Management of Marestail in Soybean

Overview

Marestail (*Conyza canadensis*), also known as horseweed, is an annual weed that is widely distributed in the United States and Canada. Emergence is shallow, usually less than 1/2-inch depth, and thrives in no-till fields. It can be a winter or summer annual. As a winter annual, it germinates in late summer or fall, forming a short statured rosette (Figure 1), and then enters dormancy as winter approaches. After breaking dormancy in early spring, the plants go through a period of stem elongation known as bolting (Figure 2). Once a plant begins to bolt, chemical control becomes more difficult. Flowering (Figure 3) typically occurs in July. An individual plant can produce as many as 200,000 seeds and can potentially grow to nearly 6 feet in height. Seed dispersal begins in August and continues through the fall. Seeds can also overwinter and germinate in the spring. Table 1 shows the lifecycle of marestail, with the approximate timeframe and plant height associated with various stages of growth. Studies indicate that fall germinated marestail are more competitive with soybean and are more prolific seed producers.[2] Regardless of fall or spring germination, marestail is more susceptible to chemical control in the rosette stage and prior to bolting. Marestail can be controlled with tillage, so it is primarily a weed of no-till or reduced tillage environments.[1,2]

Table 1. Lifecycle of Marestail.

Stage	Approx. Timeframe	Fall Germ.	Spring Germ.	Comments
		Approximate plant height (inches)		
Overwinter	January – Mid-March	0-6	0	Ideal for best control
Spring Germination/Growth	Mid-March – June	6-18	0-8	Bolting starts about mid-April
Summer Growth	June – Mid-August	18-60	8-48	Flowering begins in July
Seed dispersal and fall germination	Mid-August - November	60	48	Seed dispersal begins in mid-August
Overwinter	November - December	0-6	0	

Figure 1. Marestail seedlings. Photo courtesy of Bruce Ackley, The Ohio State University, Bugwood.org.

Figure 2. Marestail plant beginning to bolt.

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Herbicide Activity for Marestail control

Herbicide options for controlling marestail are limited to some extent due to widespread herbicide resistance to glyphosate (Group 9) and/or ALS-inhibiting (Group 2) herbicides.[3] Soybean growers should strive to have fields free of marestail at planting time. Fall and/or spring burndown herbicide applications can help growers achieve this goal. Residual herbicides applied prior to, or at soybean planting time are needed to keep fields clean for at least an additional 6 to 8 weeks.
This coincides with the critical weed-free period for soybean which is first-third trifoliate leaf stage (V1-V3). The critical period of weed control is defined as the time of a crop's life cycle when weed competition can cause crop yield loss. A study of marestail conducted by The Ohio State University indicates that soybean yield of 65 bu/acre was achieved when an effective burndown plus residual herbicide combination was incorporated into an overall control strategy. The lack of residual herbicides following an effective burndown reduced soybean yield by 8 bu/acre, and an additional 7 bu/acre yield loss occurred if the burndown treatment failed to control emerged marestail.[4]

It is critical to have the burndown applications made while the marestail is in the seedling, or rosette stage, before stem elongation occurs.

Figure 3. Seed heads of marestail. Photo courtesy of Bruce Ackley, The Ohio State University, Bugwood.org.

Controlling marestail in soybean

Fields that will be planted to soybean should be scouted before and after herbicide applications are made.

1. Control of marestail should begin with a fall and/or early spring burndown herbicide application, targeting control of emerged weeds with the use 2,4-D or dicamba as the base herbicide. Good coverage with the application equipment is also critical in achieving the desired control. Applicators should consult the herbicide label before spraying to ensure that the correct volume of solution is being applied.
2. Starting weed-free at planting time with a preplant herbicide application. Roundup Ready 2 Xtend® soybean and XtendFlex® soybeans may be used with an in-crop application of XtendiMax® herbicide with VaporGrip® Technology*, a Restricted Use Pesticide (RUP), which must be used with VaporGrip® Xtra Agent or equivalent Volatility Reduction Adjuvant (VRA). The combination can provide up to 14 days of soil activity on certain small-seeded broadleaf weeds** including marestail. Residual control should be accomplished with the use of broad-spectrum herbicide products with multiple, or different modes of action, tank-mixed with Xtendimax® herbicide with VaporGrip® Technology* (to find approved tank-mix partners, nozzles and labels, along with a summary of application requirements, please visit: XtendiMaxApplicationRequirements.com). Plant-back restrictions apply to crops that are not tolerant to dicamba by genetics or by herbicide-resistant traits.

* XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information visit XtendiMaxApplicationRequirements.com. Applicators must check XtendiMaxApplicationRequirements.com no more than 7 days before application of this product for additional labeling, including state restrictions. Where applicable, users must comply with additional requirements found on this website.

** Results may vary, depending on rainfall and soil type. Always use dicamba with residual herbicides in pre-emergence and post-emergence applications that have different, effective sites of action, along with other Diversified Weed Management Practices.

