

Benchmark Study

Glyphosate Resistance Management

2009 Report #4

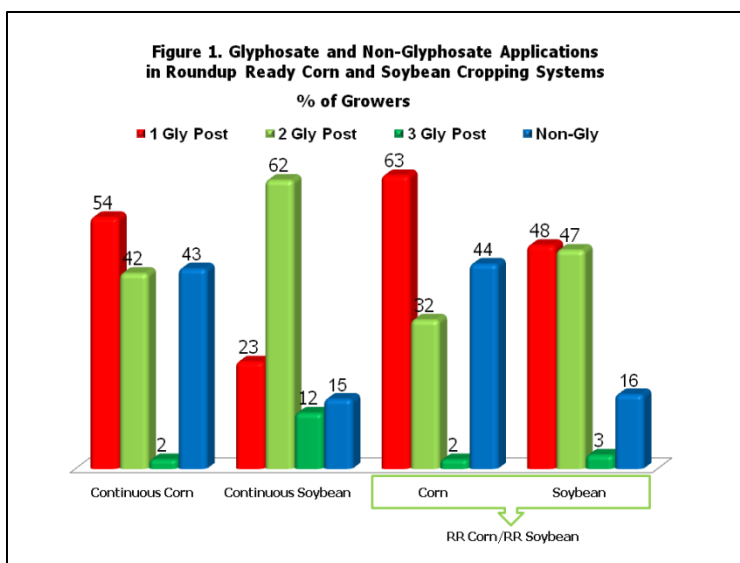


Herbicide Use Patterns Have Changed with the Wide-spread Adoption of Roundup Ready® Crops*

University weed scientists initiated a grower survey to quantify herbicide use patterns in Roundup Ready cropping systems. Approximately 1200 growers in six states (approximately 200 per state in Iowa, Illinois, Indiana, Mississippi, North Carolina, and Nebraska) were surveyed by telephone in the winter of 2005-2006. Only growers utilizing the Roundup Ready technology for a minimum of 3 years qualified for the survey.

Between 4 and 16% of growers made fall applications of herbicides and 20 to 76% of the growers made a preplant or burndown application in Roundup Ready cropping systems (Data not shown). Burndown applications were highest in the cotton and soybean Roundup Ready cropping system. Glyphosate and glyphosate/2,4-D combinations were the most commonly used herbicide programs across all cropping systems for fall and burndown applications.

Most growers made two or fewer in-crop applications of glyphosate in Roundup Ready corn and soybean systems (Figure 1). Single applications of glyphosate were used in corn by 54 and 63% of the growers in continuous corn and corn/soybean rotations, respectively.

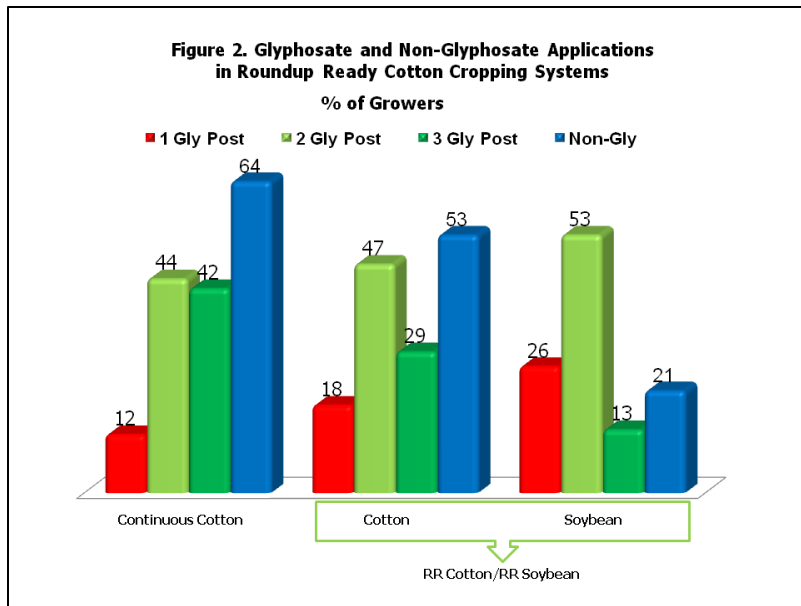


While single applications of glyphosate in soybean was 23% in continuous soybean and 48% in corn/soybean rotations. The use of non-glyphosate herbicides (preemergence and post herbicides) was higher in corn than soybeans which scientists indicate may partially explain the higher use of single

applications in corn compared to soybean. Two applications of glyphosate were used extensively in Roundup Ready soybean (47-62%), but to a lesser degree in corn (32-42%). Only 15 to 16% of the growers utilized non-glyphosate herbicides in Roundup Ready soybean.

The frequency of glyphosate applications and the use of non-glyphosate herbicides were higher in Roundup Ready cotton compared to Roundup Ready corn and soybean (Figure 2). Only 12-18% of the growers used single applications of glyphosate in Roundup Ready cotton. Also, fewer growers used single applications in Roundup Ready soybean when in a cotton/soybean rotation (26%) compared to a corn/soybean rotation (48%). Approximately 30 to 40% of the growers made three applications of glyphosate in cotton.





Scientists state that more cotton growers are moving toward total postemergence weed control programs because fewer preemergence herbicides are available, the marginal crop tolerance of many herbicides, and the difficulties of applying post-directed herbicides.

The highest use of non-glyphosate herbicides was in Roundup Ready cotton (53-64% of growers) whether in continuous cotton or rotated with soybean (Figure 2). The majority of the non-glyphosate applications in Roundup Ready cotton were postemergence applications.

Long-term field studies are on-going as a part of the Benchmark study to evaluate the effectiveness of growers' current herbicide programs in Roundup Ready crops compared to more extensive weed management programs designed to reduce the selection pressure of glyphosate and lower the potential risk of weeds developing resistance to glyphosate.

Summary of Herbicide Programs in Roundup Ready Cropping Systems

- Fall herbicide applications were made by 4-16% of the growers and preplant/burndown applications were made by 20 to 76% of growers depending on the crop rotation. The highest use of preplant/burndown applications was in Roundup Ready cotton and soybean. Glyphosate and 2,4-D were the most commonly used herbicides for these applications.
- Single applications of glyphosate were used by 54-63% of the growers in Roundup Ready corn. Single applications of glyphosate in Roundup Ready soybean and cotton ranged from 23 to 48% and 12 to 18%, respectively. Two applications of glyphosate were used by 32-42%, 47-62%, and 44-47% of growers in Roundup Ready corn, soybean and cotton, respectively
- The highest use of non-glyphosate herbicides in Roundup Ready cropping systems was in Roundup Ready cotton (53-64%) and the lowest use was in Roundup Ready soybean (15-21%).

*Wade A. Givens and David R. Shaw – Mississippi State University; William G. Johnson and Stephen C. Weller – Purdue University; Bryan G. Young – Southern Illinois University; Robert G. Wilson – University of Nebraska; Micheal D. K. Owen – Iowa State University; and David Jordan – North Carolina State University. 2009. A Grower Survey of Herbicide Use Patterns in Glyphosate Resistant Cropping Systems. *Weed Technology* 23:156-161.

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