USE OF FLURIDONE FOR SEASON-LONG PALMER AMARANTH CONTROL Z.T. Hill J.K. Norsworthy H.D. Bell M.T. Bararpour C.J. Meyer University of Arkansas Fayetteville, AR

<u>Abstract</u>

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 and 2013, a cotton research trial was conducted at the Lon Mann Cotton Research Center in Marianna, AR. This trial was setup as a three (PRE herbicides) by three (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 none, 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.

By 12 weeks after initial application (WAIA) in 2012, PRE herbicides alone provided less than 25% Palmer amaranth control; while in 2013 both fluridone rates provided superior control of Palmer amaranth compared to fluometuron. By 12 WAIA, all PRE treatments followed by four POST herbicide applications were similar, providing 78 to 85% Palmer amaranth control. With only two POST herbicide treatments, Palmer amaranth control decreased to less than 80% in both years. Greater control resulted with both fluridone rates compared to fluometuron when followed by 2 POST applications in 2012, but acceptable control was not obtained with either of these treatments. Greater Palmer amaranth control occurred with fluridone followed by 4 POST applications compared to fluridone followed by two POST herbicide applications. In conclusion, fluridone does not provide sufficient control of Palmer amaranth to allow for a reduced number of postemergence applications in cotton.