

2023

202

Regional Commercial Vegetable Specialists

The Cornell Vegetable Program is a Cornell Cooperative Extension partnership between Cornell University and County Associations in 14 counties–Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Monroe, Niagara, Ontario, Orleans, Oswego, Seneca, Steuben, Wayne and Yates–serving the commercial vegetable, greenhouse, potato, and dry bean industries in New York.



Preview





Cornell Cooperative Extension Cornell Vegetable Program 14-County Region

This region accounts for more than half of all vegetable acres in the state with 1,229 farms, and a farm gate value exceeding \$200 million¹.

3,067

farm visits and crop consultations made by the Cornell Vegetable Program

91

educational meetings and presentations given by the Cornell Vegetable Program Specialists

1

3,507

people increased their knowledge by attending presentations given by the Cornell Vegetable Program

A Message from Julie Kikkert

Team Leader, CCE Cornell Vegetable Program

As we reflect on 2023, I want to thank you for your partnership and continued support of the CCE Cornell Vegetable Program, New York's team of specialists addressing issues that impact the commercial vegetable industry in the western and central portion of the state. Inside, you'll find highlights of some of the many research and outreach programs led by our team members over the last year plus a look ahead to some of our plans for 2024.

Our talented and passionate staff often spend years of their career tackling issues on local farms to bring practical solutions to realization. For the past 21 years, the CCE Cornell Vegetable Program has pioneered education, surveys, and research on the invasive swede midge insect that can devastate brassica crops. Discover the latest research results to find management solutions for organic and urban farms (page 3). Similarly, learn about other multiyear projects: laser scarecrows (page 6) and monitoring Western bean cutworm in dry beans (page 7).

During the growing season, the CCE Cornell Vegetable Program tracks and alerts growers to pest outbreaks (see Late Blight response on page 5). We also seek out new ways to improve the WNY Food System (page 5) and evaluate new varieties (page 4) and new crops for our area such as sweet potatoes (page 8).

Without the generous support of area producers, agribusinesses, and grantmakers, the Cornell Vegetable Program could not offer the level of support that we provide to the New York vegetable industry. Onfarm trials and in-field meetings are the backbone of our program. In 2023, 78 organizations provided in-kind donations to support our work in the region! Thank you!

While we are proud of our accomplishments in 2023, we are excited for you to see what we have planned for 2024. Be sure to sign-up for our program through the Cornell Cooperative Extension office in your county during their annual enrollment campaign going on through March. VegEdge newsletter remains our primary means of reaching our enrollees with timely information but you must be enrolled in the Cornell Vegetable Program to receive it.

If you have any questions about our program or suggestions for us, please contact me at 585-394-3977 ext. 404 or by email at <u>jrk2@cornell.</u> edu.

Julie R. Killert



Use of Ground Barriers as a New Management Strategy for Swede Midge in Brassicas for Small Organic and Urban Farms

Swede midge (SM) is a tiny invasive insect pest that causes serious economic losses in brassica crops, especially organic broccoli. Organic insecticides are generally not effective against SM and organic/urban farms often grow brassicas season-long on small land bases, making crop rotation challenging. **Cornell Vegetable Program Specialist** Christy Hoepting hypothesized that placing a ground barrier over SMinfested soil would prevent the SM from emerging. If successful, such an interruption of the SM life cycle could allow a grower to "crash" a population of SM on their farm, allowing them to grow susceptible brassicas when otherwise they could not. Proving this concept took 5 years, but the Cornell Vegetable Program's perseverance paid off!

Follow our journey...

STEP 2: Large-cage Study



STEP 1: Small-cage Create artificially infested SM trial plots



Small-cage study where soil was artificially infested with laboratoryreared swede midge and then covered with various ground barriers, both with and without plant holes, to see if they prevented swede midge from emerging from the soil.

