Cornell Cooperative Extension
Cornell Vegetable Program

Q1 2022

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.

544
farm visits and direct contacts

45
events & presentations featuring CVP Specialists

2,218
people attended CVP presentations

Photo from John Whitney, CCE Erie County

Urban Farmers Speak! New Videos Highlight Urban Sustainable Pest Management Approaches

Approximately 80% of the world's population lives in urban areas. In New York State, our majority population is urban and the Cornell Vegetable Program region includes the 2nd and 3rd largest cities in the state. Urban agriculture has risen as a way to meet the social, environmental, and economic needs of these communities. Urban residents grow fruits and vegetables to improve health of local residents as well as strengthen their communities through green space, volunteerism, and employment opportunities.

Urban Agriculture Faces Unique Challenges

The unique context of food production within city spaces creates many challenges. For example, pest pressure and management practices are influenced by several aspects markedly different from rural New York spaces.

Urban centers are well known to be heat islands—the temperature of cities is often a few degrees warmer than surrounding areas due to the presence of impervious surfaces and buildings. Insect development is largely driven by temperature. Knowing this, urban producers may have to adjust the timing of pest exclusion, succession planting, or crop sprays. Finally, even the simplest of pest management practices – crop rotation – may be insufficient, as space is often limited on urban farms.

Because urban communities tend to be more demographically diverse than rural areas, urban farms strive to grow culturally relevant foods for their neighborhoods. This often means growing crops that are not typical for our climate and very little may be known about managing pests or diseases of these crops.

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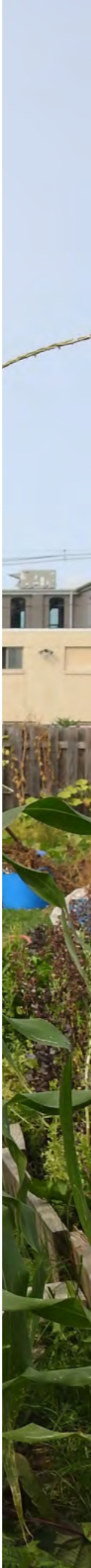

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Successful Urban Farmers Share Their Experience Using Sustainable Pest Management Practices

Despite these unique challenges, the Cornell Vegetable Program (CVP) region has some of the state's most successful urban farmers. With funding from Northeast Sustainable Agriculture Research and Education (NESARE) and the Towards Sustainability Foundation, the CVP partnered with CCE Harvest NY, to capture the voice and experience of these diverse farmers.

Members of the project team conducted more than 300 visits to urban farms in Buffalo and NYC and observed that these urban growers prefer to utilize cultural, biological, or mechanical pest controls as opposed to chemical.

> **To enhance visibility of urban production, improve knowledge of sustainable pest management practices in urban ag settings, and amplify the voices of underrepresented growers in agriculture, we created a series of educational videos that featured underrepresented voices of experience in sustainable pest management.**

Video Objectives and Production Timeline

- Spring 2021: We identified four urban farms to be featured in this video series.
- Spring 2021: The project team identified Buffalo and NYC based videographers and confirmed topics to be covered.
- Summer - Fall 2021: Project team coordinated with growers and videographers on filming. Cornell Cooperative Extension educators developed interviews and facilitated on-farm video shoots at all 4 farms.
- Winter 2022: Videographers created educational video series.
- Spring 2022: The project team posted videos with urban growers on YouTube and will next share across NYS, with Extension educators, and public officials in order to increase visibility of urban production and increase the number of peer-led educational resources available to urban producers.

Urban IPM @ Urban Fruits and Veggies, Buffalo, NY

Using Row Cover and Exclusion Netting at Common Roots Farm, Buffalo, NY

Pest Management at Pink Houses Community Farm, Brooklyn, NY

Aquaponics at Oko Farms in Brooklyn, NY

Urban Farmers: Urban Fruits and Veggies/Alison Dehoney, Buffalo; Common Roots/Terra Dumas, Buffalo; Pink Houses/Kelly Guevara, Brooklyn; Oko Farms/Yemi Amu, Brooklyn.

Videographers: Rifat Chowdhury and Isa Jamira Moise.

