

## Challenges and Options for Giant Ragweed Management

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Giant ragweed is an early germinating, summer annual weed species that is commonly found throughout the southern two tiers of Michigan counties and throughout many areas of the Midwest. Surveys conducted in several Michigan counties this year ranked giant ragweed one of the most problematic and common weed escapes in both corn and soybean fields. Giant ragweed possesses several characteristics that contribute to its ranking.

Giant ragweed is potentially the most competitive weed species in Michigan. The competitive characteristics of giant ragweed include seed persistence, early seedling emergence, and rapid plant growth that results in competition for light, water, and nutrients. Competition research has shown that season-long competition from 2 giant ragweed plants per m<sup>2</sup> can reduce corn yield 37% and 1 giant ragweed plant per m<sup>2</sup> can reduce soybean yield 52%.

Historically, giant ragweed was found mostly in undisturbed areas such as fencerows and drainage ditches, and could occasionally be found in flood-plain fields. However, in the last couple of decades giant ragweed populations have dispersed from their primary habitats into many fertile fields across the state. The cause of this spread is

unknown. However, it is clear that giant ragweed has adapted to survive new agronomic practices such as earlier planting and less tillage.

One adaptation that giant ragweed has made has been a shift in the time of emergence. Historically, giant ragweed plants would emerge early in the growing season and normally would not be a problem in agronomic production systems. Results from University of Illinois research in the 1960s and 70s showed that virtually all giant ragweed plants would emerge by May 1<sup>st</sup>. However, recent research has shown that giant ragweed emergence in several Midwestern production fields can start in March and continue into June and sometimes into late-July, making this weed a management challenge because of its multiple emergence times.

Effective control of giant ragweed has relied heavily on the use of herbicides. In soybean there are fewer herbicide options for controlling giant ragweed than in corn. Prior to the wide-spread use of Roundup Ready soybean, ALS-inhibiting herbicides such as FirstRate and Classic were used extensively for giant ragweed control. The extensive use of these herbicides resulted in the development of ALS-resistant giant ragweed populations. ALS-resistant giant ragweed populations have been confirmed in several production fields in Indiana, Ohio, Illinois, and Iowa. Currently, there are no known confirmed populations of ALS-resistant giant ragweed in Michigan. However, because ALS-resistance is wide-spread in several states giant ragweed populations should be monitored closely for any changes in control with ALS-inhibiting herbicides. One reason that ALS-resistant giant ragweed has not continued to increase in many fields is due to the wide-spread adoption of the use of glyphosate for control of giant ragweed in Roundup Ready crops.

For several years glyphosate has been an extremely effective herbicide for controlling giant ragweed in both Roundup Ready corn and soybeans. However, recently giant ragweed has been harder to control with glyphosate. Too low herbicide rate on large giant ragweed plants, giant ragweed emergence after herbicide application, and inadequate herbicide coverage may explain some of these control failures. However, more recently researchers in Indiana and Ohio have confirmed that there are a few fields in each of these states where giant ragweed populations have developed a low level of resistance to glyphosate. Several of these populations were able to survive glyphosate applications up to 3 lbs ae/A (1 gallon of a 3 lb ae/gal glyphosate).

### ***Management of Giant Ragweed***

There are a number of very effective herbicides available for controlling giant ragweed; however control with these herbicides can be rather inconsistent. Giant ragweed can escape control from soil-applied herbicides by germinating from considerable depths and emerging later in the season where a soil-applied herbicide may have already dissipated. Inconsistencies with postemergence herbicide programs are usually attributed to giant ragweed's considerable growth rate. Often times giant ragweed may already be too large when the postemergence application is made, allowing for the plant to regrow after the treatment. In addition, with the shift in giant ragweed emergence some of the plants may emerge after the postemergence application has already been made. Another caveat to add to the lack of giant ragweed control is the development of resistant populations to ALS-inhibitors and now to glyphosate has limited the use of some very effective herbicides in some areas. To overcome these different challenges the most consistent giant ragweed control programs are those that

combine a *sequential management* approach. These include the use of both preemergence (PRE) and postemergence (POST) herbicide applications.

To manage giant ragweed in corn and soybean the most effective giant ragweed programs should include the following steps:

- ◆ Control weeds that emerge prior to planting with tillage or preplant burndown applications.
- ◆ Apply PRE herbicides with activity on giant ragweed to reduce competition with crops, provide flexibility in the timing of POST applications, and reduce the need for additional POST glyphosate applications.
- ◆ Where a PRE herbicide is used with giant ragweed activity apply POST herbicides before plants are 6 to 10 inches tall. If a PRE is not used, apply when giant ragweed is less than 6 inches tall. With non-glyphosate herbicides, applications should be made prior to 4-inches tall.
- ◆ Scout fields two weeks after the POST application. Control escapes or plants that emerge after the initial POST application with a second POST application.

