#### **Cornell Cooperative Extension Cornell Vegetable Program**



# 03 2024 **Quarterly Highlights**

The Cornell Vegetable Program (CVP) is a Cornell Cooperative Extension partnership between Cornell University and CCE Associations in 14 counties: Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Monroe, Niagara, Ontario, Orleans, Oswego, Seneca, Steuben, Wayne and Yates.

The team of Vegetable Specialists provides educational programs and information to growers, processors and agri-business professionals, arming them with the knowledge to profitably produce and market safe and healthful vegetable crops.



demonstrates a robotic weeder in a beet field at an August twilight meeting organized by the CVP. See page 4 for details.

farm visits and direct contacts

events & presentations featuring CVP **Specialists** 

people attended CVP presentations



### **New Pest Management Resources for NY Urban Growers**

Urban growers face unique pest management challenges which include limited space, proximity to neighbors, constructed soils, and early exposure to invasive pests. Typically, urban growers we work with strive to use a chemical pest management approach as a last resort or not at all. Project team members Judson Reid and Lori Koenick of the CCE Cornell Vegetable Program and Sam Anderson of CCE Harvest NY have been exploring non-spray pest management options that are economically and environmentally sustainable for urban farms.

As part of this multi-year project, we partnered with dozens of urban farms across New York State to demonstrate and evaluate sustainable pest management strategies. In our work, we focused on arthropod pests (mites and insects) and crop diseases. Demonstration trials included management strategies for aphids and whiteflies, flea beetles, cucumber beetles, aphids, swede midge, downy mildew and bacterial spot. Together with farmers, we found success using control methods that prevent or reduce crop losses through exclusion strategies, crop timing, host resistance, and the introduction of beneficial organisms. Regardless of management strategy used, common requirements for success include a knowledge of the pest and disease complex, preventative deployment and commitment to the process.

From this work, we've developed a <u>set of fact sheets</u> with case studies highlighting pest management techniques that New York urban farms have found valuable. Techniques featured include <u>row covers</u>, <u>disease resistant crop varieties</u>, <u>biocontrols</u>, and taking a <u>brassica break</u>. These fact sheets are now available on the Cornell Vegetagle Program website and are in the process of being translated to Spanish, Arabic, and Chinese.

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 [LNE21-421 "Sustainable Pest Management for New York Urban Farmers"].



# Tracking Tar Spot: A New and Emerging Disease of Sweet Corn in NY

The CCE Cornell Vegetable Program is at the forefront in detection of a new disease in sweet corn in New York. Tar spot caused by the fungus Phyllachora maydis can infect leaves, stalks, and husks of all types of corn. Symptoms of the disease are raised, black tarry spots. Thousands of fungal spores produced from the lesions become airborne and infect other plants near and far. The disease has the potential to severely reduce yields of susceptible corn varieties, so we are closely monitoring disease spread and impact. In sweet corn, tar spot causes crop loss by contributing to defoliation, reducing the size and affecting the shape and uniformity of ears, reducing the recovery of kernels for processing sweet corn, and reducing the marketability of ears by unsightly tar spots on the husks.

Tar spot was first detected in Indiana and Illinois in 2015 and has become widespread throughout the Midwest. The first report in New York was in field corn in 2021. At the end of 2023, tar spot had been detected in 12 WNY counties in field and/or sweet corn. In 2024, the disease was first detected in Niagara County on August 13<sup>th</sup>. By the end of September, tar spot had been detected in 17 New York counties (map).

In addition to scouting sweet corn fields throughout the region, the Cornell Vegetable Program has reported new tar spot detections in a county to the national database, assisted growers and crop consultants with identification, and provided alerts in our newsletters. It is critically important to document tar spot in fields for future disease management decisions. With recent USDA NIFA Smith-Lever Extension Funds through Cornell Cooperative Extension awarded to Pethybridge (Cornell AgriTech) and Kikkert (CCE Cornell Vegetable Program), educational resources and presentations will be developed to prepare sweet corn growers for this disease.



Tar spot lesions on corn can be individual on a leaf (left) or in large clusters (right).



The distribution of tar spot in field and sweet corn by state and county in 2024. Source: <u>https://cropprotectionnetwork.org/</u><u>maps/tar-spot-of-corn</u>, 10/2/2024.

This project was partially funded by the New York State Vegetable Research Association and Council (the processing vegetable industry).

# Robotic Weeders, High-Value Potatoes, and Hands-On Diagnostics Skills? Yes, please!

A crowd of 27 growers and industry members made the trek to Root Down Farm in Clarence Center on August 14<sup>th</sup> for an on-farm meeting and demonstration. The evening started off with a pizza and watermelon social that gave folks a chance to relax, network, and shift into learning mode. The audience was dynamic and well-represented all segments of WNY vegetable production: beginning growers, organic farmers, ag service providers, processing vegetable raisers, small-mid sized conventional growers, and even a multigeneration father-and-daughter farming team.