CCE Team: Judson Reid (PI), Senior Extension Specialist, CCE Cornell Vegetable Program; Caitlin Tucker (Co-PI), former Extension Assistant, CCE Cornell Vegetable Program; Yolanda Gonzalez (Co-PI), Extension Specialist, CCE Harvest New York; Sam Anderson (Co-PI), Extension Specialist, CCE Harvest New York.

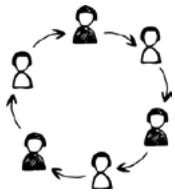
Field Research and Webinar Prepare Growers for Using Laser Scarecrows in 2022

Bird peck makes sweet corn ears unmarketable if detected at harvest and can also lead to mold growing on ears during shipping and marketing. In a previous survey by the Cornell Vegetable Program, 84% of Western NY growers reported bird damage and the estimated revenue lost ranged from $102 to $1,300 lost per acre.

Laser beams are known to deter birds feeding on sweet corn and other crops. Commercially available devices that are designed for large acreages cost around $10,000 per unit. Researchers at the University of Rhode Island (URI) designed a low-cost unit that utilizes a rapidly moving green laser beam to scare birds from fields, with published results on effectiveness in sweet corn fields. The Cornell Vegetable Program tested two of the units in local fields last season, and plan to conduct tests on additional local farms in 2022. Furthermore, interested growers can purchase URI laser scarecrows kits for $650/unit and deploy the units themselves. Our field tests have shown us that there is a learning curve to understand how to properly position the units in the field and adjust the laser beam for optimal results.

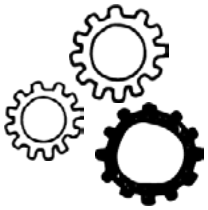
CCE Cornell Vegetable Program spearheaded an online meeting on March 22, 2022 entitled “Success with Laser Scarecrows in 2022” to prepare growers and Extension educators for the upcoming season. Seventy participants learned basic information from Dr. Rebecca Brown from the University of Rhode Island, and the extensive upgrades planned for the device in 2022 from David Brown, also from the University of Rhode Island. Julie Kikkert from the Cornell Vegetable Program and Chuck Bornt from the CCE Eastern NY Commercial Horticulture Program spoke about their on-farm experience with the URI laser scarecrows and provided tips for set up and adjustments. The recorded webinar is available on YouTube.

This project is supported by grants from the New York Farm Viability Institute and the USDA NIFA Multistate Specialty Crop Block Grant Program.





Grower Discussion Group Formed to Focus on Managing Profitability Obstacles




Throughout the winter, there were numerous opportunities for conversations with vegetable farmers, particularly smaller operations. The subject matter ranged widely, however, one topic emerged more often than most: profitability. Small farms that have been in business for 7-12 years are particularly concerned about profitability.


After a deal of back-and-forth conversations, many people felt there was something worth trying: bring together a group of concerned growers to talk about the largest ostacles to their profitability and brainstorm some possible solutions. Forming a farmer-to-farmer discussion group, consisting of people facing similar issues, would provide a comfortable platform for open communication and problem solving.

In March, a virtual farmer group discussion group was formed. Cornell Vegetable Program team members, Elizabeth Buck and Robert Hadad, were facilitators. After initial introductions and a gripe session, the group started to focus on 4 main issues:

- loss of market-share
- trouble getting necessary prices for produce
- rising costs of supplies
- labor


These factors were contributing to grower stress and reduced profitability, in some cases significant enough to threaten the future existence of the farm.

Regular meetings are now scheduled; under the guidance of the Cornell Vegetable Program, the next meeting's goal is to build an action plan.

NYS Dry Bean Industry Meets Virtually

The 2022 NYS Dry Bean Meeting was held virtually in March, bringing together NY dry bean growers and industry members to hear research results and production outcomes from the 2021 growing season, and discuss how those may impact the 2022 season. Research projects were funded by the NYS Dry Bean Endowment the previous growing season.

