

QUARTERLY HIGHLIGHTS (1) • • • •

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 2019.

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.





The Cleaning Produce Washing Equipment Checklists are available at CVP.CCE.CORNELL.EDU/FOOD_SAFETY.PHP

Farm Food Safety School

Wash/Pack Equipment and Hygiene Farmer Training

The Produce Safety School, held in late March in Geneva, was the first in an upcoming educational series of workshops based on the culmination of two years of research investigating the best practices for cleaning produce wash/pack line equipment. The major principle of farm food safety is assessing microbial risks while minimizing the chances of pathogenic contamination. Research funding came from a grant sponsored by the USDA through the Northeast Center for the Advancement of Food Safety.

Farmers, educators, NY Ag & Mkts inspectors, and Wegmans farm and food safety managers attended the training. This all-day workshop combined classroom lecture and discussion with hands-on activities as well as demonstrations. From harvest through produce wash/pack, storage, and transportation, food safety relies on having clean food contact surfaces. Produce washing equipment was never designed to be taken apart and cleaned at this level. Our research has investigated techniques to clean equipment in a thorough yet cost effective manner.

The impact of the training will be measured both during the short term as well as the long term. Short term impacts are found with having cleaning techniques and procedures that are easy to follow. We created illustrated checklists that highlight where farmers need to focus their cleaning for the equipment, the tools required, the cost of tools, and the amount of time necessary to get the job done. In this manner, farmers can dedicate the trained labor to effectively and efficiently accomplish the cleaning tasks. Being efficient will save growers money. Estimated costs for implementing farm food safety range, depending on farm size, from several thousands of dollars to tens of thousands of dollars. We estimate labor savings over the cost of the season to average \$2100 a season.

The long term impact is gained from minimizing the risks of microbial contamination. A foodborne illness outbreak would be a financial disaster to the individual farm. There would be a big hit on local and regional NY farms as well. The livelihood of NY produce farmers depends on growers being able to implement farm food safety practices, keeping the food supply safe, and maintaining their financial stability.



Cornell Vegetable Program Partner Counties Lead Production, Research and Marketing for NYS Dry Beans

The March 15, NYS Dry Bean Meeting and Variety Evaluation, held in Geneva, NY brought together 44 dry bean growers, packer/ shippers, seed suppliers, and Cornell faculty and Extension Educators to discuss the state of the industry and to receive reports of industry-funded research. According to Amie Hamlin from the Cool School Food Program www.healthyschoolfood.org, dry beans are overflowing with health benefits, being high in protein, fiber, iron and other nutrients. While the NYS Dry Bean industry has supported the Healthy School Food Program for many years, new interest has been stimulated through the NYS No Student Goes Hungry Program https:// www.nycfoodpolicy.org/in-new-york-state-nostudent-goes-hungry/, which includes a higher incentive to school districts to use more local products and increases the reimbursement that schools receive for lunches to \$0.25 per lunch to those schools that purchase at least 30% of their lunch ingredients from NY farms and food processors (whose product is comprised of 51% NY farm ingredients). Cornell Vegetable Program (CVP) dry bean specialist Julie Kikkert facilitated discussions at the March 15 meeting between the Healthy School Food Program and the dry bean packer/shippers, and has worked with local CCE Farm to School Coordinators and CCE-Harvest New York to facilitate schools purchasing NY dry beans.

According to the 2017 Census of Agriculture, 72 western NY farms produce roughly 10,000

acres of dry beans, with CVP partner counties providing 6,820 of those acres. Leading counties in the CVP region are Monroe (2,288 acres), Steuben (1,360 acres), Genesee (1,192 acres), Ontario (906 acres), and Yates (844 acres). Black beans and red kidney beans are the types that produce well in our soils and climate. After local beans are harvested, they are sent to one of several factories in NY or PA for cleaning and processing into canned product or packaged for the dry pack market. Product is sold to local, regional, export and organic markets. The value of the NY crop varies, but averages around \$7 million.

