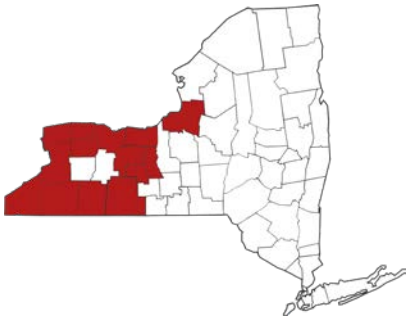
Cornell Cooperative Extension | Cornell Vegetable Program

Review 2019

REGIONAL COMMERCIAL VEGETABLE SPECIALISTS

The Cornell Vegetable Program is a Cornell Cooperative Extension partnership between Cornell University and Associations in 14 counties – Allegany, Cattaraugus, Chautauqua, Erie, Genesee, Monroe, Niagara, Ontario, Orleans, Oswego, Seneca, Steuben, Wayne and Yates – serving the commercial vegetable, greenhouse, potato and dry bean industries in New York.



Cornell Cooperative Extension
Cornell Vegetable Program
14-County Region

This region accounts for **more than half of all vegetable acres** in the state with **1,229 farms**, and a farm gate value **exceeding $200 million**[1].

2,673
farm visits and crop consultations made by the Cornell Vegetable Program team

104
educational meetings and presentations given by Cornell Vegetable Program Specialists

3,936
people increased their knowledge by attending presentations given by the Cornell Vegetable Program

38
research grants and projects managed by the Cornell Vegetable Program

[1] 2017 Ag Census

Design and Fabrication of An Affordable Laser Scarecrow

Birds are a major pest of New York grown fresh market sweet corn and grapes with devastating economic losses. Growers use different methods to scare and deter birds from their fields. To assist vegetable and fruit growers adopt a new technique for wildlife damage management, Specialists from Cornell Cooperative Extension have designed a laser scarecrow called LS.CCE.

Under our Extension and educational plan for this project, we intend to educate farmers about this technique, enabling them to use the technology under a do-it-yourself program. Estimated cost for the LS.CCE could be as low as $500 to cover one acre and $720 for five acres. This technology is far more affordable than the commercially available laser which would cost thousands of dollars.

High Tunnel Research Increases Profits for New York Growers

According to the latest Census of Agriculture, there are nearly 8,000 U.S. farms growing tomatoes in protected settings including greenhouses or high tunnels with a total value of $419 million.

How does New York rank?

- **#2 in the U.S. for number of farms growing in protected settings with a total of 489 farms**
- **#3 in the nation for number of square feet under protection at 4,188,563 sq. ft.**
- **#4 in the nation in value of sales at $28,590,555**

To support this national ranking, the Cornell Vegetable Program continues to advance knowledge in high tunnel farming to achieve long term profitability through sustainable soil and fertility practices. Over $100,000 in funding from a USDA Specialty Crop Block Grant, NNY Agricultural Development Program, Federal Capacity Funds and the Toward Sustainability Foundation support these efforts.

Under this funding, the Cornell Vegetable Program is developing Best Management Practices for winter cover crops and nitrogen rates for cold climate high tunnels. Research includes trialing different species of cover crops suitable for high tunnel systems and optimizing the timing of planting and incorporation to maximize soil health benefits while minimizing the time spent out of vegetable production. We are also examining appropriate rates of nitrogen for winter high tunnel crops such as spinach. Early data from our research shows the promise of significant profits for farmers.

Nitrogen applications for overwintered tunnel greens varies widely farm-to-farm. Although the recommended nitrogen rate for field spinach is 100-125 lbs N/acre, anecdotally, we have heard reports of growers applying 200-600 lbs N/acre for high tunnel spinach. For our experiments, we used an unheated moveable 22 x 48 ft high tunnel with a single layer of plastic. Within the tunnel, we examined differences in spinach yield and foliar nutrients across two planting dates with four N fertility treatments, for a total of 8 treatment combinations. We applied nitrogen in rates of either 0, 65, 130, or 200 lbs N/ac.

