USE OF FLURIDONE FOR PALMER AMARANTH (*AMARANTHUS PALMERI*) CONTROL IN ARKANSAS COTTON

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Abstract

Prior to the release of glyphosate-resistant crop cultivars, weeds were controlled primarily through tillage and various herbicides applied throughout the growing season. In 1997, glyphosate-resistant cotton cultivars were introduced to the market, which allowed for multiple in-crop applications of glyphosate. The extensive use of glyphosate caused several weeds to evolve resistance to glyphosate. Palmer amaranth was confirmed resistant to glyphosate in 2006 in Arkansas; since then it has infested most Arkansas cropping counties. New herbicides are desperately needed in cotton with good residual activity to help manage the current wide-spread occurrence of glyphosate-resistant Palmer amaranth and reduce the risks of resistance evolving to the other herbicides that are currently being used to control this weed. Although the herbicide fluridone was never marketed for field crop use, it was found to be most effective in cotton when applied preemergence (PRE).

In 2012, a cotton research trial was conducted at the Lon Mann Cotton Research Center in Marianna, AR. This trial was setup as a four (PRE herbicides) by two (POST herbicides) factorial. Factor A consisted of fluridone at 0.2, 0.3, and fluometuron at 1.0 lb ai/A; and factor B consisted of glyphosate + prometryn (8- to 10-lf) fb MSMA + flumioxazin (layby); glyphosate + *S*-metolachlor (2-lf) fb glyphosate + *S*-metolachlor (4- to 5-lf) fb glyphosate + prometryn (8- to 10-lf) fb MSMA + flumioxazin (layby); all herbicides were applied at their labeled rates.

At 27 days after initial application (DAIA), no treatment provided greater than 90% Palmer amaranth control. A rate response was seen with the two rates of fluridone. In absence of a postemergence herbicide, both rates of fluridone provided greater control than fluometuron. By 85 DAIA, all PRE treatments followed by four postemergence herbicide applications were significantly similar, providing 78 to 85% Palmer amaranth control. With only two postemergence herbicide treatments, Palmer amaranth control with all treatments decreased to no more than 65%. Significant differences were seen between the fluridone treatments and fluometuron with only two postemergence applications. In conclusion, increasing the rate of fluridone to reduce the number of applications did not provide season-long Palmer amaranth control. The lack of Palmer amaranth control with PRE-applied herbicides alone could be a result of insufficient rainfall to activate the herbicides.