Abstract

Farming practices are attributable to improvement or deterioration of soil properties and policy decisions must be directed towards introduction of farming practices that enhance soil quality. Conservation agriculture (CA) was introduced in Laikipia over twenty years ago and is practised alongside conventional farming (CF), and there is need to determine the changes in soil condition from these farming practices. The overall objective of the study will be to examine farmers' farming practices and determine effects of these practices on selected soil physical, chemical and biological properties in the study area. The specific objectives will be to determine the effects of CA farming practices on soil bulk density (BD), % soil moisture, SOC, total N, available P, exchangeable cations and microbial diversity and compare with conventional farming and virgin soils. Questionnaires will be used to collect data on farming practices from the sampled farmers. Soil samples shall be collected during long rain seasons (April-May) long rains. A total of five hundred and fourty (540) composite soil samples shall be collected from a sample of 60 farmers based in 5 wards practising both CA and CF and from virgin (VL), at 0– 20cm depth using a metallic soil auger. Soil for determining BD will be collected using a metal core sampler of 5cm diameter and 10cm height. Data on the farming practices will be analyzed using SPSS (Ver.25) statistics, at $p \leq 0.05$, and presented using descriptive statistics. Data on the effects of farming systems on selected physical, chemical and biological properties will be done using JMP Pro 13, statistics at $p \leq 0.05$. Extraction of soil microbial DNA for determining diversity of bacteria and fungi will be done by PCR and sequenced using NGS Illumina Miseq. It is expected that, this study will provide crucial information determining the effects of farming practices and adoption of climate smart (CS) farming in Laikipia.