

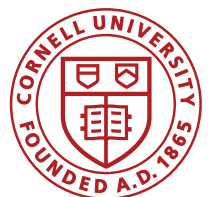
# Review

2018

KNOWLEDGE IS  
POWER

## CORNELL VEGETABLE PROGRAM SPECIALISTS PROVIDE

educational programs and information to growers, processors and agribusiness professionals, empowering them with the knowledge to profitably produce and market safe and healthful vegetable crops, contributing to the viability of farms and the economic wellbeing of New York State.



# Highlights



The Cornell Vegetable Program, a Cornell Cooperative Extension partnership between Cornell University and CCE Associations in 14 counties, serves the commercial vegetable, greenhouse, potato and dry bean industries in New York.

This region accounts for more than half the acres of the New York vegetable industry, with 1,017 vegetable farms and an estimated farm gate value of more than \$250 million<sup>1</sup>.

## **CORNELL VEGETABLE PROGRAM PREVENTS ECONOMIC LOSSES CAUSED BY SWEDE MIDGE ON ORGANIC BRASSICA FARMS**

Swede midge (SM) is an invasive insect pest that is threatening the viability of organic production of broccoli, cabbage, kale, kohlrabi and turnip throughout the northeastern United States. Feeding by larvae results in scarring and distortion of plant tissues, including lack of head formation and unmarketable crops. Small-scale organic growers are especially at risk for economic loss from SM, because organic insecticides, analogous to the systemic products that have proved vital to conventional management of SM, do not exist. Small acreage with a high proportion cropped to brassicas in multiple plantings season-long makes long and widely spaced crop rotations challenging and/or ineffective. Thus, swede midge can build to devastating populations quickly.

From 2015 to 2017, Christy Hoepting and her team worked intensively with seven small-scale organic farms that were suffering significant economic losses from SM. The project deployed 174 pheromone traps from early May until November over three years to monitor and understand SM population dynamics as they related to management practices. Almost 20

small-plot trials and demonstrations were conducted on these farms to test various management strategies, including the use of insect exclusion netting and feasibility of using preferred brassicas as trap crops.

At the end of the 2017 growing season, 5 out of the 7 farms (= 71%) no longer suffered economic losses from SM. Insect monitoring and demonstration of effective management strategies allowed these growers to understand how to crash the SM population on their farms.

Results from this project led Hoepting to team up with University of Vermont Entomologist Yolanda Chen to investigate feasibility of ground barriers such as plastic mulch, landscape fabric or tarps to crash SM populations as an affordable management strategy for small organic brassica farms. In 2018, this tactic was studied in the lab at UVM and in the field in New York. As a result of Cornell Vegetable Program's dedication to finding effective strategies for managing SM, small organic farms will soon have the tools to reduce economic losses from this invasive enemy of brassica crops.



2,681



Farm visits and crop consultations made by the Cornell Vegetable Program team

119



Educational meetings and presentations given by Cornell Vegetable Program Specialists

3,535



People increased their knowledge by attending presentations given by the Cornell Vegetable Program



### EDUCATE BEFORE YOU REGULATE: FSMA ON-FARM READINESS REVIEW EDUCATION

To expand the farm food safety expertise of the Cornell Vegetable Program, Fresh Market Specialist Robert Hadad was trained in the first class in New York under the new Food Safety Modernization Act (FSMA) initiative called On-Farm Readiness Review (OFRR). The goal of this new program is to “Educate Before You Regulate”. Over the next 3-5 years, specially trained CCE food safety educators will team with the New York Department of Agriculture & Markets inspection division to visit interested farms and provide one-on-one educational guidance regarding implementation of FSMA regulations before actual compliance inspections occur. The OFRR approach hopes to ease growers through their apprehension and frustration over having to comply with another set of regulations.

The Cornell Vegetable Program will continue to work closely with growers to clarify the differences between buyer-imposed food safety programs, like GAPs and HGAPs, and government-enforced regulations like FSMA.

