Marestail Management in Pennsylvania

PennState Extension

Herbicide resistant marestail (horseweed) is widespread in Pennsylvania. Glyphosate (Roundup)-resistant marestail is prevalent throughout the state, with ALS-resistance (Group 2; i.e. FirstRate, Classic) in some areas. It is particularly challenging in no-till and reduced-tillage systems, where integrating multiple tactics often becomes necessary. To prevent resistant populations from establishing, management programs need to avoid reliance on glyphosate and ALS herbicides, diversify herbicide modes of action (MOA), and integrate appropriate chemical and non-chemical control tactics.

Marestail Biology

This winter annual weed emerges in both fall and spring (September-November and April-early June in Pennsylvania). Most fall-emerged plants survive the winter and keep growing in the spring, at which point they become harder to control. Seedlings have small lobed leaves that grow into rosettes. The rosettes "bolt" into upright stems that produce up to 200,000 seeds and reach up to 6 feet tall. The seeds are wind-blown long distances, spreading to neighboring farms, counties, and states. Once plants grow above 5 inches tall, they are very difficult to control with herbicides alone.

Crop Management Effects on Marestail

Marestail is more prevalent in no-till, reduced-till, and perennial production systems compared to annually tilled fields, because it thrives in landscapes where soil is not disturbed. While it can infest all row crops and forages, it is most challenging to control in soybeans due to limited herbicide options and soybean's summer annual life cycle. Winter wheat and winter annual cover crops develop thick canopies in the early spring, shading out spring-emerging horseweed. But in Pennsylvania, soybean and corn planting happens after marestail has already established. Marestail can often recover and produce viable seeds following damage by ineffective herbicide application, grazing or mowing.

Best Management Practices for Marestail:

1) **Control fall-emerged marestail before the winter** with a fall burndown. If fall seedlings are not controlled, they overwinter and are more challenging to control in the spring. If planting a cereal rye cover crop, 2,4-D and dicamba may be used.

2) **Control all horseweed prior to cash crop planting**. Effective POST options are limited, especially in soybean.

3) **Use multiple effective herbicide modes of action (MOA).** Vary MOAs in tank mixes and between applications. Using herbicides with different MOAs prevents selection of weeds resistant to certain herbicides like glyphosate or ALS.

4) **Target marestail under 5 inches tall** when they are most susceptible to herbicides. Scout early and regularly.

5) **Include residuals** at planting to prevent late-spring emerging horseweed plants.

6) **Shade out spring marestail** with winter annual crops or cover crops, narrow row spacing, or high seeding rates.

7) **Hand-remove mature marestail** before flowering, before it has a chance to produce and disperse its seeds.

8) **Include corn or small grains in rotation,** to increase herbicide options and compete with marestail for sunlight. Small grains and alfalfa also allow for mowing and harvesting as control options.

Cover crops for marestail suppression in no-till soybeans

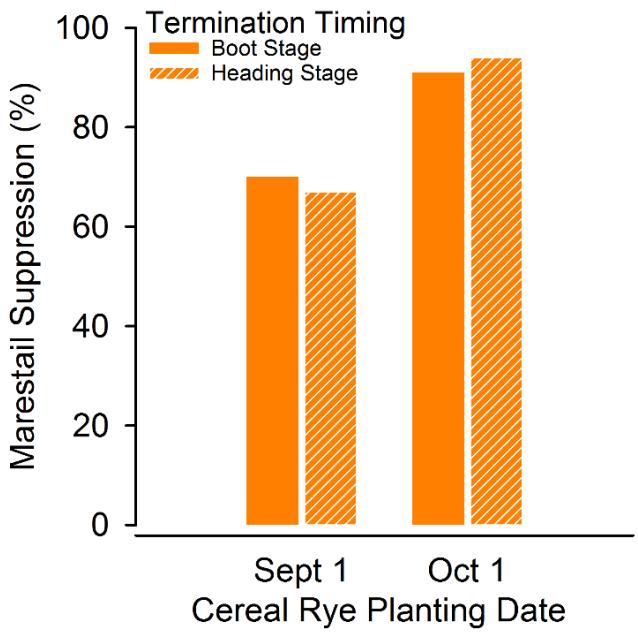
A high-biomass winter annual cover crop can suppress a high percentage of marestail in the spring. If it is left on the field after termination, it can also shade out marestail that emerges after cash crop planting. A vigorous species like cereal rye should be planted after fall harvest and allowed to grow for several weeks into the spring. This allows it to accumulate biomass so that it can function as a weed suppressive mulch that the crop is later planted into. In general, 4000 lb or more dry matter is necessary prior to termination, in order to actively suppress emerging weeds in the spring. Higher biomass can be achieved by earlier planting dates and later termination dates. Before planting cover crops for weed suppression, please contact Penn State Extension for more information, as results depend on various management decisions and individual farm factors.

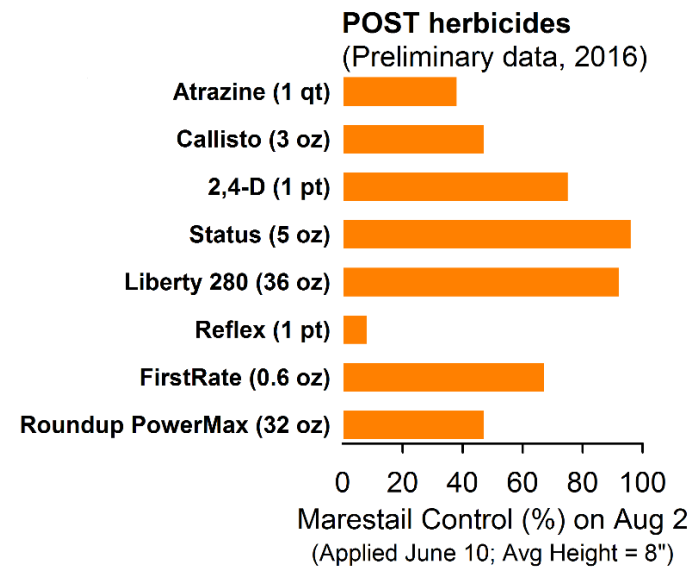
Mechanical control options for marestail

Cultivation, mowing, hand removal, and tillage are all mechanical tactics that help manage horseweed.

- Hand-pull mature plants before they flower, so they cannot drop seeds and reproduce.
- Cultivation may be used to uproot plants under one foot tall.
- Mowing slows horseweed growth but must be done frequently to stop regrowth and seed production.

Marestail is more common in no-till and reduced-till fields. In tilled fields, late spring tillage uproots seedlings prior to planting.





Above herbicides are examples of POST options for marestail (horseweed). It is not a complete list.

BURNDOWN

- Control all marestail prior to cash crop planting.
- Glyphosate and ALS herbicides will not work if resistant.
- Combine 2,4-D ester (1 pt, ≥ 7 days before planting) with other MOA: Gramoxone, Liberty, glyphosate, or ALS herbicides (Ex: Classic, Synchrony, FirstRate).
- Dicamba-resistant soybeans allow the use of specific dicamba formulations (Engenia, FeXapan, Xtendimax).

PRE RESIDUAL AT PLANTING

- Include multiple effective MOA like groups **2** (ALS inhibitors), **4** (PGR's), **5** (atrazine, metribuzin), **14** (PPO inhibitors) and **15** (acetochlor, s-metolachlor, etc).
- Group 2 herbicides are ineffective on ALS-resistant horseweed.
- Many PRE mixes are available that incorporate these MOAs.

POST

Do not rely on POST herbicide applications for marestail, especially in soybean. Options are very limited (see figure).

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