

Management of Giant Ragweed in Roundup Ready Soybean Fields with a History of Poor Control

Giant ragweed biology and herbicide resistance

- Giant ragweed is one of the most problematic weeds in the eastern corn belt, and is increasing as a problem westward into Iowa and Minnesota. It can germinate from late March through July. It is one of the first summer annuals to emerge in the spring and is often present before crops are planted.
- Corn and soybean yield losses as high as 30 to 50% can occur with season-long interference.
- ALS-resistant biotypes were becoming widespread in Ohio and Indiana in the late 1990's, and are still a problem in many non-GMO soybean fields.
- Giant ragweed biotypes with a low level of resistance to glyphosate have been identified in Ohio and Indiana. These biotypes have initially developed in continuous Roundup Ready soybean fields in response to repeated use of glyphosate exclusively. Resistant plants are not completely immune to glyphosate, but resistance appears to be the cause of poor control in some fields.



Top - giant ragweed control failure in RR soybeans.
Bottom - glyphosate-resistant giant ragweed.



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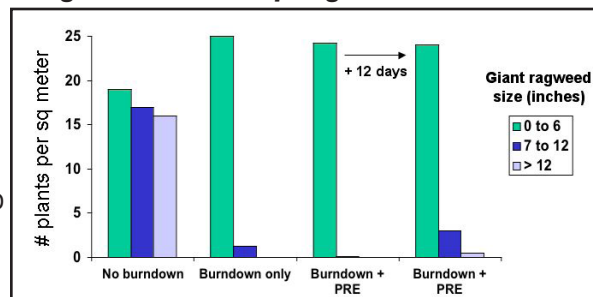
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For Free Herbicide Labels Go to
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The value of PRE herbicides in giant ragweed control programs

- PRE herbicides can reduce the giant ragweed population and slow the growth of emerging plants, which creates a wider window of time of POST application and increases POST herbicide effectiveness. Glyphosate is more effective on small plants. PRE herbicides also reduce yield loss from early-season weed interference.
- In chart at right, use of a PRE herbicide resulted in the following at time of POST glyphosate application:



Results shown are the average of data from 4 glyphosate-resistant sites in OH and IN. Burndown = glyphosate + 2,4-D ester; PRE = Gangster.

- without a burndown, 63% of giant ragweed plants were more than 6 inches tall, and 31% were more than 12 inches tall.
- with burndown only (no PRE), 95% of the plants were less than 6 inches tall.
- with burndown + PRE, 99% of the plants were less than 6 inches tall. After another 12 days, 87% of the plants were still less than 6 inches tall.



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How does resistance affect control with glyphosate?

- In chart at right, neither sensitive or resistant giant ragweed was adequately controlled by 2 POST glyphosate applications without a preplant burndown.
- Where a preplant burndown (glyphosate plus 2,4-D ester) was followed with two POST glyphosate applications at 0.75 lb ae/A, the glyphosate-sensitive giant ragweed were completely controlled (100%), but glyphosate-resistant ragweed were not adequately controlled (88%).

Bottom line - these populations may not be adequately controlled by herbicide programs consisting of only glyphosate!

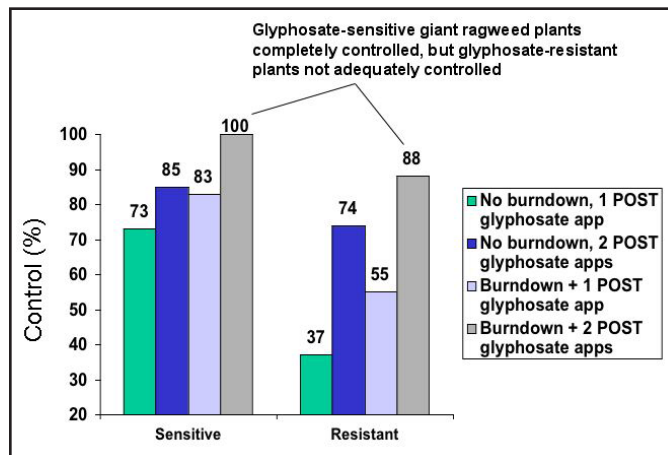
Note on glyphosate rates - what is a "lb ae/A"?