### REPELLENCY TACTICS TO MINIMIZE BIRD IMPACTS ON SWEET CORN

Birds continue to wreak havoc in sweet corn. CVP fresh market specialists Darcy Telenko and Robert Hadad, along with NYS IPM specialist Marion Zuefle partnered with 6 vegetable farms over a 3-yr period to evaluate repellency tactics to minimize wildlife damage in sweet corn, a project supported by NESARE and NYFVI. Various tactics for bird deterrence were evaluated including a chemical deterrent, Avian Control; detasseling; scare-eye balloons; and an air-dancer. Data was collected on overall bird activity on the farm, specific bird activity at each field location, crop maturity at application, and damage at harvest. Research conclusions are summarized in a video produced by the team, and an 8 page glossy report both available online <https://cvp.cce.cornell.edu/pests.php>. Success of the four deterrence tactics was highly dependent on application timing, placement and crop maturity. The average reduction in ear damage over the 3-year period was 85% for detasseling, 77% airdancer, 63% balloon, and 38% Avian control. Results were presented at the Empire State Producers Expo and local vegetable meetings.

### IMPROVING THE SUSTAINABILITY OF HIGH TUNNELS AND NEARBY WATERWAYS

In 2018, CVP Specialist Judson Reid completed a 2-year project on managing soil health in high tunnels for long-term productivity. Cooperating growers provided input and yield data via baseline and fall/winter surveys and interviews. This data tracked changes in management practices, trends in soil and foliar nutrient levels, and allowed the CVP to correlate changes in yield and quality with management practices. Real time data was shared with the growers allowing them to react and shift fertility practices to maximize yield.

Resulting economic gains were due to increased yields, improved quality, and reduced inputs and labor costs due to a shift in management style to a targeted, minimal input approach tailored to the soil and plant conditions in each tunnel. These changes contributed to the sustainability of farm operations with phosphorus levels decreasing by 100 lbs/acre, indicating that growers responded to excess phosphorus levels and avoided additional applications. This improves both the sustainability of the high tunnels, as excessive phosphorus levels limit long-term productivity, and the environment, as excess phosphorus applications pose a threat to waterways.

# Research Grants

Funding received October 2017 – September 2018

## BEETS

**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)

**Enabling the Registration of Miravis Top for Cercospora Leaf Spot Control in Table Beet**, New York State Vegetable Research Association/Council, 4/1/18 - 3/31/19, \$18,000 (Pethybridge, Kikkert)

**Engaging the Enemy! Root Decay in Table Beets, Part II**, New York State Vegetable Research Association/Council, 4/1/18 - 3/31/19, \$18,000 (Pethybridge, Kikkert)

**Screening Table Beet Cultivars for Susceptibility to Phoma Leaf Spot and Horticultural Characteristics Under New York Growing Conditions**, Towards Sustainability Foundation (TSF), 2/1/18 - 12/31/18, \$7,624 (Kikkert, Pethybridge)

**Supporting the Expansion of the New York Table Beet Industry through Tools for Quantifying Risk of Root Decay**, NYSAES Research Venture Fund, 4/1/18 - 3/31/19, \$31,371 (Pethybridge, Kikkert)

## CABBAGE & COLE CROPS

**Testing Ground Barriers for Swede Midge IPM on At-Risk Small-Scale Brassica Farms**, Northeast Integrated Pest Management (NE-IPM) Partnership Grant, 4/1/2018 - 3/1/2018, \$50,000 (Chen (University of Vermont) and Hoepting)

## DRY BEANS

**Towards a Durable Management Strategy for White Mold in Dry Beans in New York, Part II**, NYS Dry Bean Endowment, 4/1/18 - 3/31/19, \$8,000 (Pethybridge, Kikkert)

**Breaking Down the Barriers to Organic No-Till Soybean and Dry Bean Production Through Improved White Mold Management**, USDA NIFA Organic Transitions Program, 9/1/18 - 8/31/21, \$500,000 (Pethybridge, Ryan, Kikkert, Stanyard)



## HIGH TUNNEL

**BMP and Winter Cover Crop Integration in High Tunnel and Urban Vegetable Systems**, Federal Capacity Funds, 9/1/18 - 8/31/21, \$30,000 (Reid)

