Cornell Cooperative Extension Cornell Vegetable Program



Q2-Q3 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.

CCE Cornell Vegetable Program Specialist Elizabeth Buck leading a field walk and discussion at the Niagara County Vegetable Meeting, 7/28/22. *Photo: J. Kikkert, CCE* farm visits and direct contacts events & presentations featuring CVP Specialists 750 people attended CVP presentations

We Get by With a Little Help From Our Friends

Organizations Work Together to Create 2022 Cover Crop Demo Plots and Host a Field Day

CCE Cornell Vegetable Program Fresh Market Specialist Elizabeth Buck has an interest in cover crops, particularly around how they can perform auxiliary functions on the farm. Through her work with the Climate Smart Farming team at Cornell, she works to show growers how cover crops can help increase a farm's physical, biological, and economic resiliency in response to an increasingly unpredictable climate. Members of that group inspired her to hold a field day and demo planting of multi-use summer cover crop options that would be suitable for short-term use in vegetable or vegetablesmall ruminant settings.

But she couldn't do it alone...



The **CCE Cornell Vegetable Program** partnered with the **CCE SWNY Dairy**, **Livestock & Field Crops Program**, working closely with Amy Barkley (Livestock Specialist) and Katelyn Miller (Field Crops Specialist) to design a demonstration that would be relevant for vegetable, small ruminant, poultry, forage, and honey producers. The teams co-planned the field day, generated detailed, pragmatic resources for growers, and facilitated insightful discussions of the many uses for our chosen cover crops.

CCE Erie offered the use of their newly purchased farmland to host the trial. The Orchard Park site is next door to Providence Farm Collective, a non-profit organization that provides farmland access and grower training to over 200 refugee and socially disadvantaged farmers. **Providence Farm Collective** agreed to be a partner on the cover crop demo project, specifically to do all the custom tractor work necessary to prep, establish, maintain, and terminate a field trial.

The **Erie County Soil & Water District** joined in on the project. The District runs a conservation equipment lending program where growers can use a no-till drill or no-till seeder for a nominal fee and receive hands-on instruction on how to calibrate and best use the machines to establish new cover crop and pasture plantings. We used their no-till drill to establish our cover crops. This allowed us

to assess how well teff–a very small-seeded, drought tolerant, short stature, frost killed summer grass–can be established using no-till practices. At the field day, growers could see and ask questions about Erie County Soil & Water District's no-till seeder as well as hear about all of their cover cropping programs and incentives.

The **Natural Resources Conservation Service** (NRCS) in Erie County, a district office of the federal agency, helped with education efforts. They spoke at the field day, offering farmers and industry resource guides for accurate, meaningful DIY soil health assessment techniques. They also highlighted federal programs, technical assistance, web tools, and payment incentives that farmers can use to help support their cover crop adoption efforts.



Cornell Vegetable Program Fresh Market Specialist Elizabeth Buck leads a group discussion about how buckwheat can be used in a vegetable rotation.

Seed for the demonstration was generously donated by **Preferred Seed** (buckwheat, sorghum-sudan) and **King's AgriSeed** (teff). Both seed companies provided cover crop seed information booths at the field day and sent staff to learn about the demo plots. Funding from the **NY Soil Health Project** minigrant program paid for the trial establishment and maintenance costs, and expenses associated with hosting the field day. **Cornell's Climate Smart Farming** program funding paid for the Cornell Vegetable Program's labor on the cover crop demo and field day.

Of course, no CCE activity would be complete without the participation of **our growers and other stakeholders**. Growers attending the field day operated vegetable, mixed vegetable-small ruminant, apiary, and urban farms. Nine attendees were **impact multipliers from industry** who will share what they saw and learned with other growers, amplifying the entire project team's educational outreach efforts.

Wonderful things can happen when you work together!





