

## Glyphosate Resistance Management

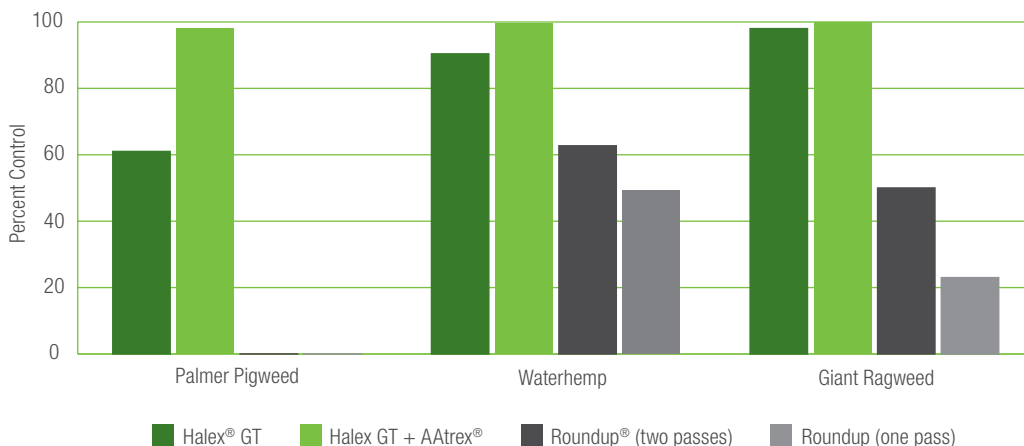
While glyphosate remains an efficient and valuable tool for controlling emerged weeds, resistance concerns have cast doubt on the effectiveness of glyphosate-only weed control programs. A Resistance Fighter™ brand, Halex® GT corn herbicide contains mesotrione, glyphosate and S-metolachlor – **three active ingredients to control broadleaf weeds and grasses in one application with excellent crop safety.**

Studies have found losses in U.S. crops due to uncontrolled weeds exceed \$20 billion annually.<sup>1</sup> With several resistant species, a grower could expect herbicide costs to double just to manage weeds, according to a recent presentation by Bill Johnson of Purdue University. Johnson and his colleagues studied a field in Indiana with glyphosate-resistant giant ragweed and marehail, and glyphosate-tolerant lambsquarters. **The grower's annual herbicide inputs skyrocketed from \$19 per acre to \$37 per acre due to glyphosate resistance.** Additionally, a recent survey of farm managers and crop consultants found **glyphosate-resistant weeds can reduce yields by 5.5 percent plus add \$16.90 per acre for herbicide costs.**<sup>2</sup>

<sup>1</sup> Basu C, Halfhill MD, Mueller TC and Stewart Jr. CN, Weed genomics: new tools to understand weed biology. *Trends in Plant Science*; 9(8): 391-398 (2004).

<sup>2</sup> Land Value Evaluation, Directions Research, August 2010.

**Halex GT vs. Roundup on Glyphosate-Resistant Weeds**



- Halex GT was applied at 3.6 pts./A; AAtrex rate was per local practice.
- Trials conducted in 2008: Palmer pigweed was tested in one trial at the University of Georgia; waterhemp was tested in two trials (University of Missouri and University of Illinois); and giant ragweed in one trial at The Ohio State University.
- NIS at 0.25% v/v was added to all Halex GT treatments.
- Roundup PowerMAX® was the glyphosate brand used and applied at recommended rates.
- All treatments included ammonium sulfate (AMS).

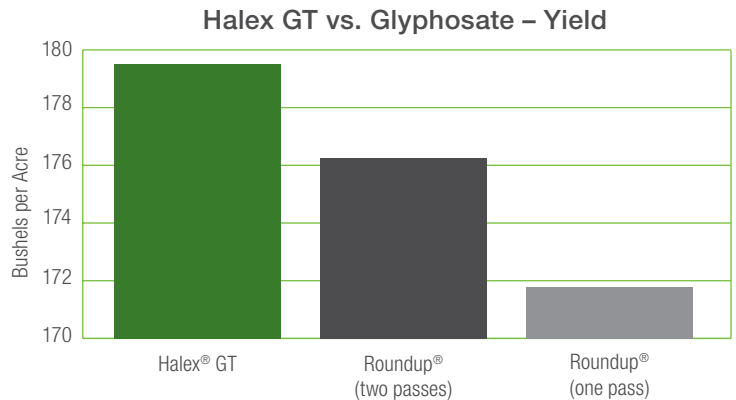
**The three modes of action in Halex GT, and when combined with an AAtrex® brand herbicide (an additional mode of action), were able to control glyphosate-resistant weeds significantly better than glyphosate alone.**



## Yield Comparison to One-Pass and Two-Pass Glyphosate Programs

Weak herbicide programs will result in poor weed control and reduce revenue by lowering yield. Conversely, a high-performance herbicide program will maximize yield potential for higher returns at harvest.

**Trial results prove Halex GT out-yields one application of Roundup® by nearly 8 bu./A and two applications of Roundup by 3 bu./A.**



- 82 trials conducted from 2003-2008
- Halex GT was applied at 3.6 or 4.0 pts./A or as a stimulated mixture.
- NIS at 0.25% v/v was added to all Halex GT treatments.
- Roundup Original Max®, PowerMAX® or WeatherMAX® was the glyphosate brand used and it was applied at recommended rates.
- All treatments included ammonium sulfate (AMS).

## The Dangers of Incomplete Control

The picture at right shows an outbreak of **giant ragweed in Minnesota**, 19 days after being treated with 48 oz. of straight glyphosate. Weeds growing at this pace will render glyphosate helpless, cripple yield potential and contribute to the ever-expanding resistance problem.



Halex GT, which is powered by the Callisto® chemistry, owes its origin to the discovery of a natural herbicide secreted by the *Callistemon* plant. This is Callisto Plant Technology® and it brings unprecedented broadleaf weed control and exceptional crop safety to Halex GT that the competition cannot match.



**syngenta**® For more information, visit [halexgt-herbicide.com](http://halexgt-herbicide.com), [FarmAssist.com](http://FarmAssist.com) or contact the Syngenta Customer Center at 1-866-SYNGENTA (796-4368). Halex GT is a Resistance Fighter™ brand. For more information about managing against weed resistance, visit [resistancefighter.com](http://resistancefighter.com).

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