

RESIDUAL ACTIVITY OF DIREX, CAPAROL, COTORAN, BRAKE, STAPLE, DUAL MAGNUM, PROWL, AND WARRANT ON GLYPHOSATE-RESISTANT PALMER AMARANTH**Taghi Bararpour****David A. Bell****Jeff Gore****Thomas W. Allen****Tessie H. Wilkerson****Department of Plant and Soil Sciences****Mississippi State University – Delta Research and Extension Center****Stoneville, MS****Abstract**

The first report of glyphosate-resistant Palmer amaranth (*Amaranthus palmeri*) in the United States was from Macon County, GA, in 2005. Cotton (*Gossypium hirsutum*) is a major crop in Mississippi. Widespread glyphosate-resistant Palmer amaranth, the most troublesome weed in Mississippi row crop production, has led to a heavy reliance on PRE herbicides in addition to POST residual herbicides in cotton. A field study was conducted in 2021 at the Delta Research and Extension Center, in Stoneville, Mississippi, to evaluate residual activity of Direx, Caparol, Cotoran, Brake, Staple, Dual Magnum, Prowl, and Warrant on glyphosate-resistant Palmer amaranth. Cotton (ST 4550) was planted (four rows plot) on May 25, 2021, and emerged on May 31. The experiment was designed as a randomized complete block with four replications. Herbicide treatments are as follows (rate in oz/a): 1) Cotoran (fluometuron) at 32; 2) Direx (diuron) at 21; 3) Caparol (prometryn) at 24; 4) Brake (fluridone) at 16; 5) Brake at 32; 6) Staple LX (pyrithiobac) at 1.5; 7) Dual Magnum (*S*-metolachlor) at 24; 8) Prowl (pendimethalin) at 32; 9) Warrant (acetochlor) at 48; 10) Cotoran at 32 + Brake at 16; 11) Cotoran at 32 + Staple LX; 12) Cotoran at 16 + Warrant; 13) Cotoran at 32 + Warrant; 14) Command (clomazone) at 32; 15) Cotoran at 32 + Command; 16) Brake at 21; 17) Cotoran at 24 + Brake at 16; 18) Brake at 16 + Warrant at 32; and 19) Untreated check.

There was 8 to 10% cotton injury from command treatment (Trt. 14 & 15) by 3 weeks after emergence (WAE) (no injury 4 WAE). All herbicide treatments provided >90% control of glyphosate-resistant Palmer amaranth except treatment 6 by 2 WAE. Residual activity of herbicide treatments for controlling Palmer amaranth reduced 3 WAE. Staple LX treatment (Trt. 6) was the weakest application for controlling glyphosate-resistant Palmer amaranth (only 61%) 4 WAE. Brake (32 oz/a) and Dual Magnum (24 oz/a) provided the best (81 to 82%) control of glyphosate-resistant Palmer amaranth as compared to the other treatments by 5 WAE. Residual activity of all herbicide application reduced over time. Overall, Staple LX (Trt. 6) and Brake at 21 oz/a (Trt. 16) treatments were the weakest applications to control glyphosate-resistant Palmer amaranth. These herbicide treatments (Trt. 6 & 16) provided only 48 to 51% and 41 to 44% by 6 and 7 WAE, respectively. In general, Brake at 32 oz/a (Trt. 5) numerically provided the best (71%) level of glyphosate-resistant Palmer amaranth control by 7 WAE, however all other herbicide treatments provided comparable level of Palmer amaranth control as treatment 5, except Staple LX and Brake at 21 oz/a. Based on these results, the residual activity of most herbicide applications was effective for 3 weeks.