

The study was conducted in KARI S National Range Research Center Ranch in Kiboko Makueni District in Central-Southern Kenya. Three parallel belt transects of 15m by 220m were established in each of the three study sites and 22 plots established along the length of each transect at intervals of 5metres. Three major treatments namely; controlled burning, clipping at varying intensities and frequencies and woody species removal at varying intensities were replicated 22 times and randomly administered to the 22 plots. Range condition was assessed on the basis of the health of the soil, herb and shrub components. Range condition and forage production dynamics were observed to follow the rainfall patterns. Rainfall had a highly significant influence on range condition trend ($F = 0.410$ at $p = 0.680$). Burning improved forage quality and yields indirectly by improving the soil fertility. Of all the mineral elements tested for in the soil, phosphorus and nitrogen had the greatest impact on herbaceous forage yields. Nitrogen content in soil from burnt plots significantly affected the nitrogen and protein contents in herbaceous forage harvested from the same plots ($F = 3.38$ at $p = 0.116$ and $F = 3.05$ at $p = 0.131$ for nitrogen and protein respectively). In addition burning before the short rainy season (October burn) resulted in less forage compared to burning before the long rainy season (March burn). Soil was observed to have high bulk density and low moisture content at the beginning of the two dry seasons Regression analysis revealed that there was a significant negative relationship between soil bulk density and soil moisture content in February ($F = 0.549$ at $p = 0.594$). This was attributed to the trampling effect of animals, which compacted soil reducing water infiltration and consequently the water-holding capacity. This impacted negatively on forage production during the dry seasons since there was little soil moisture to support plant growth. Clipping at the moderate intensity of 5cm above the ground and at intervals of 60 days gave more forage than the other intensities and frequencies. Forage yields from burnt and unburnt plots were significantly different when both sets of plots were clipped at varying intensities ($F= 0.13$ at $p=0.880$). The 30-day clipping frequency was second to the 60-day in forage yields but the former tended to compromise the ability of forage species to recover in the long run especially when combined with heavy clipping intensity (1 cm). The 90-day clipping interval gave the lowest amount and quality of forage because it promoted a lot of rank growth, which hindered much flush growth. It was also observed that removal of woody species at varying intensities did have some significant influence on herbaceous forage production. It was observed that the woody canopy cover (%) exerts significant influence on herbaceous species biomass production ($F = 3.07$ at $p= 0.07$). NOAA/AVI-IRR NDVI images revealed the sensitivity of vegetation growth to rainfall and therefore these images (though all not obtained) could be used to monitor the dynamics of both rainfall and vegetation growth in over time.