Overall, nitrogen rates did not significantly affect yield. Control plots with no added nitrogen yielded as much spinach as plots treated with 200 lbs/acre N. This was consistent within both planting dates, and across harvest dates. Planting date did affect yield in the fall and winter, with the earlier planting producing significantly greater yields than spinach planted two weeks later. However, the later planting caught up to produce similar yields. If a grower is paying $20/lb of nitrogen, this could result in a savings of $4000/ac!

A reduction in nitrogen applications could save farmers $4,000/acre!

Collaborators and contributors include Eastern NY Commercial Horticulture Program's Elisabeth Hodgdon, farmers in 6 NYS counties, Cornell University Department of Horticulture's Thomas Bjorkman, Cornell Willsboro Farm Manager Mike Davis, and Betsy Leanord, Organic Farm Coordinator at the Cornell Student Farm, Dilmun Hill.

Improved White Mold Management Guidelines for Snap, Lima, and Dry Beans

White mold, caused by the fungus *Sclerotinia sclerotiorum*, regularly reduces the profitability of New York's $35+ million snap bean, lima bean, and dry bean industry. When favorable environmental conditions exist, spores of the fungus infect bean flowers, which may then spread to the pods and foliage causing rot and plant collapse. Currently, the disease is managed by application of a protectant fungicide during flowering, at a cost of more than $500,000 per year to the industry. Additionally, thousands of dollars are spent on crop scouting to attempt to manage this disease. Despite this effort, crop and quality losses continue, with an average of 3 to 4% of the acreage lost (value of $800,000) annually.

Over the past 5 years, the Cornell Vegetable Program has partnered with Cornell University Faculty to conduct research to test the efficacy of different fungicide products, number and timing of sprays, remote sensing to predict the onset of bean flowering, and risk assessment from the analysis of historical field data. Research is also being conducted on the use of a rolled-cereal rye mulch to inhibit the disease. Growers and industry members were informed of research results and best management practices at the annual commodity meetings, newsletter articles, field days, the Empire State Producers Expo and personal consultations.

Each year, the roughly 100 bean growers and crop consultants who attended meetings or received information from our program gained knowledge on the most up to date white mold management practices. Better timed fungicide applications with more efficacious products resulted in reduced loss of product, saving thousands of dollars annually. The snap bean industry faces stiff competition with the Midwest, with production prices higher in NY. It is important to solve production issues in order to maintain farm profitability and keep the industry in NY.

New Potato, Dry Bean, and Vegetable Storage Specialist Joins the Team

In 2019, the Cornell Vegetable Program welcomed Margie Lund as the new potato, dry bean, and vegetable storage specialist. Margie jumped right in this summer, working on building connections with growers and making Cornell faculty connections related to disease management and variety trial projects. Late blight and potato virus Y samples were collected in potatoes, and white mold samples were collected in dry and snap beans, and delivered to Cornell faculty to further their research on disease management. Additionally, positively identified late blight samples were uploaded to usablight.org, which provides growers and industry members with updated information on late blight incidence across the country, helping them to make management decisions for their own farms. Margie also assisted with potato variety trials in Steuben and Wayne counties, which Cornell researchers use to produce new potato varieties for New York growers. These trials aim to produce potatoes that have increased disease resistance, good overall appearance, and increased yield, among other traits.

NEW YORK STATE

A National Leader in Vegetable Production

#2	#2	#2	#5	#5	#7	#8	#9	#10	#11
Table Beets 21.8%	Cabbage 14.7%	Snap Beans 11.3%	Squash, all 10.6%	Green Peas 5.4%	Onions, dry 4.5%	Sweet Corn 4.2%	Bell Peppers 0.6%	Pumpkins 3.3%	Potatoes 1.1%

Percentage of US Production from National Ag Statistics Service

First Cornell Vegetable Program On-Farm Cabbage Herbicide Trial Explores Novel Approaches to Weed Control

This summer, the Cornell Vegetable Program undertook its first on-farm cabbage herbicide trial. Our gratitude is extended to Dave Leverenz Sr. and Jr. of Hamlin, NY for hosting this project. Treatments included mostly herbicide combinations of pre-plant and post-transplant applications with novel approaches and pipeline products. Common lambsquarters was the main weed species in this trial, with some Fall Panicum, an annual grass.

