WEED CONTROL IN ENLIST™ COTTON WITH DELAYED POST APPLICATIONS

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<u>Abstract</u>

Glyphosate-resistant Palmer amaranth continues to be the greatest pest management challenge in Georgia cotton. Growers currently spend \$210 ha⁻¹ in managing this pest including implementing a sound herbicide program, hand weeding, and either tillage or cover crop residue. During 2012, 49% of Georgia's cotton was treated with glufosinate; however, the window for application with glufosinate is narrow since Palmer amaranth more than 8 cm tall is often not effectively controlled. In an effort towards more weed-control options, technologies are being created that allow for POST application of other herbicide chemistries, such as 2,4-D. Thus, an experiment was conducted to determine if 2,4-D systems in Enlist[™] cotton could be used to control Palmer amaranth in salvage situations.

The RCBD experiment with three or four replications included a factorial arrangement of three sequential POST herbicide options 2,4-D followed by [fb]2,4-D; 2,4-D fb glufosinate; or 2,4-D + glufosinate fb 2,4-D + glufosinate) and three intervals between POST herbicide applications (5, 10, or 15 d). Glufosinate (Liberty; 590 g ae ha⁻¹) and 2,4-D (Weedar 64; 840 g ae ha⁻¹) were applied at 140 L ha⁻¹ with DG 11002 VS nozzles. At-plant herbicide applications were not made in an effort to simulate a salvage situation. Diuron (Direx; 1 lb ai ha⁻¹) plus MSMA (MSMA Plus 6; 2 lb ai ha⁻¹) was applied at layby.

Site locations were Macon County and Attapulgus (Decatur Co), Georgia during 2011 and 2012. Palmer amaranth (*Amaranthus palmeri*) was present at all locations; smallflower morningglory (*Jacquemontia tamnifolia*), carpetweed (*Mollugo verticillata*), and Florida beggarweed (*Desmodium tortuosum*) were present at Attapulgus. Initial POST applications were made when Palmer amaranth reached 9-20 cm in height, other weeds ranged from 5-6 cm. Visual estimates of weed control (relative to the non-treated control) at layby and harvest are reported. Seed cotton was harvested and results are discussed. Data are reported by main effects of POST option or timing interval unless interactions were noted.

In Macon County at layby and harvest, sequential applications of glufosinate + 2,4-D controlled Palmer 31 to 36 percentage points more than 2,4-D fb glufosinate or 2,4-D applied sequentially when pooled over application intervals. Pooled over herbicide options, intervals of 10 or 15 d between applications controlled Palmer amaranth 15 to 27 percentage points more than the 5 d interval. Cotton yields were 1390 kg ha⁻¹ with sequential 2,4-D + glufosinate applications compared to less than 330 kg ha⁻¹ with other systems; yields with the interval of 10 d (similar to 15 d) between herbicide applications was twice of that noted with the 5 d interval.

Palmer amaranth control in Attapulgus was much greater than in Macon County due to ideal growing conditions using irrigation. Palmer control was at least 89% with glufosinate + 2,4-D applied sequentially or with 2,4-D fb glufosinate at layby or harvest, regardless of the interval between applications. Similar control with the sequential 2,4-D system was noted, but only when the interval between applications was 10 d. Smallflower morningglory was completely controlled with all systems throughout the season. Florida beggarweed was controlled at least 94% at layby or harvest by 2,4-D fb glufosinate or 2,4-D + glufosinate applied twice. Sequential 2,4-D applications controlled beggarweed 68% at layby and the interval between applications had no impact; however, after layby complete control was noted.

Carpetweed was completely controlled when glufosinate was applied, but control was only 53 to 71% with sequential applications of 2,4-D; the 10 d interval between applications was 18% more effective than the 5 d

interval. After layby, carpetweed was completely controlled. Seed cotton yields were greater with the 2,4-D + glufosinate system as compared to the 2, 4-D only systems and the interval between applications did not influence yield.

Overall weed management was most consistent and effective when using sequential applications of glufosinate + 2,4-D made 10 to 15 d apart. Cotton yields improved as Palmer amaranth control improved.

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