- Matt Stawowy of Steele & Co. opened up the meeting by sharing an overview of the 2021 growing season, and how production of different varieties varied across multiple states this past year.
- Cornell Plant Pathologist Sarah Pethybridge presented results of her continued research on white mold and sclerotia survival in dry beans, and how this could influence white mold management.
- CCE Cornell Vegetable Program Specialist Margie Lund shared updates on the western bean cutworm trapping network and the progression of pest numbers over the past ten years in NY.
- Marion Zuefle, NYS IPM Program, updated attendees on a newer pest to dry beans in NY: soybean cyst nematode.
- Phillip Griffiths talked about Cornell's dry bean breeding, evaluation, and variety development, and how impressive new varieties could become staples for NY growers in the years to come.
- Michael Rosato told attendees which currently available dry bean varieties look the most promising for NY growers, based on the results of the 2021 dry bean variety trials conducted at Cornell AgriTech.
- Amie Hamlin, NY Coalition for Healthy School Food, wrapped up the meeting with a presentation on their efforts to bring NY dry beans into school lunches, and the current challenges in doing so.

On-Farm Biopesticide Trials Aim to Reduce the Severity of Two Serious Diseases of Tomatoes

Bacterial speck and spot of tomato are two serious diseases that can cause both direct and indirect crop loss. The diseases can come from a variety of sources on the farm, including the soil, contaminated greenhouses or tools, and seed. Once an infection begins, the disease can spread rapidly from plant to plant and even be transmitted throughout a field by movement. Yes, a worker or tractor brushing up against a sick plant, particularly when the canopy is damp, can carry these bacterial diseases on them and infect an entirely different area of the planting or even a new field.

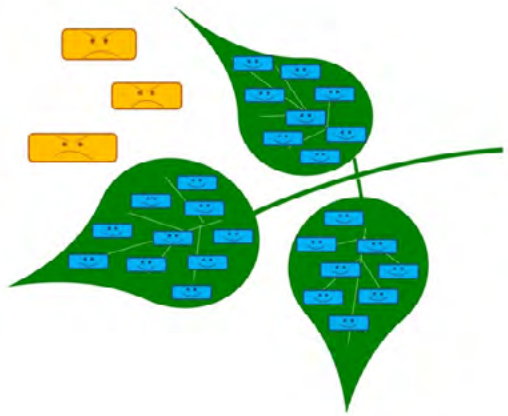
Infected plants develop numerous black flecks on the leaves. Speck produces smaller markings than spot. The tissue around the flecks will die, and there can even be lesions on the stems and vines. The vascular tissue becomes clogged with bacterial ooze as the disease progresses. This chokes the plants and limits the distribution of water and sugar, as well as spreads the disease further within the infected tomato. On the whole, yield will be reduced as the plant struggles to function and as it loses photosynthetic tissue. These are indirect yield losses.

But bacterial speck and spot get worse. They will directly attack the fruit. Infected fruit develop nasty, dark, somewhat sunken lesions all over and are completely unmarketable. Losses to bacterial speck and spot can be high and cost growers a large portion of one of their highest-value crops.

Bacterial diseases are very hard to treat once an infection begins. Little can be done to stop a plant with bacteria flowing through its veins. The only approach is to try to prevent new plants from getting infected, and to kill the bacteria landing on leaves before they can make it into the plant.

Control options are extremely limited. Fungicides don't work because these organisms aren't fungus. Agricultural antibiotics aren't an option for the open field, and are not something that would be sustainable to pursue as a solution. Mancozeb can offer a little preventative protection, but it has a harsh environmental profile. Copper is pretty much the only currently viable solution, but copper is a solution that leaves something to be desired. It cannot give complete control and must be frequently applied. Additionally, there are some bacterial spot populations in other states that have developed partial tolerance to copper. There has long been a need to find new options for bacterial control that can augment and support copper, ideally with products that defray the risk of resistance development.

Enter biopesticides. Simply put, biopesticides use good microbes to prevent, exclude, eat, or kill bad microbes from infecting plants. Biopesticides are usually strong enough on their own to control diseases. They can make useful contributions to overall disease control when used in rotation with other products. Moreover, biopesticides are attractive and responsible because they have very gentle environmental and human safety profiles.



