PALMER AMARANTH, BENGHAL DAYFLOWER, CARPETWEED, PITTED MORNINGGLORY, AND BROADLEAF SIGNALGRASS RESPONSE TO GLUFOSINATE APPLIED ALONE OR MIXED WITH 2,4-D OR DICAMBA

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Abstract

Glyphosate-resistant Palmer amaranth was confirmed to infest 38 GA counties at planting time in 2009. Resistance to the ALS-inhibitors is also common, and biotypes with multiple resistance to both herbicide chemistries have been confirmed in the state. 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 allowing growers the ability 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 2014, a study was conducted to determine the response of Palmer amaranth, benghal dayflower, carpetweed, broadleaf signalgrass, and pitted morningglory to glufosinate, 2,4-D, and dicamba alone and glufosinate mixed with 2,4-D or dicamba.

The study was conducted at 4 locations in the summer of 2009. Two sites were located in Macon County, GA (glyphosate-resistant Palmer amaranth); 1 site was located in Chula, GA (glyphosate-sensitive palmer amaranth and carpetweed); and the last site was located at the Sunbelt Ag Expo in Moultrie, GA (benghal dayflower, broadleaf signalgrass and pitted morningglory). The experimental herbicide programs included 2,4-D at 0.5, 0.75, 1.0 lb/A or dicamba at 0.25, 0.5 or 1.0 lb/A applied alone or in combination with glufosinate at 0.42 lbs/A. A glufosinate-only treatment and a non-treated control were also included in the study. All treatments were replicated 4 times. Herbicides were applied postemergence to 7-9 in tall weeds at 15 gal/A using a backpack sprayer with Drift Guard T-Jet 11002 VS nozzles. Applications were made early in the morning to reduce drift. 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 73% when combined over the three locations. 2,4-D alone controlled Palmer amaranth 69 to 79% while dicamba at 0.25 and 0.5 lb/A controlled Palmer amaranth 65 to 77%. Dicamba at 1 lb/A was the most effective individual herbicide treatment controlling Palmer amaranth 90%. Tank-mixtures of glufosinate plus either 2,4-D or dicamba controlled glyphosate-resistant Palmer amaranth 91% or greater, regardless of rate of 2,4-D or dicamba.

Carpetweed control was 99% with 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 singly controlled benghal dayflower 91-98%. Glufosinate and dicamba (0.25 lb/A) provided 68% control of benghal dayflower; dicamba at 0.5 and 1.0 lb/A controlled benghal dayflower 84 to 93%. Greater than 93% benghal dayflower control was achieved when 2,4-D or dicamba were applied in combination with glufosinate.

Glufosinate controlled broadleaf signalgrass 96% while no control was noted with dicamba or 2,4-D. Combinations of glufosinate plus 2,4-D or dicamba controlled broadleaf signalgrass 88 to 93%. Mixing 2,4-D at 1.0 lb/A with glufosinate reduced control 8% compared to glufosinate applied alone.

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

Mixtures of glufosinate plus 2,4-D or dicamba provided excellent control of 7-9 inch tall Palmer amaranth, carpetweed, benghal dayflower, and morningglory. Additional efforts are needed to understand grass responses to these mixtures as a trend for reduced grass control was noted when mixing 2,4-D or dicamba with glufosinate.