ROUNDUP READY PLUS®
CROP MANAGEMENT SOLUTIONS

MARESTAIL MANAGEMENT

What You'll Learn...

- Marestail populations have increased as no-till has become a more common cultural practice.
- Marestail can germinate in the spring, summer, or fall and is capable of producing 200,000 seeds/plant with 80% of the seeds capable of germinating as soon as the plant is mature.
- Herbicide programs for marestail control in corn and soybean should include soil residual herbicides, postemergence and preemergence herbicides with multiple modes of action, and multiple applications during the season.

Marestail Biology

Marestail, horseweed, and Canada fleabane all refer to *Conyza Canadensis*, which is a native species to North America. Historically it was found in waste areas, fence rows, and fallow fields. However, with the reduction in tillage over the last 15-20 years, marestail has become a problem in no-till and some tilled fields in many states. Marestail is an annual weed that can follow a winter or summer annual lifecycle.

Marestail is often misidentified as whitlowgrass, or fleabane, but can also be mistaken for mouseear chickweed, shepardspurse, annual fleabane, or Persian or corn speedwell.[1] After emergence in the fall or spring, marestail forms a basal rosette. The rosette bolts in the spring and grows to a height of 1.5 to 6 feet. The plant produces a panicle with small, white rayflowers and yellow disk flowers. Marestail is self-compatible with only minimal out-crossing within a population. Seeds are small and easily dispersed by wind. Marestail is capable of producing 200,000 seeds/plant and 80% have the ability to germinate as soon as seed falls from a mature plant. Seed will germinate in the fall, spring, or mid-summer, if soil conditions are adequate. Marestail does not mature until late summer, allowing it to compete with soybeans or corn throughout the growing season.

Marestail has increased in prevalence and herbicide-resistant biotypes have developed due to three primary factors: reduced or no-tillage, a lack of diversity in crop rotations (production of soybeans in the same field for consecutive years), and limited herbicide diversity. Marestail herbicide-resistant biotypes have been identified in several states for ALS inhibitor, triazine, paraquat, and glyphosate herbicides. Abundant seed production and wind dispersal facilitate the spread of herbicide-resistant marestail biotypes.

Figure 1. Marestail rosette (left) and seedling (right).

Marestail Control Challenges

Several factors can influence marestail control. The size and stage of growth at the time of herbicide application can have a significant effect on efficacy. Marestail is most susceptible to control when it is small, in the rosette stage of growth and less than 4 to 6 inches tall. Once marestail bolts it is more difficult to control. The second factor is the extended emergence time of marestail which can complicate the timing of burndown applications. In many cases, including a herbicide with residual activity can help control later-emerging plants. A third challenging factor to marestail control is the limited number of post-emergence (POST) herbicide options, particularly in soybean. Because of this limitation it is important to use burndown, preplant, and pre-emergence (PRE) herbicides effectively.

Herbicide Management

There are herbicide options available for fall or spring burndown, PRE, and POST for marestail control (Tables 1 and 2). PRE herbicides with residual should be the foundation of a marestail management program.

In soybean, dicamba and 2,4-D should be tank mixed with glyphosate products for burndown applications. Use a residual herbicide that will provide 6 to 8 weeks of marestail control and one that includes flumioxazin, sulfentrazone, or metribuzin close to or at planting.[2,3] Consult each product label to identify use precautions and restrictions, like geographic and pH restrictions, for products that have chlorimuron (Rowlel™ FX, Valor® XLT, Authority® XL) or metribuzin (Authority® MTZ) as an active ingredient. POST herbicide options are limited in soybean and fields should be scouted frequently to identify ALS, glyphosate, or other herbicide-resistance.

Marestail is less difficult to manage in corn than soybean because of cultural practices, herbicide modes of action, and crop competitiveness. Burndown options in corn for tank mixtures with glyphosate products include dicamba and 2,4-D. Atrazine is effective for PRE marestail control, in

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Table 1. Monsanto recommended herbicides for marestail.

Roundup Ready®, Genuity® Roundup Ready 2 Yield® Soybean

Burndown

Roundup PowerMAX® herbicide plus dicamba or 2,4-D ester (*consult labels for planting interval, rainfall, and other restrictions*).

PRE with residual

Rowel™, Rowel™ FX, Valor®, Valor® XLT, Gangster®, Authority® First, Authority® Assist, Authority® XL, Authority® MTZ, Fierce®, Fierce® XLT, or metribuzin. FirstRate® if marestail is sensitive to ALS herbicides.

