

Management of Herbicide-Resistant Horseweed (Marestail) in No-Till Soybeans



Horseweed Biology

- Horseweed *Conyza canadensis* (marestail) has two primary periods of emergence — from late March through June and from late summer through late fall.
- Horseweed plants remain in the rosette stage through late March in the southern states to late April in northern states, followed by stem elongation (bolting) and rapid growth to an eventual height of 3 to 6 feet. Plants that emerge the previous fall will bolt earlier than spring-emerging plants.
- Horseweed competes with soybeans throughout the growing season and reduces crop yield. Horseweed matures in late summer or early fall, and produces up to 200,000 seeds per plant, which are readily dispersed by wind.
- Horseweed is most easily controlled when in the seedling — or rosette — stage, and spring burndown herbicides should be applied before stem elongation.
- Horseweed populations with evolved resistance to glyphosate or ALS-inhibiting herbicides (Group 2, such as Classic® and FirstRate®) are widespread, and many populations are resistant to both sites of action. Farmers should therefore not expect to obtain effective control with in-crop postemergence herbicides in glyphosate-tolerant or non-GMO soybeans.



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Management Steps

1. Use fall or early spring herbicide treatments in fields where horseweed seedlings are observed and fields with a history of horseweed-control problems. The primary goal of a fall treatment is control of emerged plants. It should not be considered a substitute for preplant application of burndown plus residual herbicides in spring. For fall applications, use 2,4-D as the base herbicide and combine it with one or more of the following to help ensure control of horseweed and other winter weeds:
 - Glyphosate
 - Dicamba (can use premix, such as Brash® or Weedmaster®)
 - Basis® Blend or other similar products
 - A low rate of Canopy®/Cloak® EX or DF
 - Autumn™ Super or metribuzin
 2. Start weed-free at planting by using one of the following preplant herbicide treatments, applied when horseweed plants are no larger than the rosette stage. Do not plant into existing stands of horseweed.
 - Note: Thorough tillage close to planting also effectively removes horseweed.
 - 2,4-D ester or dicamba plus glyphosate (1.5 lb. a.e./A.). See notes below on use of dicamba in non-Roundup Ready 2 Xtend® vs. Roundup Ready 2 Xtend soybeans and use of 2,4-D in non-Enlist vs. Enlist soybeans.
 - 2,4-D ester or dicamba plus saflufenacil (Sharpen®/Verdict®/Zidua® PRO) plus glyphosate and methylated seed oil (MSO).
 - 2,4-D ester plus paraquat (Gramoxone®, 3 to 4 pts./A.) plus a metribuzin-containing herbicide.
 - Glufosinate (32 oz./A. or more) plus 2,4-D ester and/or a metribuzin-containing herbicide.
 - Saflufenacil (Sharpen/Verdict/Zidua PRO) plus MSO (1% v/v) plus either glyphosate or glufosinate (Liberty, 29 to 36 oz./A.).
- The mixture of glyphosate and 2,4-D ester or dicamba has become more variable for control of horseweed in some areas. Use the more complex mixtures in fields not treated the previous fall, containing multiple non-glyphosate herbicides with activity on horseweed.

- The addition of metribuzin or 2,4-D can improve control from any treatment not already containing these herbicides.
 - **2,4-D ester — non-Enlist soybeans:** Use the highest rate of a 2,4-D-ester product that is allowed, based on the interval between application and soybean planting. For all 2,4-D-ester products, rates up to 0.5 lb. of active ingredient per acre (ai/A.) must be applied at least seven days before planting. Rates between 0.5 lb. and 1 lb. ai/A. should be applied at least 30 days before planting, with the exception of some products, such as E-99, Salvo[®] and Weedone[®] 650 that allow 1 lb. ai/A. to be applied 15 days before planting. See product labels for specifics.
 - **Enlist One[®] and Enlist Duo[®] — Enlist E3[®] soybeans:** These products can be applied any time before or after planting Enlist soybeans. They are the only 2,4-D-containing products that do not have to be applied per the restrictions in the preceding paragraph when used on Enlist E3 soybeans. The higher labeled rates of these products should generally be used for control of emerged horseweed, especially for overwintered plants. See product labels for specific requirements including approved tank-mix partners, adjuvants and specific nozzle requirements.
 - **Dicamba — non-Roundup Ready 2 Xtend soybeans:** Typical label statement for 4 lb./gallon dicamba product reads, “Following application of dicamba and a minimum accumulation of 1 inch of rain, a waiting interval of 14 days until soybean planting is required for rates of 8 oz./A. or less, and 28 days for rates up to 16 oz./A.” See product labels for specifics.
 - **Dicamba — Roundup Ready 2 Xtend soybeans:** Approved dicamba products (XtendiMax[®], Engenia[®], FeXapan[®]) can be applied any time prior to or after planting without risk of injury. Refer to product labels and websites for information on approved tank-mix partners, adjuvants and nozzles, and stewardship to reduce risk of off-target movement.
3. Include one of the following residual herbicides or herbicide combinations with the spring preplant burndown treatment. Use of the more complex combinations provides a better chance for residual control of horseweed until the soybean leaf canopy develops.
- Flumioxazin — Valor and Fierce[®] products, Envive/Enlite[®], Surveil[®], Trivence[®], Panther Pro[®], others.
 - Sulfentrazone — Authority products, Zone, Broadaxe[®] or Spartan[®]/Shutdown[™], others.
 - Metribuzin — Rates of at least 0.28 to 0.38 lb. ai/A., and preferably 0.47 to 0.56 lb. ai/A., but do not exceed recommended rate for soil type. When using metribuzin-containing premix products, add more metribuzin as needed to attain these rates. Sensitivity to metribuzin varies among soybean varieties; check with seed supplier for more information.
 - Most consistently effective residual control occurs with combinations of a flumioxazin or sulfentrazone product with metribuzin (0.19 to 0.38 lb. ai). Trivence and Panther Pro are examples of premix products that already contain flumioxazin and metribuzin. Where allowed by labels and time until planting, the addition of higher rates of Sharpen (1.5 to 2 oz.) will also improve residual control.
4. Use a soybean trait system that provides for postemergence herbicide options for control of horseweed that emerges after planting.
- LibertyLink and LL-GT27 soybeans — glufosinate (Liberty, Interline, Cheetah, etc.). Apply 32 oz./A. or greater when horseweed plants are less than 6 inches tall and soybeans are up to the R1 stage.
 - Roundup Ready 2 Xtend soybeans — labeled rates of Engenia, FeXapan, Tavium or XtendiMax will control horseweed. Apply prior to 45 days after planting or through V4 (Tavium) or R1 stage (others), whichever occurs first.
 - Enlist E3 soybeans — Enlist One (2 pt./A.) plus glufosinate (Liberty 32 oz./A.) or sequential applications of Enlist Duo (4.75 pts./A.) and Liberty (32 oz./A.) can be applied postemergence for effective control of horseweed plants. Refer to label for rates and timings. Enlist Duo or Enlist One must be applied at a growth stage no later than R2 (full flower) and Liberty no later than R1 (bloom).

For more information and links to additional resources, visit growiwm.org/take-action-home/.

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