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Abstract

Northern Kenya's arable pockets fall within three main zones; the Mountains, hills and uplands; the foot slopes; the bottom lands and riverrine areas. Faced with the challenges of climate change that have led to frequent and prolonged droughts culminating in massive livestock losses the pastoralists of northern Kenya are turning to farming in these arable pockets. Although the potential for farming exists, more needs to be done in providing technologies suitable in the management of these fragile areas. A study was therefore conducted aimed at developing suitable tillage and soil fertility management technologies for these areas. On-farm trials were set up to investigate the effectiveness of different soil fertility management and tillage options for the three arable zones of northern Kenya. The soil fertility management treatments included a control (no manure or fertilizer), manure at 2.5t/ha, manure at 2.5t/ha + Triple Supper Phosphate fertilizer (TSP) at 50kg/ha, TSP alone at 50kg/ha and TSP (50kg/ha) + Calcium Ammonium Nitrate (CAN) fertilizer at 50kg/ha. The tillage methods tested included the Marasha (Local) Borana plough, the ripper, victory plough and herbicides was also tested as a minimum tillage technology. Two sets of experiments were set up. Fertilizer treatments were arranged in a Randomized Complete Block Design (RCBD) while tillage treatments were in a split plot design with tillage as the main plot and maize varieties as sub-plots. Maize was the test crop. Results indicate that for fertility management a combination of manure and TSP gave the most economical returns while use of TSP + CAN gave the highest yields across the zones. Fertilizer application increased yields by 65% from 1.99ton/ha to 3.29ton/ha Use of the ripper in land preparation gave the best results in all the sites. The victory plough gave results that were not statistically ($P<0.01$) significantly different from the ripper. We recommend that further research be done to improve sustainable agricultural productivity from these areas.