Some biopesticides contain microbes that grow on the plant. These beneficial microbes use up space and nutrients so there is no room for the bacteria, excluding it. Graphic by Amara Dunn, Biocontrol Specialist, NYS IPM Program

The ability of several biopesticide products to reduce the severity of tomato bacterial speck and spot when used in rotation with copper will take place on several farms throughout the state over the next two summers. Two on-farm trials will take place in Western NY. By placing the biopesticides in a realistic chemical rotation program and by using real, on-farm conditions, this work will rigorously assess the benefits of using these reduced-risk microbial products.

This work is part of a larger grant funded project: **Making the Switch: Incorporating Biopesticides into Vegetable Disease Management**, USDA Specialty Crop Block Grant, 1/1/22 – 12/31/23. $99,436.00 grant with $15,939 allocated to Cornell Vegetable Program efforts. (Dunn, McGrath, Buck, Stewart Courtens)

Stop the Rot! New York Part of National Team to Find Solutions for Onion Bulb Rot

When Dr. Lindsey du Toit, a Plant Pathologist from Washington State University, announced that she would lead a national project on bacterial bulb rot of onion, Cornell Vegetable Program Onion Specialist Christy Hoepting said, "Sign me up!" Bulb rot is the arch-nemesis of onion production. Over the past 5 years, more than 10% of the onion crop has been lost due to bulb rots with nearly 20% of growers experiencing catastrophic crop losses of more than 50%.

Hoepting is a co-PI and the Extension lead on this national $8 million dollar, 4-year (2020-23) USDA-funded grant to "Stop the Rot" in onions. In New York, Hoepting is evaluating the following strategies to combat bulb rot:

1. onion variety tolerance
2. nitrogen fertilizer rate and timing
3. pesticides including copper products, plant defense activators, a sanitizer and an antibiotic
4. the cultural practice of rolling improperly lodged onions
5. artificial curing with heated forced air vs. outdoor natural curing

Hoepting is providing environmental and crop data that will be used to develop a predictive model for bulb rot. Hoepting's team produced a bulb rot diagnostic video and organized the onion educational session for the 2021 Empire State Producers Expo, which featured bacterial bulb rot.

Tremendous Progress Made by Dynamic Research Team to "Stop the Rot"

- So far, 95 genera of bacteria have been found to be associated with rotting onions. The majority belong to only four genera, and of those, only 31% (range 3-82%) are pathogenic. In New York, genus *Burkholderia* is more prevalent than in any other region.
- The gene clusters responsible for causing rot in a major pathogen, *Pantoea ananatis*, were discovered. With this information, rapid and accurate diagnostic tools are now being developed to detect pathogenic onion bacteria in plant, weed, water and seed samples, and work is underway to discover the gene clusters responsible for causing rot in other bacterial species.
- Bactericides failed to protect against bacterial disease in 8 out of 10 bactericide trials, including 3 trials in New York. Bactericides will no longer be recommended, which could save growers up to $200/A.
- No association was found between bulb rot and nitrogen rate or timing. However, these studies clearly demonstrated that onions can be grown with lower rates of nitrogen, which is now being recommended.
- Promising results were found that suggest rolling onions that are dying standing up and artificial curing may help alleviate bulb rot.

At this rate, pragmatic solutions to onion bacterial bulb rot are within reach!

Christy Hoepting cuts onions in half to look for "sneaky" rot inside.

Newly Funded Grants & Projects

Your Trusted Source for Research-Based Knowledge

Determine the Magnitude and Distribution of Western Bean Cutworm and the Risk to Dry Beans in the Major Production Areas in New York
New York State Dry Bean Endowment, 7/1/2022-6/30/23, $3,400 (Lund, Zuefle, Wise).

Soybean Cyst Nematode (SCN) Sampling in Dry Beans
New York State Dry Bean Endowment, 7/1/2022-6/30/23, $2,000 (Seaman, Zuefle, Lund).

Optimizing Herbicide Weed Control and Crop Safety in Transplanted Cabbage
New York Cabbage and Research Development Program (NY CRDP), 4/1/2022 – 3/31/2023, $8,500 (Hoepting).

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