

THE ATRAZINE ANALOGY OF RESISTANCE

Andy Kendig
Extension Weed Specialist
University of Missouri Delta Center
Commercial Agriculture Program

Glyphosate resistance is a hot topic. Over 95% of our bean and cotton acreage is Roundup Ready and a few weeds are sneaking by. Roundup Ready Corn is growing and Flex Cotton promises even more glyphosate use. Weed textbooks say that repeated use of the same herbicide with limited rotation is a resistance-prone use pattern. What's a farmer to do?

This story isn't an answer, but it is something we need to consider. There is another commonly-used herbicide that goes on 95% plus of it's crop acres. This herbicide is persistent- which is another resistance-prone trait. This herbicide has a list of over 40 weeds that are resistant to it. Now, for the tough question: have we rotated away from this herbicide for resistance concerns? Have we made a whole-sale switch to alternative herbicides?

The answer is no- we continue to use this herbicide on 95% + of our corn and grain sorghum acres. And if you haven't figured it out, the herbicide is atrazine. Before the atrazine folks get mad, I want to be clear that this article is only intended to make you think. It is not intended to attack anyone's weed control program or one company's herbicide over another's.

If atrazine has 40 resistant weeds, why are we still using it on 95% of our corn and milo acres? We use it because it provides outstanding broadleaf weed control at an equally outstanding price. We've tested many programs in corn, but the best ones always have atrazine as their backbone. What have farmers done about resistant weeds? In most cases, they added alternative herbicides on an as needed basis.

Is atrazine analogous to glyphosate? Both provide outstanding weed control at outstanding prices. Farmers aren't looking for more complicated, or a less reliable weed control programs. Atrazine and glyphosate give us effective and simple weed control in their respective crops. What about glyphosate resistance? In the case of horseweed (mare's tail) we've imitated atrazine and added special burndown treatments to address the problem. Will farmers move away from Roundup Ready in a wholesale fashion? Probably not, the weed control is just too valuable.

This argument has been made before: shortly after ALS-resistant cocklebur had become widespread- it was mentioned that growers should still use ALS herbicides because they offered tremendous control of several other weeds. I must also mention that a key difference between atrazine and glyphosate is that more often than not, corn (and atrazine) is rotated with some other crop (and herbicide). With glyphosate, there is an added concern that the herbicide keeps coming back to the field, even though crops are rotating.

The purpose of this article isn't to undermine resistance prevention. But if the continued, wide-scale use of atrazine, in spite of resistance, is something we need to consider. If we get

additional glyphosate- resistance, there are strong odds that Roundup Ready will still be the backbone of our weed control programs. Glyphosate may stay- not because someone is forcing growers to use it, but because of simple economics.

It is still desirable to prevent resistance? Yes, an ounce of prevention is worth a pound of cure. When something turns resistant, the cows are usually out of the barn. Fortunately, Roundup cotton and Roundup corn actually work best when they are combined with “traditional” herbicides (layby chemistry in cotton and atrazine in corn). Bean farmers probably need to stay on guard the most. There are strong tendencies for Roundup beans to receive glyphosate-only programs. There a number of good preemergence and post-tank mix partners for soybeans that do work and their sales reps continue kicking and screaming that their “add-on” herbicides are worthwhile.

Yes, Growers should try “add-on” herbicides, but on the other hand, it’s hard to beat sequential glyphosate. Can the “add-ons” really improve 100% weed control? Another issue with add-ons is that they may prevent resistance in some weed species, but do nothing to prevent resistance in other species. These are complex issues.

Growers seem to be aware of herbicide resistance, and have recognized that we are using more glyphosate and fewer alternatives. There are instances where “add-on” herbicides benefit every-day weed control. Use “add-on” herbicides in those cases and you will get some resistance-prevention benefit. Finally, keep your eyes open. If something should have died, but didn’t, let us know.