Glyphosate rates are shown here as "lb ae/A", which refers to "pounds of acid equivalent per acre". The rate of "0.75 lb ae/A" corresponds to: Roundup WEATHERMAX/Original MAX - 22 oz/A; Touchdown Total/Glyphomax XRT - 24 oz/A; all glyphosate products containing 3 lbs glyphosate acid per gallon - 32 oz/A. See Table 23 in the "Weed Control Guide for Ohio and Indiana" for more information.

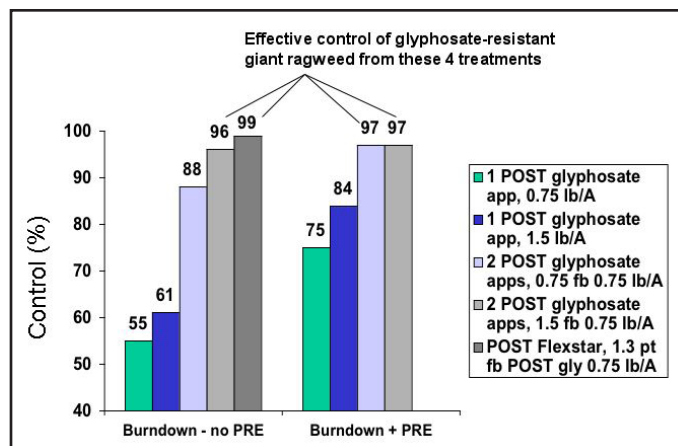
Herbicide programs to control glyphosate-resistant ragweed

In OSU and Purdue research in 2006, giant ragweed with a low level of resistance to glyphosate were adequately controlled (but still less than 100%) by the following treatments (early POST = 6 to 12 inch ragweed; late POST = 3 weeks after EPO):

- Preplant burndown (glyphosate + 2,4-D ester) followed by early POST glyphosate (1.5 lbs ae/A) followed by late POST glyphosate (0.75 lb); or
- Preplant burndown (glyphosate + 2,4-D ester) followed by early POST Flexstar (1.3 pts/A) followed by late POST glyphosate (0.75 lb ae/A); or
- Preplant burndown + residual (glyphosate + 2,4-D ester + Gangster) followed by early POST (0.75 or 1.5 lb ae/A) followed by late POST glyphosate (0.75 lb).



Control of glyphosate-resistant and sensitive giant ragweed with one vs two POST applications of glyphosate at 0.75 lb ae/A. Results shown are the average of data from 4 glyphosate-resistant sites in OH and IN. Burndown = preplant application of glyphosate + 2,4-D ester.



Control of glyphosate-resistant giant ragweed with POST glyphosate and Flexstar treatments. All plots received a preplant burndown (glyphosate + 2,4-D ester); "+ PRE" indicates the addition of Gangster (2.4 oz/A). Results shown are the average of data from 4 glyphosate-resistant sites in OH and IN.

Recommendations for 2007 - how to effectively control giant ragweed in Roundup Ready soybeans

- Do not plant into existing stands of giant ragweed. Start weedfree at the time of planting by using tillage or a preplant burndown herbicide treatment of 2,4-D ester plus either glyphosate or Gramoxone.
- Apply PRE herbicide(s) to reduce early-season giant ragweed density and the rate of weed growth, which creates more flexibility in the POST application window and improves POST glyphosate effectiveness. PRE herbicides with activity on giant ragweed include Authority First, Canopy DF/EX, FirstRate, Gangster, Scepter, Sonic, and Synchrony.
- Apply the initial POST treatments when giant ragweed are 6 to 10 inches tall. Use one of the following in the first POST application: glyphosate - 1.5 lbs ae/A; Flexstar - 1.3 pts/A; Cobra/Phoenix - 12.5 oz/A; or FirstRate (0.3 oz). Do not use FirstRate if the giant ragweed population is known or suspected to be ALS-resistant.
- Make a second POST application of glyphosate 3 to 4 weeks after the first, using a rate of 0.75 lb ae/A. Do not wait until giant ragweed have regrown above the soybeans to make the second application, or plants may not be controlled.
- Best solution - plant corn in fields with a history of giant ragweed control problems. Use a combination of PRE and POST herbicides in corn. The POST herbicide treatment should include herbicides other than glyphosate, to ensure control of glyphosate-resistant plants.