CORNELL VEGETABLE PROGRAM
TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE

QUARTERLY HIGHLIGHTS OCTOBER - DECEMBER 2017

CORNELL VEGETABLE PROGRAM

A premier regional agricultural Cornell Cooperative Extension team that 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.

- Together, the Cornell Vegetable Program made more than 475 farm consultations
- 4 educational events were organized by the Cornell Vegetable Program this quarter
- Cornell Vegetable Program Specialists gave presentations at 18 events hosted by Cornell Cooperative Extension Associations and other collaborative organizations
- 786 people attended meetings where presentations were made by Cornell Vegetable Program Specialists

CVP SEIZES OPPORTUNITY TO STUDY CONTROL OPTIONS FOR NEWLY DISCOVERED GARLIC PEST

Leave it up to CVP Specialist Robert Hadad to discover a new pest of garlic! In 2016, with the help of Cornell Plant Pathologist, Dr. Frank Hay, they discovered that desiccated garlic cloves, previously attributed to poor conditions during curing and storage, were caused by Eriophyid mites. These tiny creatures are invisible to the naked eye and with a hand lens and can be seen only under a microscope. They feed on healthy garlic cloves and cause their skins to slough off and result in a dull surface appearance of the clove, as opposed to a shiny surface (see photos). Now that we are aware of Eriophyid mites, it is obvious that they are widespread and have been a problem for a while. Unfortunately, not much is known about how to control them.

Top: Garlic cloves heavily infested with Eriophyid mites. Note the dull surface and dry scales fallen off.
Bottom: Healthy garlic cloves with dry scales intact and shiny surfaces.
Photos: Christy Hoepting, CCE Cornell Vegetable Program

Christy Hoepting and Amy Celentano setting up garlic trial. *Photo: Cornell Vegetable Program*

Leave it up to CVP Specialist Christy Hoepting to set up an ad-hoc trial! In October 2017, after diagnosing Eriophyid mites as the cause behind 100% crop loss in two garlic varieties for a CVP garlic grower, she immediately set to work to design a trial to evaluate control methods. By the end of October, a new trial was set up on the CVP garlic grower's farm with his infested garlic (which would have otherwise been discarded) to evaluate 7 potential control options including acaricides (pesticides that kill mites) belonging to four different chemical classes, a hot water treatment and a soap/mineral oil soak. By the next planting season, the New York garlic industry will be one step closer to knowing how to manage this new pest of garlic. Potentially, effective control measures may be implemented for 2018-2019 crop.

CORNELL VEGETABLE PROGRAM COMPLETES YEAR THREE OF ON-FARM RESEARCH IN UTILIZING REPELLENCY TACTICS TO MINIMIZE BIRD IMPACTS ON SWEET CORN

Bird damage continues to wreak havoc in sweet corn. CVP fresh market specialists Darcy Telenko and Robert Hadad, along with NYS IPM specialist Marion Zuefle have partnered with six vegetable farms in central and western New York to continue a third year of evaluations of repellency tactics to minimize wildlife damage in sweet corn a project supported by NESARE and NYFVI. Sweet corn research trials were set-up starting early July following the first bird migration at the end of June. Initiation of each trial was based on crop maturity and movement of wildlife on that specific farm. These research trials ran until the end of August. Various tactics for bird deterrence were evaluated including the chemical deterrent, Avian Control; detasseling; scare-eye balloons; and an air-dancer. The timing of application of the chemical deterrent was also evaluated to determine best management practices (BMPs) in utilizing this option. At each location data was collected on overall bird activity on the farm, crop maturity, specific bird activity at each field location, crop maturity at application, and damage at harvest.

