Know What's In Your Herbicide Before You Apply

URBANA, ILL.

As a new planting season gets under way, University of Illlinois Extension Weed Specialist Aaron Hager cautions farmers to be aware of the differences between glufosinate and glyphosate, the active ingredients in two popular herbicides, before starting weed control applications.

When glyphosate-resistant soybean came on the market a few years ago, many believed it was unlikely that another herbicide or herbicide-resistant crop would be needed again, Hager said. However, over time, farmers saw more and more glyphosate-resistant weed species popping up but no new herbicide active ingredients coming into the marketplace to control them.

"Resistance evolves in weeds through repeated applications of the same type of herbicide," Hager said. "The once-perceived invincibility of glyphosate has been tempered by the realities imposed by the diversity of our Illinois cropping systems. New weed management practices are needed to manage the consequences of long-term weed control."

One new herbicide-resistant variety, glufosinate-resistant soybean, became commercially available in 2009. Glufosinate, another non-selective herbicide, is sold under the trade name Ignite.

And while glyphosate and glufosinate may sound alike and share certain similarities as they provide broad-spectrum weed control, lack soil-residual activity, and require herbicide-resistant crops for in-crop applications, they should not be used interchangeably.

"Significant differences exist between these two popular herbicides that require deeper understanding of how each one works," Hager said. "For example, in 2010 you would not want to spray glyphosate on glufosinate-resistant soybean, or glufosinate on glyphosate-resistant soybean."

Glufosinate inhibits a plant enzyme involved in the early steps of nitrogen assimilation. Its target site is completely different than glyphosate's. Because of this, glufosinate can control glyphosate-resistant weed populations such as waterhemp and marestail.

While their spectrum of control is comparable for several weed species, glufosinate tends to be more effective on annual broadleaf weeds than annual grasses, while glyphosate is more effective on grasses.

Glufosinate is a "contact" herbicide, in contrast to glyphosate being extensively translocated within the plant. Hager encourages farmers to utilize application parameters that provide for the best coverage of target weeds and consider environmental conditions that optimize glufosinate's performance.

For example, glufosinate performs better in bright sunshine and warm air temperatures. Due to its limited translocation, glufosinate should be applied when annual weeds are 6 inches tall or less.

"We can control large weeds with glyphosate," Hager said. "But we have to manage weeds with glufosinate. We need to think differently about how we apply it. Farmers may want to include soil-residual herbicides or spray glufosinate twice – early when the weeds are smaller because it needs contact with the whole plant and a second time due to waterhemp's late emergence." Δ