

Programs For Managing Glyphosate Resistant Italian Ryegrass In The Mississippi Delta

DR. JASON A. BOND

MISSISSIPPI STATE, MISS.

Italian ryegrass (*Lolium perenne* ssp. *multiflorum*) is an erect winter annual with a biennial-like growth habit. It is often planted as a cover crop, as a temporary lawn grass, for roadside restoration, or for soil enrichment; however, it often escapes cultivation and becomes established in fallow fields as a winter weed. Italian ryegrass has a wide range of adaptability to soils, and it thrives in fertile soils in regions with mild climates. Plants emerge in the fall and grow vigorously through winter and early spring. Individuals of the species are highly competitive for nutrients, water, and sunlight.

Glyphosate-resistant (GR) Italian ryegrass 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. Since the initial confirmation in 2005, field observations suggest some populations are resistant to much higher glyphosate rates. Survey data from 2009 indicate that GR Italian ryegrass is now present in 12 counties in the Mississippi Delta. It has also become problematic in other southern states. Populations of GR Italian ryegrass have been confirmed in at least one county/parish in Arkansas, Louisiana, and North Carolina during the last three years. Several other counties/parishes in Arkansas, Louisiana, and Tennessee are also suspected to contain GR Italian ryegrass.

Dense populations of GR Italian ryegrass are problematic for producers. This weed can jeopardize burndown programs, and few affordable postemergence herbicides are available. Fields containing GR Italian ryegrass not controlled at burndown will have significant plant residue at planting. Residue will impede planting practices, contribute to competition between crop seedlings and established GR Italian ryegrass, and hinder herbicide programs due to inadequate coverage. Therefore, it is important to identify effective herbicide and/or cultivation programs to adequately control GR Italian ryegrass to prevent competition and yield loss.

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 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. These include integration of postemergence and residual herbicides, tillage, and sanitation.

A GR Italian ryegrass management program should begin with residual herbicides applied when weather permits between mid-October and

mid-November. Depending on rainfall totals through the fall and winter months, residual herbicides [Dual Magnum (S-metolachlor), Treflan (trifluralin), and Command (clomazone)] applied in the fall prior to GR Italian ryegrass emergence may provide control that lasts until spring. Dual Magnum (1.33 pt/A) or Treflan (3 pt/A) should be utilized in fields that will be planted to cotton or soybeans the following year. Dual Magnum is the only fall residual herbicide for GR Italian ryegrass that may be safely applied if the field will be planted in corn. In fields where the following year's crop will be rice, Command (2 pt/A) is the only fall residual herbicide option. Treflan requires incorporation within 24 hours of application or GR Italian ryegrass control will be poor. Because Dual Magnum and Command are soil-applied herbicides, they still require incorporation, but this can be achieved with rainfall rather than mechanical incorporation.

None of the residual herbicides effective against GR Italian ryegrass have postemergence activity. Glyphosate-resistant Italian ryegrass that has emerged prior to application of residual herbicides must be controlled with aggressive tillage or an application of Gramoxone Inteon (2 to 3 pt/A). Gramoxone Inteon may be tank-mixed with Dual Magnum, Command, or Treflan. In a Treflan-based residual herbicide program, 4 to 6 hours should elapse between application and incorporation.

Few effective spring management options are available for GR Italian ryegrass, and spring herbicide programs often require sequential applications. Gramoxone Inteon (paraquat) and Select Max (clethodim) are the most effective postemergence herbicide options for GR Italian ryegrass. However, depending on the timing of application, postemergence treatments often do not provide complete control. Scouting for GR Italian ryegrass that escaped the fall residual herbicide application should begin in January. Sequential spring herbicide programs for controlling GR Italian ryegrass should include either glyphosate (0.77 lb ae/A) plus Select Max (12 to 16 oz/A) followed 4 to 6 weeks later by Gramoxone Inteon (4 pt/A) or sequential applications of Gramoxone Inteon (4 pt/A) spaced 7 to 10 days apart. Regardless of the program utilized, all ryegrass should be completely controlled prior to planting.

Glyphosate-resistant Italian ryegrass represents a serious threat to crop production systems in the Midsouth. The presence of this weed also jeopardizes traditional glyphosate-based burndown programs. Management of GR Italian ryegrass requires a multi-faceted approach. Herbicide options are limited and Italian ryegrass has a history of rapidly developing resistance to multiple herbicide chemistries. With that in mind, tillage should be an integral component of GR Italian ryegrass management strategies. Δ

DR. JASON BOND: Weed Scientist, Mississippi State University