Cornell Vegetable Program (CVP) Specialist Margie Lund started the night off strong presenting her high-value, specialty market class potato variety trial results. Attendees could handle several of the trial varieties that the host farm had chosen to grow. Next everyone got a hands-on lesson, wading into the tomato patch to practice disease identification skills. CVP Specialist Elizabeth Buck facilitated a discussion where the more experienced growers shared their preventative horticultural practices and IPM strategies for common tomato diseases with the newer growers. This excellent dialogue helped build community across all the farm types represented and strengthened professional networks.

After a quick tour of damage caused by swede midge and an intro on the miniscule insect's biology and prevention from CVP Specialists Julie Kikkert and Elizabeth Buck, the meeting caravaned to our second location, Kreher Farm's processing beet field. That's where we were treated to some truly cutting-edge agricultural technology.

Dr. Lynn Sosnoskie and Dr. Yu Jiang from Cornell AgriTech (the Geneva experiment station) demonstrated their cultivating robot manufactured by farm-ng. We walked alongside the robot as it weeded beets. It was a surprisingly fast unit, capable of working at cultivating tractor speeds. Significantly, the robot they demoed is very intentionally designed as a modest cost, multi-function ag robot. It is basically a smart platform for adding various tools and performing a range of tasks. Nearly all other ag robots are expensive one-trick-ponies that only weed, only scout, or only spray, etc. Naturally, meeting attendees had a ton of questions about the robot. The Cornell faculty members answered all of them! Importantly, they explained to growers how young and volatile the digital and robotic ag industry is and gave tips for avoiding common pitfalls when talking with ag robotics companies. Much of their future research program will be centered on de-risking ag robotics for NY growers by testing and adapting robots for NY conditions. Most robots are designed for California and struggle with rocks, mud, and sloping ground.

Dr. Sosnoskie and Dr. Jiang plan to build a weeding robot rugged enough for NY using newly available opensource training models. Two farms in attendance asked to be future testing sites, ensuring that the Cornell Vegetable Program will play a key role in bringing this state-of-the-art technology to WNY vegetable production in coming years.



Lynn Sosnoskie and Yu Jiang introduce growers to their farm–ng cultivating robot, which they demonstrated at Kreher Farms. They are explaining how the robot works and answering questions about the rapidly changing ag robotics industry.

## Research to Determine Western Bean Cutworm Trapping Best Practices Ongoing Over the 2024 Season

Western bean cutworm (WBC) is a moth pest that causes direct damage to dry beans and corn in its larval form. Cornell and the Cornell Vegetable Program (CVP) have been monitoring WBC numbers in dry beans since 2011 through trap networks throughout Western NY. In 2023, the CVP received funding through the New York Farm Viability Institute to measure the impacts of different trapping parameters on WBC moths to learn whether common trapping methods being used in NYS are what are most effective for WBC trapping in dry beans. Our 2023 trapping network measured different trap types, lure types, and field locations to better identify what works best to trap WBC in dry beans.

In 2024 we took those results and placed traps according to what performed best last year and comparing it to our past trapping procedures. We set up traps in 21 dry bean fields across Western NY and monitored moth numbers weekly. The results from this project will help us better understand how to most effectively trap for western bean cutworm in dry beans as well as provide updated pest totals to farmers. We will carry results from this year into any future years of trapping, as well as teach farmers about best practices for trapping western bean cutworm. Early results from this season were shared with dry bean growers and industry members at the Dry Bean Growers Twilight Meeting in September.



Western bean cutworm damage to a pod and a bean within.



A western bean cutworm trap sits next to a dry bean field from our 2024 trap network.



### **Agricultural Water and Farm Food Safety**

Cornell Vegetable Program Specialist Robert Hadad spends a fair amount of time talking with vegetable farmers about the food safety issues surrounding agricultural water, especially when it comes to farms who fall under the FDA regulations.

It is always a good idea for farmers using surface water for irrigation to know the quality of the water. One way of looking at this is through assessing what factors could cause contamination. Prevention is a great tool but to get started, an understanding of how contamination can occur is needed. Hadad created a checklist for farmers to use that assists them in doing surface water self-assessments but, as it turns out, growers like it a lot better if he goes over the assessments with them. Growers get to think about it as they walk around a pond or creek and ask a lot of questions, finding it easier to complete the assessment in this manner rather than on their own.

