



Northern NY Agricultural Development Program 2020-2021 Project Report

Herbicide Programs for Glyphosate-Resistant Horseweed (a.k.a Marestalk) Control in Soybeans

Project Leader:

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Cooperating Producer(s):

- A soybean grower, Heuvelton, NY

Background:

Glyphosate-resistant (GR) soybeans made postemergence weed control relatively easy with a single application. The use of postemergence (POST) glyphosate in GR soybeans has been the primary weed control program used by many Northern New York (NNY) soybean growers. While this system seemed to simplify weed management, relying on total postemergence programs can be difficult to manage if not properly implemented. In 2019, glyphosate-resistant horseweed, also known as marestalk, was discovered on several farms in NNY. In 2020, uncontrolled resistant marestalk contributed to significant yield losses on some farms in the region.

Herbicide screening trials of marestalk grown from seeds collected from multiple NNY soybean fields suggest that the horseweed populations are resistant to both Group 9 (glyphosate, i.e., Roundup) and Group 2 (ALS herbicides, i.e., Classic, FirstRate) herbicide sites of action. A single POST glyphosate application will no longer control

resistant horseweed; therefore, growers will now have to use an effective soil residual herbicide with the preplant burndown program or apply separately just prior to planting.

There are preemergence (PRE) residual herbicides with different sites of action than glyphosate (Group 9) that have the potential to help manage glyphosate-resistant horseweed in soybeans. Auxin-resistant soybeans, such as Xtend and Enlist E3 seed technologies, allow for POST applications of specific dicamba and 2,4-D herbicides for the control of emerged broadleaf weeds, including horseweed, in soybeans.

The spread of marestail that is resistant to multiple herbicide family groups (Groups 9 and 2) moving across New York State, including in Northern New York, is forcing many growers to change their current herbicide programs. This has led to a renewed interest in and need to use soil-residual herbicides for improved soybean weed control.

Also included in this trial was Spartan Charge (a premix of two Group 14s), containing the active ingredient sulfentrazone, which is not currently registered for use in New York. This herbicide and other residual herbicides play an important role in GR soybean weed control programs, while helping slow the development of glyphosate-resistant weed populations in NNY.

Methods:

A replicated herbicide trial was conducted on a farm near Heuvelton, New York, in St. Lawrence County. This trial included 13 different herbicide programs consisting of preemergence (PRE) herbicide used alone and in tank mixes. The marestail population at this site had been confirmed, by testing field-collected seeds grown out for herbicide resistance testing at Cornell AgriTech in Geneva, N.Y., to be resistant to both Group 9 (i.e. glyphosate, Roundup) and Group 2 (i.e. Classic, FirstRate) herbicides.

The soybeans were planted on June 1, 2021. The PRE herbicide treatments were applied on June 2, 2021, and visual marestail control ratings were done 35 days after application (DAA). Marestail was the dominant weed present and the only weed included in the control ratings for this trial.

Results:

Weed control ratings were taken 35 days after application of the PRE treatments applied on June 2, 2021. Our control ratings 35 days after PRE treatments application (DAA) for marestail were at least 80% control or better in only two of the treatments, Sharpen + Tricor DF (91.75% control) and Tricor DF applied at 10.6 oz per acre (82.5% control) shown in Table 1.

At 35 DAA, only five treatments provided between 60% and 68.75% control of marestail, Tricor DF (68.75% control), Valor SX + Tricor DF (63.75% control), Spartan Charge + Tricor DF (63.75% control), Sharpen (62.5% control), Boundary 7.8 EC (60% control), shown in Table 1.

The only Group 2, single active-ingredient herbicide treatments, Classic and FirstRate, only provided 5% and 10% control respectively. This was an expected outcome because

this particular population of marestalk had previously been confirmed resistant to the Group 2 herbicides, shown in Table 1.

Table 1. NNY Soybean Herbicide Trial 2021 Comparison of Pre-Emergence Treatments for Horseweed Control.

Treatment	Rate	Timing	SOA [^]	Marestalk % Control ¹ 35 DAA ²
Untreated Check				0e
Classic	1 oz.	PRE	2	5e
Sharpen	1 oz.	PRE	14	62.5ab
Sharpen	1 oz.	PRE	14	91.75a
Tricor DF	6 oz.	PRE	5	
Trivence WDG	6 oz.	PRE	2,5,14	40bcd
Valor SX	2 oz.	PRE	14	18.75cde
Valor SX	2 oz.	PRE	14	63.75ab
Tricor DF	5 oz.	PRE	5	
Spartan Charge	8.25 oz.	PRE	14, 14	43.75bc
Spartan Charge	8.25 oz.	PRE	14, 14	63.75ab
Tricor DF	5 oz.	PRE	5	
Boundary 7.8 EC	2.1 pt.	PRE	5,15	60ab
FirstRate	.75 oz.	PRE	2	10de
Tricor DF	5 oz.	PRE	5	68.75ab
Tricor DF	10.6 oz.	PRE	5	82.5a

¹Visual rating, means followed by the same letter are not significantly different (P=0.05, Tukey's HSD)

²Days After Application treatment evaluation

[^]SOA= Site of Action

The trial location only received .50” precipitation total in the 7 days after PRE treatments were applied. This may not have provided sufficient rainfall to activate the soil-applied preemergence herbicides in the trial. Should this move to after the ratings

Conclusion:

Data from well-informed development and evaluation of several herbicide testing or programs will help NNY soybean growers make informed decisions about their weed control systems and for controlling specific herbicide-resistant weed species. Varying weed control programs with residual herbicides that use different modes of action can preserve the effectiveness of new seed traits, as well as the new herbicide products designed to work with them.

Outreach:

The results from this on-farm research trial have been disseminated to crop growers, crop consultants, agribusinesses in Northern New York, and other areas across the state through newsletters and local crop grower meetings hosted by Cornell Cooperative Extension and agribusinesses.

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