**FALL RESIDUAL AND SPRING POST PROGRAMS FOR GLYPHOSATE-RESISTANT ITALIAN RYEGRASS**

**Jason A. Bond**
**Thomas W. Eubank**
**Robin C. Bond**
**Mississippi State University**
**Stoneville, MS**

**Abstract**

Glyphosate-resistant (GR) Italian ryegrass (*Lolium perenne* ssp. *multiflorium*) was first documented in the United States in Oregon in 2003. Regionally, two populations of GR Italian ryegrass exhibiting a three-fold resistance were identified in field crops in Washington County, Mississippi, in 2005. Glyphosate-resistant Italian ryegrass is now present in 13 counties in Mississippi. Research to address management of GR Italian ryegrass was initiated at the Delta Research and Extension Center in Stoneville, Mississippi, in 2005. The major conclusions of research from 2005 through 2008 were (1) postemergence (POST) options in the spring are extremely limited and require at least two herbicide applications to approach complete control and (2) residual herbicides applied in the fall offer the best opportunity for controlling GR Italian ryegrass. More recently, the research emphases have transitioned to focus on programs for managing GR Italian ryegrass with control tactics utilized in the fall and spring.

Research was conducted in 2010-11 near the Mississippi State University Delta Research and Extension Center in Stoneville to develop GR Italian ryegrass management programs that integrate fall residual and spring POST herbicides. Treatments were arranged as a three-factor factorial in a randomized complete block design with four replications, and the study was repeated in space. Factor A was fall application and included no fall treatment, tillage, or application of a mixture of Dual Magnum (*S*-metolachlor; 1.27 lb ai/A) plus Gramoxone Inteon (paraquat; 0.75 lb ai/A). Fall applications were made November 1, 2010. Factor B was winter application and included no winter treatment or Select Max (clethodim; 0.094 lb ai/A) applied February 4, 2011. Factor C was spring application and included no spring treatment or Gramoxone Inteon (1 lb ai/A) applied February 23, 2011. Data collected included visual estimates of GR Italian ryegrass control at different intervals following each application and GR Italian ryegrass density following fall applications. Data were subjected to ANOVA and estimates of the least square means were used for mean separation.

Dual Magnum controlled GR Italian ryegrass 90% prior to winter application. However, control from tillage treatment was only 42% at the same evaluation. One-pass programs controlled GR Italian ryegrass ≤83% by late-March. Programs utilizing only winter and/or spring applications controlled GR Italian ryegrass ≤85% by late-March. Efficacy of one-pass POST programs was improved when these applications were preceded by fall tillage. Fall tillage followed by Select Max followed by Gramoxone Inteon controlled GR Italian ryegrass similar to programs containing Dual Magnum followed by one POST application.

Following fall tillage, both Select Max and Gramoxone Inteon were required as POST treatments. Following Dual Magnum application, control of GR Italian ryegrass was optimized with a single POST treatment. GR Italian ryegrass control was reduced in programs that did not include a fall treatment. A minimum of two herbicide applications were required for >90% control of GR Italian ryegrass.