Another aspect of the water assessment is to verify where the quality is at any specific times of the seasons. To accomplish this, water testing is a great tool. Hadad has helped many growers navigate water sample collecting, filling out the forms, and most importantly, helping interpret the results. Surface water is never free from bacteria but knowing when levels are low or high is important information.

At the same time, if the farms have wells and this water is used for washing vegetables, testing the wells is important. If there are problems with the water (presence of certain bacteria), fixing the problem is critical. Then, figuring out why there was a problem in the first place is necessary to prevent further problems from happening.



# **"Just One More Trial" Yielded the Winning Insecticide "Trifecta" for Thrips Control in Onion**

Onion thrips are tiny insect pests that feed on the leaves of onion plants. They also vector a destructive disease, iris yellow spot virus (IYSV). When uncontrolled, the onion thrips/IYSV complex can reduce onion yields by 30-50%, costing growers \$2,900 to \$5,700 per acre. Thrips/IYSV is the worst in the Elba muck land, where over a million pounds of onions are produced annually, about 30% of the New York onion industry. Insecticides are the first line of defense for controlling onion thrips, and the growers diligently follow research-based recommendations developed by Cornell Vegetable Program (CVP) Onion Specialist, Christy Hoepting and Cornell Entomologist, Brian Nault, to prevent insecticides from developing resistance. But in 2022, it looked like one of the top-performing insecticides, Radiant was starting to slip.

According to data collected via the CVP Onion Scouting Program, Radiant could easily knock back high thrips populations of 3 to 6 onion thrips per leaf to below the spray threshold of 1 thrips/leaf. But in 2022, as an example, thrips increased from 1.7 to 4.2 thrips/leaf after two consecutive applications of Radiant. Was it because onion thrips were developing insecticide resistance to Radiant? Or was there another explanation? Hoepting was determined to get to the bottom if it. She devised a plan to track the effectiveness of Radiant across the 2023 growing season in the Elba muck through a series of on-farm research trials.

Unfortunately, it was clear that thrips had indeed developed insecticide resistance to Radiant after Hoepting completed the first trial when the 1x and 1.5x rates had as many thrips as the nontreated controls and the 2x rate reduced thrips by only 50%. When Nault's on-farm insecticide trial in Elba corroborated Hoepting's results, she knew that she did not want to be facing the Elba muck onion growers in 2024 and not have a recommendation for an insecticide treatment to use instead of Radiant. So, she added "just one more field trial" to her plate at the end of the 2023 growing season.



Tiny onion thrips nymphs, only 0.5 to 1.2 mm in length, nestled in the leaf axil of a young onion plant.



Onion scouting: CVP Technician, Sarah Mertson (right) training the next generation of farmers in the Elba muck.

Hoepting's last-ditch efforts paid off and she found a tank mix combination that was as good as the topperforming insecticides: Agri-Mek + Warrior + Lannate. Each of these insecticides belong to different modes of action than the other main insecticides used in the onion thrips management program, which is crucial for resistance management.

Onion thrips were atrocious in 2024, and the Elba onion growers were thrilled with the effectiveness of Agri-Mek + Warrior + Lannate. It annihilated high populations of 4.2 to 7.8 thrips/leaf with reductions of 66-95% after one application and 97-99% after two applications. They nicknamed Hoepting's Radiant-replacement "Trifecta".

### **Newly Funded Grants & Projects**

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#### Enterprise Budgets for Processing Cabbage and Onions in New York

USDA Risk Management Agency, 9/1/2024 – 9/30/2025, \$48,836 (Higgins, Grundberg, Ullrich, Reiners), \$9,295 for Hoepting.

The 2024 CVP Onion Team included Onion Specialist, Christy Hoepting (right), Technician I Sarah Mertson (left), and Summer Technician Destiney Schultz (middle). In 2023, the CVP team took a chance on hiring two College Juniors as Summer Technicians in hopes that at least one of them would return for a second year. Well, BOTH of them returned! In 2024, Sarah became the Lead Onion Scout for the Wayne and Oswego Onion Scouting Program. For 13 weeks from early June to late August, the three scouted onion fields in the Elba muck on Mondays and then Sarah and Destiney did a fantastic job scouting Wayne and Oswego independently on Wednesdays. Onion growers use the scouting reports to inform their spray decisions, which enables an integrated approach to pest management. The CVP Onion Scouting Program is the "beating heart" of the onion program, because it ensures grower engagement, implementation of research-based recommendations, and early detection of emerging issues (see highlight about onion thrips on page 7). The CVP Onion Team also conducted 4 onion herbicide trials, a sprout inhibitor study, Stemphylium leaf blight and nematode sampling, and a massive 26-treatment onion fungicide trial. The results of which will be spun into future research-based recommendations and new research projects.



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