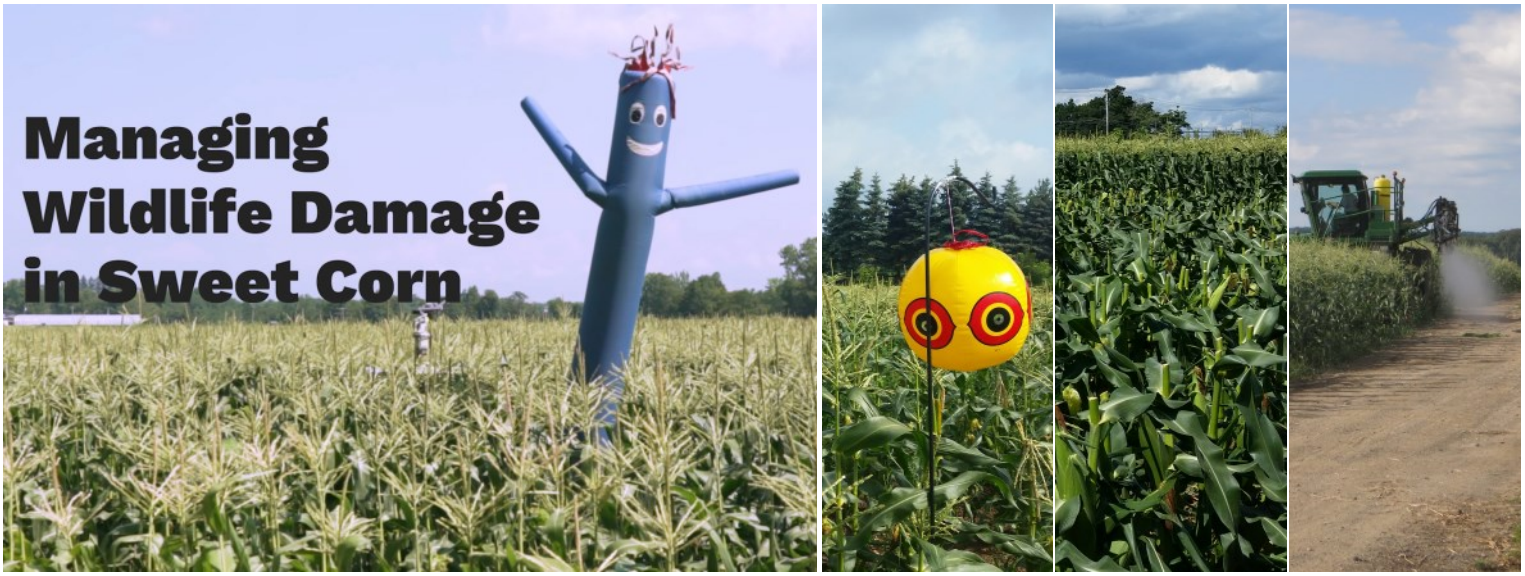
All data from the 2017 season has been collected and analysis is ongoing this winter to determine final results. A new video has just been released talking about the various tactics we have evaluated. (https://youtu.be/rq9v-hE5euQ) Results have be presented at the Empire State Expo and will be presented at regional winter fresh market vegetable meetings around the state.

A quick summary of what had been noted so far to date:

- Success was highly dependent on application timing, placement, and crop maturity and year.
- It is important to implement these tactics before birds learn about food source.
- BMP's for Avian Control – initial application two weeks (50% brown silk) prior to crop maturity, followed by 2nd application one week later.
- Air-dancer is effective for a small area near bird migration; power source can be a limitation.
- Detasseling is effective when removing tassels two weeks prior to maturity. This will increase ease of manual harvest, but will not work for mechanical harvesting.
- Scare-eye balloons are recommend in combination with other tactics.
- Cooperating growers are excited about using some of these techniques in future seasons.

This project aims to identify best management practices that can help guide the use of these tools on farm. Currently these tactics have shown variable benefits in providing the desired management objectives. Our goal is to continue to build on the preliminary data, replicating successful techniques and/or refine timing, placement for optimal use, and identify new tools as they become available.

These trials were supported by NYFVI.



A new video is now available discussing the various bird deterrent strategies evaluated by the Cornell Vegetable Program – air-dancers, scare-eye balloons; detasseling; and chemical deterrent, Avian Control.
Video produced by Jim Monahan, Cornell Cooperative Extension; Photos: Darcy Telenko, CCE Cornell Vegetable Program

CVP ADVANCES NUTRIENT KNOWLEDGE WITHIN SEASON EXTENSION

Q4 2017 saw the conclusion of a 3-year Federal Capacity Funds project that engaged over 1,500 farmers at 54 meetings. Staff made over 500 visits to cooperating high tunnel growers. Thirteen project related articles were featured in regional and national publications with combined circulation of over 70,000. Those farms participating in this project improved their ability to manage soil and nutrients through intensive soil, water and foliar analyses and implementation of project best management practices. Farmers demonstrated increased tunnel economic performance via decreased inputs, and/or increased yields, with net income gains as high as 46%.

These economic gains were due to increased yields, improved quality reported by 37% of operations (with the remaining 63% reporting similar quality each year) and reduced inputs and labor costs due to a shift in management style from labor intensive bulky amendments and general purpose fertility to a targeted, minimal input approach tailored to the soil and plant conditions in each tunnel. These changes also contribute to the sustainability of individual farm operations. In 2016, the average phosphorus level in high tunnel soil tests was 306 pounds per acre. By 2017, the average phosphorus level had decreased to 214 pounds per acre, indicating that growers responded to excess phosphorus levels by avoiding additional applications. This improves both the sustainability of the high tunnels, as excessive phosphorus levels are a limiting factor to long term high tunnel productivity, and the environmental sustainability of high tunnel operations in general as excess phosphorus applications pose an environmental threat to waterways across NYS when applied in excessive levels.

To continue to advance the industry economic stability, we submitted 4 proposals regarding cover crops in season extension with a combined request of nearly $350,000. To research this, we will grow winter cover crops at a cooperating commercial farm with 3 high tunnels over the coming 3 seasons.

