CROP SAFETY AND WEED CONTROL FOLLOWING DICAMBA AND ACETOCHLOR APPLICATIONS IN XTENDFLEX™ COTTON

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Abstract

Given the proliferation of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri* S. Wats) and tall waterhemp [*Amaranthus tuberculatus* (Moq.) Sauer] throughout the United States, efficacious and cost effective means of control are needed. XtendFlex™ Technology from Monsanto allows postemergene application of dicamba, glyphosate, and glufosinate to cotton containing this technology. Herbicide programs with multiple site of actions (SOAs) generally have the greatest effect in delaying herbicide resistance yet optimizing weed control. Research was conducted to evaluate herbicide efficacy and crop injury of acetochlor (Warrant™) and dicamba (XtendiMax™) applied PRE and POST for Palmer amaranth and tall waterhemp control in XtendFlex™ cotton.

Experiments were conducted at Hood Farms in Dundee, MS, the Delta Research and Extension Center in Stoneville, MS, and the R. R. Foil Plant Science Research Center in Starkville, MS. The following PRE and POST herbicide programs were evaluated for Palmer amaranth and tall waterhemp control: 1) dicamba at 0.56 kg ae/ha + acetochlor at 1.26 kg ai/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha + acetochlor at 1.26 kg ai/ha (3-4 leaf cotton) fb dicamba + glyphosate at 1.68 kg ae/ha (6-8 leaf cotton); 2) dicamba at 0.56 kg ae/ha + acetochlor at 1.26 kg ai/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha (3-4 leaf cotton) fb dicamba + glyphosate at 1.68 kg ae/ha + acetochlor at 1.26 kg ai/ha (6-8 leaf cotton); 3) dicamba at 0.56 kg ae/ha + acetochlor at 1.26 kg ai/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha (3-4 and 6-8 leaf cotton); 4) dicamba at 0.56 kg ae/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha + acetochlor at 1.26 kg ai/ha (3-4 leaf cotton) fb dicamba + glyphosate at 1.68 kg ae/ha (6-8 leaf cotton); 5) dicamba at 0.56 kg ae/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha (3-4 leaf cotton) fb dicamba + glyphosate at 1.68 kg ae/ha + acetochlor at 1.26 kg ai/ha (6-8 leaf cotton); 6) dicamba at 0.56 kg ae/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha + acetochlor at 1.26 kg ai/ha (3-4 and 6-8 leaf cotton); 7) dicamba at 0.56 kg ae/ha (PRE) fb dicamba + glyphosate at 1.68 kg ae/ha (3-4 and 6-8 leaf cotton). The PRE application was applied immediately after planting followed by a 3-4 leaf cotton application two weeks after, followed by a 6-8 leaf cotton application two weeks after the first post application. DP 1522 B2XF was planted in Dundee, MS and Stoneville, MS, and DP1646 B2XF was planted in Starkville, MS. Visual control ratings and cotton injury were taken two weeks after each application. Cotton yield data were also collected from all locations. Data were subjected to analysis of variance and means were separated using Fischer's Protected LSD at $\alpha = 0.05$.

Treatments containing dicamba + acetochlor (PRE) provided greater Palmer amaranth control at mid-post application. Conversely, dicamba + acetochlor (PRE) and dicamba only (PRE) did not significantly differ with respect to tall waterhemp control prior to 14 days after mid-post application. At 14 days after 6-8 leaf cotton application treatments containing acetochlor provided significantly greater Palmer amaranth control, regardless of application timing. Treatments with acetochlor applied PRE and 3-4 leaf cotton, and 6-8 leaf cotton only, provided the greatest Palmer amaranth control at 28 days after 6-8 leaf cotton application. In addition, applications of acetochlor PRE and 6-8 leaf cotton, and 3-4 and 6-8 leaf cotton, resulted in the greatest tall waterhemp control 28 days after 6-8 leaf cotton application. Cotton injury was significantly greater from treatments containing acetochlor. However, no injury was

observed 28 days after 6-8 leaf cotton application. Yield differences were not observed on DP 1522 B2XF. Nevertheless, DP 1646 B2XF had significantly greater seed cotton yield on treatments containing two applications of acetochlor, regardless of application timing. The use of acetochlor as part of the XtendFlex™ resulted in effective Palmer amaranth and tall waterhemp control in Mississippi.