

GLYPHOSATE-RESISTANT WEEDS: *CAN WE CLOSE THE BARN DOOR?*

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Abstract

Roundup Ready technology is a simple and highly effective system that has become the dominant weed management approach in soybeans, corn, and cotton; in many states, over 90% of the acreage in these crops is planted to Roundup Ready varieties. Within the past five years, glyphosate resistance in weeds has emerged as a prominent issue in Roundup Ready crops. Weed scientists are making major efforts in research and education/outreach programs to better understand the drivers behind resistance development, and to proactively educate growers on best management practices that can be used to prevent selection for glyphosate-resistant weed biotypes, or to manage them when they do appear.

Over 1200 growers in six states (Illinois, Indiana, Iowa, Mississippi, Nebraska, and North Carolina) were surveyed by telephone in January 2006 to better understand their attitudes toward the development and management of glyphosate-resistant weeds. In particular, the survey assessed the perceived levels of concern among growers about glyphosate resistance in weeds and whether they believed they had experienced glyphosate resistance on-farm. This survey also allowed the development of baseline information on how weed management and crop production practices have changed since the introduction of Roundup Ready technology. Additionally, this survey provided critical information on common weed management issues that need to be addressed through applied Weed Science research and extension efforts.

Following this survey, a series of farm-scale studies were conducted on 120 farms in these states over a four-year period to assess grower-chosen management practices (primarily or exclusively glyphosate) versus university-recommended herbicide resistance management practices in split-field studies. Although input costs were slightly higher when university-recommended practices were employed, increased yields with these practices tended to offset these costs, resulting in net returns equal to or greater than the grower systems.

A follow-up survey conducted late in 2010 will measure the effectiveness of recent educational programs in changing grower attitudes toward resistance management. This will be an important element in understanding the impact of current education and outreach programs, and target where additional Extension efforts are needed.

The Weed Science Society of America as an organization and as individual members is taking a very proactive approach to developing and disseminating information regarding glyphosate resistance management. A series of symposia have been conducted at the annual conference for the last four years on this topic. WSSA has been working in close partnership with a number of organizations in development of educational programs and materials. Partners include the National Cotton Council, American Soybean Association, National Corn Growers Association, National Association of Conservation Districts, Herbicide Resistance Action Committee, Crop Life America, USDA Natural Resources Conservation Service, USDA Animal Plant Health Inspection Service, Environmental Protection Agency, and National Research Council. Training modules, fact sheets, Powerpoint presentations, and web materials are under development that will provide foundational information, as well as species-specific, state/region specific, and crop-specific educational information on herbicide resistance management.

APHIS and EPA are sponsoring a special publication, authored by WSSA members and due to be completed by February 2011, which summarizes the latest and best information on glyphosate resistance. A second report is currently under development that provides the best available management practices for herbicide resistance, assesses their levels of implementation, explores obstacles to implementation, and provides recommendations on means to overcome these obstacles. This report will be completed by summer 2011. Presentation of the report will be provided at a national symposium in Washington DC, with participation from federal agencies, commodity organizations, industry, academia, and the Weed Science Society of America.