

**PARAQUAT AND DIREX COMBINATIONS FOR HORSEWEED CONTROL IN COTTON****J.A. Still****J.K. Norsworthy****University of Arkansas****Fayetteville, AR****K.L. Smith****Southeast Research and Extension Center****University of Arkansas****Fayetteville, AR****Abstract**

Roundup Ready® and Roundup Ready® Flex cotton make up the majority of cotton planted in the Arkansas. The exclusive use of glyphosate has lead to increased selection pressure for the evolution of glyphosate-resistant weeds. Since glyphosate-resistant horseweed was first documented in Arkansas in 2003, glyphosate is no longer an effective herbicide for horseweed control and alternatives must be investigated. Glufosinate is not effective in temperatures that exist during preplant burndown applications. Dicamba is labeled in cotton but requires 1 inch of rainfall 21 days prior to planting cotton. Paraquat and diuron are both labeled for burndown weed control in cotton and would provide flexible residual control of weeds when used in combination prior to planting. The objective of this study was to evaluate paraquat alone and paraquat plus diuron for controlling horseweed prior to planting cotton. Field and greenhouse experiments were conducted in 2009. Experimental design was a factorial arrangement of treatments in a randomized complete block design with four replications. Treatments for both experiments included three rates of paraquat alone, two rates of diuron alone, and in combination with each other. Greenhouse evaluations 21 days after treatment (DAT) indicated greater efficacy from all treatments than in the field and all provided 100% control except for diuron alone at 0.5 lb ai/A. Field evaluations 25 DAT indicated improved control of horseweed than from earlier evaluations. Paraquat at 0.6 lb ai/A plus diuron at either 0.5 or 1 lb ai/A provide the greatest horseweed control at approximately 95%. Synergism between paraquat and diuron was observed from this rate of paraquat because control from either herbicide alone summed together did not equal the control obtain from the combination. This research demonstrates that paraquat plus diuron can be an effective alternative to glyphosate for controlling horseweed.