QUARTERLY HIGHLIGHTS @•••

The Cornell Vegetable Program 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 in 2021.

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.



In-person and Online: Winter Work Continues for Cover Crops in High Tunnels

Sharing research updates is a common part of the first quarter but instead of relying heavily on in-person outreach, this winter the Cornell Vegetable Program made a major effort to reach growers virtually: Reid and Tucker adapted their outreach and made 16 online presentations to reach growers with important data on cover crops and tomatoes in high tunnels.

At a cooperating Yates County farm, Reid and Tucker seeded triticale and field peas in different combinations last fall, on two different dates, with and without row cover. Over the winter, data was collected on biomass and potential nitrogen contribution from each cover crop treatment for future tomato crops. The data collected supports the following techniques that farmers can adopt:

Plant Early

Cover crop biomass from plots that were planted on October 11th were much higher compared to those planted two weeks later on October 25th. For every treatment, the earlier seeded cover crop yields more biomass compared to the later seeded crops; 2 to 3X as much biomass than the later seeded crop!

Triticale + Field Peas Mix Often Yields More Biomass

Across both planting dates, we documented triticale and field pea mix outperforming the triticale alone in both row covered and uncovered settings. The fact that the triticale and field pea mix has higher biomass suggests that growers can plant field peas at a lower rate in a high tunnel setting.

Row Cover Can Increase Biomass

At both seeding dates, all treatments that had row cover yielded more biomass. The impact of row cover on biomass production was much greater in the later seeded planting.

Early Plantings + Row Cover = Higher N Contributions

The data (Fig. 1) represents the estimated nitrogen contribution of each cover crop to the soil. Nitrogen contribution estimates are calculated by multiplying dry weight (lbs/A) by the percent foliar nitrogen present in the biomass at time of sampling. The estimated nitrogen contribution is higher in earlier seeded treatments. It is also higher in treatments that received row cover. The highest estimated contribution is 102 lbs/acre in the early planted triticale and field pea mix that received row cover application.



Figure 1. Estimated nitrogen contributions from different cover crop mixes across two seeding dates, with and without row cover.



Though in-person farm visits were restricted for most of this project period, Reid and Tucker were able to conduct **45 farm visits** through a mix of email/Zoom consultations or one-onone, socially distanced in-person visits.



Engaged with **563 producers and service providers** from 2/1/2020-3/31/2021 at a total of 19 events.



Shared 19 updates on the project team's social media accounts, as well as the CCE Cornell Vegetable Program Facebook page. Posts generated **381 likes**, and a reach of 322 accounts.

Given the high cost of organic nitrogen, the value of our high tunnel cover crop could exceed \$1,300/acre! We thank the Towards Sustainability Foundation for their support.



Video Released

Winter Cover Cropping in High Tunnels - March 2021 Update

To meet the year-round demand for locally produced food, vegetable farmers have embraced protected agriculture to extend their growing season, improve yields, and enhance crop quality. However, a statewide survey found that after several growing seasons, farmers struggle to maintain productivity due to challenges in long term soil health and fertility management.

Cornell Cooperative Extension is exploring practices that high tunnel growers can adopt to better manage soil fertility and improve soil health.

One practice is including winter cover crops in rotations as a way to scavenge leftover nitrogen and/ or fix nitrogen. In turn, this could lead to less fertilizer use and result in higher crop health, yield, quality, and profitability. As part of this work, we are investigating suitable cover crop species, seeding dates, and seeding rates. This <u>video</u> highlights this project's goals and preliminary updates as of March 2021.

