

EVALUATION OF PRE AND POST WEED CONTROL PROGRAMS FOR PALMER AMRANTH CONTROL**D.Z. Reynolds****D.M. Dodds****D.B. Reynolds****T.H. Dixon****C.A. Samples****Mississippi State University****Starkville, MS****J.A. Bond****Mississippi State University****Stoneville, MS****J.A. Mills****Monsanto Company****Abstract**

An experiment evaluating the control of glyphosate-resistant Palmer amaranth using preemergence and postemergence herbicides was conducted in Robinsonville, MS in 2012. Plots were established within a producer's field that had historically high populations of glyphosate-resistant Palmer amaranth. Cotton containing Xtend® technology was planted on May 21, 2012. Pre-plant applications were made ten days prior to cotton planting and included fomesafen at 0.14 kg ai/ha; fomesafen at 0.14 kg ai/ha + dicamba at 1.12 kg ae/ha; and fomesafen at 0.14 kg ai/ha + dicamba at 0.6 kg ae/ha. Preemergence herbicide applications included the following: fluometuron at 1.1 kg ai/ha; acetochlor at 1.3 kg ai/ha; and prometryn at 1.1 kg ai/ha. In addition, each of these herbicides was tank mixed with dicamba at 0.6 kg ae/ha and dicamba at 1.1 kg ae/ha. Dicamba was also applied alone at 0.6 and 1.1 kg ai/ha. 2,4-D at 0.7 kg ai/ha was also applied preemergence. Postemergence applications included the following: glufosinate at 0.6 kg ai/ha; glufosinate at 0.6 kg ai/ha + dicamba at 0.6 kg ai/ha; glufosinate at 0.6 kg ai/ha + acetochlor at 1.3 kg ai/ha; glufosinate at 0.6 kg ai/ha + dicamba at 0.6 kg ai/ha + acetochlor at 1.3 kg ai/ha; glufosinate at 0.6 kg ai/ha + glyphosate at 1.1 kg ae/ha; glyphosate at 1.1 kg ae/ha + dicamba at 0.6 kg ai/ha; and glyphosate at 1.1 kg ae/ha + dicamba at 0.6 kg ai/ha + acetochlor at 1.3 kg ai/ha. Postemergence applications were made to 10 cm and 25 cm tall Palmer amaranth. All herbicide applications were made with a CO₂-powered backpack sprayer with an application volume of 140 L/ha at 324 kPa. Visual estimates of weed control efficacy, the number of Palmer amaranth plants per square meter, and height of Palmer amaranth plants in each plot were collected at weekly intervals following the early pre-plant, preemergence, and postemergence applications. This trial was conducted using a randomized complete block with four replications. Data were subjected to analysis of variance and means were separated using Fisher's Protected LSD at $p = 0.05$.

Early pre-plant applications of fomesafen + dicamba resulted in greater than 96% control of Palmer amaranth five weeks after treatment. In addition, one plant per square meter was observed in plots receiving early pre-plant applications compared to 13 plants per square meter in untreated areas. Also, cotton growth and development was unaffected by pre-plant applications. All preemergence applications containing dicamba resulted in 90 to 99% Palmer amaranth control. However, fluometuron, acetochlor, or prometryn alone resulted in less than 75% control of Palmer amaranth five weeks after treatment. Palmer amaranth counts per square meter following applications containing the proprietary premix of glyphosate + dicamba were less than two plants per square meter compared to 13 per square meter in untreated areas. Cotton growth and development was unaffected by preemergence applications five weeks after treatment. Reduced residual activity of fluometuron, acetochlor, and prometryn was likely due to very low rainfall totals at the experimental location.

Postemergence applications of glufosinate + dicamba, glyphosate + dicamba, and glyphosate + dicamba + acetochlor to 10 cm glyphosate-resistant Palmer amaranth resulted in significantly greater control (81 – 83%) than all other treatments four weeks after application. In addition, these treatments resulted in the shortest Palmer amaranth plants four weeks after treatment. Control of 25 cm glyphosate-resistant Palmer amaranth was maximized four weeks after treatment following application of glufosinate + dicamba; glufosinate + dicamba + acetochlor; glyphosate + dicamba; and glyphosate + dicamba + acetochlor. The greatest reduction in Palmer amaranth height was also observed following application of these herbicides. Cotton growth and development was unaffected by postemergence herbicide application.