

FACTORS AFFECTING BURNDOWN CONTROL OF ITALIAN RYEGRASS WITH GLYPHOSATE

James R. Martin and Charles H. Slack
Department of Plant and Soil Sciences, University of Kentucky,
P.O. Box 469, Princeton, KY 42445

Corresponding author's e-mail address: jamartin@uky.edu

ABSTRACT

Studies were conducted during the spring of 2004 to evaluate factors such as type of formulation, application timing, herbicide rate, and use of ammonium sulfate as an additive on burndown control of Italian ryegrass (*Lolium multiflorum*) with glyphosate. The different glyphosate formulations generally provided similar level of ryegrass control, yet there were a few differences in control due to formulation. Increasing the glyphosate rate from 0.75 to 1.125 lb ae/A tended to improve control, particularly when treatments were applied during early spring. Application timing tended to have the most impact on burndown control of ryegrass, with April applications usually providing faster and slightly better control than March applications. AMS did not enhance ryegrass control, except in a few instances.

SUMMARY

Italian ryegrass is a cool-season annual that has become a problem weed in no-till corn in Kentucky. Plants are easily controlled when in the seedling stage in the fall; however, once they have overwintered and developed multiple tillers, they tend to become more difficult to control with a single burndown application in the spring. There has been increased interest in using glyphosate as a component in burndown treatments, due to its ability to translocate in plants, but results with this herbicide have been variable. Studies were conducted in 2004 at University of Kentucky Research and Education Center near Princeton to evaluate such factors as product formulation, application timing, herbicide rate based on acid equivalent (ae), and use of ammonium sulfate (AMS) at a rate of 3.7% (v/v) as an additive with glyphosate on burndown control of ryegrass. Burndown control of ryegrass from early preplant (EPP) treatments was evaluated periodically during the first 4 weeks after application.

The first study compared seven glyphosate products based on the following formulations: isopropyl amine salt as 3 lb ae/gal (ClearOut 41 Plus, Glyphomax Plus, and Honcho); diammonium salt with 3 lb ae/gal (Touchdown IQ); isopropyl amine salt with 3.73 lb ae/gal (Roundup UltraMax); potassium salt with 4.17 lb ae/gal (Touchdown Total); and potassium salt with 4.5 lb ae/gal (Roundup WeatherMAX). Glyphosate was applied in all treatments in this study at 0.75 lb ae/A in combination of S-metolachlor at 1.3 lb active ingredient (ai)/A plus atrazine at 1.6 lb ai/A. The height of ryegrass averaged 3 inches on March 13 for EPP-1 treatments and 6 inches on April 14 for EPP-2 treatments.

Ryegrass response was substantially slower when treatments were applied at EPP-1 than at EPP-2. Average control ratings across all glyphosate treatments at EPP-1 were 3, 47, and 77% compared with 47, 80, and 86% for EPP-2 treatments at 9, 16, and 24 days after treatment (DAT), respectively. The fact the average temperature for the first 24 days after application was 53⁰ F for EPP-1 treatments, compared with 64⁰ F for EPP-2 treatments, may have contributed to the

difference in speed of response. The use of AMS as an additive did not enhance the speed of control with the EPP-1 treatments. However, the addition of AMS to ClearOut 41 Plus tank mixture applied at EPP-2 increased ryegrass control for 43 to 53 % at 9 DAT, but did not enhance control of other glyphosate products when combine with S-metolachlor plus atrazine. AMS did not enhance ryegrass control of any glyphosate treatment when evaluated at 16 and 24 DAT.

Applying Touchdown Total plus S-metolachlor plus atrazine at EPP-1 provided 90 and 92% ryegrass control at 24 DAT, with and without AMS, respectively. The use of Roundup UltraMax at EPP-1 resulted in 83 and 77% control with and without AMS, respectively. The other glyphosate treatments at EPP-1 provided an average of 74% control at 24 DAT, regardless whether or not AMS was included as an additive.

The second study compared Roundup WeahterMAX and ClearOut 41 Plus at 0.75 or 1.125 lb ae/A applied either alone or with AMS. The average height of ryegrass was 6 inches on March 15 for EPP-1 treatments and 11 inches on April 5 for EPP-2 treatments.

The environmental effects associated with application timing on ryegrass control were similar to those observed in study 1 and were more important than rate of herbicide or use of AMS as an additive. The cooler temperatures associated with EPP-1 treatments caused ryegrass to respond slower relative EPP-2 treatments. Control ratings made at 7, 14, and 30 DAT and averaged across both glyphosate products and both rates for EPP-1 treatments were 7, 38, and 71% compared with 48, 82, and 94% for EPP-2 treatments, respectively.

Roundup WeahterMAX and ClearOut 41 Plus provided similar ryegrass control, however there were as few instances where differences in control occurred. When 0.75 lb ae/A was applied alone at EPP-1 timing, Roundup WeahterMAX provided 63% control at 30 DAT compared with 50% for ClearOut 41 Plus. Including AMS as an additive with glyphosate at 0.75 lb ae/A resulted in 77% control for Roundup WeatherMAX but only 53% for ClearOut 41 Plus.

Increasing the glyphosate rate from 0.75 to 1.125 lb ae/A improved ryegrass control in 3 of 4 instances for EPP-1 treatments and 1 of 4 instances for EPP-2 treatments