Other topics of high interest to the industry included market updates, development and testing of new varieties, as well as management of white mold disease, western bean cutworm insects and weeds. At the end of the educational meeting, the industry prioritized research proposals and allocated funds from the Dry Bean Endowment to five research projects, totaling \$32,643. The group

then moved to the Raw Products Building to view and evaluate 56 dry bean cultivars that were canned by Furman Foods and on display for taste and visual appearance.



Prevention of Severe Pest Issues Addressed in Regional Pre-Season Onion Meetings

Unfortunately, the 2018 growing season was rough for muck onion production. In Elba, a combination of heat stress, root diseases, explosive onion thrips populations and a virus that is vectored by onion thrips called Iris yellow spot virus (IYSV) ravaged the onion crop to the extent that excessive leaf dieback prevented the majority of the crop from lodging properly. Consequently, bulb size, yield, and bulb quality were reduced to well below average. In Oswego, onion maggot, an insect that feeds on onion plants/bulbs underground causing stand loss and unmarketable bulbs, reached devastating levels of over 30% stand loss in selected fields.

In March, CCE CVP Onion Specialist, Christy Hoepting, and Cornell Onion Entomologist, Brian Nault met separately with the Elba and Oswego muck onion growers to brainstorm management strategies that may be implemented in 2019 and beyond to prevent such devastating losses from these pest issues from occurring ever again. In Elba, after reviewing 2018 onion thrips/IYSV scouting data and insecticide spray records, and current knowledge of IYSV in New York, the group teamed up to conduct large-scale field trials in 2019 so that the impact of lower insecticide spray thresholds on IYSV could be studied. In Oswego, plans are now in place to conduct on-farm small-plot research trials in search of new products, including entomopathogenic nematodes, that can be used in rotation for insecticide resistance management. Plans are also in place to implement a novel approach for reducing onion maggot pressure using sterile male technique. In 2019, Nault will monitor onion maggot populations so that quantity of sterile males that will need to be released in 2020 may be determined. This is a project that is in collaboration with researchers in Quebec, where sterile male technique has been readily adopted by muck onion growers.

Iris yellow spot virus (IYSV)

onion thrips

2019 Garlic School Showcased Latest Findings fr Cornell Vegetable Program Research Projects

The 2019 Garlic School featured final results from a 2-year study which focused on understanding and managing Fusarium disease of garlic. CVP Specialists, Christy Hoepting and Robert Hadad participated in this project, which involved trials that were repeated in 2017 and 2018, and in both Western and Eastern NY, and Long Island. Twenty-five garlic growers attended the garlic school.

Hadad's cultural practice study included comparisons between porcelain vs. racombole types, and planting on raised vs. flat beds, black plastic, silver plastic, straw mulch and bare ground, and fall vs. spring planted. Although none of these treatments had a strong effect on Fusarium diseases, white plastic resulted in the greatest proportion of jumbo-sized bulbs, while springplanted garlic had the lowest yield.

Hoepting shared the results of the effects of applied nitrogen, and the evaluation of fungicides and sanitizers on Fusarium diseases. Although nitrogen had no effect on Fusarium, interestingly, in 8 out of 8 side-by-side comparisons, there was no difference in yield among 50, 100, and 150 lb/A of inorganic nitrogen applied in a single application in the spring. Consequently, we changed the nitrogen recommendation to 50 lb/A, which has already been published in the April VegEdge. None of the sanitizer or fungicide treatments stood out as having much activity on Fusarium diseases of garlic either. Interestingly, there was a slight increase in yield only when sanitizers were used with clean seed, and not when we used Fusarium-infested seed, or when we planted clean seed in soil that we artificially inoculated with Fusarium.

Key results from Hoepting's Eriophyid mite trial were that stand of E. mite-infested seed was very poor. Unfortunately, none of the treatments applied to infested seed appeared to work, which including seed treatment, seed soak and foliar application of miticide abamectin, seed soak with mineral oil + soap, hot water treatment and foliar application of Zeal. However, clean seed from the E. mite-infested had stands and yields that were statistically the same as clean seed.