In 2018, a study was conducted with small 2 ft wide x 2 ft long x 1.5 ft tall cages covered with insect exclusion netting to contain the SM. The soil underneath the cages was artificially infested with laboratory-reared SM and then covered with plastic mulch, landscape fabric, tarp, or left uncovered. Plastic mulch and landscape fabric were tested, with and without plant holes, to learn whether a marketable crop could be grown while the ground barrier was in place. Results showed that SM emerged through the plant holes, eliminating the possibility of growing a marketable crop while the ground barrier was on. Although ground would have to be taken out of production, use of intact ground barriers, however, showed promise: SM were not captured from July 20 to September 4 (46 days) or during the following 51 days after the ground barriers were removed, ending on October 25. In case SM was not captured due to SM staying in the soil to overwinter, a second "small cage" study was conducted in 2019. This time, no SM were captured in the cages that had intact ground barriers from July 10 to August 9 (30 days) or during the following 47 days after the ground barriers were removed, ending on September 25. These results suggested that ground barriers would be effective to "crash" a SM population.

> There were some SM captured in cages where the plastic mulch had torn, so plastic mulch was dropped moving forward.

Create naturally SM-infested trial plots

The next step was to test whether ground barriers were effective with naturally SM-infested soil. Unlike the laboratory-reared cohorts of SM, which all emerged within 2 weeks, populations of SM in nature have multiple overlapping generations and take around 2 months to emerge. The minimum effective duration of ground barrier placement also needed to be determined. Hoepting and her team set out to create naturally SM-infested ground. To do this, they set up 4 ft wide x 4 ft long x 4 ft high cages in which they planted Red Russian kale. Laboratory-reared SM were introduced to the cages in early May 2021. Multiple hurdles had to be overcome, and finally in October 2022 the research plots were successfully naturally infested with swede midge. STEP 3: Large-cage Study

Test effectiveness of ground barriers in broccoli

Finally, in 2023, the trial site was ready to test the ground barriers with natural SM infestation. Each 4 ft x 4 ft cage was extended another 8 ft where broccoli was planted. The SM-infested sections were covered with landscape fabric and tarp in April prior to SM emergence. When the ground barriers were removed on June 27, up to 44% of the adjacent broccoli was unmarketable. However, when the ground barriers were removed on July 21 and August 15, 86-100% of the broccoli was marketable with the landscape fabric being more effective than tarp. Proof of concept at last!

This research was supported by a Cornell Vegetable Program Challenge Fund Grant.

Help is On the Way!

Plans are underway to begin on-farm implementation of ground barriers in 2024, and to source funding for a large collaborative project to work with several small/organic/urban farms in New York State to intensively monitor their SM populations and help design individualized integrated SM management plans. In addition to ground barriers, management tools may include crop rotation, plant type selection, and insect exclusion netting, previously developed by Hoepting. In 2023, swede midge remained one of the top pest concerns for urban farmers in Buffalo and Rochester with 80% and 50% of the farms, respectively, reporting reduced marketability and crop losses from SM, especially in collards and kale. We are optimistic that we can alleviate economic losses from SM for all small brassica growers in the near future.

We love NY potatoes!





The Cornell Vegetable Program trialed 20 fresh market potato varieties in 2023 to see how they performed in our WNY climate. A full report of our findings will be released early in 2024. <u>Contact Margie</u> <u>Lund</u> for more information on the trial results.

Work supported by a USDA NIFA Specialty Crop Block Grant.



Cornell Vegetable Program Responds to Late Blight in 2023

Late Blight is a devastating diseases of tomatoes and potatoes caused by the water mold Phytothphora infestans. Once an outbreak begins, damage spreads rapidly throughout the canopy, with fruit and tubers becoming unmarketable due to large, rotting lesions. The disease spreads rapidly and will completely destroy a field left untreated. The Cornell Vegetable Program works with colleagues throughout North America to help our local tomato and potato industry be prepared and avoid catastrophic losses. With an international cooperative effort, we were able to track an early season outbreak and prepare hundreds of tomato and potato growers in the region. Advice includes resistant varieties, high tunnels and effective fungicides. Impact? A farmer affected by the August 2023 outbreak reported that, with Cornell Vegetable Program recommendations, he was able to save approximately \$60,000 revenue per acre!