Laser Scarecrow Research Ramps Up

Laser scarecrows use a rapidly moving green laser beam to scare birds from fields. The CCE Cornell Vegetable Program continues in partnership to field test the <u>laser scarecrow device designed by the</u> <u>University of Rhode Island (URI)</u>. Feedback from our team and other project cooperators and farms in 2021 led to a significantly improved design for 2022.

We received seven of the new URI laser scarecrow kits in early June and assembled and pre-tested them. CC Farms in Wayne Co. ran an early trial to determine if the lasers would keep birds from pulling seedling sweet corn out of the ground. The farmer observed that the birds stayed out of the field when the laser was turned on in this preliminary trial. In late June, our team began deploying the laser scarecrows in commercial sweet corn fields that were about 10 to 14 days prior to harvest. Bird pecks make 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. 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.

Below: Cornell Vegetable Program Specialist Julie Kikkert gives a demonstration of the laser scarecrow at the Vegetable Growers Twilight Meeting in Erie Co. (Agle Farm). *Photo: Nina Gropp, CCE Cornell Vegetable Program*



In Western NY, there were seven farms that cooperated in laser scarecrow trials this year. Data was collected on the number of ears with bird damage at different distances from the laser.

Craig Chelini from CC Farms in Williamson, NY and CVP Technician Anthony Rampulla, Jr. with laser scarecrow deployed in seedling sweet corn. *Photo: J. Kikkert, CCE*

Laser scarecrow set up at Agle Farms in Eden, NY with Elizabeth Buck, Anthony Rampulla, Jr., and Jonathan Agle. *Photo: J. Kikkert, CCE*

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Potato Trials Aim to Improve Quality for Both Large- and Small-Scale Producers

Western New York is home to many of the highest potato producing counties in the state. The CCE Cornell Vegetable Program (CVP) supports both chipping potato production and fresh market potato growers. In June, as part of the long-standing potato breeding program at Cornell University, CVP Specialist Margie Lund helped plant the chipping potato variety trial in Steuben County and the fresh market potato trial in Wayne County. The potatoes tested in these trials are a combination of industry standards and new varieties that are bred for a range of desired qualities including tuber appearance and quality, shape, size, as well as a focus on overall yield.

This year, in addition to Cornell's large-scale potato trials, Cornell Vegetable Program Specialists Margie Lund and Robert Hadad planted a trial focusing on smaller-scale, mixed vegetable growers who include specialty variety potatoes on their farms. Our trial included potato varieties already available, and a few promising up and coming varieties, with the goal of finding potatoes that will produce high vields, good overall quality, and be of interest to consumers. In August, the Cornell Vegetable Program showcased the small-scale variety trial at a twilight meeting to many regional fresh market vegetable growers. Attendees were able to view the trial plot as well as see some early dug potatoes from each variety. Feedback from growers in attendance was highly positive, and we are excited to see the results of this trial later this fall.



Cornell Vegetable Specialist Robert Hadad shows varieties from the small-scale potato variety trial at a twilight meeting in August. *Photo: M. Lund, CCE*

Tailored Education for Farmers at the Providence Farm Collective

The Providence Farm Collective (PFC) is a farm program to help meet the expressed needs of refugee/immigrant, BIPOC and low-income communities in and around Buffalo. Through farming, individuals can develop or enhance agricultural and business skills through an incubator farm plot program–each incubator farmer has a 1/4 acre plot to grow and sell what they want. Others can learn about food production with community farm plots and provide youth with opportunities to learn new skills though a youth farming program. The PFC farm is located in Orchard Park, NY.



Photo: R.J. Anderson, CCE

The Cornell Vegetable Program (CVP) works closely with the Providence Farm Collective, teaching the farmers how to identify insect pest and diseases, and improve production techniques. Additionally, the CVP provides training in farm food safety practices to help farmers reduce the risk of contamination using simple and easy to understand techniques.

