



The perks of simplicity and convenience also spur herbicide-resistant weeds.

Simplicity and convenience have been the selling points for glyphosate-tolerant crops. Unfortunately, that's why glyphosate-resistant weeds may soon mushroom in the Midwest.

"Right now, we are on the edge of a precipice that we could step off (in the Midwest) in the next two years," says Mike Owen, Iowa State University Extension weed specialist.

So far, glyphosate-tolerant systems work well in most cases. Glyphosate will continue to be the top component of Midwestern weed-control programs, says Owen. He adds, however, that unless farmers change management strategies to alleviate continual glyphosate use, glyphosate-resistant weeds will increase.

Herbicides or traits aren't to blame for herbicide weed resistance, says Owen.

"The cause of the evolution of herbicide resistance is because of the ways growers manage or mismanage the system," he says. "Another important factor is how the system and herbicide is marketed. With glyphosate and the Roundup Ready technology, the marketing message farmers find so important is convenience and simplicity."

Unfortunately, these perks also risk

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rapid evolution of glyphosate-resistant weeds via the ecological, environmental, and economic risks of poor stewardship.

This marketing strategy isn't limited just to the Roundup Ready system. Owen notes this was also the message for ALS-inhibitor herbicides in the 1980s and 1990s, when weed resistance to this mode of action quickly developed.

"A convenience and simplicity message can encourage continual herbicide and herbicide-tolerant system use that selects for resistant weed biotypes," says Owen.

Fortunately, steps that forestall other types of herbicide resistance also apply to glyphosate. They include:

- Use of multiple application times like early preplant.
- Use of alternative modes of action.
- Field scouting for weeds.
- Use of herbicide tankmix combinations.

Be sure they have activity on the weed or weeds in question, says Owen.

- Focus on crop yield protection rather than weed kills. Glyphosate applied late-season on a glyphosate-tolerant crop will kill weeds but won't curb early-season yield loss created by weed competition.
- Use correct herbicide rates. Reduced herbicide rates can contribute to evolution of herbicide-resistant biotypes.

"One factor we have facing us in the near future is that the price of glyphosate has declined by 50%," says Owen.

A hurdle to adopting strategies that forestall glyphosate-resistance is the reality that glyphosate now costs pennies on the dollar of what it used to, he says.

That's a challenge of complementary and alternative chemistry makers face.

"We don't look at what the price of glyphosate is today, but we look at the value our products give to the grower and price it accordingly," says Rob Schrick, strategic business entity lead for Bayer CropScience. "We view the reduction in glyphosate price as an opportunity for growers to invest in additional technology to improve their yields." □

Excellent weed control can still occur if farmers adopt steps that help preserve glyphosate-tolerant systems.