#### *Giant Ragweed Control in Soybean:*

Sequential management programs (PRE followed by POST) are essential for controlling giant ragweed in soybean.

#### No-till burndown programs:

- ◆ Most effective burndown herbicide applications include the use of 2,4-D ester (1 pt/A) with glyphosate or Gramoxone Inteon. The addition of a residual herbicide that contains chlorimuron (Canopy, Synchrony, or Valor XLT) or

cloransulam (FirstRate, Gangster, Sonic, or Authority First) can improve and will provide residual control of giant ragweed populations that are not ALS-resistant. Applications including 2,4-D ester should be made 7 days prior to planting soybeans, also be aware of county restrictions in areas where grapes are grown.

- ◆ Avoid using glyphosate, Gramoxone Inteon, or 2,4-D ester alone, since control is likely to be less consistent than with combinations.
- ◆ Higher glyphosate application rates should be used when plants exceed 6-inches in height.

PRE soybean herbicides (conventional-till soybeans):

- ◆ Apply a PRE residual herbicide that contains chlorimuron (Canopy, Synchrony, or Valor XLT) or cloransulam (FirstRate, Gangster, Sonic, or Authority First) to provide initial residual control of giant ragweed populations that are not ALS-resistant.
- ◆ These herbicides will not provide season-long giant ragweed control.

POST soybean herbicides:

- ◆ Roundup Ready soybeans: Glyphosate and glyphosate products will provide good to excellent control of giant ragweed. Higher glyphosate rates 1.1 (less than 6-inch tall giant ragweed) to 1.5 lb ae/A will be more effective.
- ◆ ALS-inhibitors: FirstRate is the most effective ALS-inhibitor for control of giant ragweed. Raptor and Classic will provide good control of small giant ragweed. These herbicides will not control ALS-resistant giant ragweed populations.

- ◆ Diphenyl ether herbicides: Flexstar, Reflex, Cobra, or Phoenix can be used to control small giant ragweed 2 to 4-inches tall. These are the only options for POST control if a population is ALS- and glyphosate-resistant.

#### *Giant Ragweed Control in Corn:*

Similar to giant ragweed control in soybeans, sequential management programs (PRE followed by POST) are the most effective for control of giant ragweed. However, under light giant ragweed populations total PRE programs may provide adequate giant ragweed control.

#### Total PRE programs (low populations only):

- ◆ Combine atrazine-containing products (i.e., Harness Xtra, Bicep II Magnum, Guardsman Max, Keystone, etc.) with Hornet or Callisto.
- ◆ The premixes Lumax or Lexar (atrazine + Callisto + s-metolachlor) may also be used.

#### PRE followed by POST programs (moderate to high populations):

- ◆ PRE: Apply products that contain atrazine, Hornet, or Callisto.
- ◆ POST: There are several POST products in corn that effectively control giant ragweed. These herbicides should be applied before giant ragweed is 4-inches tall.
  - ◆ Atrazine, Buctril, and Callisto all provide good control of giant ragweed.
  - ◆ A combination of atrazine + Callisto or Buctril + atrazine will provide greater control of giant ragweed than anyone of these herbicide applied alone.

- ◆ Plant growth regulator herbicides: 2,4-D amine will provide good control of giant ragweed. Clarity, Distinct, Status, Stinger and Stinger premixes (Hornet) will provide excellent control of giant ragweed.
- ◆ ALS-inhibitors: Beacon and Spirit provide excellent control of non-ALS-resistant giant ragweed.
- ◆ Roundup Ready corn: Glyphosate will provide good to excellent control of giant ragweed. Higher glyphosate rates 1.1 (less than 6-inch tall giant ragweed) to 1.5 lb ae/A will be more effective.
- ◆ Liberty Link corn: Liberty and Liberty + atrazine will provide good to excellent control of giant ragweed. Liberty should be applied to small giant ragweed.

It is important to consider control of other weeds, soil pH restrictions, rotations restrictions, and maximum allowable rates (i.e., atrazine) when designing a giant ragweed management program. If giant ragweed is not currently a problem in your fields, make sure to keep a watch out for those giant ragweed populations in undisturbed areas, such as fencerows, roadsides, and waterways. These areas can often times be the source of seeds to spread into fields.