Preliminary experiments with adding Prowl H2O, Chateau and Spartan to the cabbage herbicide program improved lambsquarters control with surprising crop safety. Experimental application of later than normal timings of these herbicides, after nitrogen side-dressing and before row closure, extended weed control to the end of the season.

We look forward to continuing to explore these novel approaches to weed control in cabbage with the new Cornell Specialty Crop Weed Scientist, Lynn Sosnoskie, beginning in 2020.

Cabbage herbidicide trial. Left: Untreated control. Right: The best treatment with 100% control of lambsquarters. Note that the grower cultivated the row middles.

Cornell Vegetable Program technicians Emma van der Heide and Sarah Vande Brake collecting yield data on cabbage herbicide trial in Hamlin, NY.

Record-Low Insecticide Use in Muck Onion Production in 2019

The 2019 growing season will go down in history for record-low insecticide use for thrips control in onions. Thanks to the high rate of adoption of Integrated Pest Management (IPM) practices via the Cornell Vegetable Program onion scouting program. In such a high value crop, this is truly phenomenal, and likely unprecedented!

Onion thrips are the most important insect pest of onion in New York. Feeding damage caused by these tiny insects can reduce onion yield by 30 to 50%. With 3-4 overlapping generations per growing season, thrips populations can be explosive. In high value crops like onions, growers tend to error on the side of insecticide overuse rather than risk economically damaging pest levels. The Cornell Vegetable Program has been working with onion growers in the region for over a decade on development and implementation of a sustainable onion thrips program that involves use of spray thresholds and strategic sequence of products for insecticide resistance management. Through the team's scouting program, growers receive weekly scouting data and research-based recommendations.

Elba muck growers were the recipients of the 2019 NYS IPM Award for Excellence in IPM.

The Elba muck onion growers pioneered the early adoption of using scouting data to implement spray thresholds and strategic sequences to reduce insecticide use for thrips control. Despite having the highest thrips pressure in the state, they have averaged 50% reduction in insecticide use compared to calendar spray method. Of all insecticide applications, over 85% follow the spray threshold – the number of thrips per leaf that the onion crop can tolerate before economic damage occurs – and if the thrips pressure is below threshold, there is no need to spray. Their insecticide applications are not "out of sequence" because they do not risk exposure of consecutive generations of thrips to the same insecticide class. **As a testament to their stewardship, the Elba muck growers received the NYS Integrated Pest Management (IPM) Award for Excellence in Onion IPM.**

Thrips pressure was unusually low in 2019 which, through the Cornell Vegetable Program onion scouting program, allowed onion growers the opportunity to reduce insecticide use:

In Elba, a 50-acre block of early transplanted **onions were grown without ANY insecticide applications**.

In Wayne County, the onion growers averaged **65% reduction in insecticide use** compared to a calendar spray program, 71% of insecticide applications followed spray thresholds, and none were out of sequence.

Oswego County onion growers averaged a record-breaking **71% reduction in insecticide use** compared to calendar spray method, 55% of insecticide applications followed spray thresholds and for the first time ever, none were out of sequence.

Despite minimal insecticide use, thrips pressure remained well below economically damaging levels in all regions.

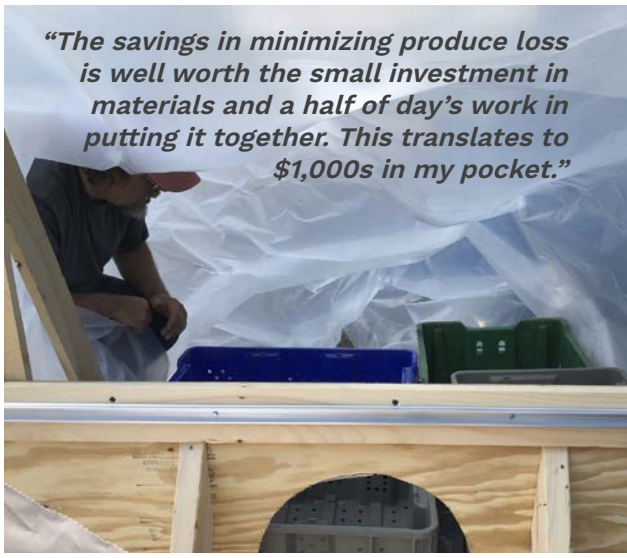
Improving Produce Storage Quality through Forced Air Cooling

Rapid Cooling of Produce Reduces Loss Due to Field Heat Related Physiological Breakdown

In a project collaboration with the University of Vermont, **Precooling and Curing Fruits & Vegetables for Improved Quality and Profit**, we have looked for ways to reduce storage losses. Field heat can have a detrimental effect on quality of stored produce with estimated losses of nearly 20%, equating to $100,000s lost each season. The project focused on design and operation of a pre-cooling device growers could easily incorporate in their post-harvest handling of fresh produce.