POST

Roundup PowerMAX® herbicide at a minimum of 32 oz/acre before marestail exceeds four inches in height. Tank mix with FirstRate® in ALS-sensitive areas if applying POST to a known glyphosate-resistant marestail population.

Roundup Ready® Corn 2, corn with Roundup Ready® 2 Technology

Burndown

Roundup PowerMAX® plus dicamba or 2,4-D ester.

PRE with residual

TripleFLEX® Herbicide and TripleFLEX® II Herbicide or other PRE products; or Roundup PowerMAX® herbicide (at a minimum of 32 oz/acre before marestail exceeds four inches in height) plus Harness® Xtra, Degree Xtra®.

POST

Roundup PowerMAX® herbicide at a minimum of 32 oz/acre before marestail exceeds four inches in height alone or in tank mix with 2,4-D, dicamba (Status®, Distinct®, Clarity®) or Impact®.

areas that do not have triazine-resistant biotypes. POST herbicide options in corn include atrazine, dicamba, 2,4-D and HPPD inhibitors (Impact®, others). To help prevent crop injury, consult product labels for application timing restrictions. Marestail susceptibility to herbicides declines significantly once the plant bolts in the spring.

Marestail Management Tips

1. Fall or early spring herbicide application for emerged plants to reduce heavy populations or seedlings. Plan for an additional herbicide application closer to planting.
2. Spring burndown application to marestail less than four inches tall to prepare a clean seedbed.
3. Add residual herbicides to the spring burndown application.
4. Use full label rates of herbicides for maximum residual activity and POST activity on variable height marestail.
5. Herbicide applications with multiple modes of action should be used in areas with ALS, glyphosate, or multiple-resistant biotypes.[1]
6. Use POST herbicides in-crop to control escaped plants.
7. Rotate crops and till to reduce heavy marestail infestations.[1]
8. Consult product labels for use precautions and restrictions to prevent crop injury or carryover.

Sources:
[1] Loux, M., Stachler, J., Johnson, B., Nice, G., Davis, V. and Norby, D. 2006. Biology and management of horseweed. GWC-9. https://www.extension.purdue.edu (verified 10/18/14) ; [2] Loux, M. 2013. Soybean herbicides for residual control of marestail. C.O.R.N. Newsletter, Ohio State University. http://corn.osu.edu/ (verified 10/18/14); [3] Loux, M. and B. Johnson. 2012. Control of marestail in no-till soybeans. Purdue and Ohio State Universities. http://agcrops.osu.edu/ (verified 10/18/14).

Table 2. Herbicide groups* for managing marestail in soybean and corn.

Soybean - PRE	Soybean - POST
N-phenylphthalmide (14) - flumioxazin; **Aryl triazinone** (14) - sulfentrazone	**Glycine** (9) - glyphosate **
Triazone (5) - metribuzin	**Phosphinic acid** (10) - glufosinate***
Triazolopyrimidine (2) - cloransulam **Sulfonylurea** (2) - chlorimuron	**Triazolopyrimidine** (2) - cloransulam
Corn - PRE	**Corn - POST**
Isoxazole (27) - isoxaflutole **Triketone** (27) - mesotrione	**Phenoxy** (4) - 2,4-D **Benzoic acid** (4) - dicamba
Triazine (5) - atrazine, simazine	**Pyrazolone** (27) - topramezone, pyrasulfatole
	Glycine (9) - glyphosate**
	Phosphinic acid (10) - glufosinate***

* Marestail herbicide resistant biotypes have been identified for Herbicide Groups 2, 5, 9, 22. Contact local University experts to determine if one or more of these biotypes are in a production area.
** Only for Genuity® Roundup Ready 2 Yield® and Roundup Ready® Soybeans and Roundup Ready® Corn 2, corn with Roundup Ready® 2 Technology.
*** Only for soybean and corn products with the LibertyLink® trait.

THIS DOCUMENT IS INTENDED TO PROVIDE INFORMATION ABOUT THIS WEED AND GUIDELINES FOR CONTROL. AS A TOUGH-TO-CONTROL WEED, KNOWLEDGE ABOUT THE BIOLOGY AND WEED CONTROL PROGRAMS WILL HELP IN THEIR MANAGEMENT.