## ONIONS

**Weed Management in Muck-Grown Onions**, New York State Onion Research and Development Program (ORDP), 4/1/2018 - 3/31/2019, \$16,000 (Hoepting)

**Improving the Durability of Disease Management of Onion in New York Through Monitoring of Fungicide Resistance**, New York Farm Viability Institute – Specialty Crops Block Grant (NYFVI-SCBG), 12/1/2018 - 11/30/2020, \$97,567 (Hay, Grundberg, Hoepting)

**Interaction of Variety, Nitrogen Fertility and Bacterial Bulb Decay in Onion**, Monsanto, 4/28/18 - 11/5/18, \$38,400 (Hoepting)

**Evaluation of Fomesafen (tradename Reflex) for Weed Control and Crop Tolerance in Direct Seeded Onion in Muck Soil**, IR-4, 9/1/18 - 8/31/19, \$5,000 (Hoepting)

## SNAP BEANS

**Towards a Site-Specific Risk Model for White Mold in Processing Snap Bean in New York**, New York State Vegetable Research Association/Council, 4/1/18 - 3/31/19, \$18,000 (Pethybridge, Kikkert)

## GENERAL / OTHER

**Quantifying Benefits of Biofungicides in Vegetable Disease Management Using Novel Disease Detection Methods**, New York Farm Viability Institute (NYFVI), 5/1/18 - 4/30/2020, \$84,641 (Dunn, McGrath, Stewart, Telenko, Kikkert, Buck)

**Evaluation of Vegetable Varieties for Organic Vegetable Production for Both Urban and Rural Farms**, Towards Sustainability Foundation, 4/1/18 - 3/31/19, \$10,000 (Telenko, Burley, Reid)

**Refining Weed Control Tactics in New York Processing Vegetables**, New York State Vegetable Research Association/Council, 4/1/18 - 3/31/19, \$35,000 (Wallace, Kikkert, Telenko)

**Fostering Agricultural Remote Sensing (FARMS) Alliance**, NSF PFI (subcontract with Rochester Institute of Technology), 9/1/18 - 8/31/21, \$119,441 (Pethybridge, Kikkert)

**NY Crop Insurance and Risk Management Education Project 2018**, USDA Risk Management Agency – subaward, 10/1/17 - 9/30/18, \$6,500 (Kikkert, Telenko, Hoepting, Reid)



“ Julie has been an extremely critical part of our vegetable production efforts. Her research and trials have helped us and our neighboring producers stay on top of disease, pest, and weed control options. We feel very fortunate to have Julie working on our behalf. ”

— Jason Gaylord, My-T Acres, Inc.



## PARTNERSHIPS PROFIT NEW YORK PROCESSING VEGETABLE, TABLE BEET AND DRY BEAN INDUSTRIES

Cornell Cooperative Extension (CCE) and Cornell University researchers have a long history of strong relationships that bring impactful research and best practices to New York farms. In working with the processing vegetable, table beet and dry bean industries, CCE's Cornell Vegetable Program (CVP) maintains relationships with growers, crop consultants, raw product managers, seed companies and a variety of other agribusiness representatives to ensure that production issues are brought to the forefront to be addressed by grower, state, and federally funded research.

At the heart of this process are advisory meetings. Held with each commodity group annually, the meetings are moderated by CVP vegetable specialist Julie Kikkert. The groups discuss the past growing season, production concerns, and develop priorities for research. Reports from industry funded research projects are also shared.

Smaller groups meet throughout the year to work on specific topics. In 2018, Kikkert brought in the expertise of a slug specialist from Pennsylvania, arranging a series of videoconferences and other communications that resulted in processing industry led research trials in green pea fields this spring. Slugs are a serious contamination issue in the plant and create the need for costly cleaning steps.

The CVP is a strong partner in applied research with faculty at Cornell and other institutions. Successful project funding requires background information on the industry, research priorities and letters of support, garnering in-kind support, and a clear research and extension plan. All these things are facilitated by the CVP, as evidenced by our research grants and grower-cooperators (see separate listings in this report).

