GLYPHOSATE MANAGEMENT FOR WISCONSIN

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Issues related to herbicide-resistant weeds are not new to Wisconsin, considering triazine-resistant lambsquarters date back to the 1970s. Through this time, Wisconsin growers have frequently adapted to the problems created by the resistant weeds by switching to herbicides with different modes of action. These growers have continued to successfully manage weeds once the problem was identified and herbicide-resistant weeds have not led to the failure of farming.

Now, there is new discussion about the risk of glyphosate resistance. It is logical to determine the degree of this risk and whether management practices should be used to delay resistance or to manage the problem when it occurs. Because this issue may affect many sectors of Wisconsin's agriculture, University of Wisconsin Extension decided to host a focus group to determine the level of concern about resistance among these sectors and determine what additional information may be needed by our agricultural industry. This focus group meeting was called the Glyphosate Resistance Roundtable. Two representatives from each of the following sectors were invited to the Roundtable: dairy producers, corn growers, soybean growers, vegetable growers, independent consultants, pesticide dealers, extension agents, and university weed scientists.

During the Glyphosate Resistance Roundtable, nine of 13 participants indicated they were moderately concerned and four participants indicated they were highly concerned about the risk of glyphosate-resistant weeds. In general, participants felt grower acceptance of glyphosate technology was unprecedented and they were worried about the loss of the technology due to the development of resistant weeds. Numerous ideas were suggested during the Roundtable and many ideas related to educating growers on the issue, being proactive, and developing a position paper that can be endorsed by Wisconsin's agricultural industry. As a consequence of that request, the following text has been developed for use in a position paper and is being presented today.

Wisconsin Farmers and Agri-Business Call for Glyphosate (Roundup) Stewardship

Key Points

- Glyphosate and Roundup Ready Crops are valuable tools for Wisconsin farmers.
- The risk of glyphosate-resistant weeds will increase with improper use of glyphosate.
- Glyphosate-resistant weeds will reduce the value of this technology.
- New herbicides are not being developed to replace glyphosate.
- Wisconsin farmers should be proactive leaders and practice glyphosate stewardship.

Glyphosate and Roundup Ready crops are valuable tools

The wide scale adoption of Roundup Ready crops by Wisconsin farmers is unprecedented. Since their introduction in 1996, Roundup Ready soybean acreage has steadily increased and is now approximately 85% of Wisconsin's total soybean acreage. Adoption of Roundup Ready corn, released in 1998, hasn't been as rapid, but it represents approximately 10% of Wisconsin's total corn acreage.

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The rapid adoption of the Roundup Ready technology by farmers is directly related to value of this technology. Glyphosate, applied to Roundup Ready soybean varieties and corn hybrids, provides broad-spectrum weed control at a low cost with excellent crop safety. It has a wider window of application than other herbicides, has no soil activity, which provides flexible crop rotations, and has low environmental and human health risks. The simplicity of glyphosate and the Roundup Ready soybean system is remarkable. No other herbicide has all of these characteristics. However, improper use of glyphosate increases the risk of weeds developing resistance to glyphosate.

Why be concerned about glyphosate resistance after 30 years of use?

Glyphosate was first marketed in 1974. Initially, it was used in Wisconsin for perennial weed control and burndown applications in no-till farming. This restricted the number of acres where glyphosate was applied and other herbicides were used to control remaining weeds. However, glyphosate use is different today. Since the introduction of Roundup Ready crops in 1996, glyphosate is used for both burndown treatments and in-crop weed control. This has dramatically increased the number of acres where glyphosate is used and billions of weeds are being sprayed each year. This greatly increases the potential for resistance to develop.

Glyphosate-resistant weeds can develop

The first weed to become resistant to glyphosate was rigid ryegrass in Australia in 1996. In 2000, horseweed (also called marestail) was the first glyphosate-resistant weed to appear in soybean fields the United States. Initially found in Delaware, there now nine states with glyphosate-resistant horseweed (Delaware 2000, Tennessee 2001, Indiana 2002, Maryland 2002, New Jersey 2002, Ohio 2002, Arkansas 2003, Mississippi 2003, and North Carolina 2003). Six weeds have developed resistance to glyphosate in the past 8 years.

