



## Giant Ragweed Control In Cropland



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Giant ragweed (*Ambrosia trifida*) is an upright annual broadleaf weed. It is native to North America. Giant ragweed can often reach final heights of over 8 feet. It contributes to late summer hay fever because it sheds large amounts of airborne pollen. A very competitive plant, giant ragweed is capable of causing dramatic yield loss in crop production and dominating disturbed sites by out-competing other weeds and vegetation. Competitiveness of this weed is due to its vigorous growth during the seedling stage.

Giant ragweed leaves are usually opposite, large, slightly hairy, and three-lobed (occasionally five-lobed or un-lobed). The stems, which are rough and hairy, are unbranched to frequently branched. Flowers develop in clusters on the tips of branches and stems. Female and male flowers develop in separate clusters. The seeds are enclosed in a woody hull (0.25 to 0.33 inch long) containing a central beak and surrounded by a circle of five or more short, thick, blunt spines. The true seeds are black and smooth.

Giant ragweed seeds germinate best at 68 to 86°F, but can germinate over a large range of temperatures. Giant ragweed is often one of the first weeds to emerge in the spring, which greatly enhances its competitiveness with later emerging plants.

Plants can emerge from seeds as deep as 6 inches in the soil, but seeds closer to the soil surface result in a greater percentage of plants becoming established. Seeds at the soil surface often do not germinate.

Giant ragweed grows best in flood plains, moist areas of drainage ditches or open stream banks, and in low heavier soils of cultivated fields.

### PREVENTION

Giant ragweed is a prolific seed producer and these seeds can be spread by many means. Of

particular importance is its spread by seeds carried in crop harvesting equipment. Proper cleaning of equipment requires use of an air compressor, pressure hose, or sweeping. Letting the equipment run to clean itself out is not adequate. Another important means of infestation is the planting of soybean seed from infested fields. Giant ragweed seeds are similar in size to soybeans, and are difficult to remove in regular seed cleaning operations. Growers should buy certified seed; or if saving seed or buying from a neighbor, they should be familiar with fields where the seed was grown. Be sure the soybean seed is not contaminated with giant ragweed seed. Giant ragweed in field edges and roadsides can be a source of seed. Be sure weeds in areas outside the field are not permitted to produce seed.

## **CULTURAL AND MECHANICAL CONTROL**

Cultural practices that result in a rapid, dense crop canopy will improve overall level of control of giant ragweed. A dense crop canopy is very important to prevent emergence, suppress growth and limit seed production of giant ragweed. Soybeans and sorghum planted in 15-inch rows (or less) will shade the ground earlier than 30-inch rows. Varieties with good early-season vigor will also improve crop competitiveness.

A thick layer of cover crop residue will help lower seedling density and seedling growth. Cover crop species with tissue resistant to decay (i.e. cereal rye, winter wheat or triticale) would be most beneficial. Delaying cover crop termination until shortly before planting will allow for maximum biomass production and more tissue resistant to decay.

Hand pulling and removal is important when giant ragweed plants are present late in the season.

## **Cultivation**

Cultivation in combination with herbicide application can increase the overall level of control. Do not cultivate 7 days before treatment or until 7 days after treatment. When cultivating, care must be taken to avoid bringing soil not treated with an herbicide near the soil surface, thereby increasing the opportunity for seeds to germinate and seedlings to emerge.

***Pursuant to the provisions of Title 3, Chapter 24 of Delaware Code, the Delaware Department of Agriculture under its Rules and Regulations has declared giant ragweed a noxious weed. Designation as a noxious weed requires that giant ragweed must be controlled.***

A noxious weed is a plant that has adverse effects on or threatens agricultural production. A plant is designated as "noxious" by the U.S. or Delaware Departments of Agriculture. An attribute of a noxious weed is that it is difficult to control with many 'standard' weed control programs. Often fields infested with a noxious weed need special attention and require different management than non-infested fields.

Growers who have noxious weeds can call Todd Davis, noxious weed specialist, at Delaware Department of Agriculture to sign a compliance agreement. Failure to control this weed can result in fines of \$25 per acre (\$100 minimum).

Noxious weeds can be reported to Mr. Davis at 1-800-282-8685. He will contact the owner or agency to work on developing a control program. Noxious weeds also must be controlled on right-of-ways, lots and undeveloped lands as well as farmland.

## HERBICIDE RESISTANCE

Populations of giant ragweed have evolved resistance to glyphosate (Group 9) and ALS-inhibiting (Group 2) herbicides. Resistance has not been observed in Delaware, but many states in the eastern US have reported this resistance.