Working Groups Help to Improve the Western NY Food System

From the business side of vegetable production, all of the innovation and research doesn't always translate into improved profitability, especially for smaller growers. Large operations can afford huge investments in the latest technology and labor-saving equipment. Smaller farms, working alone, often don't have the resources needed to make big investments. What these farmers need is to be sharper on the economics-side like being on top of their cost of production, collaborating with other farmers/groups, and trying alternative markets. Since they are too busy to pursue much of this, reliance on a committed resource partner can make a huge difference.

Cornell Vegetable Program Specialist Robert Hadad has joined the NY Sustainable Agricultural Working Group (NYSAWG) along with committed farmers, dedicated buyers, and Non-governmental organizations (NGOs) to help establish a local food system marketing network focusing on small farms across the WNY region. The group is identifying progressive buyers and entrepreneurs who want to increase the promotion of locally grown WNY agricultural foods into the mainstream marketplace.

The efforts are multipronged. There is exploration of buyer-driven collaborations with many growers to sell into restaurants, specialty markets, and processing operations. Others are investigating farmer-run entities that tie localized farms together to market a full "dinner" subscription box program while keeping the retail pricing. Another group is tackling farmer training on a variety of topics including cost of production, pricing, business organization options, and food safety.

Hadad lends his expertise to 3 committee groups. The goals of these committees is to come up with several marketing strategies and also bring in infrastructure investment and commitment from buyers to create relationships with growers and purchase produce/products at reasonable prices.

Field Trials Completed to Test Lasers as a Bird Deterrent in Sweet Corn

In 2023, the CCE Cornell Vegetable Program completed the third year of field trials to test the effectiveness of laser scarecrows to reduce economic damage from birds pecking the ears of sweet corn. The units tested were designed by the University of Rhode Island (URI) and utilize a solid green laser beam that moves randomly throughout the field. The laser frightens the birds because eyesight is their primary sense. Over the past three years, the URI laser scarecrows were tested at dozens of commercial farms across New York state (in collaboration with the CCE Eastern NY Commercial Horticulture Program) and by farms in multiple states who purchased URI laser scarecrow kits for research testing on their own farms.

Based on grower feedback over the trial period, the design of the URI laser scarecrow was improved to be more user friendly and more durable in the field. The most important part of the research was that growers could see the laser units and how they worked on their own farm. Bird pressure and the availability of alternate food and water sources are a huge part of the success of any deterrent. The lasers were met with mixed success on local farms. They were effective and a good fit on some farms, but not others. In one 2023 test site, the installation of a URI laser scarecrow and scare-eye balloons moved birds off the farm and saved over \$10,000 on a block of corn when compared to an adjacent earlier planting that had 30% loss without bird deterrents installed.

Important lessons learned from our research include:

- It is best to utilize a laser scarecrow that is optimized for sweet corn (or the crop of interest).
- Bird deterrents should be deployed before the birds find the field, about 10 to 14 days before sweet corn is ready for harvest.
- Laser scarecrows are not a stand-alone device. They should be used with other bird deterrents such as scare-eye balloons, noise makers, etc. A BirdGard squawker which emits loud bird distress and predator calls utilized in our research improved the effectiveness when combined with the lasers.
- Laser scarecrows must be adjusted to project just above the sweet corn tassels and adjusted for the lay of the land.
- Safe practices include turning the laser off when workers are in the field and shielding roads and houses from the laser beam.

A report with more detailed tips for use and our data summary will be forthcoming in early 2024. The CCE Cornell Vegetable Program owns 10 units that are available for growers to loan for testing on local farms on a first come basis. The University of Rhode Island is looking for a company to commercialize the device, but the design is open access at <u>URI Laser Scarecrow (google.com)</u>.

This project is supported by grants from the New York Farm Viability Institute and the USDA NIFA Multistate Specialty Crop Block Grant Program. Other cooperators on this project are Marion Zuefle, NYS Integrated Pest Management Program, and Chuck Bornt, CCE Eastern NY Commercial Horticulture Program.