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Evaluation of weed control efficacy for XtendiMax® herbicide with VaporGrip® Technology compared to Enlist One® Herbicide with Colex-D® Technology

Bayer research in the Midwest and South in 2019 points to the effectiveness and use of XtendiMax® herbicide with VaporGrip® Technology as a burndown herbicide. The research focused on tank mixes. The first was a mix of XtendiMax herbicide with VaporGrip Technology (22 fl oz/acre) plus Roundup PowerMAX® herbicide (32 fl oz/acre) plus a DRA. The second was a mix of Enlist One® Herbicide with Colex-D® Technology (25 fl oz/acre) plus Roundup PowerMAX herbicide (32 fl oz/acre). The third tank-mix was Enlist One® Herbicide with Colex-D® Technology (32 fl oz/acre) plus Roundup PowerMAX® herbicide (32 fl oz/acre).

The control of marestail at three locations 28 days after treatment was significantly higher with tank mixes of XtendiMax® herbicide with VaporGrip® Technology* (22 oz/acre) plus Roundup PowerMAX® Herbicide (32 fl oz/acre) than tank mixes of Enlist One® Herbicide with Colex-D® Technology at rates of 25 and 32 fl oz/acre plus Roundup PowerMAX® Herbicide (32 fl oz/acre) (Figure 3). This is because XtendiMax® herbicide with VaporGrip® Technology, in addition to providing post-emergence and burndown control, is also helping to prevent another flush of weeds to emerge due to its soil activity benefit keeping fields clean longer compared to the competitive treatment. The tank mixes with XtendiMax® herbicide with VaporGrip® Technology included a DRA at 0.5% v/v.

Readers should note that this research was done prior to the label requiring the addition of a volatility reduction agent (VRA) that was included starting in 2020. It is unlikely that the addition of a VRA would have had an impact on the efficacy results that were found in this trial. Today, the first tank-mix would require a VRA be to be included.

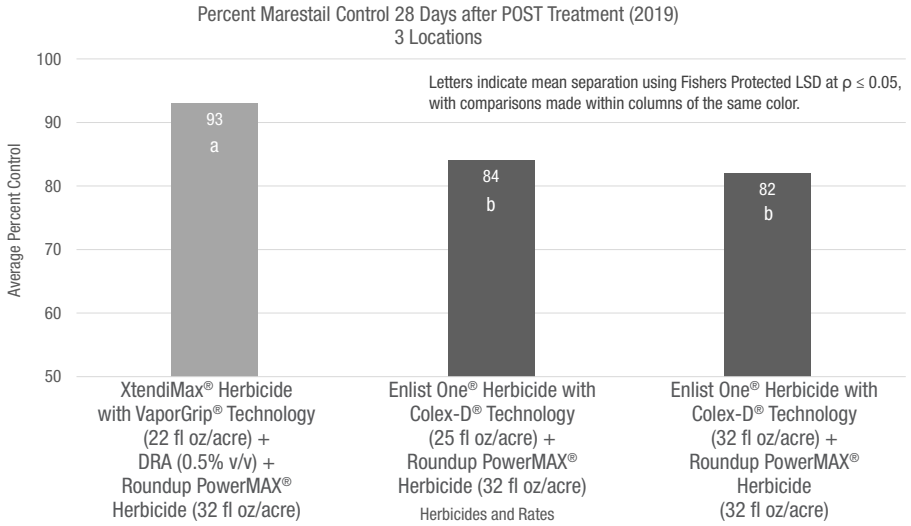

Figure 4. Comparison of weed control efficacy for XtendiMax® herbicide with VaporGrip® Technology*, a Restricted Use Pesticide (RUP), compared to Enlist One® Herbicide with Colex-D® Technology 28 days after application for marestail control. The trial locations, conducted in 2019, were in Missouri, Illinois, and Minnesota.

* XtendiMax® herbicide with VaporGrip® Technology is a restricted use pesticide and must be used with VaporGrip® Xtra Agent (or an equivalent volatility reduction adjuvant). For approved tank-mix products (including VRAs and DRAs), nozzles and other important label information visit XtendiMaxApplicationRequirements.com. Applicators must check XtendiMaxApplicationRequirements.com no more than 7 days before application of this product for additional labeling, including state restrictions. Where applicable, users must comply with additional requirements found on this website.

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Sources

[1]Marestail (Horseweed) (*conyza canadensis* (L.) Cronq.) Michigan State University Extension. Marestail (Horseweed) - Weeds (msu.edu)

[2]Scout for marestail and other early emerging weeds. University of Nebraska-Lincoln Extension. CropWatch. Published before 2015. Scout for Marestail and Other Early Emerging Weeds | CropWatch | University of Nebraska–Lincoln (unl.edu)

[3]Marestail in soybeans: Strategies for the best control. Kansas State University. Agronomy eUpdates. March 3, 2022. Issue 895. Agronomy eUpdate March 3rd, 2022 : Issue 895 (ksu.edu)

[4]Loux, M. 2018. Management of herbicide-resistant horseweed (marestail) in no-till soybeans. Take Action Herbicide-Resistance Management. United Soybean Board and Take Action Partners. Herbicide-Resistant Horseweed (Marestail) Management in No-Till Soybean | MU Extension (missouri.edu)

Web sources verified 1-27-2023

Legal Statements