Currently, there are no confirmed reports of glyphosate-resistant weeds in Wisconsin. However, there are increasing concerns that glyphosate-resistant common lambsquarters may occur in Wisconsin. In 2002 and 2003, farmers, consultants and agronomists frequently observed common lambsquarters as the only surviving weed in Roundup Ready soybeans fields after glyphosate applications. While not confirmed by research, the potential for common lambs-quarters to develop resistance to glyphosate is a major concern.

Glyphosate-resistant weeds will reduce the value of Roundup Ready technology

Glyphosate-resistant weeds will be costly in the short- and long-term. With resistance, farmers will need to use herbicides that may be more expensive, have shorter application windows, or greater potential of crop injury or carryover. Landowners could face losses from lower land rental values as a result of glyphosate-resistant weeds in a field. At the very least, glyphosate-resistant weeds will require additional herbicides to control the resistant weed, which will increase costs.

Glyphosate is almost an essential component of no-till systems. Glyphosate-resistant weeds could make no-till an unmanageable system, requiring a return to increased tillage and increased soil erosion. Considering there has been only one new herbicide mode of action discovered and registered in the last 20 years, it is unlikely that another herbicide will be developed any time soon to replace glyphosate.

The future of glyphosate and Roundup Ready technology in Wisconsin

Cleary, it is important to protect the value of Roundup Ready crop technology through proper stewardship of glyphosate use. The future of this technology depends on the decisions of Wisconsin farmers. While no federal law states what Wisconsin farmers must do, we believe Wisconsin farmers should be proactive and be leaders in the adoption of glyphosate stewardship practices.

This Call for Stewardship is currently being promoted and endorsed by:

Wisconsin Fertilizer and Chemical Association
Wisconsin Association of Professional Agricultural Consultants
Wisconsin Soybean Association
Wisconsin Potato and Vegetable Growers Association
UW-Extension Team Grain
UW-Madison Weed Scientists
UW-Madison Production Agronomist

Glyphosate Stewardship Practices

- Rotate between Roundup Ready and conventional crops or crops with other types of herbicide resistance. Use Roundup Ready crops in your rotation where they have the greatest economic and management value.
- Rotate glyphosate with other herbicide modes of action. Rotate non-glyphosate herbicides over time as well.
- Apply glyphosate at labeled rates at the correct stage of growth.
- If glyphosate is used as a burndown treatment and in-crop, tank mix one of the glyphosate applications with another mode of action.
- Use cultivation after in-crop applications of glyphosate when possible.
- Scout fields regularly and identify weeds present.
- Respond quickly to changes in weed population.

Examples of crop and herbicide rotations that promote glyphosate stewardship

Tilled Corn/Soybean	No-Till Corn/Soybean	Alfalfa/Corn	Continuous Corn
Year 1 Conventional Corn apply herbicides with non-glyphosate modes of action **Year 2** Roundup Ready Soybean apply glyphosate early postemergence **Year 3** Repeat rotation	**Year 1** Conventional Corn *Burndown:* apply glyphosate + 2,4-D *In-crop:* apply herbicides with non-glyphosate modes of action **Year 2** Roundup Ready Soybean *Burndown:* apply glyphosate + 2,4-D *In-crop:* apply glyphosate early postemergence **Year 3** Repeat rotation	**Year 1** Alfalfa apply glyphosate + 2,4-D in early fall **Year 2** Roundup Ready Corn apply glyphosate early postemergence* cultivate **Year 3** Conventional Corn apply herbicides with non-glyphosate modes of action **Year 4** Alfalfa	**Year 1** Conventional Corn apply herbicides with non-glyphosate modes of action **Year 2** Roundup Ready Corn may be grown to manage specific weed problems apply glyphosate early postemergence* cultivate **Year 3** Repeat rotation

* An application of a preemergence herbicide is recommended to minimize the risk of early season weed competition.