

Glyphosate Resistance Management

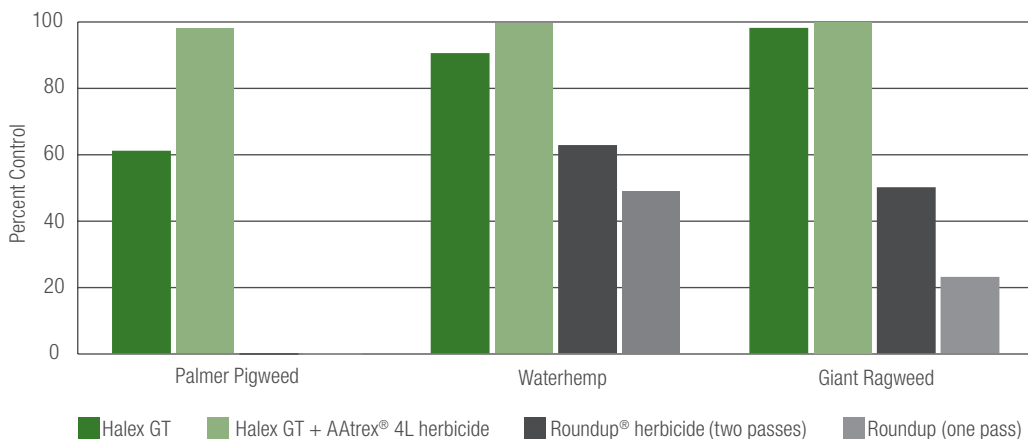
While glyphosate remains an efficient and valuable tool for controlling emerged weeds, resistance concerns have cast doubt on the effectiveness of glyphosate-only weed control programs. A Resistance Fighter™ brand, Halex® GT post-emergence corn herbicide is Glyphosate with Residual™ containing **three 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.¹ With several resistant species, a grower could expect herbicide costs to double just to manage weeds, according to a 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 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.**²

¹ 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).

² 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 4L 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® herbicide was the glyphosate brand used and applied at recommended rates.
- All treatments included ammonium sulfate (AMS).

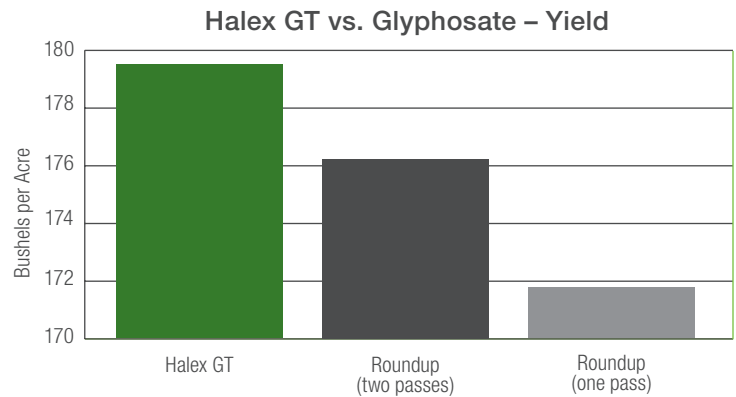
The three modes of action in Halex GT, especially when combined with an AAtrex brand herbicide (an additional mode of action), were able to control glyphosate-resistant weeds significantly better than glyphosate alone.



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[®] herbicide, Roundup PowerMAX or Roundup WeatherMAX[®] herbicide 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.



For more information, visit FarmAssist.com. Halex GT is a Resistance Fighter brand. For more information about managing against weed resistance, visit resistancefighter.com.

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