



Northern NY Agricultural Development Program 2023 Final Report

Comparison of Enlist™ Corn and Soybean Weed Control Programs

Project Leader:

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Collaborators:

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Cooperating Producer(s):

- Lewis County soybean grower, Constableville, NY
- Jefferson County corn grower, Adams, NY

Background:

Glyphosate-resistant (GR) corn and soybean made postemergence weed control relatively easy with a single application. The use of postemergence (POST) glyphosate in GR corn and soybean has been a widely used weed control program for many field crop growers in NNY. While this system seemed to simplify weed management, relying on total postemergence programs can be difficult to manage if not properly implemented. Glyphosate-resistant weeds are becoming more of a problem each year forcing corn and soybean growers to use more than just glyphosate for control.

One of the best practices to minimize selection for herbicide resistant weed populations includes using multiple herbicides with different site of action. The Enlist™ herbicide-resistance trait is available in corn and soybean. Enlist corn is tolerant of 2,4-D (Enlist One), glyphosate (Roundup®), and 'fop' graminicides (Assure II). Enlist E3 soybeans are tolerant of 2,4-D (Enlist One), glyphosate (Roundup), and glufosinate (Liberty®). With tolerance to three different modes of action, Enlist corn and soybean provides more

flexibility for weed control options than were previously available. Enlist corn hybrids have enhanced tolerance to POST applications of 2,4-D that allows for a wider window of application without crop injury. Enlist E3 soybean varieties allow for POST applications of 2,4-D choline herbicide (Enlist One) for the control of emerged broadleaf weeds including glyphosate-resistant marestalk.

In Northern New York (NNY), there has been a rapid adoption of Enlist E3 soybean varieties and growing interest in the recently released Enlist corn hybrids. The development and evaluation of several POST herbicide programs will help NNY corn and soybean growers make informed decisions about their weed control systems, while reducing the development of herbicide-resistant weeds.

Methods:

Enlist™ Corn Weed Control Trial

A replicated Enlist corn herbicide trial was established on a farm in Jefferson County on May 10, 2023, to evaluate the control of perennial broadleaf weeds with POST herbicide applications of Enlist One, Status, DiFlexx, Peak, Yukon and dicamba. On May 11, 2023, we applied a preemergence application of Degree Xtra® herbicide to the entire plot area to control the annual broadleaf and grass weeds, allowing the perennial broadleaf weeds to grow. Unfortunately, there was no uniform emergence of any perennial broadleaf weeds; therefore, POST herbicide treatments were not made and this trial was deemed a loss with no meaningful data collected.

Enlist Soybean Weed Control Trial

A replicated herbicide trial was conducted on a farm growing Enlist E3 soybeans near Constableville, New York, in Lewis County. This trial included one untreated control and 12 different herbicide programs consisting of postemergence (POST) herbicide used alone and in tank mixes. The soybeans were planted on May 21, 2023. The early postemergence (EPO) herbicide treatments were applied on July 11, 2023; the late postemergence (LPO) herbicide treatments on July 20, 2023; and visual marestalk control ratings made 35 days after application (DAA).

Results:

Soybean weed control ratings were taken 35 days after application of the POST treatments applied. For both POST treatment timings, our control ratings 35 DAA for marestalk provided 90% and greater control in all of the treatments, except the untreated check that applied Roundup PowerMAX+ FirstRate EPO and LPO application timings that had 0% control (Table 1).

The uncontrolled marestalk from both the EPO and LPO treatments with Roundup PowerMax (Group 9) + FirstRate (Group 2) was an expected outcome because the marestalk population at this site had been previously (2019) confirmed to be resistant to both Group 9 (i.e. glyphosate, Roundup) and Group 2 (i.e. Classic, FirstRate) herbicides.

Table 1. Rating of Postemergence Herbicides Applied for Marestalk Management in Soybean, 2023 trial, Lewis County, NY, NNYADP-funded Enlist Corn and Soybean Weed Control project.

Herbicide	Rate	Application	% Control ¹ 35 DAA ²	% Control ¹ 35 DAA ²
	Amt/A	Timing	2022 ^{3^}	2023 ^{3^}
Roundup PowerMax FirstRate	22 oz .6 oz	EPO	0c	0c
Roundup PowerMax FirstRate	22 oz .6 oz	LPO	2.5c	0c
Enlist Duo	4.75 pt	EPO	96.25a	100a
Enlist Duo	4.75 pt	LPO	80b	99.75a
Enlist One Liberty	2 pt 32 oz	EPO	98.5a	99.5a
Enlist One Liberty	2 pt 32 oz	LPO	99.5a	100a
Liberty (20 GPA*)	32 oz	EPO	99.25a	97.5a
Liberty (20 GPA*)	32 oz	LPO	98.5a	100a
Liberty (10 GPA*)	32 oz	EPO	99a	97.5a
Liberty (10 GPA*)	32 oz	LPO	97.75a	97.5a
Enlist One Section Three	2 pt 5.33 oz	EPO	91.75ab	100a
Enlist One Section Three	2 pt 5.33 oz	LPO	88.5ab	90ab

¹Visual control rating, means followed by the same letter are not significantly different

²Days After Application treatment evaluation

³Calendar year of trial

[^]2022 Jefferson County farm, 2023 Lewis County farm

*Gallons per acre of spray water volume used

Conclusion:

This data from a well-informed development and evaluation of several herbicide testing or programs will help NNY soybean growers make informed decisions about their weed control systems for specifically controlling marestalk (and indirectly helps inform decision making re: other 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 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.

For More Information:

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