A signature program is bringing precision agriculture to white mold management in snap beans. For the past two years, the CVP has been a partner in a project that brings together the plant pathology

expertise of Cornell University's Dr. Sarah Pethybridge with the imaging science capability of Rochester Institute of Technology. Growers/processors spend in excess of \$500,000 annually in fungicides to control white mold, plus more than \$100,000 in crop scouting efforts. Still, on average, processors lose 3-4% of the crop each year, with additional deficits in crop quality.

Using drones, the collaborative research has identified the useful spectral bands to detect flowering in snap beans, the stage at which a protective fungicide must be applied. This will make the technology more cost effective for the grower.

To ensure fungicides are only used when warranted, the group is building a risk model studying agronomic factors such as row spacing and in-row plant density as it affects canopy closure and white mold incidence. The project is funded by a \$299,692 USDA NIFA CARE grant. Building on that success, the group recently received a large NSF funded grant to extend the efforts, which will include harvest maturity scheduling.

Kikkert's penchant for building relationships was again on display when the NYS table beet industry expanded with construction of the new Love Beets factory in Rochester, NY in 2015. In the project's early days, Kikkert arranged a series of advisory meetings with growers and researchers that cultivated strong industry support. Over the past three years, there have been 13 grant funded projects with a total of \$654,748 awarded to Pethybridge, Kikkert and collaborators to study leaf disease, root rot, early season diseases, remote sensing, and weed management.

In addition to advisory meetings, CCE outreach is conducted through on-farm visits, newsletter articles, videos, presentations, responding to trouble calls and collecting disease samples for identification. Providing research-based knowledge on grower and industry identified needs, the CVP has helped the industry adapt to changes in crop production methods and markets.

# Generous Support

Without the financial and in-kind donations by area vegetable producers and agribusinesses, the Cornell Vegetable Program could not offer the level of support that we provide to the New York vegetable industry. Thank you!

## IN-KIND DONATIONS

**A & L Garlic Farm, Adam McCallister** – disease and Eriophyid mite control in garlic

**A. Ferlito Farms, Joe Ferlito** – onion Stemphylium leaf blight product trial

**Abe Datthyn Farms, Mike Johnson** – evaluation of Velum Prime for control of nematodes in onion

**Amos Stoltzfus** – produce auction meeting host

**Amos Zittel & Sons, David Zittel** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation; transplant production for organic vegetable variety trial; Sweet Corn Pheromone Trap Network

**Andy E Yoder** – produce auction meeting host

**Bauman's Farm Market, Bob Trier** – Evaluation of Fungicides for Control of Alternaria Head Rot in Broccoli

**Bickford Farm, Bob Bickford** – dry bean Western Bean Cutworm Trap Network

**Big O Farm, Max Torrey** – evaluation of fungicide programs for SLB control; Onion Variety Nitrogen Rot Project; onion research scouting program and muck donut hour

**Blowers Farm, Tim and Earl Blowers** – dry bean Western Bean Cutworm Trap Network

**Clearview Farm, Kurt Forman** – garlic disease trial; Developing BMPs on Cleaning Produce Wash Equipment

**Craig Phelps** – dry bean Western Bean Cutworm Trap Network

**CY Farms, Chuck Barie, Emma Long** – onion research scouting program and muck donut hour; Application of Electromagnetic Conductivity Measurements for Precision Irrigation

**David Fox** – produce auction education series

**David Hostetler** – produce auction education series

**Duyssen Farms, Bob Duyssen, Dan Duyssen** – dry bean Western Bean Cutworm Trap Network

**Eugene Hoover** – produce auction education series

**Farm Fresh First, Mike Gardinier, Buzz Lowe, Roger Ward, Steve Lashbrook, Mike Lynch** – processing vegetable research; Snap Bean Remote Sensing Project