## CONTROL IN CORN

Excellent giant ragweed control can be achieved in field corn. Control programs should consist of soil-applied atrazine followed with a postemergence herbicide program. Atrazine rate restrictions must be considered when planning herbicide programs that include atrazine and/or atrazine premixes.

### Preplant or Preemergence Control

Apply atrazine preplant incorporated or preemergence at labeled rates for the soil type. A follow-up with a postemergence herbicide may be needed to control escaped plants. Follow all herbicide label precautions.

Prepackage mixtures containing atrazine such as Bicep II Magnum, Degree Xtra, Fulltime, Guardsman Max, Harness Xtra, Keystone, Lexar, Lumax, or Acuron are readily available for soil-applied and early-postemergence use. Spiking pre-mixes with additional atrazine may be needed in order to achieve a total soil-applied atrazine rate of 1.5 lbs ai/A. Be certain to follow atrazine maximum use rate restrictions per application and per season.

### Postemergence Control

The following table lists herbicides that can be used at labeled rates and according to label directions to control emerged giant ragweed plants. Subsequent flushes of giant ragweed may require multiple or split applications of some products or follow-up applications with other products. See labels for details.

| Herbicide              | Herbicide Group | Corn growth stage   |                     | Maximum size | Rate/Acre   | Efficacy rating <sup>a</sup> |
|------------------------|-----------------|---|---------------------|--------------|-------------|------------------------------|
|                        |                 | maximum size or range                                     |                     |              |             |                              |
|                        |                 | Broadcast   | Directed            |              |             |                              |
| 2,4-D                  | 4               | 8 in  | pre-tassel          | *            | 0.5 to 1 pt | E                            |
| Banvel / Clarity       | 4               | 16 oz: 5 lvs or 8 in<br><8 oz: 36 in or 15 day pre-tassel | n/a                 | 3 in         | 8 to 16 oz  | G-E                          |
| Stinger                | 4               | 24 in   | n/a                 | 5-lf         | 0.5 pt      | G-E                          |
| Status                 | 4 + 4           | 24 in at 4 oz<br>4-10 in at 6 oz                          | up to 36 in at 4 oz | *            | 4 to 6 oz   | G-E                          |
| Marksman               | 4 + 5           | 5 lvs or 8 in   | n/a                 | *            | 2 to 3.5 pt | G-E                          |
| NorthStar <sup>b</sup> | 2 + 4           | V6 or 4-20 in   | 20-30 in            | 9 in         | 5 oz        | G-E                          |
| Yukon                  | 2 + 4           | spike to 36 in  | n/a                 | 6 in         | 4 to 8 oz   | G-E                          |
| Atrazine               | 5               | 12 in   | n/a                 | **           | 2.4 pt      | G                            |

| Herbicide                          | Herbicide Group | Corn growth stage<br>maximum size or range |           | Maximum size | Rate/Acre         | Efficacy rating <sup>a</sup> |
|------------------------------------|-----------------|--|-----------|--------------|-------------------|------------------------------|
|                                    |                 | Broadcast                                  | Directed  |              |                   |                              |
| Glyphosate products <sup>c</sup>   | 9               | V8 or 30 in                                | n/a       | 6 in         | 1 qt <sup>c</sup> | G                            |
| Liberty <sup>d</sup>               | 10              | through V5                                 | n/a       | 6 in         | 22 to 32 oz       | F-G <sup>e</sup>             |
| Callisto <sup>b</sup><br>+atrazine | 27 + 5          | 12 in                                      | n/a       | 5 in         | 3 oz              | G-E                          |
| Impact or Armezon<br>+atrazine     | 27 + 5          | 12 in                                      | as needed | 6 in         | 0.75 oz           | G-E                          |
| Laudis<br>+atrazine                | 27 + 5          | 12 in                                      | n/a       | 6 in         | 3 oz              | G-E                          |

\* Indicates giant ragweed is listed on the label, but no size information is given.

\*\* Experience in the Mid-Atlantic region indicates activity with this herbicide, although giant ragweed is not listed on the label. Treatment should be made before giant ragweed is 4 inches tall.

<sup>a</sup>E = Excellent (>90% control) G-E = Good to Excellent G = Good (80-90% control)

F-G = Fair to Good F = Fair (60-80% control)

<sup>b</sup>Callisto and NorthStar labels all contain restrictions concerning soil insecticide use. Follow label carefully or serious crop injury may occur.

