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Glyphosate Resistant Horseweed (Marestail) Found in 9 More Indiana Counties

We have just completed screening of horseweed (marestail) seed samples collected in the fall of 2004 for tolerance to glyphosate. The purpose of this article is to briefly summarize the methods used in this process and show the newest counties which have documented populations of glyphosate-resistant horseweed.

This project is a three-year process in which we will intensively sample 48 of Indiana's 92 counties for the presence of glyphosate-resistant horseweed. We initiated the project in 2003 with the idea that we would sample 16 counties each year. In each county surveyed, twenty to forty randomly predetermined GPS coordinates are selected with a mapping software program. When we arrive at the coordinate, we drive to the first soybean field after the coordinate. We enter the field and look for horseweed seed heads protruding through the soybean canopy. If horseweed is found, seed heads are composited from 40 plants and placed in a container for transport back to campus. The seed heads are collected for an individual field and seed is removed from the plant, cleaned and kept separate from other seed sources. When we are ready to screen the samples, a small volume of seed is planted into a large flat and after several hundred plants emerge, 12 individual plants are transplanted into smaller flats.

When the rosettes of transplanted plants are 2 to 3 inches wide, they are sprayed with a 2X rate of Roundup Weathermax (44 oz/A of product or 1.5 lb ae/A) + AMS (2.5 lb/A) in 20 GPA carrier volume. At 3 to 4 weeks after treatment, plants are visually rated for % biomass reduction and the number of live and dead plants from each field are counted. We use a combination of overall biomass reduction values and presence of live plants which show little if any effect of glyphosate to determine whether or not to call a population resistant. For more information on how the survey is conducted and locations of other glyphosate resistant weed populations, see our horseweed web site at <http://www.btny.purdue.edu/weedscience/marestail/counties/index.html>.

Our 2004 results show that glyphosate-resistant horseweed (marestail) can now be found in Clay, Delaware, Knox, Madison, Park, Posey, Putnam, Tipton, and Warrick counties (Table 1). The bad news is that glyphosate-resistant populations have now been found 28 out of Indiana's 92 counties. The good news is that the prevalence of escaped horseweed in soybean fields in the regions sampled in 2004 is much lower than the region sampled in 2003, which included 10 counties in southeast Indiana and 6 other counties spread throughout Indiana. In 2003, we found escaped horseweed in about 390 out of 780 sites sampled (roughly 1 out of every 2 sites sampled). In 2004, we sampled 16 counties in an area from Evansville north to Crawfordsville, then east to Richmond. Escaped horseweed was found at roughly 1 out of every 6 sites or about 60 out of 360 sites sampled.

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Table 1. New counties in Indiana where glyphosate-resistant horseweed was found in the 2004 glyphosate-resistant horseweed survey.

County	Number of sites where glyphosate resistant horseweed was found	Number of sites where horseweed was found	Region of Indiana
Clay	2	5	West Central
Delaware	2	6	East Central
Knox	1	2	South West
Madison	3	6	Central
Park	1	3	West Central
Posey	2	2	South West
Putnam	2	6	West Central
Tipton	1	3	Central
Warrick	5	9	South West

Management of this weed in soybean will continue to be an issue for growers in these areas to consider when planning their weed management program. At this point in the season, if soybeans are already planted and you suspect you have glyphosate-resistant horseweed, the only effective in-crop control options would be tankmixes of glyphosate with Classic or FirstRate. We have screened several of the 2003 populations for tolerance to ALS inhibitors such as Classic and FirstRate. To date, we have found that about 20% of the populations that are resistant to glyphosate are also resistant to Classic or FirstRate. Conversely, we have found that about 1/3rd of the populations that were not resistant to glyphosate, but were resistant to Classic or FirstRate. The good news is that ALS resistance has been found in relatively low percentages of glyphosate-resistant populations, but appears to be more prevalent in populations that are not glyphosate-resistant.

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