

# 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 postemergent herbicides, including combinations of glyphosate plus Classic, Synchrony® or FirstRate.

## Most Effective Strategies for Control

### LibertyLink® Soybeans

- The LibertyLink soybean system is an effective tool for management of herbicide-resistant horseweed, especially in fields with high horseweed populations.
- Use burndown and residual herbicides as outlined on the next page. Apply Liberty® after emergence (29 to 36 oz./A.) before horseweed plants exceed 6 inches in height. Follow with a second application of Liberty as needed.

### RoundUp Ready 2 Xtend®

- RoundUp Ready 2 Xtend soybeans are another viable option that would allow pre-emergence and postemergence use of XtendiMax™ and Engenia™ and FeXapan™ herbicides for control of horseweed. Refer to the product label for specific instructions regarding rates, approved tank-mix partners, nozzles, buffers and other application parameters.

## 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.

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- Apply effective burndown herbicides in spring. Do not plant into existing stands of horseweed. Start weed-free at planting by using one of the following preplant herbicide treatments, applied when horseweed plants are in the rosette stage. *Note: Thorough tillage close to planting also effectively removes horseweed.*
    - 2,4-D ester or dicamba plus glyphosate (1.5 lb. a.e./A.)
    - 2,4-D ester or dicamba plus saflufenacil (Sharpen®/Verdict®) 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 (Liberty, 29 to 36 oz./A.) or glufosinate plus a metribuzin-containing herbicide
    - Saflufenacil (Sharpen/Verdict) 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 fields. Plants should be in the rosette stage at the time of application for best results. In fields where this mixture has previously failed to provide effective control, use one of the other burndown treatments listed above.
  - 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 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. Refer to the specific product label to confirm the interval between application and planting.
  - Dicamba can be more effective than 2,4-D on marestalk in the spring, but risk of injury to soybeans is greater if the plant-back guidelines are not followed. Labels on dicamba products, such as Clarity®, contain the following statement: “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. unless you have planted Roundup Ready 2 Xtend soybeans. If so, you may apply XtendiMax, Engenia or FeXapan (but no other dicamba formulations) and immediately plant soybeans.” Refer to the specific product label to confirm the interval between application and planting.
- In horseweed populations sensitive to ALS-inhibiting herbicides, the activity of any of the above can be improved with the addition of a herbicide that contains chlorimuron (e.g. Canopy/Cloak/Fallout™, Valor® XLT, Envive®, Authority® XL/MAXX) or cloransulam (Gangster®, Sonic®, Authority First). The addition of metribuzin to any burndown treatment can also improve control of emerged horseweed.
  - 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, Valor XLT, Envive, Enlite®, Fierce® or Gangster
    - Sulfentrazone – Authority First, Sonic, Authority XL, Authority Broadleaf, Authority Assist, Authority Maxx or Spartan®
    - Metribuzin – Metri™ DF, Tricor®, etc. Use rates of at least 8 oz./A., and preferably 10 to 12 oz./A., but do not exceed recommended rate for soil type. You can add metribuzin to other metribuzin-containing products (e.g., Boundary®, Canopy/Cloak DF, Intimidator®, Matador®, Authority MTZ) to bring total metribuzin rate to 0.38 to 0.5 lbs. ai/A. Sensitivity to metribuzin varies among soybean varieties; check with your seed supplier for more information.
    - The ALS-inhibiting (Group 2) component of premix products will not contribute to control of ALS-resistant populations, and product rates should be increased as necessary to maximize control from the non-ALS herbicide component. Adding 4 to 6 oz./A. of metribuzin to flumioxazin- and sulfentrazone-based products can improve residual control of these populations.



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