Processing Vegetable Meetings Continue Online

Industry advisory meetings and educational programs are an important part of our regular winter programming. The Board of Directors for the New York Vegetable Research Association and Council which is made up of processing vegetable growers and commodity managers from Seneca Foods Corporation and Farm Fresh First LLC (manage raw product for Bonduelle) deemed these meetings important to the industry and supported an online format. A total of 56 participants attended 4.5 hours of programming divided into the Snap Bean Advisory; Pea & Sweet Corn Advisory; and Beet & Carrot Advisory on December 15-16, 2020. Commodity managers provided an update on the 2020 growing season and market, while the Cornell Vegetable Program specialist reported on insect, disease, and weed management issues. The group then received research reports from Cornell faculty on projects funded by the group and reviewed priorities for research and outreach. Not only are the priorities used for funding decisions by the local growers/processors, researchers utilize the priorities when applying for larger state and federal grants to ensure the critical needs of New York growers are met. The priorities reside on the Northeastern IPM Website.

Additional outreach and advisory programs this winter included a 1.25 hour Snap Bean session at the 2021 virtual Empire State Producers Expo on January 13, and the March 16 Table Beet Plant Pathology Update held on the Zoom platform.

In total, participants in these meetings were eligible to earn 3.75 DEC Pesticide Applicator Recertification credits as well as 4.0 Certified Crop Advisor Credits. Growers and processors expressed appreciation for these meetings and look forward to returning to in-person meetings in the future.



Expanding Management Strategies to Control Swede Midge

Swede midge (SM) is a tiny insect pest that can cause serious economic losses in brassica crops, especially organic broccoli. Long (3 years) and wide (1,000 feet) crop rotation and systemic insecticides are key to successful SM management in conventional production. However, organic insecticides are generally not effective. Organic farms often have small land bases and grow brassicas season-long, making crop rotation challenging/ineffective. From 2015 to 2019, Christy Hoepting and her team monitored SM populations on 7 small organic brassica farms, and conducted about 20 on-farm research trials and demonstrations investigating different novel strategies for managing swede midge.

This work showed that crop rotation can effectively be reduced to 3 months (until spring SM emergence subsides) and 500 feet, allowing brassica production in the same field every year. In January 2021, Hoepting launched a fact sheet outlining these new recommendations, including relative susceptibility of different brassica crops and tips for avoiding economic losses from SM when brassicas are planted in an infested field. Extension Educators in Jefferson County NY, Michigan, and Pennsylvania are already sharing this resource with growers struggling with SM.

It's important to note that this new crop rotation plan requires that at least two fields be separated by a wooded area. For growers whose fields do not meet this requirement, Hoepting's preliminary research with artificial SM infestations indicates that tarp or landscape fabric could successfully crash a SM population by preventing its emergence. In January 2021, she secured funding to continue this research, specifically examining whether ground barriers work on naturally infested ground, and how long ground barriers must remain in place. Finally, Hoepting teamed up with two other SM experts, Yolanda Chen (UVM) and Elisabeth Hodgdon (CCE Eastern NY Commercial Horticulture Program), and submitted a grant proposal to develop pheromone mating disruption as another novel approach to managing SM.

<image>

New Crop Rotation Recommendations for Swede Midge Fact Sheet

New Cornell research has demonstrated that brassica crop rotations of 500 ft (down from 3,000 ft) and 3 months (down from 3 years) could effectively "crash" a swede midge



population when fields are secluded from each other, making crop rotation a much more feasible strategy for small farms.

A <u>fact sheet</u> written by Christy Hoepting and Sarah Caldwell of the CCE Cornell Vegetable Program details the new crop rotation recommendations and provides information on the pest's life cycle, biology, and crop preferences in addition to real-world examples of crop rotation. The crop rotation strategies were developed to serve the needs of small organic farmers, but have utility for conventional farmers as well.

The fact sheet was accessed 525 times from its release in May 2020 through the end of 2020!

2021 NYS Dry Bean Meeting Goes Virtual

The 2021 NYS Dry Bean Meeting, held in mid-March, was executed virtually this year due to COVID-19. However, that didn't stop New York dry bean growers and industry members from attending to discuss research results and dry bean production outcomes for the 2020 growing season. This year's packed schedule provided attendees with updated information and research results across many different topic areas pertinent to New York dry bean production.