Furthermore, the Cornell Vegetable Program Specialists engage with the Providence Farm Collective management staff, providing advice on structure and building improvements. PFC is in the midst of a capital funding campaign to create a facility that can house coolers, wash/pack areas, meeting space, kitchen facilities and more. This effort may include remodeling their current barn structure, or starting from scratch and building a new facility. Whether remodeling or building a new structure, much planning is required to reduce the microbial risk associated with food growing and handling.

The CVP is looking forward to a long-lasting relationship with the PFC as trained farmers move on to start their own farms and new people come into the program to learn new skills.



During a farm food safety training, information from the Cornell Vegetable Program was translated into three different African languages by the man on the right. *Photo: R. Hadad, CCE*

Muck Onion Growers Combat Record High Nitrogen Fertilizer Prices by Reducing Application Rates

Cornell Research and Extension Programming Saves Farmers Money and Lessens Nutrient Pollution in Waterways

Recent record high nitrogen prices have begged the question: How much nitrogen do muck-grown onions really need? Luxurious use of fertilizer by muck onion growers to ensure large onions and high yields (e.g. 120-140 lb/A of nitrogen) has been a tradition passed down through generations. This practice is hard to change because lowering fertilizer rates risks producing smaller onions. With the cost of nitrogen fertilizer tripling from 2021 to 2022, this "cheap crop insurance" was suddenly not so cheap anymore!

Since 2017, Christy Hoepting (CCE Cornell Vegetable Program) and Brian Nault (Cornell Entomology) have conducted 11 on-farm nitrogen fertility trials in muckgrown onions which have overwhelmingly indicated that onions can be grown on good muck using 60–90 lb/A of applied nitrogen without yield loss. Hoepting and Nault took 57 muck onion growers and allied industry representatives into their own fields to see for themselves. In each of three onion fertility trial tours in Elba (2019 & 2021) and Oswego (2019), the growers could not identify the treatment with zero added N or NPK (nitrogen-phosphorous and potassium). In 2022, the results of the 11 studies were shared via a feature newsletter article in an April issue of VegEdge, and at a pre-season meeting with Elba growers.



In 2022

5 of the 15 muck onion farms in the CVP region reported reduced nitrogen inputs with no perceivable reductions in yield or bulb size:

- 1. Reduced rate of nitrogen from 140 lb/A to 120 lb/A on entire acreage (2300 acres), plus banded NPK on all transplanted acreage (1400 acres), which halved per acre rate of NPK (Elba & Yates).
- 2. Reduced rate of nitrogen from 120 lb/A to 75 lb/A on entire acreage (60 acres in Wayne Co.).
- 3. Reduced rate of nitrogen from 140 lb/A to 60 lb/A on entire acreage (200 acres in Oswego Co.).
- 4. Reduced rate of nitrogen from 130 lb/A to 80 lb/A on deep muck acreage (60 acres in Oswego Co.).
- 5. Reduced rate of NPK (15.3-14-14) by 70% from 800 lb/A to 560 lb/A NPK (= reduced rate of nitrogen from 122 lb/A to 86 lb/A) on half of acreage (120 acres in Elba).

We estimate that these five farms reduced nitrogen applications by 40% overall, which is equivalent to 156,000 lbs of nitrogen fertilizer. This reduction saved \$70,200 and lessened nutrient pollution of waterways.

Improving Winter High Tunnel Soil Nitrogen Management

Recent studies reveal a rapidly changing economic reality for New York farmers. Potassium and phosphorus fertilizer indices nearly doubled over the last year, and nitrogen, in some cases, tripled! Analysts predict that farmers will continue to face much higher fertilizer prices in the coming season, as higher natural gas prices further increase the cost of nitrogen. However, ongoing research by the Cornell Vegetable Program contributes to farm sustainability by reducing reliance on shipped-in nitrogen and decreasing input costs.

