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Glyphosate Resistance

By Bryan Cook, CCA-ON

Glyphosate is the most successful patented herbicide on the planet. Transgenic technology has allowed this non-selective herbicide to be applied on millions of acres. Offering good weed control, an acceptable environmental package, no visual crop damage, and competitive pricing has ensured this product remains popular.

The impact of glyphosate on agriculture will become more evident in the next decade. Reduced tillage and grower consolidation has created an uncomfortable dependence on chemical weed control. A subtle convenience not realized until technology failure. History indicates that products with major success have similar cycles.

Atrazine had two decades of market dominance. Eventually, weed resistance and reduced efficacy demoted atrazine to be a helper herbicide, adding performance to popular products Banvel, Dual and Callisto.

Pursuit during the 90's had a decade of supremacy in the soybean market. Unfortunately the Ultim epidemic occurred in the middle of the same decade. Rotating herbicides out of group II chemistry became a challenge. Group II resistance and weed shifts forced Pursuit off the podium. A new silver bullet was found in Roundup Ready crops.

As glyphosate meanders down a similar path of success, intensive selection pressure within weed populations will cause weeds to evolve new survival tactics. The performance of glyphosate will decline over time.

Resistance

Although glyphosate is considered a low risk product for resistance, the first glyphosate resistant weed was identified in 1996. It would seem that the 30 year old chemistry is losing the battle against genetic diversity. Diversity accumulated over millions of years of evolution and programmed for survival. There are now eight confirmed cases of glyphosate resistant weed species globally, five are in the United States.

Resistance Management

Tank mixing herbicides with various modes of action is good resistance management. There is no incentive for growers to tank mix glyphosate. Performance with glyphosate alone remains acceptable. Any products added to glyphosate may narrow the application window and create possible crop safety issues. It also adds cost.

Glyphosate Application Rates

In an ironic twist to battling resistance with glyphosate, weed researches suggest to apply the highest labeled rate of glyphosate. Low application rates enhance the opportunity for more tolerant weeds to survive. Although the survivors are not resistant, the increased tolerance may come from a recessive resistant gene. If only tolerant plants survive and pollinate, the probability of producing a true resistant species increases. The same high dose management strategy is used in Bt technology for minimizing resistance in the European corn borer.

Be Responsible

It is important to evaluate the amount of glyphosate used on your farm. Realize the value it has and how your operation could be impacted if it was not available. Consider herbicide rotation, tank mixing and any tillage options. Maintain a high labeled rate of glyphosate. Be aware of critical weed free periods and reconsider the definition of acceptable weed control. Discuss glyphosate management with your local Certified Crop Adviser. Assess your level of addiction and start to manage withdrawal symptoms.



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This industry driven program helps ensure that Ontario crop producers are well served by those providing their crop production advice.