After choosing a design from lab trials, pre-cooler units were built and put into action on-farm to forcibly pull cold air through the produce (forced air cooling). A unit consists of a small-sized, powerful barrel fan and a framed pallet-sized structure with a plastic sheeting cover. Once parked within a grower's walk-in cooler, harvest bins are placed inside the unit. Within a few minutes of operation, cold air is forced through the produce quickly removing field heat.

Costing under $350, the improvement of shelf life for summer produce returns the investment more than 10 fold. One western NY farmer put a unit right to work. He was hugely impressed with the simplicity of the design yet being able to reduce field heat more than 30°F in under 20 minutes. He said his cooler would have taken most of the day to get that kind of temperature reduction. Design and instructions are available on the Cornell Vegetable Program website under Food Safety.



Mapping the Way to Better Disease Management

Soil borne diseases plague many vegetable farms. Pathogens like rhizoctonia, pythium, white mold, verticillium, fusarium, and phytophthora blight are long-lived organisms that each attack several vegetable crops and can cause perennial yield losses.

The presence and duration of favorable environmental conditions strongly influences the severity of soil borne disease outbreaks. Creating an unfavorable pathogen environment best reduces crop losses. Effective practices can include reducing compaction, adding drainage, changing varieties, and improving soil structure. Some of these techniques can be expensive to implement, or may be a poorly suited for a one-size-fits-all approach when there is inherent field variability.

Precision mapping offers a way to optimize soil disease management. Using a digital file, we can combine geo-referenced physical field data, like topography and compaction, with detailed field histories and cropping practices while also tracking disease progression, severity, and spread.

In 2019, Cornell Vegetable Program staff created centralized, geo-referenced maps for current disease outbreaks in three grower fields and one neighborhood-scale region. After building the maps in 2019, we worked with each cooperator to develop a list of precision, sub-field scale management techniques they can implement to help mitigate losses from soil borne diseases.

If funded again in 2020, we will use the digital mapping approach to evaluate the efficacy and economics of implementing precision-management for soil borne disease reduction. We will also continue to evaluate GIS-based software as a tool for consolidated record keeping of field characteristics, field operations, crop disease risk, and scouting data.

GROWER SUPPORT

A & L Garlic Farms – Adam McCalister

Abe Datthyn & Sons – Kevin Datthyn, Mike Johnson

Amos Zittel & Sons, Inc. – Mike Wright

AgriNetix – Rich Wildman, Josh Cawley

Alan Nolt

Anita Amsler

Arlen Brubaker

Ayers & Gillette, LLC – Thomas Ayers

Bauman Farms – Bob Treier

Baxter Farm Market – Corey Baxter

Bezon and Sons – Jim Vogt

Big O Farm – Max Torrey

Blowers Farm – Greg Blowers

Bodine Farms – Robert Bodine

Breslawski Farms, Inc. – Nicholas Breslawski

Bushart Farms, LLC – Brent Bushart, Bryan Bushart

Canticle Farm – Mark Printz

Chase Farms – Robert Chase

Chautauqua Produce Auction

Clearview Farm – Kurt Forman

Cory Mark Farms – Cory Mark

CY Farms – Chuck Barie, Emmaline Long

Dan Dunsmoor Farms – Joe Burghart

Dave Wallace Farms – David Wallace

Decker Farms – Jeff Decker

DelMar Farms – Calvin Winkstern

Dewey Produce – Mark Dewey

Dilmun Hill – Betsy Leonard

DiSalvo Farms – Joe DiSalvo III

Duyssen Farms – Bob Duyssen, Dan Duyssen

Edler Acres – Jerry Edler, Ellen Edler

Evergreen Farms – Eugene Hoover

Falcone Farms – Joe Falcone

Farm Fresh First – Mike Gardinier, Roger Ward, Buzzy Lowe

Fellenz Family Farm – Erik Fellenz

Fenton's Produce – Paul Fenton

Fisher Hill Farm – Phillip Munson

Fleischman Farms Inc.

