

## **EFFICACY OF GLUFOSINATE-AMMONIUM: A BELTWISE SUMMARY**

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### **Abstract**

Glufosinate-ammonium (Liberty<sup>®</sup> Herbicide) is a post emergent broad-spectrum herbicide being developed for use in conventional and transgenic (Liberty Link<sup>®</sup>) cotton. Glufosinate-ammonium demonstrated excellent control of many common and troublesome grass and broadleaf weeds found in cotton at rates of 32 oz/A. Susceptible weeds include morningglories, prickly sida, ragweed, Jimsonweed, cocklebur, sicklepod, pigweeds, crabgrass, signalgrass, and sprangletop. Rate and weed size were factors in control.

### **Introduction**

Glufosinate-ammonium (Liberty<sup>®</sup> Herbicide) is a broad-spectrum herbicide being developed for use in conventional and transgenic cotton (Liberty Link<sup>®</sup>). Pending regulatory approval a limited commercial launch is expected in 2003. The Liberty Link<sup>®</sup> system allows for a wide application window of application of glufosinate-ammonium for excellent broadleaf control and good grass control. Crop tolerance to applications of glufosinate-ammonium to cotton containing the Liberty Link<sup>®</sup> gene is unprecedented. In order to further fine tune the label, studies were initiated across the cotton belt to identify susceptible weeds, effective rate, optimum weed size, length of control and the effect of additives.

### **Materials and Methods**

Fields trials were established in 25 locations across the cotton belt. Trials were established as weed screens in non-regulated cotton or crop free fields. Weed control evaluations from four rates of Liberty (24, 28, 32 and 40 ozs. product/A) were conducted as well as comparisons to the addition of ammonium sulfate, and in combinations with Staple<sup>®</sup> Herbicide. Applications were made in 13-20 gallons of water per acre to 2-4 inch weeds. Plot size was approximately 30 feet by 12 feet with three to four replications. Visual weed control evaluations were conducted approximately 3-5, 7-14, and 18-21 days after treatment.

### **Results**

In the southeast cotton growing region, glufosinate-ammonium at 32 ozs/A or greater provided 95% or greater control of FL beggarweed (DEDTO), coffeebean (SEBEX), prickly sida (SIDSP), common ragweed (AMBEL), Jimsonweed (DATST), cocklebur (XANST) and sicklepod (CASOB) 14 days after treatment. The addition of AMS or Staple<sup>®</sup> did not increase speed of activity or level of control. Glufosinate-ammonium also provided greater than 95% control of morningglory species tested. Again the addition of ammonium sulfate or Staple<sup>®</sup> did not enhance activity. Decreased control of red root pigweed (AMARE) was observed at the 24 oz/A rate but was above 90% with rates greater than or equal to 32 ozs/A. Reduced control at all rates were observed with Palmer pigweed (AMAPA), with control ratings ranging from 55% at 24 ozs/A to 85% at 40 ozs/A. The addition of ammonium sulfate or Staple<sup>®</sup> did not impact control levels. Control of grasses was also good. Control of large crabgrass (DIGSA), and seedling Johnsongrass (SORHA) was 95% or greater with all rates of glufosinate-ammonium 14 days after treatment. Reduced control (less than 85%) of goosegrass (ELEIN) was observed at rates less than or equal to 32 ozs/A, but control increased to 90% at the 40 oz/A rate.

Trials from the mid-south region evaluated morningglory species, prickly sida, redroot pigweed, and large crabgrass. Results indicated greater than or equal to 98% control for all rates of glufosinate-ammonium tested 14 days after treatment. Results from the western growing region indicated control levels of weeds such as pigweed and morningglory species were reduced compared to other cotton growing regions. The addition of ammonium sulfate did increase control of morningglory species to acceptable levels. Glufosinate-ammonium did not control field bindweed (CONAR).

### **Conclusions**

Glufosinate-ammonium provided excellent weed control of many common and troublesome weeds found in cotton throughout the cotton growing regions. These weeds included FL beggarweed, sicklepod, cocklebur, common ragweed, morningglories, Jimsonweed, crabgrass, and seedling Johnsongrass. Weeds that exhibited reduced control included Palmer pigweed, goosegrass, and field bindweed. The optimum rate that provided the most consistent control was 32 ozs product/A. Applications to weeds greater than 4 inches may reduce control. The addition of ammonium sulfate increased efficacy in some cases, but not in others. Increased control with ammonium sulfate was observed under dry, hot conditions, or with harder to control

species. The addition of ammonium sulfate may also aid control of weeds taller than 4 inches. The addition of Staple<sup>®</sup> Herbicide did not improve weed control on weeds evaluated.

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