We recently completed a project that included on-farm research for both winter nitrogen fertilizer rates for greens crops such as spinach, plus cover cropping in rotation with warm season tomato crops in high tunnels. (For details about the trial and project collaborators, contact Judson Reid.)

The Results

In year 1, we saw little variation in foliar nitrogen across foliar samples from spinach. According to anecdotal observations from the growers, spinach receiving lower nitrogen treatments performed better earlier in the season. However, by late February, spinach with lower nitrogen grew poorly and turned yellow. In the second season of research, we found that 130 and 200 lbs N/ac were the highest yielding treatments. For the cooperating farm, 200 lbs N/ac is their preferred fertilizer rate for winter greens. Other factors on individual farms will influence how much nitrogen application is required, for example, number of anticipated harvests, organic matter levels in the soil, and leftover nitrogen credits from the previous crop.

Our research demonstrated row cover increases cover crop biomass, without the need for additional heat inputs. We also found that early planting date combined with row cover led to higher nitrogen scavenging/fixation. The highest estimated contribution in our trials was 102 lbs/acre. With a Cornell Vegetable Guidelines recommend rate of 125-150 lbs of N/ac, our project demonstrated tremendous potential to reduce fertilizer input costs!

An outreach program brought our findings to farmers and service providers via in-person and virtual events: 5,107 individuals through combined in-person meeting attendance and 9 media outputs such as print articles, podcasts, and YouTube videos, as well as 36 presentations by the project team.

After program exposure, 71% reported a greater understanding of how winter cover crops can be used in high tunnels. Of those that adopted cover crops, 92% report planting in the fall or winter. The ranking of reasons for adoption are: increase organic matter – 27%; support soil microbes – 21%; break disease cycles – 16%; add nitrogen to soil – 16%; scavenge nutrients – 16%; suppress weeds – 8%. Of those that have implemented cover crops, 90% reported an improvement in their operation associated with adoption.

We estimate our work created a new gross savings of up to \$89,760¹ per year for these reporting farms. The total potential industry impact in New York = \$564,311.55 per year.

¹ Fertilizer cost data reference: Schnitkey, G., K. Swanson, N. Paulson, C. Zulauf, J. Coppess and J. Baltz. "Nitrogen Fertilizer Outlook for 2023 Decisions." farmdoc daily (12):106, Department of Agricultural and Consumer Economics, University of Illinois at Urbana-Champaign, July 19, 2022

Newly Funded Grants & Projects

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Multi-Use, Short-Term Summer Cover Crops: Demonstration Plots and Field Day New York Soil Health project minigrant, \$500 (Buck).

Improving Production Practices for 3 Niche Crops in Response to Shifting Climatic Opportunities

Northeast Sustainable Agriculture Research and Education (NESARE), 2/1/2023-1/31/2024, \$21,470 (Buck).

Manipulating Carrot Growth Through Plant Growth Regulators: PHASE 3

NYS Vegetable Research Council/Association (NYSVRC/A), 4/1/2022 – 3/31/2023, \$25,127 (Pethybridge, Kikkert).

Management of Table Beet Growth and Health Through Plant Growth Regulators: PHASE 3 NYS Vegetable Research Council/Association (NYSVRC/A), 4/1/2022 – 3/31/2023, \$35,487 (Pethybridge, Kikkert).

Towards a Site-Specific Risk Model for White Mold in Dry Bean in New York NYS Dry Bean Endowment, 4/1/2022 – 3/31/2023, \$6,000 (Pethybridge, Kikkert, Lund).

Maintaining Efficacy of FRAC 3 Fungicides for Control of Stemphylium Leaf Blight (SLB) in Onion

New York Onion Research and Development Program (NY ORDP), 4/1/2022 – 3/31/2023, \$29,640 (Hay, Hoepting, Pethybridge).

Weed Management in Muck-Grown Onion

New York Onion Research and Development Program (NY ORDP), 4/1/2022 – 3/31/2023, \$19,500 (Hoepting).



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