

LONGEVITY OF RESIDUAL PALMER AMARANTH CONTROL WITH PREEMERGENCE-APPLIED COTTON HERBICIDES**Lou Adams****Department of Crop, Soil, and Environmental Sciences****University of Arkansas****Fayetteville AR****Tom Barber****University of Arkansas Research and Extension Service****Lonoke AR****Jason Norsworthy****Department of Crop, Soil, and Environmental Sciences****University of Arkansas****Fayetteville AR****Aaron Ross****Ryan Doherty****University of Arkansas Research and Extension Service****Lonoke AR****Abstract**

Cotton growers in the mid-southern U.S. region must successfully control Palmer amaranth (*Amaranthus palmeri*) populations due to its ability to cause significant yield reductions. As a result, growers must apply residual herbicides containing multiple modes of action (MOA) for the best control of Palmer amaranth. The objective of this research was to evaluate the longevity of Palmer amaranth control using multiple modes of action herbicides applied prior to cotton emergence. Experiments were conducted in 2021, on-farm in Tillar, Arkansas and at the Lonn Mann Cotton Research Station in Marianna, Arkansas to evaluate the longevity of residual Palmer amaranth control with preemergence-applied cotton herbicides. A total of 11 treatments containing one to three different modes of action were applied at planting. Herbicides and rates included fluridone (alone/tank mix) at 252/168 g ai/ha, prometryn at 840 g ai/ha, fluometuron at 840 g ai/ha, acetochlor at 840 g ai/ha, and dicamba at 560 g ai/ha. Visual Palmer amaranth control ratings were taken 4 and 6 weeks after treatment (WAT). Results indicate that treatments containing 2 or 3 MOA provided the greatest control of Palmer amaranth 4 and 6 WAT. At 4 WAT, herbicide treatments containing 2 and 3 MOA increased control by 12 and 17 percentage points respectively when compared to 1 MOA. At 6 WAT, 2 MOA herbicide treatments increased control by 8 percentage points when compared to 1 MOA. Treatment combinations containing fluridone herbicide provided the best control at 6 WAT. Therefore, Palmer amaranth can successfully be controlled up to 6 WAT containing multiple MOA herbicides. Additionally, multiple MOA herbicides with residual activity will provide lengthy Palmer amaranth control while also reducing risk of yield loss in cotton production systems.