Abstract

Kenya has a large population of multifunctional tree species like Moringa oleifera (Lamark). Two provenances of Moringa oleifera from areas of Gede and Machakos were used in a study to examine how Negarim micro catchment affects their growth and survival traits under various spacings. An experiment was set up in a Randomised Complete Block Design with three replicates. Root collar diameter, branches development, survival rate and increase in height were the variables of interest and data was collected for 16 months (January 2018/April 2019). For Gede provenance under catchment, plant height ranged from 83 to 123 cm, root collar diameter from 1.7 to 2.5 cm, number of branches from 13 to 15, and survival rate of 51 to 74 %. Under no catchment, plant height varied from 127 and 191 cm, root collar diameter between 2.7 and 4.4 cm, number of branches between 15 and 19, and survival rate between 70 and 75 %. The Machakos provenance results under catchment revealed that plant height varied from 62 to 174 cm, root collar diameter ranged from 0.9 to 4.7 cm, the number of branches varied from 8 to 15, and survival rate ranged from 48 to 69 %. Under no catchment, it reached a height of between 43 and 171 cm, root collar diameter between 1.5 and 3.6 cm, 10 to 16 branches, and survivability of between 57 and 78 %. Provenance and Negarim micro catchment had a significant effect on survivability ($p \leq 0.05$), height ($p \leq 0.05$), and branch development ($p \leq 0.05$). The significant differences between plants under Negarim micro catchment were because the catchment provided more moisture advantages to plants than those that were under no catchment. This demonstrates their appropriateness and the possibility of recommending them to be included in tree cultivation systems in the area and other places with comparable climatic circumstances. This research is noteworthy in promoting soil erosion management and environmental preservation by providing information and methods for effectively using runoff in valuable crops/tree production.