

Proactive Weed Management

What You'll Learn...

- Proactive weed management involves the timely use of herbicides and cultural practices to minimize the risk of herbicide-resistant weed development.
- Strategies that use residual herbicides along with timely postemergence applications, multiple modes of action, and maintaining good weed control throughout the season will help reduce the risk of herbicide-resistant weed pressure on the farm.
- Implementing effective proactive weed management strategies can help to minimize the spread of glyphosate-resistant weeds, and the increased costs associated with their control.

Herbicide-resistant Weeds

Natural weed populations contain individual plants (biotypes) that are more tolerant to a herbicide. Repeated use of any herbicide by itself will expose weed populations to selection pressure which may result in the survival of individual plants with greater tolerance or resistance to the repeatedly used herbicide. If these plants are not controlled by another herbicide or cultural practice, the herbicide-resistant biotype can reproduce and spread.

Impact of Glyphosate-resistant Weeds

The development of resistant weed species and weed shifts typically increase control costs, when compared with previously susceptible weed populations.¹ If not properly managed, a small isolated glyphosate-resistant weed patch can soon spread across an entire field and potentially into neighboring fields. Depending on the crop, a limited number of postemergence herbicide options may be available for in-crop control of glyphosate-resistant weeds. In some fields, growers have resorted to applying herbicides with hooded sprayers or hiring crews to hand hoe the weeds. Advancements have

been made in hooded sprayer technology; however, weeds within the row will still need to be controlled. Depending on the region and weed density, hand-hoeing weeds can be very expensive. These measures add costs to production, but still can be a part of managing weeds successfully.

Any field can develop glyphosate-resistant weeds, and glyphosate resistance is not restricted to certain regions or as a result of raising certain crops. Growers are faced with the challenge of dealing with and learning to manage herbicide-resistant weeds in their fields, just as they have done with other chemistries in the past. Implementing effective management strategies, will not only benefit your fields, but will also minimize the risk of spreading weeds to neighboring farms.

Proactive Weed Management Strategies

1. **Using Herbicides with Residual Activity and Multiple Modes of Action in the Same Growing Season** - Residual herbicides can provide early-season weed control and allow for better timing of postemergence herbicide applications. A soil residual herbicide should always be incorporated into a weed management program for corn, soybean, and cotton production. Incorporating other herbicides with multiple modes of action into glyphosate postemergence programs can help to reduce weed population shifts.
2. **Applying Herbicides at Full Rates** - Herbicides should be applied at their full labeled rate, as lower rates may allow weed escapes or may "select" for herbicide tolerance.
3. **Eliminating Weeds Prior to Planting** - Weeds will begin to compete with a crop for water, nutrients, and sunlight at emergence. It is best to start the season with a weed-free field. Once a crop is established, fewer herbicide options may be available to control certain weed species.
4. **Controlling Weeds When They Are Small** - The larger weeds become, the more difficult they are to control. Postemergence applications should be made before weeds reach 4 inches tall. (continued on page 2)

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- 5. Maintaining Good Weed Control Throughout the Season** - Providing excellent weed control, especially until canopy closure, can help provide clean fields through harvest. Weeds present at or above the crop canopy are more likely to outcompete and reduce yields. Any weed that sets seed will contribute to the seed bank in that field and may result in seed being transported to other fields via harvest equipment. Residual herbicides applied preplant and preemergence may not provide effective weed control throughout the crop growing season. Overlapping residuals with approved in-crop applications of residual herbicides can pick up where preemergence treatments begin to break down.
- 6. Using Glyphosate Best Management Practices** - Glyphosate applications should always be made at the right time and the right rate. To reduce the selection pressure for resistant plant biotypes, herbicides with different modes of action or tillage should always be incorporated into a weed management program. Growers that have implemented season-long weed control programs by including a preplant or preemergence residual herbicide followed by an early postemergence herbicide in a Roundup Ready® system are reducing the risk of selecting for herbicide-resistant weed pressure on their farm.
- 7. Scouting and Monitoring Fields** - After herbicide applications, always scout fields to ensure weed control. If any escapes are found, either spot spray or remove the weed by hand. If the weed escape has already set seed, the best option is to bag the weed and remove it from the field. Always clean machinery before moving between fields to prevent the spread of weed seed. Weeds in ditch banks, field borders, and along roadsides should also be controlled as weeds can easily spread into adjacent fields.

- 8. Rotating to Other Crops** - Rotating crops allows for different weed management and cultural practices. Crop rotation can allow for tillage, the use of other cultural practices, and the use of different herbicide programs which can help prevent certain weed species from becoming dominant in a field.

The Economics of Delaying vs. Managing Herbicide Resistant Weeds - Proactive approaches will protect yields, which must be taken into account in any economic analysis. A proactive weed management plan helps minimize the risk of developing weed resistance on your farm. Being diligent in your activities can go a long way to maintaining your profitability.

Roundup Ready PLUS® Weed Management Solutions were developed by Monsanto in conjunction with leading academics and industry partners to help growers improve weed control, especially to improve control of tough-to-manage and glyphosate-resistant weeds. The Roundup Ready PLUS® web site includes weed management recommendations by crop and by geography, including the use of residual herbicides that provide multiple modes of action for controlling tough weeds, as well as other weed control resources. Visit the website at www.roundupreadyPLUS.com.

Source: ¹Mueller, T.C. et.al. 2005. Proactive versus reactive management of Glyphosate-resistant or -tolerant weeds. *Weed Technology* 19(4):924-933.

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Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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