- Matt Stawowy from Steele & Co. presented an overview of the 2020 growing season, sharing that beans should not be overlooked in a growers rotation, and that New York dry bean markets continue to look strong.
- Cornell Plant Pathologist Sarah Pethybridge shared updates on her research of white mold sclerotia survival, and its implications for NY farmers.
- Cornell Vegetable Program Specialist Margie Lund provided updates on Western bean cutworm trapping and management.
- Jaime Cummings shared her work tracking soybean cyst nematode with the NYS IPM program, and the confirmation of this new pest in dry beans in New York State.
- Cornell Weed Scientist Lynn Sosnoskie presented on the potential for and managing herbicide resistance in dry beans.
- Phillip Griffiths shared on his work on dry bean breeding, evaluation, and variety development, and Michael Rosato shared on the results from the 2020 dry bean variety trials run at Cornell AgriTech.
- Amie Hamlin from the NY Coalition for Healthy School Food presented a talk on their work promoting and bringing NY dry beans into school lunches.
- Lastly, Anu Rangarajan and Ryan Maher talked with growers about their work with Vision 2050: NY Dry Beans and what dry bean production in New York could look like moving forward.

This year's virtual format was met with higher registration numbers than seen in previous years, with 45 meeting attendees from across New York, Pennsylvania, and Michigan.

Cornell Vegetable Program Creates Food Safety Trainings Specifically Designed for Greens Growers

With the increase of scrutiny on lettuce due to E. coli outbreaks twice a year for the last 4 years, the food industry and FDA are taking a closer look at how greens of all types are being grown and handled. With this in mind, we set out to share our knowledge of food safety practices and experience with growing leafy greens through a newly created a virtual training for our region's farmers.

Looking at each segment of leafy greens production, we identified areas where growers need to assess the potential risks to the produce from possible contamination events. Building from here, we focused on preventive actions to stay ahead of trouble, corrective actions for the unexpected events that could cause a problem, how to monitor for food safety issues, and designing Standard Operating Procedures farmers could use to instruct them on how to proceed with relevant food safety actions. Then, we tied it all together by identifying areas that growers will need to train their staff on.

With several months of advertising, we had 35 growers sign up for the 3-hour training. Combined with activities included with the online presentations, growers opened up with meaningful discussion about the issues that are impacting their ability to implement food safety practices. During the training, they informed us that we covered all their questions. Follow up conversations with growers days after the training gave us feedback on their positive experience as they move forward with growing safer greens.

This training will be a key part to future programming for our region, state, and the Northeast.

A Cornell Cooperative Extension partnership between Cornell University and CCE Associations in western and central NY counties.

Vegetable Growers Learn New Tools for Their IPM Journeys

IPM School at the Expo Provided Top-Notch Education and 8.0 DEC Credits

IPM School took place during 6 Expo sessions and, in total, offered 8.0 DEC credits, provided 9 hours of top-notch education, and accounted for 35% of vegetable production content at Expo! This short-course was developed cooperatively by the NYS IPM Program and the Cornell Vegetable Program. Expert speakers recruited from Cornell and across the Northeast and Midwest made IPM School a star attraction of this year's online Empire State Producers Expo in January.

IPM School Sessions at the Expo

- Session 1: A Bird's-Eye View of IPM
 Session 2: Keeping Ahead of the Problems
 Session 3: Off to a Good Start with Vine Crops
 Session 4: Keeping Ahead of Insects and Diseases in Vine Crops
 Session 5: Bright Brassica Beginnings
- Session 6: Clean Cole Crops



IPM School at Expo attracted a whopping 87 to 110 participants during each of the 6 sessions. By dedicating 2 sessions to fundamental Integrated Pest Management (IPM) concepts and then building on those classes to deliver 4 pragmatic IPM options-focused sessions, IPM School attracted many smaller, beginner, and out-of-state growers to Expo while also offering experienced growers meaningful programming. Every session featured a grower-speaker who excelled at implementing IPM on their own farm. Hearing the voices and wisdom of farmers who use innovative IPM practices was the highlight of each session. More importantly, the experienced growers were able to reassure those new to IPM that they, too, can find an IPM mix that will work on their farms.

