

EVALUATION OF GLYTOL/LIBERTY LINK COTTON IN THE MIDSOUTH**Daniel O. Stephenson, IV****LSU AgCenter****Alexandria, LA****Jason A. Bond****Mississippi State University****Stoneville, MS****Donnie K. Miller****LSU AgCenter****St. Joseph, LA****Abstract**

In 2012, Bayer CropSciences will commercially release GlyTol/Liberty Link technology, which will provide cotton varieties that are resistant to postemergence (POST) applications of glyphosate and glufosinate. In 2011, research was conducted at the LSU AgCenter Dean Lee Research and Extension Center in Alexandria, LA, the Northeast Research Station in St. Joseph, LA, and the Mississippi State University Delta Research and Extension Center in Stoneville, MS to evaluate weed management utilizing the GlyTol/Liberty Link technology. The first experiment evaluated the order in which glyphosate or glufosinate should be applied and whether the rate of either herbicide could be reduced if co-applied. Herbicide(s) were applied POST to 1-2, 4-5, and 8-10 leaf cotton. The second experiment assessed the optimum application timing, based on cotton leaf number, of glyphosate or glufosinate for overall weed management. Treatments included either glyphosate or glufosinate applied to 2- followed by(fb) 6 leaf cotton, 4 fb 6 leaf, 6 fb 8 leaf, 6 fb 10 leaf cotton with each herbicide alternating and each herbicide applied alone or co-applied to 6 leaf cotton. Weeds evaluated were glyphosate-susceptible Palmer amaranth, entireleaf morningglory, sicklepod, and hemp sesbania at Alexandria; barnyardgrass, broadleaf signalgrass, entireleaf morningglory, pitted morningglory, sicklepod, and hemp sesbania at St. Joseph; and barnyardgrass, broadleaf signalgrass, 70% susceptible/30% glyphosate-resistant Palmer amaranth, entireleaf morningglory, and pitted morningglory at Stoneville.

In the order and rate experiment, either glufosinate or glyphosate applied alone at 1-2 leaf cotton caused 0-5% injury; however, the co-application of glyphosate and glufosinate injured cotton 23% at St. Joseph, but the co-application caused 3% or less injury at Alexandria and Stoneville. No cotton injury was observed following the 4-5 and 8-10 leaf applications at any location. At Alexandria, glyphosate and glufosinate, applied alone or together, provided 99% Palmer amaranth control 10 d after the 1-2 leaf application. However, only glufosinate provided greater than 80% control of Palmer amaranth at Stoneville 10 d after the 1-2 leaf application, which was due to the presence of glyphosate-resistant Palmer amaranth. Barnyardgrass and broadleaf signalgrass control 10 d after the 1-2 leaf application was 93% or greater at Stoneville, but only treatments containing glufosinate provided greater than 90% control at St. Joseph, which may have been due to severe drought conditions affecting the efficacy of glyphosate. Regardless of location, Palmer amaranth, barnyardgrass, broadleaf signalgrass, sicklepod, entireleaf morningglory, and hemp sesbania were controlled 76 to 100% by all treatments 28 d after the 8-10 leaf application. No differences in seed cotton yield were observed in this experiment. Preliminary data indicates that there is no advantage of either applying glyphosate or glufosinate as the first herbicide application in the tested sequences to maximize weed control. Also, no advantage or disadvantage was observed when glyphosate and glufosinate were co-applied or the rate of either herbicide, when co-applied, was reduced.

In the application timing experiment, all treatments controlled Palmer amaranth 90-95% 28 d after the 10 leaf application timing at Alexandria. No treatment provided greater than 80% Palmer amaranth control at Stoneville, which may be due to the presence of glyphosate-resistant Palmer amaranth. At Stoneville, treatments that contained glyphosate provided 78-93% barnyardgrass control 28 d after the 10 leaf application timing, but no treatment provided greater than 70% barnyardgrass control at St. Joseph, which may be due to severe drought conditions at this site. Entireleaf and pitted morningglories and hemp sesbania were controlled 78-98% by all treatments at all locations. Two herbicide applications were required to maximize seed cotton yield. Preliminary data indicates that cotton leaf number should not be utilized to initiate herbicide applications in GlyTol/Liberty Link cotton, weed size should be the primary factor. When glyphosate-resistant Palmer amaranth is present, no postemergence application timing provided acceptable control, indicating the need for a preemergence residual herbicide in this system.