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ROUNDUP READY COTTON TOLERANCE TO VARIOUS GLYPHOSATE FORMULATIONS

Nathan W. Buehring, Daniel B. Reynolds, David G. Wilson,
Normie W. Buehring, Jason C. Sanders, and L. Thomas Barber
Mississippi State University
Mississippi State, MS

Abstract

The recent patent expiration on glyphosate has resulted in the availability of numerous new glyphosate herbicides, some of which are labeled for use in Roundup Ready cotton. This has lead to more options for cotton producers; however, it has also increased their concerns about Roundup Ready cotton tolerance to all glyphosate herbicides. The objective of this experiment was to compare various glyphosate herbicides for Roundup Ready cotton tolerance. This experiment was conducted at the North Mississippi Research and Extension Center in Verona, MS in 2002. The experimental design was a randomized complete block. Cotton, Stoneville 4892 BR, was planted into 6.33 by 50 ft plots. The glyphosate herbicides used in this experiment are as follows: Glyfos, Glyfos X-tra, Glyphomax, Glyphomax Plus, Glyphosate Original, Roundup UltraDry, Roundup Original, Roundup D-Pak, Roundup UltraMax, Touchdown 5, Touchdown IQ, ClearOut 41, and ClearOut 41 Plus. For comparison purposes, an untreated check was also included in the experiment. The glyphosate herbicides were applied at 0.75 lbs ae of glyphosate per acre with a spray volume of 15 GPA. If an additional surfactant was required by the label, Latron AG-98 at 0.5% v/v was added to the spray solution. All of the glyphosate herbicides were applied topically at the 2-leaf stage and followed by another topical application at the 4-leaf stage. Data were collected for visual injury and yield. Also, plant mapping data were collected from five plants within each plot. Plant mapping data were analyzed by two different methods: percent boll retention at each fruiting position (1, 2,and 3); and percent boll retention at zone 1 (all positions between nodes 6 through 10), zone 2 (all positions between node 11 through 15), and zone 3 (all positions greater than node 15).

Visual injury was observed with Touchdown 5 at 10 days after the 2-leaf application (21%) and 7 days after the 4-leaf application (10%). Roundup UltraMax had lower percent boll retention (32.9%) at position 1 than the untreated (51.4%), but did not differ from any other glyphosate herbicide. All of the other glyphosate herbicides resulted in no differences at position 1 from the untreated. None of the treatments were different in percent boll retention from the untreated at position 2, position 3, zone 1 and zone 3. At zone 2, Glyfos and ClearOut 41 Plus resulted in lower percent boll retention (37.2 and 39.7%) than the untreated (47.7%). All of the treatments responded similarly in yield when compared to the untreated.

These preliminary data show some variability among herbicide sources but generally were not significantly different from the untreated check. Further research is needed, under a variety of growing conditions, before broad statements can be made regarding differential tolerance of Roundup Ready cotton varieties to various glyphosate herbicides.