

DOES WEED SIZE AND SPECTRUM INFLUENCE GLYPHOSATE AND GLUFOSINATE EFFICACY WHEN TANK-MIXED?**M.R. Miller****J.K. Norsworthy****University of Arkansas****Fayetteville, AR****J. Bond****Mississippi State University****Stoneville, MS****D. Stephenson, IV****Louisiana State University****Baton Rouge, LA****A. Cotie****Bayer Crop Science****Abstract**

The introduction of Glytol® Libertylink® cotton provides growers with an option to control difficult-to-manage and herbicide-resistant weed species by allowing over-the-top applications of glufosinate and glyphosate. Tank-mixing contact and systemic herbicides often lessens the control with systemic herbicide; therefore, an experiment was conducted in 2014 to evaluate potential interactions between glyphosate and glufosinate on barnyardgrass and Palmer amaranth. Field experiments were conducted in Keiser, AR (two trials); Fayetteville, AR; Stoneville, MS; and Alexandria, LA. The experimental design was a randomized complete block with a two-factor factorial treatment structure. Factors included targeted weed size and herbicide treatment. The target weed size for barnyardgrass was 2, 6, and 12 inches and 3, 12, and 18 inches for Palmer amaranth. Herbicide treatments were comprised of Roundup PowerMax at 22 fl oz/A, Liberty at 29 or 43 fl oz/A, and Roundup PowerMax + Liberty at 22 + 29 or 22 + 43 fl oz/A. Visual estimates of weed control were taken 14 days after treatment. The Colby method was used to evaluate behavior of tank-mix interactions. Roundup PowerMax + Liberty treatments were consistently antagonistic on 8- to 12-inch barnyardgrass. However, the mixture was deemed to be additive for all other application timings with the exception of one trial at the Keiser location. The addition of Liberty to Roundup PowerMax increased Palmer amaranth control compared to Roundup PowerMax alone. Roundup PowerMax alone was not effective on Palmer amaranth, regardless of growth stage at application due to the presence of a resistant population at each of the locations. The greatest control of Palmer amaranth was achieved when applications were made to 1- to 3-inch plants across locations. Results from these studies indicate that antagonism of Roundup PowerMax + Liberty combinations on barnyardgrass is likely, especially when weeds are large at application. Furthermore, Liberty tank-mixed with Roundup PowerMax provided greater control of Palmer amaranth than Roundup PowerMax alone regardless of weed size at the time of application. However, it is recommended to apply these products at weeds no greater than 3-inches in size, and when applied at this timing, there should be minimal risk of detectable antagonism and resulting weed escapes.