

Growth and Tolerance of Sesame (*Sesamum indicum* L.) Varieties to Pre and Postemergence Graminicides

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Abstract

The use of herbicides for weed control in arable crop production is known to be fast and effective. However, there is paucity of information on the safety of commonly used grass herbicides on emergence, growth, and productivity of sesame (*Sesamum indicum* L.) genotypes currently being grown in Zimbabwe. A study was carried out in Zimbabwe during the 2017/18 cropping season in Gokwe South to evaluate the effect of alachlor, metolachlor, propaquizafop, and fluazifop-p-butyl on seed germination, growth, and yield of three sesame genotypes, namely, IETC, Lind 02, and Ziada 94. A laboratory experiment was laid in a completely randomised design with genotype and herbicide type as the factors. Seed germination, radicle, and plumule length were recorded at the end of the experiment. In the pot studies, two separate experiments were carried out to evaluate the effect of pre and postemergence herbicides on 50% emergence, plant height, number of branches, 50% flowering, number of pods, and yield of three sesame genotypes. The laboratory experiment results revealed significant ($p < 0.05$) interactions among varieties and preemergence graminicides for germination percentage, radicle length, plumule length, and germination vigor index. Alachlor and metolachlor differentially reduced all germination parameters in the sesame genotypes used in the study. In the preemergence pot studies, there were significant ($p < 0.05$) interactions on 50% emergence, plant height, and number of branches but not on number of pods and yield. Metolachlor significantly reduced all the measured parameters in IETC and Ziada 94. In the postemergence pot study, propaquizafop significantly ($p < 0.05$) reduced plant height, number of pods, and yield of sesame more than fluazifop-p-butyl and hand pulling. It can be concluded that metolachlor and propaquizafop are not safe for use in these sesame genotypes at dosage rates that were used in this study. There is need for further screening of more sesame genotypes for tolerance to these and other commonly used genotypes to avoid unintentional phytotoxic damage on sesame.