<sup>c</sup>Requires the use of glyphosate-resistant soybean varieties. Glyphosate rate given is for a formulation of 4 lb ai (3 lb ae) per gallon. Adjust the rate for other formulations.

<sup>d</sup>Liberty requires the use of glufosinate-resistant corn hybrids.

<sup>e</sup>Indicates that maximum weed size is rate dependent; consult label for details.

Always consult herbicide labels for the proper adjuvants to use. When tank-mixing products, different adjuvants may be required. Consider whether tank-mixes, split applications or follow-up applications that are recommended on the label would be preferred to using a single product or timing. Other important considerations are crop variety, soil insecticide interactions, environmental conditions, herbicide volatility or drift to sensitive crops, crop health and stage, crop rotation, and grazing and feeding intervals. This information is available on herbicide labels.

## CONTROL IN SOYBEANS

Control of giant ragweed in soybeans is difficult because it continues to germinate and grow throughout the summer and early fall.

Satisfactory control is possible with a chemical control program that includes a preplant incorporated or preemergence herbicide plus timely application of a postemergence herbicide. Cultivation can be used to remove plants between rows. When the number of plants is limited, they can be hand removed before they produce seed.

## Preplant Incorporated or Preemergence Control

The following herbicides can be used at labeled rates and according to label directions.

| Herbicide                | Herbicide Group Number | Application | Rate/A              | Efficacy rating <sup>a</sup> |
|--------------------------|------------------------|-------------|---------------------|------------------------------|
| Authority First or Sonic | 2 + 14                 | PPI or PRE  | 6.5-8 oz            | F-G                          |
| Envive                   | 2 + 2 + 14             | PRE         | 5 oz                | F-G                          |
| FirstRate                | 2                      | PPI or PRE  | 0.6-0.75 oz         | F-G                          |
| Gangster                 | 2 + 14                 | PRE         | 3.6 oz <sup>b</sup> | F-G                          |
| Valor XLT                | 2 + 14                 | PRE         | 3 oz                | F-G                          |
| Canopy                   | 2 + 5                  | PPI or PRE  | 4-7 oz              | F                            |
| Valor SX                 | 14                     | PRE         | 2-3 oz              | F                            |

<sup>a</sup>E = Excellent (>90% control) G = Good (80-90% control) F-G = Fair to Good F = Fair (60-80% control)

<sup>b</sup>equivalent to 3 oz of Valor and 0.6 oz of FirstRate.

## Postemergence Control

The following herbicides can be used at labeled rates and according to label directions to control emerged giant ragweed plants. Subsequent flushes of giant ragweed may require multiple or split applications of some products or follow-up applications with other products. See labels for details.

| Herbicide                        | Herbicide Group Number | Soybean growth stage – maximum size or range          | Maximum giant ragweed size | Rate/Acre                | Efficacy rating <sup>a</sup> |
|----------------------------------|------------------------|---|----------------------------|--------------------------|------------------------------|
| Classic                          | 2                      | 60 days before maturity                               | 2-6 in                     | 0.75 oz                  | G-E                          |
| FirstRate                        | 2                      | before 50% flowering                                  | 6 leaf or 10 in            | 0.3 oz                   | G                            |
| Pursuit                          | 2                      | not specified on label                                | 4 leaf or 1-3 in           | 4 fl oz                  | F                            |
| Raptor                           | 2                      | Pre-bloom   | 5 in                       | 4 to 5 oz                | F                            |
| Synchrony XP <sup>b</sup>        | 2 + 2                  | first trifoliolate to 60 days before soybean maturity | 4 in                       | 0.75 oz                  | F-G                          |
| Cobra                            | 14                     | 45 days before harvest or before R6 (full seed)       | 36 in                      | 12.5 oz                  | G                            |
| Ultra Blazer                     | 14                     | not specified on label                                | 2 leaf or 3 in             | 1.5 pt                   | F-G                          |
| Reflex                           | 14                     | Pre-bloom   | 4-6 leaf                   | 1 to 1.5 pt <sup>c</sup> | G                            |
| Flexstar GT <sup>d</sup>         | 9 + 14                 | 45 days before harvest                                | 4-8 in                     | 3 to 4.5 pt <sup>c</sup> | G-E                          |
| glyphosate products <sup>d</sup> | 9                      | through full flowering                                | 6 in                       | 1 qt <sup>e</sup>        | G                            |

| Herbicide                                   | Herbicide Group Number | Soybean growth stage – maximum size or range | Maximum giant ragweed size | Rate/Acre       | Efficacy rating <sup>a</sup> |
|---|------------------------|--|----------------------------|-----------------|------------------------------|
| Liberty <sup>f</sup>                        | 10                     | 70 days before harvest                       | 12 in                      | 29 to 36 fl oz  | G                            |
| Engenia, FeXapan, or XtendiMax <sup>g</sup> | 4                      | 45 days before harvest (pre-bloom)           | 4 in                       | 12.8 / 22 fl oz | F                            |

