WEED RESPONSE TO GLUFOSINATE APPLIED ALONE OR MIXED WITH 2,4-D OR DICAMBA IN GEORGIA, NORTH CAROLINA, AND TENNESSEE

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Abstract

Glyphosate-resistant Palmer amaranth has become common throughout the Southeast and Midsouth. Resistance to the ALS inhibitors is also common, and biotypes with multiple resistance to both herbicide chemistries have been confirmed in Georgia, North Carolina, and Tennessee. Since the development of glyphosate-resistance, cotton growers in the most severely infested counties have employed residual herbicides, cultivation, and hand-weeding. Growers have also adopted glufosinate-tolerant cotton in some areas, giving them the option to spray glufosinate topically. Although glufosinate is more effective than glyphosate in controlling glyphosate-resistant Palmer amaranth, glufosinate must be applied very timely or Palmer amaranth will not be adequately controlled. A tank-mix partner to improve Palmer amaranth control by glufosinate could be beneficial. It is possible that mixing 2,4-D or dicamba with glufosinate would improve control of Palmer amaranth as well as several other broadleaf weed species. Although 2,4-D- and dicamba-resistant cotton will not be commercialized until at least 2015, a study was conducted to determine the response of Palmer amaranth, Benghal dayflower, carpetweed, broadleaf signalgrass, Texas millet, and morningglory spp. to glufosinate, 2,4-D, and dicamba alone and glufosinate mixed with 2,4-D or dicamba.

The study was conducted at two locations in the summer of 2009 and three locations in the summer of 2010. In 2009, trials took place in Macon Co., GA and Chula, GA. In 2010, trials took place in Ty Ty, GA, Rocky Mount, NC, and Millington, TN. The experimental herbicide programs included 2,4-D at 0.5, 0.75, or 1.0 lb ae/A or dicamba at 0.25, 0.5 or 1.0 lb ae/A applied alone or in combination with glufosinate at 0.42 lb ae/A. A glufosinate-only treatment and a non-treated control were also included in the study. All treatments were replicated four times. Herbicides were applied postemergence in a spray volume of 15 gal/A to weeds 7 to 9 inches tall using a backpack sprayer with Drift Guard 11002 VS nozzles.

Percent weed control (relative to the non-treated control) for each plot was determined at 10, 20 and 30 days after treatment (DAT), although only data from the 20 DAT observations are presented.

Glufosinate alone controlled Palmer amaranth 74% when combined over the locations. 2,4-D alone controlled Palmer amaranth 67 to 80% while dicamba alone controlled Palmer amaranth 59 to 83%. Tank mixtures of glufosinate plus either 2,4-D or dicamba controlled glyphosate-resistant Palmer amaranth 89 to 97%, and control was greater than respective herbicides applied alone.

Carpetweed was controlled 99% by glufosinate; neither 2,4-D nor dicamba provided greater than 66% control when applied alone. Complete carpetweed control was achieved when 2,4-D or dicamba were applied with glufosinate.

2,4-D applied alone controlled Benghal dayflower 90 to 98%. Glufosinate and dicamba (0.25 lb/A) provided 69% control of Benghal dayflower; dicamba at 0.5 and 1.0 lb/A controlled Benghal dayflower 84 to 94%. Greater than 94% Benghal dayflower control was achieved when 2,4-D or dicamba were applied in combination with glufosinate.

Glufosinate controlled broadleaf signalgrass 89%, while no control was noted with dicamba or 2,4-D. Combinations of glufosinate plus 2,4-D or dicamba controlled broadleaf signalgrass 81 to 90%.

Glufosinate controlled Texas millet 90%, while no control was noted with dicamba or 2,4-D. Combinations of glufosinate plus 2,4-D controlled Texas millet 70 to 81%, with less control noted when 2,4-D (1 lb/A) was mixed with glufosinate. Mixing dicamba with glufosinate did not impact control (91 to 95%).

Glufosinate, dicamba, and 2,4-D controlled morningglory spp. at least 97%. Combinations of glufosinate and dicamba or 2,4-D provided complete control.