

Effects of selected herbicides for management of weeds in finger millet (*Eleusine coracana* L.) in Baringo and Kericho counties

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ABSTRACT

Finger millet (*Eleusine coracana* L.) is a cereal that is drought resilient and can provide food and nutrition security to most communities in Kenya. Its production is however limited by many factors and one of them is weed infestation. Efforts to manage weeds have seen farmers rely on manual weeding which has led to high drudgery among women and loss of moisture due to frequent soil disturbance. Use of herbicides provides an alternative to mechanical weeding hence realization of conservation agriculture. The objectives of this study were (i) to determine the effects of selected herbicides on weed control and yield of finger millet (ii) to determine the effects of different application rates of the herbicides at different growth stages on weed control and yield of finger millet. Field experiments were conducted in Baringo and Kericho Counties (Agricultural Training Centres) in 2020 and 2021 to determine the effects of selected herbicides on weed management. Herbicides evaluated included two post-emergent herbicides (Ariane and 2-4D) and four pre-emergent herbicides (Sencor, Primagram, Maguguma and Dual gold). The effectiveness of different rates of the best selected herbicides from locational trial was conducted at Njoro. Data was collected on %WCE, crop biomass, yields and crop phytotoxicity rating that was scored using a scale. The treatments means for the experiment was separated using Tukey's honest significant difference at $p \leq 0.05$. The results of the study showed that post-emergent herbicides, Ariane and 2-4D recorded higher weed control efficiency of 90.56% and 88.88% respectively and no phytotoxicity. Pre-emergent herbicides Sencor, Maguguma and Primagram recorded high weed control efficiency of 89.92%, 90.13% and 88.34% respectively however, they were associated with high crop phytotoxicity ratings, lower yields and crop biomass. 2-4D and Ariane recorded a higher crop biomass of 2.6 t/ha and 2.7 t/ha that as compared to negative control (no spray) that had a crop biomass of 0.5 t/ha. Application of 2-4D or Ariane resulted to higher yields of 5.04 t/ha and 5.4 t/ha respectively as compared to no yield when Lumax was used, Due to death of the crop due to phytotoxicity.

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Results from application of different rates of herbicides at different growth stage showed that application of either 2-4D or Ariane at 1.5 times the registered rate of application during the seedling stage of the crop recorded a yield of 2.88 t/ha and 2.90 t/ha respectively with no crop phytotoxicity recorded. Findings of this study have demonstrated that use of either Ariane or 2-4D at 1.5times the registered rate of application should be encouraged to farmers for the management of weeds in finger millet.

Keywords: Finger millet; herbicides; weed management, crop yield