Active Learning Techniques Aid Comprehension

Since listening to lectures on Zoom can feel disjointed and impersonal, the entire School used active learning techniques to engage participants. Delivering active learning programming calls upon presenters to find creative and frequent ways to directly engage students in working with the new material to encourage enhanced integration of the learning points, lead to better comprehension, and promote adoption of improved field practices.

Engagement in the active learning techniques was high and the method proved effective as an educational approach. In every session, 96-100% of survey respondents reported learning something new and 84-95% of survey respondents said they plan to change a practice in 2021 because of new information they learned during IPM School. After IPM School at Expo, 68 growers asked to be (and were) connected to their local CCE Educator to receive follow-up support as they implement their new IPM plans.

Missed the Expo? Watch IPM School on Video

IPM School at Expo is having continuing impact that stands to eclipse the immensely successful originally delivered program. Each talk given during Expo was recorded, edited, and turned into standalone, fully accessible educational videos. As a result, a suite of 17 videos will be posted on the NYS IPM Program website. Growers seeking to fine tune their crop protection strategies can view these videos as self-tutorials. CCE and other Ag Educators can incorporate these videos into future instructional programs.

Customized Content for Various Audiences

The success of IPM School at Expo has already led to a spin-off course, "Intro to Vegetable IPM for Urban Growers", which was a re-teach of the IPM School at Expo Session 1 material adjusted for the diversity and crop production needs of urban growers. Undoubtedly, IPM School at Expo delivered an enormous amount of high-quality, high-impact programming that will continue to find meaningful use well into the future.

Newly Funded Grants & Projects

Your Trusted Source for Research-Based Knowledge

A Peer Learning Approach to Sustainable Pest Management for Urban Agriculture

Judson Reid and Caitlin Tucker of the Cornell Vegetable Program, along with Yolanda Gonzalez and Sam Anderson of Harvest NY were awarded \$9,999 from the Towards Sustainability Foundation to develop and disseminate peer-led educational resources for urban agriculture. A video series focused on sustainable pest management practices like crop rotation, use of beneficial insects, and pest exclusion will enhance integrated learning and the knowledge foundation for urban farmers and community gardeners. The resources we create as part of this project will also improve and expand organic and sustainability systems knowledge for Extension educators and Master Gardeners that routinely work with urban farmers and/or gardeners. We intend to center underrepresented voices in agriculture in this project, including, but not limited to Black and Indigenous growers, persons of color, and women. This project will help urban farmers share their expertise and knowledge around sustainable farming practices, elevate and enhance the legitimacy of urban agriculture, and create visibility for diverse farmers. Engaging visual content will highlight the important role that urban agriculture plays to combat food insecurity and build resiliency in our food system.

Sustainable Pest Management for New York Urban Farmers

Judson Reid and Caitlin Tucker of the Cornell Vegetable Program, along with Yolanda Gonzalez and Sam Anderson of Harvest NY were awarded \$136,585 from Northeast Sustainable Agriculture Research and Education (NESARE) to develop pest management strategies for urban farmers.

Urban farmers are unique among agriculturalists as they operate on a smaller scale in settings with less biological diversity and have less pest management options on hand. Members of the project team have observed that growers are challenged by pests that are not typically significant in rural New York settings, like Harlequin Bug, Two Spotted Spider Mite, and Whitefly. While pests are universally problematic for all agricultural producers, challenges in urban areas are unique and include limited space, lack of scale appropriate IPM inputs, limited research, and historically minimal technical support from Extension and crop service providers.

