



Ohio State HCS News

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Giant Ragweed Added to Glyphosate Resistant List



A study demonstrates how glyphosate-resistant giant ragweed does not respond to treatments of the popular herbicide.

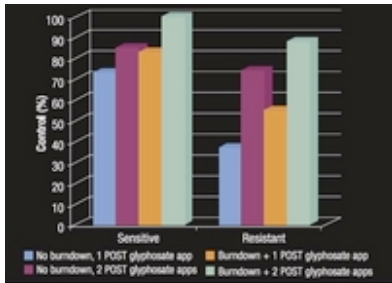
Giant ragweed soon could cast a giant shadow on the world's most popular herbicide.

Researchers at Ohio State and Purdue universities have confirmed glyphosate-resistant giant ragweed populations in Indiana and Ohio. Glyphosate is the active ingredient in herbicides such as Roundup and Touchdown, which are used for burndown weed control in no-till cropping systems and postemergence in Roundup Ready soybeans and corn.

The weed species is the seventh in the United States to show resistance to glyphosate.

"We've identified one giant ragweed population in Indiana and a few in Ohio that are showing resistance to glyphosate," said **Bill Johnson**, Purdue Extension weed scientist. "The population in Indiana is located in Noble County, which is northwest of Fort Wayne. The field in which it was located had been in soybeans six out of the last seven years, and the producer relied solely on glyphosate for giant ragweed control."

The three Ohio fields with glyphosate-resistant giant ragweed are in central and southwest counties.



Glyphosate-sensitive giant ragweed plants were completely controlled, but glyphosate-resistance plants were not adequately controlled in this test.

Johnson and **Mark Loux**, Ohio State University Extension weed scientist, urge farmers to alter their weed control strategies in 2007 to slow the development of glyphosate-resistant weed populations. They recommend starting with a weed-free cropland at planting and using a program of pre-emergence herbicides, followed by a series of timely postemergence herbicide treatments.

Giant ragweed is the most competitive broadleaf weed in Indiana soybean production, Johnson said. The weed can grow as tall as 15 feet, if left undisturbed. Populations of three to four giant ragweed plants per square yard can reduce crop yields by as much as 70 percent, he said.

Farmers annually plant millions of acres in crops genetically modified to withstand glyphosate applications. While giant ragweed can complicate corn production, it is a bigger problem in soybeans because there are few alternative herbicides that provide effective control.

"The reason this is a problem in soybeans is because we have only four effective postemergence herbicides for giant ragweed," Johnson said. "Those are glyphosate, Flexstar, Cobra and FirstRate. If the giant ragweed population is resistant to ALS inhibitors, we are left with only glyphosate, Flexstar or Cobra. If the populations are with either Flexstar or Cobra as a post-treatment."

resistant to glyphosate and FirstRate, then we're left



OSU Extension Agronomist Dr. Mark Loux

Like glyphosate, aceto-lactase synthase (ALS) inhibitors kill weeds by preventing them from producing essential amino acids necessary for growth. FirstRate is an ALS inhibitor. Flexstar and Cobra are postemergence contact herbicides that attack a plant's cell walls.

Johnson and Loux have monitored suspected glyphosate-resistant giant ragweed since 2004, when farmers in Indiana and Ohio reported weed populations that were responding poorly to glyphosate applications. In some cases, producers were treating their fields with the herbicide three or four times the same year or when giant ragweed populations had reached 15-25 inches tall.

"Our on-farm field research in 2006 demonstrated that resistant populations were not adequately controlled by glyphosate-based programs that have been effective in other populations," said Loux, a professor in the Horticulture & Crop Science Department.

Johnson and Loux expect glyphosate resistance to show up in more giant ragweed, although it might not spread as easily as it has in marestail, another problem weed.

"The wind can blow marestail seeds longer distances than giant ragweed," Johnson said. "Giant ragweed seeds are large and heavy, so we don't think seed movement is going to be a huge issue. It is unknown whether the resistance trait might be able to spread in giant ragweed pollen."

Producers have a big role to play in managing weeds to avoid glyphosate resistance, Johnson said. They should start before planting their 2007 crop, he said.

"If growers have fields with a history of poor control of giant ragweed with glyphosate, they need to change their management tactics," Johnson said. "One big key is to start out with a clean field, with tillage or an effective burndown, which includes 2,4-D. Other keys to control include using a residual herbicide, and targeting the first in-crop postemergence treatment when the giant ragweed is between six inches and 12 inches tall."

"For the first postemergence treatment on 6- to 12-inch-tall giant ragweed, they also should use the maximum labeled rate of 1.5 pounds of acid equivalent per acre of glyphosate, or substitute tank mix FirstRate, Flexstar or Cobra for glyphosate in that first treatment."

If plants survive the initial postemergence treatment, a second postemergence treatment should be made three to four weeks after the first treatment, before the weeds start to poke through the top of the soybean canopy, Johnson said.

Additional recommendations can be found in "Management of Giant Ragweed in Roundup Ready Soybean Fields with a History of Poor Control," by Johnson, Loux, Purdue weed scientist Glenn Nice and OSU weed scientist **Jeff Stachler**. The article can be downloaded at <http://agcrops.osu.edu/weeds>. The recommendations also are included in the 2007 Weed Control Guide for Ohio and Indiana, available through the OSU publications distribution center by calling (614) 292-1607.

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