

**TIME OF DAY INFLUENCE ON CONTROL OF PALMER AMARANTH BY DICAMBA TANK MIXES****A.S. Culpepper****P.M. Eure****T. Grey****University of Georgia****Tifton, GA****T. Fowler****Monsanto****St. Louis, MO****Abstract**

Cotton with tolerance to glyphosate, glufosinate, and dicamba will offer growers more effective weed management options with the potential for long-term sustainability. However, adoption of this technology and respective herbicide systems will be determined by the ability of growers to manage off-target movement of these herbicides. In Georgia, fruits and vegetables comprise of a farm gate value similar to that of cotton (\$1.1 billion) and these crops must be protected from off-target herbicide movement. Since winds favoring drift are much more prevalent during the day as compared to early mornings, an experiment determined the response of 5-inch glyphosate-resistant Palmer amaranth to glyphosate, glyphosate + dicamba, glufosinate, and glufosinate + dicamba when applied during early mornings.

Glyphosate (Roundup WeatherMax, 32 oz/A) + dicamba (Clarity, 12 oz/A) or glufosinate (Liberty, 32 oz/A) + dicamba (Clarity, 12 oz/A) were applied at 5:00, 6:30, 8:00, 9:30, and 11:00 AM. Additional treatments included glyphosate or glufosinate alone at 5:00 or 11:00 AM as well as a non-treated control. All applications were made at 15 GPA using AIXR 11002 nozzles during June of 2013 in Macon County, Georgia. Reported evaluations were recorded 20 d after treatment.

All herbicides were influenced by application time of day. Glyphosate + dicamba controlled Palmer amaranth 72 to 74% when applied at 5:00 or 6:30 AM; delaying the application until at least 8:00 AM improved control by 15 to 21%. Similar results were noted with glufosinate + dicamba, Palmer amaranth was controlled 59 to 64% with applications at 5:00 or 6:30 AM while 91 to 94% control was achieved with applications at or after 8:00 AM. When applied alone, glufosinate controlled Palmer amaranth only 26% with the 5:00 AM application and control was improved 58% by waiting until 11 AM to make the application. Of greatest interest was the impact time of day had on glyphosate activity when applied to this highly glyphosate-resistant Palmer amaranth population. Glyphosate applied at 5:00 AM controlled Palmer amaranth only 16% as compared to 56% control being achieved with applications made 6 hours later.

Environmental conditions were studied closely throughout the application process and it is believed that these results cannot be explained solely by humidity, temperature, stage of the moon, sunlight intensity, cloud percentages, Palmer amaranth leaf orientation, soil moisture, or presence of dew. Results do suggest that a physiological process within Palmer amaranth may be a contributing factor for the responses observed in this experiment.

Results from this experiment, and other experiments, suggests growers should wait at least 1.5 hr after sunrise to apply glyphosate, glufosinate, or dicamba if their goal is to maximize control of Palmer amaranth.