.05$ ) was used to differentiate varieties means according to the Least Significant Difference (LSD). All growth and yield parameters were significant ( $p < 0.05$ ) for all the bean varieties. This was mainly attributed to genetic variability in the different bean varieties. Varieties KAT B9 and Mwezi Moja which are early maturing and which may have escaped drought that was experienced during the research period competed favourably and perfomed better that Mwitemanina. The two varieties were found to have higher yield potential and are therefore recommended for production in the area. In view of the changing weather, the research recommends farmers to practice continuous practice of conservation tillage to adapt and build resilience of their farming systems to the changing weather partterns. Further research is recommended to improve the growth and yield characterisitics of Mwitmania bean variety which is preferred by most farmers in the county.