Increased Monitoring of Western Bean Cutworm in Dry Beans

The western bean cutworm (WBC) is a moth pest to dry beans which causes direct damage to dry bean pods in its larval state. Adult WBC lay their eggs in corn and beans in July and early August, and larvae feed on the maturing pods, drilling through the pod and feeding on the beans inside causing yield loss. The Cornell Vegetable Program has been monitoring WBC numbers since 2011 in various locations across western NY in order to track changes in WBC pressure and flight times. This year, the Cornell Vegetable Program increased its WBC monitoring from 12 fields in 2022 to 24 fields in 2023, in order to test different trap types, lure types, and field positions to ensure our trapping efforts are most effective for NY farmers. In this project we tested four different traps, three different lures, and three trap placement locations around a field to see which factors might influence the number of moths caught in a field. While these traps do not give us a direct measure of damage to bean pods in a field, we can get an idea of what that pressure looks like depending on the number of adults caught in a particular area.

In our first year of data collection observing overall trap catch in different trap and lure types and trap location, we have already found some promising results that will help guide how we set up traps in years to come. In 2024, we will continue this project and use results from this past year to create new trapping guidelines which we will test in more dry bean fields over the summer. We hope to determine best practices for trapping WBC in dry beans, so we can share these with growers and continue to use them in trap networks in New York.

Work supported by NYS Dry Bean Endowment and NY Farm Viability Institute.

Cornell Vegetable Program Specialist Margie Lund shows the different types of traps used in 2023 to monitor for Western Bean Cutworm at the Dry Bean Twilight Meeting held in September in Geneva, NY.

Sweet Potato Varieties Suitable for Western NY Production?

Sweet potatoes are a tempting crop. They can fetch strong prices at market and require little agronomic investment while offering a rotation away from disease-susceptible crops. Sweet potatoes have great appeal from a field work standpoint because they are a low-input, low-maintenance, high-value crop.

Unfortunately, sweet potatoes are a difficult crop to grow in Western NY. Most varieties need 100-120 days to mature in southern climates; many varieties need longer in our climate. Even with black plastic mulch, sweet potatoes poorly tolerate soil temperatures below 65°F at planting and maturing tubers risk damage below 50°F. At best, WNY growers can squeeze in 120 days of production time...if the weather cooperates. Realistically, WNY sweet potato growers will receive their slips and plant around June 5 and usually need to harvest around September 20. That's only 105 days–barely enough time for most commercial varieties to reach the smallest marketable size! Tubers must be handled carefully during harvest to keep their delicate skin intact. They are then cured in high temperature and humidity followed by storage for 4-6 weeks to convert their starches into sugars. Post-harvest rots can destroy a large percentage of the harvest if curing or storage conditions are suboptimal.

Sweet Potato Variety Trial Established

Luckily, there are new varieties under development that could resolve these major barriers and make sweet potatoes a viable crop here. With the support of a NESARE Partnership Grant, Cornell Vegetable Program Specialist Elizabeth Buck and Matt Agle of Henry W. Agle & Sons conducted a sweet potato variety trial in Eden Valley, Erie County this summer. This geography offers maximum season length for sweet potatoes.

Building off work conducted by Chuck Bornt of the CCE Eastern NY Commercial Horticulture Program, we selected and tested six sweet potato varieties for regional production suitability:

- Bellevue, 100-110 days Market and production standard. Orange-copper skin and orange flesh.
- **Developmental variety #18-100**, days estimated at 90-100 A short-day, unreleased Louisiana State University breeding line. Rosy-orange skin and orange flesh.
- **Radiance**, 110-120 days Developed by Vineland on the Niagara peninsula of Ontario, Canada in collaboration with Louisiana State University. Orange skin and orange flesh.
- **Bonita**, 110-115 days Market standard tuber size and shape, holds shape better on non-sandy ground. Tan skin and white flesh.
- **Luminance**, 120 days Another regionally adapted variety produced by Vineland and Louisiana State University. Purple skin and yellow-white flesh.
- Vermilion, 120 days A Louisiana State University niche market variety. Red-purple skin and orange flesh.

