

Roundup corn changes the game

By **CHERRY BRIESER STOUT**

IT'S a sign of the times. More and more farmers are staying on the glyphosate wagon, planting Roundup Ready crops year after year.

Today, it's almost become a rarity to see a field of non-Roundup Ready soybeans.

Farmers were slower to adopt RR corn, which was introduced in 1999. However, it is rapidly gaining ground as an increasing number of corn hybrids have traits stacked with glyphosate resistance.

An estimated 43% of U.S. corn acres were Roundup Ready this year, and some in the industry predict that RR corn could jump to almost 60% in 2007.

"I think it [Roundup] can be as successful in corn as soybeans," says Purdue's Tom Bauman. The driver in the corn market has not been the herbicide, but the insect part of the thing. (If you want rootworm resistant corn, it's stacked with glyphosate resistance).

"An increase in stacked traits has created a need to simplify inventory," Bauman says.

"RR is an excellent tool for weed management," he continues. "Glyphosate will remain the cornerstone of weed control programs for several years."

Tougher weeds

While Roundup changed the game for weed control in soybeans, producers are now in the midst of another major game change with RR corn.

Weed scientists predict the adoption of RR corn will ultimately make weed control more complex as agriculture deals with weed resistance.

Key Points

- Many producers like the simplicity of Roundup.
- Use of continuous RR crops creates some challenges.
- To maintain glyphosate value, reduce selection pressure.

"If Roundup is used every year, it will speed up resistance. The key is to treat RR corn differently than beans," says Aaron Hager, a University of Illinois weed scientist.

"Corn doesn't compete as well with early weeds as soybeans," Hager adds, noting that it's critical to pay attention to timing of weed control in corn.

Bauman agrees. "One of the difficulties in corn is that weed competition kicks in much earlier than with soybeans." Herbicide programs should include a soil-applied component or a tankmix partner, he says.

Currently, about 40% to 50% of glyphosate-resistant corn gets a residual herbicide, compared to 20% of RR beans.

"I think split applications are much better," says Bauman. "One application is not as good as two." A preemergence application, followed by a post-emergence application, gives "a better window to control weeds if the weather doesn't cooperate in corn."

While weed resistance or weed shifts may provide opportunities for the development of new herbicides, don't bank on another blockbuster to come along if glyphosate fails.

"I'm concerned where the next product will come from," says Bauman. "I don't see any other magic bullets coming down the road.

"With new products, we're



DIFFERENT TACK: Consider treating RR corn differently than RR beans by using additional herbicide modes of action in combination with glyphosate, recommends U of I's Aaron Hager.

just going to plug holes," says Bauman, referring to two tankmixes coming to the market.

Industry's downfall

Roundup has transformed much of the agricultural marketplace, and contributed greatly to the demise of the agricultural chemical industry.

From 1997 to 2003, Roundup soybean revolution took an estimated \$750 million to \$1 billion out of the game. A large number of products going off patent and the rise of generics contributed to the downfall of the industry.

In response to market changes, many companies consolidated and shifted most of their research dollars into seed and fungicides, instead of herbicides.

"Can the industry really afford to develop a new herbicide for corn, cotton or soybeans?" asks Bauman. "The cost of developing a new herbicide is estimated at \$150 million to \$200 million. It takes seven to 10 years to bring a new product out."

And in 10 years, it's anyone's guess as to how well glyphosate will work.

Weed control wake-up call

THE rise of glyphosate-resistant horseweed (marestail) is "a good wake-up call," in the words of Purdue weed scientist Tom Bauman. It was hard for Corn Belt farmers to get too worked up over glyphosate resistance in rigid ryegrass or goosegrass in faraway places 10 years ago; but it's harder to ignore resistant horseweed in Delaware, and the rapid spread of the resistant weed in Kentucky, Tennessee, Ohio, Indiana and Missouri in recent years.

"Horseweed is perfect for rapid spread of resistance," says Bauman, noting that seed blows on the wind.

Illinois weed scientists suspect resistant horseweed, but haven't confirmed it.

"We're pretty confident we've got resistant populations," says Aaron Hager, a weed scientist, University of Illinois.

In southern Illinois, Bryan Young, a weed scientist at Southern Illinois University, has found several fields near Murphysboro where glyphosate is no longer controlling marestail. He calls for farmers to use strong resistance management practices to slow resistance down.

They said it

"We've got to handle RR corn a lot differently than beans or we're going to set the stage for potential yield losses."



Aaron Hager, U of I



"I don't think you can prevent resistance. Once you use a herbicide, you've started down the road to resistance. It's just a matter of how quick you get there."

Tom Bauman, Purdue

"It's important for growers to focus on alternative management solutions for marestail. Glyphosate-only programs won't work anymore, so you need to look at other options, including spraying earlier to target weeds at the appropriate size for maximum control, selecting herbicide with a different mode of action and using labeled rates."



Bryan Young, SIU

Scientists say the clock is ticking for glyphosate herbicides

IF you depend on glyphosate for weed control, the clock is running on weed resistance in your fields. However, University of Illinois weed scientist Aaron Hager thinks that Illinois farmers may have added a little more time to delay the arrival of glyphosate resistance than farmers in many other states.

"One thing that's helped delay glyphosate resistance in Illinois is that we've not seen as high an adoption of RR corn as have several other states," says Hager.

He estimates that about 30% of the corn grown in Illinois was Roundup Ready this year, compared to 43% RR corn acreage nationwide. "Since Illinois hasn't grown an abundance of RR corn, we've been in a forced herbicide rotation," Hager explains. Prior to full export approval for glyphosate-resistant corn, many Illinois farmers were hesitant to deal with trying to segregate it. The Plains states feed a lot of the corn they grow, while a higher percent of Illinois corn is exported, making Illinois farmers more likely to plant conventional corn.

The good news is that selection for glyphosate-resistant weeds may be slowed down in Illinois; the bad news is that it may only be for a year or two longer. That largely depends on how you use glyphosate and RR crops.

While glyphosate-resistant weeds start out in small isolated patches, "we've gone to bigger patches and more places around the world," says Purdue's Tom Bauman. "There's as much pres-

sure on this herbicide as any we've ever had."

Glyphosate resistance worldwide now occurs in four grass species and six broadleaf species.

Rise of resistance

Experts say you can count on resistant weeds continuing to increase. Weed shifts will also continue to occur as populations naturally more tolerant to glyphosate build up.

Since Roundup was introduced in soybeans 10 years ago, farmers have found more weed problems that require an increase in rates for good control.

Though the weed scientists discourage farmers from using glyphosate alone in both crops, they expect farmers will continue to use glyphosate until they're forced to switch.

"Most people are not terribly concerned with glyphosate resistance until it happens on their own farm," says Hager.

While farmers may recognize that resistance is inevitable, many are more concerned about trying to make it farming next year than worrying about future resistance.

It's hard to say when that time will come, but Bauman provides some assurance. "Not every field has a resistant weed lurking. Some growers may be able to get by for years without resistance developing. In the short term [for the next five to 10 years], I think glyphosate will control most weeds."