

GLYPHOSATE-RESISTANT PALMER AMARANTH IN LOUISIANA**Daniel O. Stephenson, IV****Randall L. Landry****Brandi C. Woolam****LSU AgCenter****Alexandria, LA****Abstract**

Palmer amaranth has been documented as resistant to glyphosate in many states, specifically Arkansas and Mississippi. In 2009, a Palmer amaranth population growing in a cotton field in Concordia Parish, Louisiana was suspected to be resistant to glyphosate. Two applications of glyphosate (one at 840 g/ha and the second at 1680 g/ha) failed to control 4-6 leaf Palmer amaranth. Suspected resistant Palmer amaranth plants were collected and transported to a greenhouse to produce seed for resistance evaluation. Glyphosate-resistance screening experiments were conducted at the LSU-Alexandria greenhouse facility in 2010 to confirm glyphosate-resistance in the Concordia Parish Palmer amaranth population by quantifying the level of glyphosate resistance. To determine if glyphosate resistant existed in the population, an absence/presence experiment was conducted. Seed were sown in a potting mixture and plants were treated with 840 g/ha of glyphosate at the 5 to 7 leaf stage (7 to 11 cm tall). A known glyphosate-susceptible population was treated also. Following application, plants were returned to the greenhouse for an additional 21 days. Absence/presence experiments indicated the probable existence of glyphosate-resistance. To quantify the level of glyphosate resistance, dose response experiments were conducted. Glyphosate doses ranged from 1/50 to 16 times the recommended glyphosate dose (876 g/ha) for the glyphosate formulation used. Data indicated that the LD₅₀ for the susceptible and resistant biotypes was 59.3 and 3220 g/ha of glyphosate. The resistant biotype was 54 fold less sensitive to glyphosate compared to the susceptible biotype. Increasing glyphosate use rate is not a viable option for controlling this resistant Palmer amaranth population. A systems approach which includes residual herbicides applied preplant burndown, preemergence, and postemergence should be utilized for its management.