Our solution is to recruit 15 farms to participate in on-farm demonstration trials. These trials will educate growers on sustainable, non-spray options that are economically and environmentally sustainable while contributing to the social mission of the farms. Furthermore, they will simultaneously be used to evaluate the suitability of certain controls (exclusion, biological controls, varietal resistance, intercropping) in an urban setting. Farmers and project team members will identify site-specific pest management needs and sustainable solutions will be implemented and evaluated. Data and experiences will then be shared with other farmers through virtual and in-person events. Evaluation will document adoption and impact of sustainable techniques by farmers. As part of the project, we will develop a guide on sustainable pest management practices for urban farms. Findings from the on-farm trials will be included, as well as a review on the different types of pest management practices (mechanical, biological, cultural, etc.), and additional resources that farmers can turn to for pest management help. To reduce barriers to accessing this knowledge, this guide will be translated into three foreign languages. This translated resource can greatly improve the ability for non-English speaking growers to succeed in their farming endeavors and thus increase the diversity of urban and rural farming in NYS and across the Northeast. We are privileged to count Amara Dunn of NYS IPM and Carol Glenister of IPM Labs as advisors on this project.

Growing Tribal Capacity and Outreach

A NESARE funded project lead by the United South and Eastern Tribes, Inc. The project term is 3/1/2021 – 11/30/2024 with an award of \$13,670. Co-PIs are Elizabeth Buck, CCE Cornell Vegetable Program, and Crystal Stewart-Courtens, ENY Commercial Horticulture Program (ENYCHP).

Developing Culturally Appropriate Record Keeping Methods & Tools to Enable Discovery & Communication of Marking Risks & Opportunities at Amish Produce Auctions

Northeast Extension Risk Management & Education grant awarding Elizabeth Buck, Cornell Vegetable Program, and Co-IP Elizabeth Higgens, ENYCHP, \$40,714. Project term 4/1/2021 – 9/30/2022.

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Combating Stemphylium Leaf Blight of Onion: A Critical Threat to the Sustainability and Profitability of Onion Production in New York

USDA-AFRI-CARE (United States Department of Agriculture – Agriculture and Food Research Initiative – Critical Agriculture, Research and Extension), 10/1/2022 – 9/30/2022, \$299,577 (Hay, Pethybridge, and Hoepting (\$10,000)).

Efficacy and Crop Safety of XDE-659 for the Control of Alternaria Leaf Spot in Broccoli IR-4 – Project No. P12806, 9/1/2020 – 8/31/2021, \$7,500 (Hoepting).

Ground Barriers as Pragmatic Management Strategy for Swede Midge in Small Organic Brassica Prodution: Final Step Before Grower Adoption Cornell Toward Sustainability Foundation (TSF), 2/1/2022 – 1/31/2022, \$9,936 (Hoepting).

Optimizing Herbicide Weed Control and Crop Safety in Transplanted Cabbage New York Cabbage and Research Development Program (NY CRDP), 4/1/2021 – 3/31/2022, \$13,622 (Hoepting (\$8,738), Sosnoski).

Advancing On-Farm Management of Foliar Diseases for Sustainable Table Beet Production Towards Sustainability Foundation (TSF), 2/1/2021-1/31/2022, \$9,972 (Kikkert and Pethybridge).

Towards a Durable Management Strategy for White Mold in Dry Beans in New York in Year (2021/22): Sclerotial Survival (PHASE 2) NYS Dry Bean Endowment, 4/1/2021 – 3/31/2022, \$6,000 (Pethybridge, Kikkert, and Lund).

Determine the Magnitude and Distribution of Western Bean Cutworm and the Risk to Dry Beans in the Major Production Areas in New York NYS Dry Bean Endowment, 7/1/2021-12/31/2021, \$3,400 (Lund, Zuefle, Wise).

Soybean Cyst Nematode Sampling in Dry Beans NYS Dry Bean Endowment, 7/1/2021-12/31/2021, \$2,000 (Seaman, Zuefle, Lund).

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