

# Control of Marestalk in No-till Soybeans

## Mark Loux

OSU Weed Science  
The Ohio State University  
[u.osu.edu/osuweeds/](http://u.osu.edu/osuweeds/)

## Bill Johnson

Purdue Extension Weed Science  
[www.btny.purdue.edu/weedscience](http://www.btny.purdue.edu/weedscience)

Find Herbicide Labels at:

[cdms.net](http://cdms.net)  
[agrian.com](http://agrian.com)  
[greenbook.net](http://greenbook.net)

Information listed here is based on research and outreach Extension programming at Purdue University, Ohio State University, and elsewhere. The use of trade names is for clarity to readers and does not imply endorsement of a particular brand nor does exclusion imply non-approval. Consult herbicide labels for the most current information. Copies, reproductions, or transcriptions of this document or its information must bear the statement "Produced and prepared by Purdue University or Ohio State University Extension Weed Science" unless approval is given by the author.

## Marestail Biology

- Marestail (aka horseweed) has two primary periods of emergence - from late summer into fall, and from late March through June.
- Marestail plants overwinter in the rosette stage, and remain in this low-growing stage through late April, followed by stem elongation (bolting) and growth to an eventual height of 3 to 6 feet. Plants that emerge the previous fall will start stem elongation earlier than spring-emerging plants.
- Marestail is most easily controlled when in the seedling or rosette stage
- Marestail competes with the soybeans throughout the growing season, and reduces crop yield. Marestail matures in late summer or early fall, and large mature plants can interfere with soybean harvest.
- Marestail plants can produce up to 200,000 seed that are transported by wind, providing for effective spread of herbicide-resistant populations.



## Soybean yield loss due to marestail

- Herbicide programs should consist of: 1) fall and spring burndown treatments (or two spring treatments - early spring and at plant) to ensure that the field is free of marestail at the time of soybean planting, and 2) spring-applied residual (PRE) herbicides to control marestail for another 6 to 8 weeks after planting.
- Failure to follow these guidelines can result in poor control and reduced soybean yield. We observed the following soybean yields in a 2010 OSU marestail study:
  - 51 bu/A - the burndown treatment failed to control emerged plants
  - 57 bu/A - the burndown treatment was effective, but there was no residual herbicide
  - 65 bu/A - the burndown was effective and included residual herbicides



**THE OHIO STATE UNIVERSITY**

COLLEGE OF FOOD, AGRICULTURAL,  
AND ENVIRONMENTAL SCIENCES

**PURDUE**  
EXTENSION

**LOCAL FACES**  
COUNTLESS CONNECTIONS

## Herbicide resistance in marestalk

- Most populations of marestalk in Ohio and Indiana are resistant to glyphosate (group 9), and will not be controlled by burndown or postemergence applications of glyphosate alone.
- Many marestalk populations are now also resistant to group 2 (ALS-inhibiting - e.g Classic, FirstRate) herbicides. Growers should therefore not expect to obtain effective POST control in soybeans with combinations of glyphosate plus Classic, Synchrony, or FirstRate. Postemergence group 14 herbicides, such as Flexstar, Cobra, and Cadet, also do not control marestalk.



Photos: multiple-resistant marestalk surviving treatment with (from left to right): glyphosate alone, ALS inhibitor alone, and a combination of ALS inhibitor and glyphosate

## Other impacts of multiple resistance (group 2 + 9)

- Fall-applied Canopy or other chlorimuron- or cloransulam-containing herbicides will not provide residual control of group 2-resistant marestalk into spring. Activity of other residual herbicides does not persist from fall into spring, and their use should be reserved for spring applications
- The ALS component of residual premix products will not contribute to marestalk control when applied in spring. Spring-applied residuals should include active rates of non-ALS herbicides - metribuzin, flumioxazin (Valor), sulfentrazone (Authority), or higher rates of saflufenacil (Sharpen).
- In burndown applications, there will be no added effectiveness on emerged marestalk from products that contain chlorimuron or cloransulam, which makes selection of the other herbicides in the mix more important.

## LibertyLink soybeans - the most effective marestalk control strategy

- LibertyLink soybeans are the most effective tool for management of herbicide-resistant marestalk, especially in fields with high marestalk populations.
- Use burndown and residual herbicides as outlined on the next two pages. Apply glufosinate POST (29 oz/A) before marestalk plants exceed 6 inches in height. Glufosinate can be applied POST at rates up to 36 oz/A for taller plants or plants that have survived previous herbicide treatments, but control may be variable. Follow with a second POST application of glufosinate as necessary.

---

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, sex, religion, age, disability, political beliefs, sexual orientation, and marital or family status. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

To file a complaint of discrimination write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice or TDD). USDA is an equal opportunity provider and employer.

# Steps for effective management of marestail

1. **Use fall herbicide treatments** in fields with a history of problems or where marestail seedlings are observed in fall. Consider using 2,4-D as the base herbicide to control marestail, and combining it with one of the following to ensure control of other winter weeds:

- glyphosate; dicamba (dicamba/2,4-D premixes - Brash, WeedMaster, Outlaw, Rifle); Basis/Crusher/Harrow; Express/Nuance; a low rate of Canopy/Cloak EX or DF; or metribuzin
- can add Canopy/Cloak to other herbicide combinations to obtain residual control of weeds into spring, but do not expect residual from fall-applied Canopy/Cloak to adequately control spring-emerging marestail. We do not recommend the use of other residual herbicides in the fall due to cost and lack of residual control into spring.
- Do not overspend on fall treatments. Keep the cost of herbicides in the \$6 to \$15 range.

