

EFFECT OF SHADING, VARIETY, AND APPLICATION TIMING ON COTTON TOLERANCE TO GLUFOSINATE**Brandon Schrage****Jason Norsworthy****Holden Bell****Brent Johnson****Zach Hill****Dilpreet Riar****University of Arkansas****Fayetteville, AR****Abstract**

Glufosinate has become an important postemergence alternative to glyphosate in cotton, especially in fields having dense populations of glyphosate-resistant Palmer amaranth. Our objective was to determine if degree of injury to Phytogen (Widestrike) and Liberty Link cotton is influenced by cotton growth stage and light quantity prior to application. The reduction in light quantity that was simulated in this trial was intended to be reflective of prolonged periods of cloudy conditions prior to applying glufosinate.

An experiment having a split-split-split plot design was conducted in Fayetteville, Arkansas in 2012. The main plot consisted of cotton variety (PHY 375 WRF, PHY 499 WRF, and Stoneville 4145 LLB2). The sub-plot factor was degree of shading: shaded cotton (50% shading) and non-shaded cotton. The sub-sub plot factor was application timing (1-, 4-, and 6-leaf stage). The sub-sub-sub plot included two rates of glufosinate (0.79 and 1.58 lb ai/A) and a nontreated check. Plots were shaded 3 d prior to application and irrigated 0.25 in 1 d prior to their respective applications. Glufosinate was applied using a CO₂-pressurized backpack sprayer calibrated to deliver 15 GPA. Injury was visually assessed at 2 and 4 to 5 weeks after treatment (WAT), and seedcotton was harvested.

Cotton tolerance to glufosinate differed by variety at 2 WAT, but injury was observed on all varieties, including Liberty Link cotton. In general, cotton plants that were shaded prior to applying glufosinate were injured to a greater extent than non-shaded plants. Injury at 2 WAT following the 1-leaf application was generally greater for 375 WRF and 499 WRF compared to 4145 LLB2. At 4 to 5 WAT, all varieties showed similar potential for recovery. Seedcotton yield was reduced when glufosinate was applied at the 1X rate to 1-leaf cotton or at the 1X and 2X rates to 4-leaf cotton when plants were shaded for 3 d prior to glufosinate application. Our results indicate that in general, shading (cloudcover) 3 d prior to glufosinate application at 1X and/or 2X rates increased injury, irrespective of variety, and decreased seedcotton yield.