The Cornell Vegetable Program examined yield and rot susceptibility. Matt Agle field tested current production best management practices related to weed control, irrigation scheduling, and vole/mole deterrence. He also tested harvest techniques and curing methods that could work for farms without specialized equipment.

Our Findings

While we were unsuccessful in identifying a variety that fully met commercial production needs for WNY, we did gain many valuable production insights. Importantly, we harvested the two shorter-day varieties after 100 days and harvested the remaining varieties at 119 days.

- **YIELD:** 'Bellevue' and '18-100' had variable maturity at harvest and, on the whole, needed more than 100 days. '18-100' was slower to bulk up than 'Bellevue'. 'Bellevue' and '18-100' still produced the greatest amount of marketable yield and outperformed the other varieties, despite being harvested too soon.
- **TUBER SHAPE:** 'Bellevue' and 'Bonita' produced the greatest proportion of on-type, non-stringy tubers. 'Radiance' and 'Vermilion' produced the most stringy tubers.
- **ROT:** 'Bonita' and 'Vermilion' had a lot of rot. Had it not rotted, 'Bonita' would have compared to 'Bellevue' in yield. 'Luminance' scuffed easily at harvest and subsequently experienced a high level of storage rot.
- **CURING:** Good airflow during curing is as important as maintaining temperature and humidity.
- **PEST DETERRENCE:** Maintaining an 8-foot clean cultivated border and mowing field edges successfully deterred rodents and kept weeds down.



A partially dug set of 'Bonita' showing tuber size and shape, and illustrating the variety's strong dual-set habit (one at the crown, one at the bottom of the slip).

This material is based upon work supported by the National Institute of Food and Agriculture, U.S. Department of Agriculture, through the Northeast Sustainable Agriculture Research and Education program under subaward number ONE22-409.

In 2024.

"In 2024, I am excited to evaluate multi-species cover crop mixes in winter high tunnels. We have made great gains in our knowledge of species and seeding dates for cover crops. With more tests available to us in 2024, we hope to demonstrate the benefit of cover crops on microbial communities in our vegetable soils." - Judson Reid "In 2024, I'm excited to build collaborations with NY Sustainable Working Group (NYSAWG) alongside committed farmers and buyers to build a local food system marketing network focusing on small farms across the WNY region."

– Robert Hadad

"In 2024, I am looking forward to asparagus variety trial results! 2024 is the first year all 10 varieties will be in full production."

– Elizabeth Buck

"In 2024, I am excited to continue to support the viability of the vegetable farms in our region through research and bringing together resources to solve problems. My research with Dr. Sarah Pethybridge will explore options for foliar disease management in carrots." - Julie Kikkert

"In 2024, I am looking forward to continuing to learn from our incredible community of vegetable growers. I am excited to support our urban growers with soil and pest management." Lori Koenick





I'm excited to expand my scouting program in potatoes and dry beans to help support growers in these industries. This program will help provide realtime pest and disease information to aid growers in management decisions."

– Margie Lund

New York Vegetable Industry

Support

Without the financial and in-kind donations by area vegetable producers, agribusinesses, and grantmakers, the Cornell Vegetable Program could not offer the level of support that we provide to the New York vegetable industry. Thank you!

