

Abstract

Kajiado County is an arid and semi-arid area in Kenya that experiences frequent flash floods. Most of the water evaporates due to the high temperatures experienced in the area. However, to attain reasonable crop yield the soil moisture can be conserved for longer provision to the plants. The objective of this research was to assess the best technique in retaining the soil moisture content of a spate-irrigated sorghum field in Ewaso Nyiro South Drainage Basin. The conservation techniques used were *Chloris gayana* grass-mulch, ridges and ridge-furrow mulch. The techniques were then compared to the control which was the traditional way of growing sorghum in the area. The experiment was set-up in a Randomized Complete Block Design (RCBD) of three blocks of 10m by 10m. The blocks were further subdivided into four equal plots of 5m by 5m. The effect of the treatments on moisture retention was monitored using YL-69 sensors installed at depths 20 cm and 40 cm respectively for 125 days. At the 20-cm depth, there was no significant difference in terms of moisture retention from the different treatments. However, at the 40- cm depth, mulch treatment had the highest moisture retention value of 31.69%. This was closely followed by the combined ridges and mulch, ridges and control which had means of 31.61%, 31.59% and 30.39% respectively. These findings are important as they can be used by agriculturalists, farmers and relevant stakeholders in prioritizing soil moisture conservation techniques for increased crop production.