2. **Apply effective burndown herbicides in spring.** Do not plant into existing stands of marestail. Start weedfree at the time of planting by using one of the following preplant herbicide treatments, applied when marestail plants are still in the rosette stage. Note - tillage close to time of planting also effectively removes marestail, but must thoroughly mix the upper few inches of soil and uproot existing plants.

- 2,4-D ester plus glyphosate (1.5 lb ae/A)
- Saflufenacil product (Sharpen/Verdict) plus MSO (1% v/v) plus either glyphosate or Liberty
- 2,4-D ester plus glyphosate plus Sharpen/Verdict plus MSO (1% v/v)
- 2,4-D ester plus Gramoxone (3 to 4 pts/A) plus a metribuzin-containing herbicide
- glufosinate - 29 to 36 oz/A (addition of 2,4-D and/or metribuzin can improve control)
- The mixture of glyphosate and 2,4-D ester applied in the spring has become variable for control of marestail over time, especially in fields that were not treated the previous fall. Plants should be newly emerged/small rosettes at the time of application for best results. In fields where this mixture has previously failed to provide effective control, add metribuzin and/or Sharpen or use one of the other burndown treatments listed above.
- Control can be improved by using 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 active ingredient/A must be applied at least 7 days before planting. Rates between 0.5 and 1.0 lb/A should be applied at least 30 days before planting, with the exception of several products (E-99, Salvo, and Weedone 650) that allow 1 lb/A to be applied 15 days before planting.
- Mixtures of Sharpen with herbicides containing other group 14 herbicides (flumioxazin, sulfentrazone, fomesafen) must be applied 14 days prior to soybean planting on most soils, and 30 days prior to planting on coarse-textured soils with less than 2% organic matter.
- The addition of dicamba to early spring burndown treatments can improve control of emerged marestail, especially plants that have overwintered. Dicamba can be more effective than 2,4-D on marestail in the spring, but has more potential to injure soybeans if the recrop guidelines are not followed. Following dicamba application, soybeans can be planted 14 to 28 days **after an inch of rain has occurred** (in total). For example, the Clarity label states the following - "following application of Clarity and a minimum accumulation of one inch of rain, a waiting interval of 14 days is required for rates of 8 oz/A or less, and 28 days for rates up to 16 oz/A".



## Steps for effective management of marestail (continued)

3. **Include non-ALS residual herbicides** with the burndown treatment, for control of marestail until the soybean leaf canopy develops.

- flumioxazin - Valor/Encompass/Outflank/Panther, Valor XLT, Envive/Enlite, Fierce, Fierce XLT, Surveil
- sulfentrazone - Authority First, Sonic, Authority XL/Maxx, Authority, Authority Assist, BroadAxe
- Metribuzin - Metri DF, Tricor, Glory (at least 8 oz/A, and preferably 10 to 12 oz/A), but do not exceed recommended rate for soil type
- Increase rate or add metribuzin to bring total rate to 0.38 to 0.5 lbs ai/A, for premix products that contain metribuzin, such as Boundary/Ledger, Canopy/Cloak DF, Intimidator, Matador, Authority MTZ, Ransom
- In OSU research, most effective residual control has occurred with mixtures that contain two non-ALS residual herbicide components. Examples: mixture of a flumioxazin or sulfentrazone product with metribuzin; mixture of a metribuzin product with Sharpen (1.5 to 2 oz). Trivence and Ransom are examples of premixes that contain flumioxazin and metribuzin.
- Residual control of marestail with Sharpen occurs primarily at the 1.5 to 2 oz rate, which must be applied 14 to 30 days prior to planting - see label for specific information on application timing.
- Where early spring application is needed due to lack of a treatment the previous fall, it is especially important to increase herbicide rates and use more complex mixtures (or consider split spring approach).

4. **No fall treatment? - consider split-spring applications.** Failing to treat fields in the fall can result in a population of overwintered marestail plants the following spring, which should be controlled early in spring to ensure effective burndown. Applying all of the burndown and residual herbicide early can result in poor control of plants that emerge mid-season. An alternative approach is to apply burndown herbicides with some of the residual herbicide in early spring, and then when soybeans are planted, apply the rest of the residual herbicide. The second application may require some additional burndown herbicide. Examples here include:

- early spring - glyphosate + 2,4-D + Sonic (2.5 oz/A); at plant - Sonic (2.5 oz) + Gramoxone
- early spring - glyphosate + 2,4-D + metribuzin (4 oz); at plant - Canopy DF (4 oz) + metribuzin (2 oz) + Sharpen (1 oz)
- early spring - glyphosate + 2,4-D + metribuzin (6 oz); 7 days preplant - Envive (4 oz) + 2,4-D ester

5. **So this all seems really involved. Can't I just do it all with one spring preplant treatment?**

Maybe - but this is not an approach that has consistently worked well (see photos below). It can be difficult to accomplish unless the marestail population in the field has been well managed for several years and the population is generally low. Growers should use their own previous experiences here as guidance, and plan on increasing the complexity and rates of the herbicide program. Problems with skipping the fall treatment, and applying everything at once in spring include the following: 1) applying early in spring when plants are small can result in poor control of plants that are emerging in mid-season if the residual herbicide runs out; and 2) applying closer to planting to maximize the length of residual often results in less effective control of larger, older marestail plants, especially those that have overwintered.



Left photo - spring application of glyphosate + 2,4-D + residual herbicides (no fall herbicide treatment)

Right photo - fall application of glyphosate + 2,4-D followed by spring application of glyphosate + 2,4-D + residual herbicides

Fall application = early November  
Spring application = April 21 (7 days preplant)

