

Common Ragweed Management in Soybeans



Common Ragweed Distribution and Biology

- Common ragweed (*Ambrosia artemisiifolia*) is a native summer annual that infests crop fields in all tillage systems and fertility levels, but higher densities are more often associated with reduced tillage and lower fertility.
- Germination occurs in the spring and requires light and a chilling period to break dormancy. Seeds need to be near the soil surface with increasing air temperatures for germination.
- Seed production varies from 32,000 to 62,000 seeds per plant.
- Flower initiation in common ragweed is sensitive to day length. Plants will start flowering as day lengths begin to shorten right after the summer solstice, regardless of plant height.
- Soybean yield can be reduced by up to 10 percent by common ragweed densities of four plants per 30 feet of row.
- It has been documented that root- and stem-boring insects can reduce glyphosate efficacy on giant ragweed when applications are delayed. This problem may occur in common ragweed, as well, if postemergent applications are not timely.

Herbicide Resistance in Common Ragweed¹

- Common ragweed with evolved resistance to Group 2 herbicides (ALS-inhibitor) was identified in Delaware, Illinois, Indiana, Michigan, Minnesota and Ohio as early as the mid-1990s.
- Resistance to Group 14 herbicides (PPO inhibitors) in common ragweed is confirmed in Delaware and Ohio.
- Resistance to Group 9 (glyphosate) herbicides occurs over a larger geography, including Arkansas, Indiana, Kansas, Kentucky, Minnesota, Missouri, North Carolina, North Dakota, Ohio, Pennsylvania and South Dakota.
- In addition, common ragweed populations with resistance to multiple herbicides (i.e., multiple sites of action) have been identified in Delaware, Minnesota and Ohio.

Management of Common Ragweed

Single applications of any single pre- or postemergent herbicide will not provide season-long control of weeds, especially competitive broadleaf weeds, like common ragweed. Successful common ragweed management programs must include both pre- and postemergent applications, with at least two effective herbicide sites of action.

Here are more tips to managing common ragweed:

- 1. Start Clean.** Get the season off to a great start by controlling existing weeds with preplant tillage or herbicides, and be sure to include herbicides with residual activity (Table 2). Regardless of resistance levels, remember to include two or more sites of action in each application.
 - a. For glyphosate-resistant populations,** use a tank mix of at least two sites of action for preplant and pre-emergent applications, including herbicides with residual activity.
 - b. For ALS-resistant populations,** consider rotation to corn or wheat and delay planting to soybean. The preplant and pre-emergent strategies are similar to the glyphosate-resistant program except that the pre-emergent application should contain either a Group 14 (PPO inhibitor) or Group 5 (metribuzin) herbicide.

Table 1. Preplant and pre-emergence herbicides for glyphosate-resistant common ragweed

Timing	Herbicide	Site of Action Group(s)
Preplant		
	2,4-D + glyphosate	4 & 9
	2,4-D + paraquat	4 & 22
Pre-emergence		
	Authority [®] First/Envive [®] / Gangster [®] /Sonic [®] /Valor [®] XLT	2 & 14
	Canopy [®]	2 & 5

Table 2. Control and/or suppression of susceptible and resistant common ragweed with residual herbicides

Herbicide	Site of Action Group(s)	Common Ragweed Control Rating		
		Susceptible	Resistant (Group 2)	Resistant (Group 2+14)
Authority® Assist	2 & 14	6	-	-
Authority® First/Sonic®	2 & 14	9	-	-
Authority MAXX/XL	2 & 14	9	-	-
Boundary®/Ledger™/Tailwind®	5 & 15	6	6	6
Canopy® DF/Cloak™ DF	2 & 5	9	-	-
Canopy® EX/Cloak™ EX/FallOut™	2	9	-	-
Command®	13	7	7	-
Envive®/Enlite®	2 & 14	9	7	-
Fierce®	14 & 15	8	8	6
FirstRate®	2	9	-	-
Gangster®	2 & 14	9	7	-
Intimidator®	5, 14 & 15	8	8	-
Lorox®	7	8	8	8
Matador®	2, 5 & 15	7	-	-
Metribuzin	5	7	7	7
Optill® PRO	2, 14 & 15	7	-	-
Prefix®/Vise®	14 & 15	8	8	-
Pursuit®	2	6	-	-
Pummet®	2 & 15	6	-	-
Python®	2	7	-	-
Scepter®	2	8	-	-
Valor®/Encompass™/Outflank®	14	7	7	-
Valor® XLT	2 & 14	9	7	-
Zidua®	15	6	6	6

Modified from Table 10, page 87, "Weed Control Guide for Ohio and Indiana" (Purdue Extension publication WS-16, Ohio State University Extension bulletin 789). Ratings of 8 to 9 indicate control and 6 to 7 reflect suppression.

2. Stay Clean. The most effective way to achieve full-season weed control and address herbicide-resistance concerns is to start with a pre-emergent application and follow with at least one effective postemergent-applied herbicide. The POST application should occur before the weeds exceed four to six inches in height, depending on herbicide and growing conditions. After the first postemergent application, the fields need to be scouted to determine if there are newly emerged seedlings and to verify the application's efficacy.

- a. For Group 9 (glyphosate)-resistant populations,** use one of the following postemergent programs:
 - Flexstar® (Group 14) at 1.0 to 1.5 pints/A. – be sure to check the label for rate allowed in your area.
 - Cobra® or Phoenix® (Group 14) at 12.5 oz./A.
 - Classic® or FirstRate (Group 2)
 - Liberty® (Group 10) if soybeans are tolerant to glufosinate (i.e., LibertyLink®)
- b. For Group 2 (ALS-inhibitor)-resistant populations,** use one of the following postemergent programs:
 - Cobra® or Phoenix™ (Group 14) at 12.5 oz./A., or Flexstar (Group 14) at 1.0 to 1.5 pints/A. (check label to see if 1.5 pt./A. rate allowed in your area). Reduced rates of these herbicides will result in less control of ALS-resistant plants.
 - Liberty (Group 10), if soybeans are tolerant to glufosinate (i.e., LibertyLink)

In all cases listed above, herbicide combinations may need to be considered to satisfy the need of using multiple effective sites of action (e.g., Liberty + Cobra or Flexstar as a postemergent application) and/or additional herbicides may be needed to control other weeds in the mix. For example, many options listed above don't control grass weeds. Please read and follow directions to avoid herbicide antagonism² and/or crop injury.

3. Scout. Two weeks after the first postemergent application, the fields should be checked to see if a second application is necessary.

For more information and links to additional resources, visit www.IWillTakeAction.com.

¹ Heap, I. The International Survey of Herbicide Resistant Weeds. Online. February 2014. www.weedscience.org

² Herbicide antagonism: When two or more herbicides are mixed together, the result can be a reduction in the activity of one of the herbicides on certain weeds.

Technical editing for this publication was led by Vince Davis, University of Wisconsin; Elizabeth Bosak, University of Wisconsin; Christy Sprague, Michigan State University; Bill Johnson, Purdue University; and Travis Legleiter, Purdue University, in partnership with other universities in the soybean-growing regions of the United States. Take Action is supported by BASF, Bayer, Dow, DuPont, FMC, Monsanto, Syngenta, Valent and corn, cotton, sorghum, soy and wheat organizations. The United Soybean Board and all Take Action partners, including the companies mentioned above, neither recommend nor discourage the implementation of any advice contained herein, and are not liable for the use or misuse of the information provided. ©2018 United Soybean Board.