**Fenton's Produce, Paul Fenton** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation

**Finger Lakes Produce Auction, Board of Directors** – produce auction education series

**Floyd Zimmerman** – High Tunnel Sustainability

**Fraser's Garlic Farm, Ed Fraser** – garlic quality improvement

**Fresh Ayr Farm, George Ayres** – Sweet Corn Pheromone Trap Network

**G. Mortellaro & Sons, Matt Mortellaro** – evaluation of pre- and post-emergent herbicides for mixed broadleaf control in onion; pre- and post-emergent herbicides for ragweed control in onion; evaluation of select fungicides for control of SLB in direct seeded onion; onion research scouting program and muck donut hour

**Gary Swede Farms, Jay Swede** – dry bean Western Bean Cutworm Trap Network

**Genesee Valley Produce Auction, Board of Directors** – produce auction education series

**Ground Work Market Garden, Mayda Pozentides** – Evaluation of Vegetable Varieties for Organic Vegetable Production for Both Urban and Rural Farms

**Growmark FS, Knowlesville** – product for research trials

**Harrington's Produce, Andy Harrington** – Management of Fusarium Disease in Garlic

**Harvey Leid** – produce auction education series

**Henry W. Agle & Sons, David Agle** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation

**Hurtgam Farms, Jeff Hurtgam** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation; Sweet Corn Pheromone Trap Network

**Jacobson Farms, Adam Jacobson** – evaluation of Velum Prime for control of nematodes in onion

**Johnson Creek Farm** – produce auction education series

**Jonathan Sensenig** – produce auction education series

**Joseph DiSalvo Farms, Joe DiSalvo Jr., Joe DiSalvo III** – onion variety nitrogen rot project

**Journey's End** – Evaluation of Vegetable Varieties for Organic Vegetable Production for Both Urban and Rural Farms

**Justin Zimmerman** – produce auction education series



## IN-KIND DONATIONS (continued)

**Kirby's Farm Market, Tim Kirby, Chad Kirby** – Eastern Broccoli Project Large-Scale On-Farm Variety Evaluation

**Klaas & Mary-Howell Martens Farm, Klaas Martens** – Organic Processing Vegetable Scouting Project

**Kreher's Family Farms, Brett Kreher, Emily Reiss** – Organic Processing Vegetable Scouting Project; Application of Electromagnetic Conductivity Measurements for Precision Irrigation

**L. Art Christensen Farm, Larry Christensen** – Sweet Corn Pheromone Trap Network; NYVRAC Carrot Herbicide Trial

**L-Brooke Farm, R. B. Glazier, Patty Dills** – NYVRAC Beet Root Rot Disease Survey

**Mahlon C Byler** – produce auction education series

**Mahlon Giroud** – produce auction education series

**Maple Lane Produce, Nelson Hoover** – produce auction education series; High Tunnel Sustainability

**Maxon Farms, Charles Maxon** – Organic Processing Vegetable Scouting Project

**McCracken Acres, Eric McCracken** – Organic Processing Vegetable Scouting Project

**Mele Garlic Farms, Mike Mele** – evaluation of bicyclopnone herbicide on garlic

**Morgan Brothers Farm, Mark Morgan** – dry bean Western Bean Cutworm Trap Network

**My-T Acres, Jason Gaylord, Pete Call** – NYVRAC Beet Root Rot Disease Survey

**Ontario Produce Auction, Board of Directors** – produce auction education series

**Partridge's on the Farm Market, Donald Partridge** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation

**Pedersen Farms, Rick Pedersen** – Sweet Corn Pheromone Trap Network; Organic Processing Vegetable Scouting Project

**Perry Farm, Bernard Perry** – Organic Processing Vegetable Scouting Project

**Perry-Dice Organics, Miles Perry** – Organic Processing Vegetable Scouting Project

**R. L. Jeffres & Sons, Tom Jeffres** – Organic Processing Vegetable Scouting Project

**Ray Hoover** – produce auction education series

**Seneca Foods, Jeff Johnson, Jay Westfall** – NYVRAC Beet Root Rot Disease Survey; Snap Bean Remote Sensing Project

**Seneca Produce Auction, Board of Directors** – produce auction education series

**Star Growers, Leo Starowitz Jr., Dan Starowitz** – onion research scouting program and muck donut hour

**Stein Farm, Paul Stein** – dry bean Western Bean Cutworm Trap Network

**Triple G Farms, Guy Smith** – Evaluation of Pre-Emergent Herbicides for Control of Yellow Nutsedge; onion research scouting program and muck donut hour

