OPTIMIZING POSTEMERGENCE OPTIONS USING DICAMBA, GLYPHOSATE, AND GLUFOSINATE IN XTENDFLEX® SYSTEMS

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Abstract

Palmer amaranth (*Amaranthus palmeri*) is one of the most problematic and troublesome weeds in Midsouth cotton. Resistance to many herbicide modes of action (MOA) poses the need for further research to find ways to effectively control Palmer amaranth. XtendFlex cotton is resistant to dicamba, glufosinate, and glyphosate. These resistance traits allow growers to broaden their postemergence herbicide options to combat herbicide resistance. However, due to label restrictions in Arkansas, dicamba, glufosinate, and glyphosate cannot be legally mixed. In 2019, two field experiments were conducted at the Lon Mann Cotton Research Station near Marianna, AR, and at an on-farm site near Crawfordsville, AR. The experiments were implemented as one-factor randomized complete block designs with four replications. The objective of the experiments was to determine if the timing of sequential applications of dicamba and glufosinate and the addition of glyphosate can be optimized to provide better Palmer amaranth control than dicamba or glufosinate alone. Single application treatments included these herbicides: Xtendimax (dicamba), Xtendimax + Roundup (glyphosate), Liberty (glufosinate), Liberty + Xtendimax, and Liberty + Xtendimax + Roundup. Sequential application treatments included Xtendimax fb Liberty at 4 hours after and 14 days after, Xtendimax + Roundup fb Liberty at 4 hours after and 14 days after, and Liberty fb Xtendimax or Xtendimax + Roundup at 4 hours after and 14 days after. In Marianna, applications were made to 8-10" Palmer amaranth at a density of 64 plants/yd^2, and in Crawfordsville applications were made to 2-4" Palmer amaranth at a density of 985 plants/yd^2. In Crawfordsville, four weeks after the sequential applications, treatments containing sequential applications of dicamba fb glufosinate or glufosinate fb dicamba 14 days after provided >90% Palmer amaranth control and were the most effective treatments. In Marianna, four weeks after the sequential applications, treatments containing sequential applications of dicamba fb glufosinate, dicamba + glyphosate fb glufosinate, and glufosinate fb dicamba + glyphosate 14 days later all provided >95% Palmer amaranth control. Overall, dicamba fb glufosinate at the 14-day interval provided comparable or better control than all other treatments. These data suggest that the use of two effective modes of action for postemergence control of Palmer amaranth will aid in providing some safety against the evolution of herbicide resistance.