<sup>a</sup>E = Excellent (>90% control)    G-E = Good to Excellent    G = Good (80-90% control)

F-G = Fair to Good    F = Fair (60-80% control)

<sup>b</sup>Synchrony XP (Classic + Harmony premix) requires use of STS soybean varieties. Using this product on non-STS soybean varieties will seriously injure the soybean crop.

<sup>c</sup>Indicates that maximum weed size is rate dependent; consult label for details.

<sup>d</sup>Products containing glyphosate require the use of glyphosate-resistant soybean varieties.

<sup>e</sup>The glyphosate rate given is for a formulation of 4 lb ai (3 lb ae) per gallon. Adjust the rate for other formulations.

<sup>f</sup>Liberty requires the use of glufosinate-resistant soybeans. Two postemergence applications of Liberty can be used; max rate per application is 36 fl oz and total application cannot exceed 65 fl oz.

<sup>g</sup>Engenia, FeXapan, and XtendiMax contain dicamba and must be used only with dicamba-resistant soybeans. Only approved formulations of dicamba are allowed to be applied to dicamba-resistant soybeans. Refer to product label for application requirement, restrictions, and precautions, including allowed tankmix partners.

## Post-directed Application

If a serious regrowth of giant ragweed occurs before soybeans canopy, and cultivation is not practical, a post-directed application of 2,4-DB at 1 pt/A may be beneficial. This strategy is not as effective as other strategies and should be used only when necessary. Giant ragweed must not be more than one-third the height of the soybeans to allow for effective spray coverage of the giant ragweed. Do not spray higher than the bottom one-third of the soybean plants to avoid crop injury.

## Rescue Treatment

Cobra is labeled for suppression of large (up to 36 inch tall) giant ragweed plants. Apply Cobra at 12.5 oz/A with 0.5 % v/v crop oil concentrate.

To control large giant ragweed that has canopied above the soybean, use a rope wick applicator with glyphosate. Apply a 1 to 1 ratio of glyphosate to water when most plants are 6 inches above the soybeans. Refer to the label to determine if additional surfactants are needed.

## CONTROL IN GRAIN SORGHUM

Excellent giant ragweed control can be achieved in grain sorghum. Control programs should consist of soil-applied atrazine followed with a postemergence herbicide program. Atrazine rate restrictions must be considered when planning herbicide programs that include atrazine and/or atrazine premixes.

## Preplant or Preemergence Control

Apply atrazine preplant incorporated or preemergence at labeled rates for the soil type. A follow-up with a postemergence herbicide may be needed to control escaped plants. Hand pulling may be

equally effective when there are few uncontrolled plants. Follow all herbicide label precautions.

Prepackage mixtures containing atrazine such as Bicep II Magnum or Guardsman Max are readily available for soil-applied use. Spiking pre-mixes with additional atrazine may be needed in order to achieve a total soil-applied atrazine rate of 1.5 lbs ai/A. Be certain to follow atrazine maximum use rate restrictions per application and per season. Sorghum seed must be protected with seed treatments of Concep or Screen when using Dual premix products containing metolachlor.

### **Postemergence Control**

Control of emerged giant ragweed plants can be obtained with dicamba (8 oz/A Banvel or Clarity), Marksman (2 pt/A), Huskie (12.8-16 oz/A) plus atrazine (1-2 pt/A), Maestro 2E (1.5 pt/A), Sandea (0.67 oz/A), or Yukon (4-6 oz/A). Subsequent flushes of giant ragweed may require multiple or split applications of some products or follow-up applications with other products. Consult the labels (or corn section of this sheet) for giant ragweed sizes that can be treated with these products.

Always consult herbicide labels for the proper adjuvants to use. When tank-mixing products, different adjuvants may be required. Other important considerations are seed treatment, soil insecticide interactions, environmental conditions, herbicide volatility or drift to sensitive crops, crop health and stage, crop rotation, and grazing and feeding intervals. This information is available on herbicide labels.