**W. D. Henry & Sons, Dan Henry, Mark Zittel** – Application of Electromagnetic Conductivity Measurements for Precision Irrigation; Sweet Corn Pheromone Trap Network

**Williams Farms, John Williams** – Cornell Potato Variety Trial

50



Research grants and projects managed by the Cornell Vegetable Program\*

255,087



Dollars received in newly funded grants to support vegetable research in our region\*

65



Farms and organizations offered land, labor, and supplies to support Cornell Vegetable Program research trials and events

1,200



Pounds of tomatoes, cucumbers, and acorn squash harvested from Cornell Vegetable Program research plots was donated to the Friendly Kitchen (Dunkirk), St. Susan Center (Jamestown), and Westfield Community Kitchen (Westfield)

## CONTRIBUTIONS



Allen Nolt

Bob-Mar Farms, Phillip White

Bowman Farms, Larry Bowman

Breslawski Farms, Nicholas Breslawski

Bruce Reed

Certis USA, Judy Collier

Evergreen Farms, Eugene Hoover

Fisher Hill Farm, Phillip Munson

Henry W. Agle & Sons, James and William Agle

Hu-Lane Farm, Hugh Dudley

Kreher's Family Farms, Brett Kreher

Kwilos Farm & Greenhouse, Joseph Kwilos

Lilyea Farms, Gary Lilyea

Reeves Farms, Mark Reeves

Reukauf Farm, Charles Reukauf

Root Brothers Farms, Robin Root

Sam Kostarellis

Vacco Farms, Carmen Vacco

Veggies Galore, Karen Baase

Weiss Farms, Anthony Weiss

\* some are multi-year projects

To make a donation to support the Cornell Vegetable Program, visit [HTTP://CVP.CCE.CORNELL.EDU/DONATION\\_INVOICE\\_PAYMENT.PHP](http://CVP.CCE.CORNELL.EDU/DONATION_INVOICE_PAYMENT.PHP)



# About

Cornell Vegetable Program regional Specialists work together with Cornell faculty and Extension Educators to address the issues that impact the New York vegetable industry. The team offers educational programs and information to growers, processors and agribusiness professionals in pest management, variety evaluation, cultural practices, market development, and farm food safety.

## TRUSTED SOURCE FOR RESEARCH-BASED KNOWLEDGE



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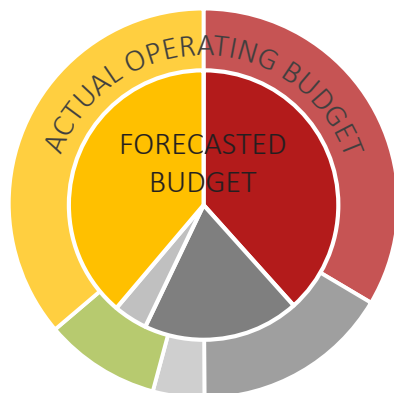
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**AMY CELENTANO, JOHN GIBBONS, and CAITLIN VORE**, Program Assistants

**ANGELA OCHTERSKI**, Administrative Assistant

## 2018 OPERATING BUDGET



Supporting County Association Shares, \$276,961

Cornell University Federal Funds<sup>1</sup>, \$135,500

Harvest New York<sup>2</sup>, \$35,266

Cornell Vegetable Program Grants and Funds<sup>3</sup>, \$299,112

In-Kind Contributions, \$79,276

<sup>1</sup> USDA National Institute of Food and Agriculture Smith Lever Funds

<sup>2</sup> New York State funds

<sup>3</sup> Includes funds from industry, state and federal grants, event registrations, sponsor support, and Cornell Vegetable Program reserve accounts

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**Cornell Vegetable Program**

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