

Stay Ahead of Problem Weeds with Residual Herbicides

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Pre-emergence, or residual, herbicides are at the core of most successful weed control programs. Because they provide long-lasting control of many problem weeds, residuals help growers stay ahead of the game, reducing the pressure for post-emergence weed control, slowing development of herbicide resistance and protecting yield by preventing weed competition with newly emerging crops.

"The use of residuals, especially at the time of planting, is really important in an overall weed management strategy," says Eric Riley, Technology Development Manager for Selective Chemistries in North America for Monsanto. "It's a two-pronged approach. Residuals provide protection during crop establishment when weeds could really take over. In addition, tank-mixing a post-emergence herbicide with a residual and putting it down in the early post-emergence period reduces selection pressure on those post herbicides. Overlapping the residuals helps with both weed control and resistance management."

Greg Elmore, Technology Development Manager at Monsanto, agrees. "You really want that one-two punch of a residual followed by a post-emergence product," he says. "Depending on the weed species, applying a residual in the post-emergence time frame can really help keep the weeds out before the crop canopies over. This is really important in situations with weeds like Palmer pigweed or waterhemp that produce many seeds and germinate over a long time period."

Residuals Are Key to Managing Weed Resistance

Elmore says weed resistance is a big problem that presents a significant challenge for today's growers, and incorporating residuals into weed control programs is a big part of the solution—both currently and into the future.

"We're seeing more and more populations of weeds that have multiple resistance to ALS chemistry, glyphosate and now PPO herbicides," Elmore says. "That means the tools growers have to control or manage weeds in their fields are reduced significantly. It's no small challenge, and it represents a lot of dollars and management strategies to overcome it. There are two parts to the problem—managing the already-existing resistant weed populations and avoiding the creation of any more that are resistant to either chemistries we know about or future ones."

Tank Mix Multiple Sites of Action for One-Two Punch

Tank-mixing herbicides with multiple effective sites of action in one application is a key element of managing weed resistance. Elmore and Riley both say data shows tank-mixing multiple effective sites of action together is more likely to provide effective weed control and protect the individual chemistries than rotating them sequentially.



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— ERIC RILEY,
*Monsanto Technology Development
Manager*

"You should never use one site of action alone, and if you did, thinking you would rotate with a different chemistry the following year, the data demonstrates you are likely to get resistance much faster that way than by tank-mixing two effective sites of action and using them every year," Elmore says. "In addition, it can be a good idea to add a residual herbicide to the post-emergence application. This will help provide additional control of emerging weeds until the crop canopy closes."

"It's important to approach weed control and resistance management proactively," Riley says. "Have a long-term program to make sure you are doing the right things to help mitigate and reduce the development of resistant weeds. Including multiple sites of action in one application is where I would start. I believe in it, and we have seen it in the data."

Riley says knowing the weeds in your field and how they have responded to various herbicides in the past is important as well. If you have weeds that are resistant to a specific site of action, make sure you have another site of action in the tank that will control these weeds. Ideally, it would be best to have two effective sites of action in the tank to control these weeds. Scout after each herbicide application to make sure the products worked as expected.

"You need to go back and scout the field to see if that application controlled the weeds," Elmore says. "If you didn't get the control you expected, why might that be? Was it a weather condition or maybe a population that may be changing over time? If you don't scout, you may not notice it."

If it looks like the population may be becoming resistant, contact the product manufacturer so they can visit the field. Elmore says there needs to be a follow up recommendation quickly. First, to control those weeds before the canopy covers them up, and second, to prevent those weeds from setting seed at the end of the season.

Best Management Practices for Managing Weed Resistance

- **Include multiple sites of action in one application:** Research shows this practice is more effective at controlling weeds and preventing development of resistance than using single sites of action and rotating them.
- **Crop rotation:** In certain crops you can't use certain chemistries. By using crop rotation you allow yourself to use a different set of sites of action that may have damaged the previous year's crop. This practice helps to get multiple sites of action down on that acre over time.
- **Apply full usage rates:** Using the full rate is the most effective way to get a clean field. Cutting rates can lead to weed survivors, which can eventually lead to resistant weed populations.
- **Timely post-emergence applications:** Spray when weeds are small to achieve good coverage and complete kill.
- **Clean up field edges:** Weeds that survive at the edge of the field could, in time, become resistant to certain chemistries — eventually leading to problems within the field.
- **Good sanitation:** Avoid spreading weed seeds — especially from herbicide-resistant populations — into other fields by thoroughly cleaning equipment.
- **Know your weeds:** By knowing what weeds are in the field and how they have responded to certain chemistries, growers can proactively develop a long-term management strategy.
- **Scout after herbicide application:** Evaluate the efficacy of the application and follow up with any problems while they are still manageable.