Fraser's Garlic Farm – Ed Fraser

Fresh Ayr Farm – George Ayers

G. Mortellaro & Sons – Matt Mortellaro

Gianetto Farms Inc. – Nick Gianetto

Harrington's Produce – Andy Harrington

Harris Farm – Nate Harris

Henderberg Farm – Charles Henderberg

Henry Stutzman

Henry W. Agle & Sons, Inc. – James Agle, William Agle, Jonathan Agle

Hewitt Farm Fresh Produce – Ben Hewitt

Hu-Lane Farm, LLC – Hugh Dudley

Jacobson Farms, Inc. – Adam Jacobson, Corey Jacobson

J. Hurtgam Farms – Jeffrey Hurtgam

Joe Dyckman

John Dunsmoor Farms, Inc. – John Dunsmoor

John R. Wallace Farms – John Wallace

Johnson Creek Produce – Levi Stauffer

Johnson Potato Farms – Mark Johnson, Jack Johnson, Eric Johnson

Jonas Peachy

K.H. Datthyn and Sons – Ken Datthyn, Eric Tuttle

Kreher Family Farms – Emily Reiss, Brooke Parsons, Josh Jurs, Brett Kreher

L-Brooke Farm – R.B. Glazier, Patty Dills

Leverenz Farms – David Leverenz Sr., David Leverenz Jr.

Love Beets USA – John Henderson, Daniel Cross, Simon Wood, Robin Leous

Mahany Farms – Gary Mahany

Maple Lane Produce – Nelson Hoover, Ruth Hoover

Melvin Hostetler

Meyer Farms – John Meyer

Morgan Brothers Farm – Mark Morgan

MY-T Acres – Jason Gaylord, Peter Call

Noah Hoover

Pedersen Farms – Rick Pedersen

Pete's Plentiful Produce – Peter Bump

Pleasant Valley Farm – Paul Arnold, Sandy Arnold

Reeds Farm – Bruce Reed

Reeves Farms LLC – Mark Reeves

Reukauf Farm – Charles Reukauf

Rickard Nursery Growers – Pete Rickard

River View Farm

Root Brothers Farms – Robin Root

Sam Kostarellis

Seneca Foods – Jeff Johnson, Jerome Kingston, Jay Westfall

Sorbello and Sons – David Sorbello

Spoth's Farm Market LLC – Kevin Spoth, Edward Spoth

Star Growers – Leo Starowitz Jr., Dan Starowitz

Stettner Farm – Rodney Stettner

Tomion Farms – Alan Tomion

Torrey Farms - Potter – Mark Torrey, Rick Hall

Triple G Farms – Guy Smith

Vacco Farms Inc. – Carmen Vacco

Veggies Galore – Karen Baase

Walstead Farms – William Walz, Donna Walz

Wayne Farms, Inc. – Jack Stowell

W. D. Henry & Sons, Inc. – Mark Zittel

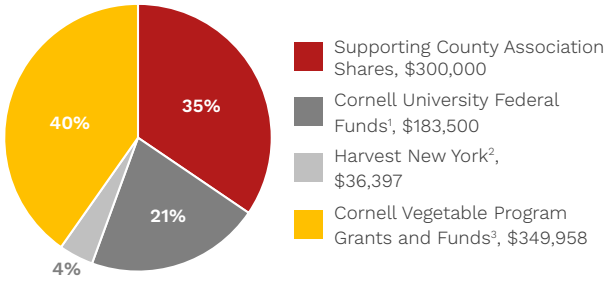
Weiss Farms – Anthony Weiss

Williams Farms – John Williams

Woody Acres Farm LLC – Dave Woodward

The Cornell Vegetable Program works 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.

2019 OPERATING BUDGET



[1] USDA National Institute of Food and Agriculture Smith Lever Funds

[2] New York State funds

[3] Includes funds from industry, state and federal grants, event registrations, sponsor support, and Cornell Vegetable Program reserve accounts

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