

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



## Horseweed Biology

- Horseweed (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.

## Herbicide Activity and Resistance in Horseweed

- Herbicide programs must include a spring burndown to ensure that the field is free of horseweed at soybean planting, followed by soil-applied pre-emergence residual herbicides to control horseweed for another six to eight weeks. Failure to follow these guidelines can result in poor control and reduced crop yield. A recent Ohio State University horseweed study with various herbicide scenarios resulted in the following soybean yields:
  - 51 bu./A. where the burndown treatment failed to control emerged plants
  - 57 bu./A. where the burndown treatment was effective, but there was no residual herbicide
  - 65 bu./A. where the burndown was effective and residual herbicides were used
- 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 postemergence herbicides in glyphosate-tolerant or non-GMO soybeans.

## Management Steps

1. Use fall or early spring herbicide treatments in fields where horseweed seedlings are observed and especially in fields with a history of horseweed-control problems. The primary goal of a fall or early spring treatment is control of emerged plants. It should not be considered a substitute for a preplant or pre-emergence herbicide treatment later in spring. An application of burndown and residual herbicides is still required closer to planting in fields that were treated with burndown herbicides in the fall or early spring. For fall applications, experts suggest using 2,4-D as the base herbicide to control horseweed and combining it with one or more of the following to ensure control of other winter weeds:

- Glyphosate
- Dicamba (can use premix, such as Brash® or Weedmaster®)
- Basis®
- A low rate of Canopy®/Cloak® EX or DF
- Autumn™ Super, or metribuzin

For early spring applications, experts suggest a similar approach using 2,4-D or dicamba as the base, and adding glyphosate and/or a reduced-rate application of a residual herbicide. Apply the remainder of the residual herbicide closer to the time of soybean planting.

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.
  - 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.
  - 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 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 lbs. of active ingredient per acre (ai/A.) must be applied at least seven days before planting. Rates between 0.5 lbs. 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. Elevore™ must be applied at least 14 days prior to soybean planting. Refer to the specific product label to confirm the interval between application and planting.
  - **Dicamba – non-Roundup Ready 2 Xtend soybeans:** Typical label statement for 4L 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.
  - The addition of metribuzin or 2,4-D can improve control from any treatment not already containing these herbicides.
3. Include residual herbicides with the preplant-burndown treatment. Add one of the following herbicides or herbicide combinations to the burndown herbicides 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™.
    - Metribuzin – Rates of at least 0.28 to 0.38 lbs. ai/A., and preferably 0.47 to 0.56 lbs. 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 lbs. 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. In glufosinate-tolerant soybeans, postemergence application of glufosinate will control horseweed plants that emerge after planting. Apply 32 oz./A. when weeds are less than 6 inches tall. Increase rate on larger weeds based on label for the glufosinate product being used.

For more information and links to additional resources, visit [www.IWillTakeAction.com](http://www.IWillTakeAction.com).

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