### **CONTROL IN PASTURE AND FORAGE**

An excellent opportunity to control giant ragweed is during pasture renovation. Apply glyphosate at 1.5 qt/A or Gramoxone at 3 pt/A. Thorough coverage of foliage is essential. Higher rates of these herbicides may be required to control other weeds or sod present.

Postemergence control of giant ragweed in permanent pasture is possible with dicamba-containing products (Banvel or Clarity 1 pt/A, Overdrive 4-8 oz/A, WeedMaster 4 pt/A) and PastureGard HL (0.75 – 1 pt/A). Crossbow and Remedy are not labeled for giant ragweed control but may provide control or suppression. These products will injure or kill desirable legumes. Mowing may be an appropriate alternative to chemical control. Mowing should take place before the plants produce seed.

Glyphosate or Gramoxone will control giant ragweed when applied prior to establishment of alfalfa, ladino clover, and red clover. Apply glyphosate at 1.5 qt/A or Gramoxone at 3 pt/A. Thorough coverage of foliage is essential. Higher rates of these herbicides may be required to control other weeds or sod present.

Pursuit (4-6 fl oz/A) or Raptor (4-6 fl oz/A) will provide postemergence control of giant ragweed in seedling alfalfa and between cuttings in established alfalfa (prior to 3" regrowth). Gramoxone will also control giant ragweed between cuttings. Apply 1 pt/A within 5 days of cutting.

Always consult herbicide labels for surfactants to use, appropriate weed and crop stages, grazing, feeding, haying, and slaughter intervals, and other restrictions.

## CONTROL IN VEGETABLES

### Chemical Control

There are limited herbicide options for giant ragweed control in most vegetable crops. Sweet corn fields can be treated with Bicep II Magnum and postemergence applications of atrazine. Callisto preemergence or postemergence, or 2,4-D, Impact, or Laudis, postemergence are other options, although some sweet corn varieties can show significant injury to these products. Sandea is an option for use with some vegetables; check the label for timing and rates. Basagran is labeled for snap and lima beans and can suppress small giant ragweed plants, but plants often regrow. Vegetables should not be planted in fields with giant ragweed infestations.

### Cultivation

Cultivation in combination with herbicide application can increase the overall level of control. When cultivating, care must be taken to avoid bringing soil not treated with an herbicide near the soil surface, thereby reducing the opportunity for seeds to germinate and seedlings to emerge.

### SPOT-SPRAY CONTROL (Crop and Non-crop)

Spot treatment can be made in corn, soybeans, wheat, barley, oats, sorghum, forage, pasture, and non-crop areas. For small or localized areas, use the chart below and apply the recommended concentration on a spray-to-wet basis (1 gal/1000 ft<sup>2</sup>) to provide thorough coverage. For larger areas, refer to the herbicide label for rates to apply on a per-acre basis. Mowing may be an appropriate alternative to chemical control, particularly in pastures and non-crop areas. Mowing should take place before the plants produce seed. Several other products are labeled for spot-spray applications in grass forage.

| Amount of herbicide to mix with various volumes of water |                         |                      |                    |
|--|-------------------------|----------------------|--------------------|
| Gallons of water   | Glyphosate <sup>a</sup> | Stinger <sup>b</sup> | 2,4-D <sup>c</sup> |
| 100  | 2 gal                   | 3 pt                 | 3.1 gal            |
| 25   | 2 qt                    | 12 oz                | 3.1 qt             |
| 1  | 2.6 oz<br>(5 Tbsp)      | ½ oz<br>(1 Tbsp)     | 4 oz<br>(8 Tbsp)   |

<sup>a</sup>Add a surfactant as required by the label. Amount is based on a 4 lb ai/gal (3 lb ae/gal) formulation of glyphosate.

<sup>b</sup>A surfactant is not necessary with Stinger. The Stinger rates in this table are for non-cropland and permanent grass pasture. Consult the label for rates to use in specific crops.

<sup>c</sup>2,4-D can be used in non-cropland and in crops labeled for postemergence 2,4-D application. Amount is based on a 3.8 lb/gal formulation of 2,4-D.

**NOTE:** Glyphosate will kill non-glyphosate resistant crops in the treated area. Take care to avoid drift outside the target area. Glyphosate does not provide residual weed control; therefore, giant ragweed seedlings that emerge after application will continue to grow.



Stinger and 2,4-D can volatilize or drift to sensitive crops or plants and cause serious injury. Consult herbicide labels for precautions and application procedures that will minimize the potential for volatility or drift. Alternatives to these products are preferred when high value sensitive plants such as ornamentals, fruit trees, vines, or flowers are nearby.

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