

Glyphosate-resistant giant ragweed confirmed in Nebraska

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In 2006 marestail (horseweed) was the first weed species found to be resistant to glyphosate in Nebraska. While marestail has become a significant management problem in many fields, a new glyphosate-resistant weed is emerging in Nebraska. Greenhouse studies conducted by UNL weed scientists have confirmed glyphosate resistance in multiple giant ragweed (*Ambrosia trifida*) populations within the state. Giant ragweed

seeds were collected from suspected populations in Butler, Nemaha, Richardson and Washington counties in the fall of 2010. Greenhouse bioassays were conducted, and glyphosate dose response curves defined for each giant ragweed population. Visual weed control ratings and plant biomass reduction curve comparisons clearly show a glyphosate resistance level ranging from two to six fold, depending on the population and plant size. For example, 90% control of a susceptible population was achieved with 32 oz of glyphosate (3 lbs/gal acid equivalent), while the resistant populations needed approximately 100 oz/A and 200 oz/A at 4 and 8 inch plant heights respectively, in order to achieve the same level of control.

Herbicide resistance usually results from repeated use of the same herbicide. Widespread adoption of glyphosate-tolerant crops in the Midwest (primarily corn and soybean), coupled with an over-reliance on glyphosate based herbicides has resulted in the evolution of glyphosate-resistant weed populations. The selection pressure exerted on weed populations by increased glyphosate use in glyphosate tolerant crops over the last ten to fifteen years is unprecedented in the era of herbicide weed control. There were only a few weed species resistant to glyphosate worldwide prior to introduction of glyphosate-tolerant crops. However, the number of weed species with reported glyphosate resistant populations has reached almost 20 worldwide, and 12 in the US, due to repeated glyphosate use over a large land area (>300 million acres just in US). In the US, the current list of weed species with glyphosate-resistant populations include common waterhemp, giant ragweed, common ragweed, kochia, palmer amaranth,

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mareetail (horseweed), hairy fleabane, junglerice, goosegrass, Johnsongrass, Italian ryegrass, and annual bluegrass (source: <http://www.weedscience.org/In.asp>).



While these giant ragweed populations are currently in small pockets, this development is a further illustration of the necessity for all individuals involved in making weed management decisions to adopt a more diversified approach to weed control. We believe that herbicide tolerant crops, including those based on glyphosate, can remain a useful component of our crop production systems, but only with proper management. Due to the currently low cost, effectiveness, crop safety and ease of use, it is easy to become over reliant on glyphosate, compared to utilizing a diversity of preemergence and post emergence tank mix partners when glyphosate tolerant crops are grown in succession. Therefore the proper use of herbicide tolerant crop technologies as a component of an integrated weed management program is the key to preserving the long-term benefits of these technologies, while avoiding many of the concerns associated with their use or misuse. More details about glyphosate-resistant weeds will be provided during the 2012 Crop Protection Clinics (cpc.unl.edu) and other UNL Extension programs.

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