In-Kind Donations (ie. land, labor, equipment, supplies, presentations, meeting host)

A & N Seasonal Produce – Andy E. Yoder Abe Datthyn Farm - Kevin Datthyn, Mike Johnson Alex Harris Farms – Alex Harris Amos Zittel & Sons, Inc. - Mike Wright Baxter Farm - Corey Baxter Bezon Farms – Joe Bezon Big O, Inc. – Max Torrey Bowman Farms - Larry Bowman Brightly Farms - Paul Brightly Bushart Farms - Brent Bushart C. Mark Farms - Cory Mark CCE Erie County Cornell Agri-Tech research farm - Sarah Pethybridge Cornell Agri-Tech research farm - Chris Smart CY Farms - Craig Yunker Dan Dunsmoor Farms - Joe Burghart Dewey Produce - Mark Dewey DiSalvo Farms – Joe DiSalvo III Les Draudt Duyssen Farms - Dan Duyssen Edgewood Farms - Clay Phelps Farm Fresh First – Mike Gardinier, Roger Ward, Buzzy Lowe, Steve Lashbrook, Mike Lynch Fenton's Produce – Paul Fenton Fish Farm – Lynn Fish Gakwi:yo:h Farms - Gerry Fisher Genesee Valley Bean – Mark Callan Gianetto Farms – Nick Gianetto Greenwell Farms - Mark Greenwell, Andy Greenwell Hansen Farms – Drew Wickham, Eric Hansen, Ed Hansen Jr. Harrington's Produce - Andy Harrington Henry W. Agle & Sons, Inc. - Jonathan Agle, Matt Agle Kenneth Horst Huntington Farm Market - Dan Huntington, Carl Huntington J. Hurtgam Farms – Jeff Hurtgam Jacobson Farms – Adam Jacobson John Dunsmoor Farms – John Dunsmoor John R. Wallace Farms – John Wallace Johnson Creek Produce – Levi Stauffer Johnson Potato Farm – Eric Johnson Matt Kauffman

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New York Vegetable Industry

Support



Visiting students learn about greenhouse production at Maple Lane Farm, a Cornell Vegetable Program cooperating farm.



Local farmer and CVP collaborator, Matt Agle shows a set of 'Bellevue' sweet potatoes during harvest of the Cornell Vegetable Program's sweet potato trial. See page 8 for more information on Matt's role in the trial.



Research grants and projects managed by the Cornell Vegetable Program*



Value of research grants and projects managed by the Cornell Vegetable Program*



Farms and organizations offered in-kind donations to support Cornell Vegetable Program research trials and events



Abe Datthyn Farms, Kevin Datthyn Ameele Farms, Michael Ameele Chad Amsler Bowman Farms, Larry Bowman Bushart Farms, Brent Bushart C.C. Farms, Craig Chelini Claymount Farms, Earl Gingerich Jr. Hewitt Farms Fresh Produce, Ben Hewitt East Village Farm, Frederick Hess Evergreen Farms, Eugene Hoover Great Valley Berry Patch, Howard Litchfield Henderberg Farm, Charles Henderberg Henry W. Agle & Sons, David Agle Herman's Greenhouse, Vincent Lee Herman Hillside Produce, Lowell Zimmerman Johnson Potato Farms, Mark & Eric Johnson June Miller Farm, June Miller Stanley Jurek Maple Ridge Fruit Farm, Gary & Barb Wells Microbes, Inc., Brian Pusch Allen Nolt Gary Patterson Reeds Farm, Bruce Reed Root Brothers Farms, Robin Root Vista View Farms, Jack & Anne George Wallace Family Farm, David Wallace Walnut Hill Farm, Darvin Weaver Walstead Farms, William & Donna Walz Wild Acres Family Farm, Don & Sharon Wild Williams Farms, John Williams

Strengthen the NY vegetable industry by supporting our program! <u>Make a donation</u> at CVP.CCE.CORNELL. EDU/DONATION_INVOICE_NEW.PHP



About Us

The Cornell Vegetable Program works with Cornell faculty and Extension educators to address the issues that impact the New York vegetable industry. The team offers educational programs and information to growers, processors, and agribusiness professionals in pest management, variety evaluation, cultural practices, market development, and farm food safety.

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2023 OPERATING BUDGET BY FUNDING SOURCE



¹ USDA National Institute of Food and Agriculture Smith Lever Funds

² New York State funds

³ Includes funds from industry, state and federal grants, event registrations, sponsor support, and Cornell Vegetable Program reserve accounts

Cornell Cooperative Extension Cornell Vegetable Program

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