The use of winter cover crops in warm season high tunnels may reduce the nitrogen demand of the summer crop, leading to less need for fertilizers and compost. Decreasing applications of nitrogen will decrease phosphorus, magnesium and calcium levels as these are part of most nitrogen applications. This will lead to increased fruit yield and quality, profitability and soil quality. *Photo: Judson Reid, CCE Cornell Vegetable Program*

PROCESSING CROPS SPECIALIST LEADS EDUCATION AND RESEARCH PROGRAM

New York state remains a leader in processing vegetable production for the canning and freezing industry, with an estimated value of $40 million annually. Did you know that approximately 175,000 tons of raw product are produced on 40,000 acres, and that the production is centered around the Bonduelle freezing plants in Bergen and Oakfield, NY and the Seneca Foods canning plants in Geneva and Leicester, NY? Growers in 10 of our CVP region partner counties (Genesee, Orleans, Monroe, Erie, Niagara, Ontario, Yates, Chautauqua, Cattaraugus, Allegany) rely on CVP processing vegetable specialist, Julie Kikkert, to lead and prioritize research and education efforts. On December 13, 2017, the annual Processing Vegetable Crops advisory meeting in Batavia was attended by 59 growers, crop consultants, processing representatives and Cornell researchers to discuss the growing season, hear research reports and set priorities. Amongst the topics of concern were weed management such as the invasive marestail, disease management such as leaf spot and root rot in table beets, white mold in snap and lima beans, insect pressure such as seedcorn maggot in peas, and corn earworm and Western bean cutworm in sweet corn. Kikkert works with Cornell faculty to address the concerns by partnering in grower -funded, state, or federal grants and research conducted on Cornell farms and grower fields. Results are reported at the advisory meetings, the statewide Empire State Producers Expo, VegEdge newsletter, individual farm consultations, and other local programs. The efforts have improved efficiencies, which is important for the industry to remain in New York.

Mechanized harvest of processing sweet corn. Processing vegetables for the canning and freezing industry are grown in 10 CVP partner counties. *Photo: Julie Kikkert, CCE CVP*

CVP SOUGHT AS COLLABORATORS ON NEW TECHNOLOGY RESEARCH PROJECTS

The reputation of the Cornell Vegetable Program is widespread and our assistance is sought by universities across the state.

UV Light Systems to Destroy Foliar Fungal Diseases in Vegetable Crops
Robert Hadad was contacted by the head of a research team from Rensselaer Polytechnic Institute to be part of a research project to take place in WNY. The goal of the project is to field test new equipment being designed to assist farmers in managing certain diseases. The technology will use UV light mounted on tractor pulled equipment to kill foliar fungal diseases on vegetable plants. Ultimately, UV light and optic units would be made available to farmers with instructions on how to retrofit them onto already existing equipment toolbars. Early lab results have been quite successful and the next phase is to move onto field trials. The time for this work in WNY will be later in the 2018 season, extending into the 2019 season. Several farmer cooperators will be identified for management of diseases in vine crops.

The potential impact of this project could be huge. Imagine running a piece of equipment that can manage disease, much in the same way a farmer would pull a sprayer, but not use any spray. This would have significant savings in time and money as well as having a terrific benefit to the environment as well as the health and safety of the farmer and workers. This could be a major breakthrough in disease management. Coincidently, hospitals have started using UV light systems in their ERs and hallways to more effectively reduce bacterial contamination. The same principle would be used on the farm.

Developing a Processed Fertilizer Derived from Recovered Food Waste
Another research team from the Rochester Institute for Technology reached out on behalf a client they are collaborating with for assistance with greenhouse and field vegetable trials. They are developing a processed fertilizer derived from recovered food waste in NYC. The research project will begin this spring on a farm in Genesee County. Vegetable transplants will be grown in a greenhouse on-farm where the farmer grows all of his field starts. Comparisons of treated transplants under greenhouse conditions will be observed against the usual production methods of the farmer. Several crops will be trialed with this new fertilizer.

Later in the season, the transplants will go out in the field. Further comparisons of growth and yield will be analyzed. If the results prove promising, further field trials will occur in 2019 on other farms in several counties in WNY. RIT will coordinate with CVP on the data collection and do the analysis as a third party observer. The RIT team is very interested in building research collaborations with the CVP and other CCE regional teams in the coming years.

Food waste could be a sustainable renewable source of material for fertilizers. It would be returning waste back into the soil. It is an interesting idea and if the economics of this project is positive, then it could become a valuable resource for our farmers.

Remote Sensing in Large Scale Table Beet Fields
Furthering the connections in remote sensing for vegetable crops with imaging scientists from Rochester Institute of Technology (RIT), representatives from Love Beets approached the team, which includes CVP Specialist Julie Kikkert, about use of the technology in table beet fields. A meeting was held at RIT to identify areas of potential research, which included quantifying plant stands as a method to predict and manage beet root size and uniformity, precision fertilization and irrigation, and disease detection and management. The group plans further discussions and will submit grant proposals to fund the research on farms in New York.

NEWLY FUNDED GRANTS

Each year, the Cornell Vegetable Program is tasked with generating a certain percentage of our operating funds, or Program Grants and Funds (PGF), through research grants, sponsorships, and meeting registration revenue. This quarter, we are pleased to have received the following grant funds:

- **Novel Seed Treatments for Early Disease Control and Increased Profitability of the Table Beet Industry in New York**, NYS Specialty Crops Block Grant, 1/1/18 - 12/31/19, $99,834 (Pethybridge, Taylor, Kikkert)