The momentum behind garlic research will continue in the Cornell Vegetable Program as the team has recently been awarded another grant, which will emphasize seed health and post-harvest practices.



Evaluation of Vegetable Varieties for Organic Vegetable Production for Both Urban and Rural Farms

The Cornell Vegetable Program (CVP) recently completed a Towards Sustainability Foundation funded project to address the needs of organic vegetable growers in western New York, in both urban and rural settings. This project included effort from Judson Reid, Elizabeth Buck, Caitlin Vore and former CVP colleague Darcy Telenko.

Project goals:

- 1. Evaluate specialty tomatoes for organic agronomic characteristics and disease susceptibility.
- 2. Evaluate niche cucurbit varieties for agronomic characteristics and pest susceptibility.
- 3. Continue the established annual Fresh Market Vegetable Field Day in Portland and showcase the results of these trials and host our an Urban Ag demonstration meeting in Buffalo.

We established research and demonstration plots for variety evaluation at three locations in Western New York including two urban farms in Buffalo and the Cornell Lake Erie Research and Extension Laboratory (CLEREL) in Portland, NY. Demonstration plots were established at the urban farms for the purpose of education of urban growers on agronomic characteristics and pest susceptibility of tomato and cucumber varieties. At all 3 sites we evaluated multiple tomato and cucumber varieties for disease resistance, as well as the efficacy of several organic fungicides. We then shared this data a two twilight meetings at the demonstration farms.

Through this project we were able to expand the knowledge of our beginning and urban growers on the importance of utilizing resistant varieties when available and other pest management tools to help improve production and soil health on their farms.

Responses from growers attending the meetings: *"I learned a lot from the twilight meeting – both from listening to the CCE experts and just visiting another urban farm. I would absolutely attend similar meetings held in the future.*"

"Cucumbers are difficult for us to grow on our urban farm due to lack of space for continued successions, but finding parthenocarpic varieties and growing these disease resistant varieties may help".

In addition to expanding growers' knowledge, the data collected from this project will be used in research and extension publications, and as preliminary data for future grant opportunities. Contact the Cornell Vegetable Program for a full copy of the report.



Remote-Sensing Aids Designed for Wildlife Management

Laser Scarecrow Systems to be Trialed in 2019

Many farmers experience wildlife damage during crop production each year. This damage causes yield and quality losses that lead to diminished profits. Wildlife damage to U.S. agriculture was reported to be at \$944 million during 2001 (USDA, NASS-2002). In New York State, particularly, fresh market products are facing severe profit cuts due to wildlife damage. There is another issue concerning wildlife in produce fields and that is the potential for microbial contamination of the crops from animal feces and increased susceptibility to other pests and pathogens (Pritts, 2001; Duffy and Schaffner, 2002; Holb and Scherm, 2008).

Telenko et. al, conducted small plot trials of bird damage in sweet corn (2015-2017) that showed devastating economic losses for farmers. Being able to manage birds in larger fields is the next step. Large-scale plantings can attract many more birds; therefore, the management options need to be updated. To implement this project, Precision Agriculture Specialist Ali Nafchi has designed two new laser systems that will be tested this year in our region. Type (a) will have a programmed variable pattern laser beam across the field to scare birds. Type (b) has a radar detector that will turn on the laser beam when birds come near the field. Solar panels will power the devices. Once the designs are tested and optimized, growers will be able to build the scare devices themselves.



Newly Funded Grants

Your Source for Research-Based Knowledge

This quarter, we are pleased to have received the following grant funds allowing us to advance our commitment to the New York vegetable industry.

- **Putting the Heat on Seed-borne Pathogens of Garlic**, New York State Farm Viability Institute (NYFVI), 9/1/2018-8/31/2021, \$124,892 (Hay, Hoepting, Hadad, Stewart)
- Weed Management in Muck Grown Onions, New York Onion Research and Development Program (ORDP), 4/1/2019-3/31/2020, \$17,000 (Hoepting)
- Evaluation of In-furrow Drench Treatments for Control of Pink Root and Fusarium Basal Rot in Direct Seeded Onion, New York Onion Research and Development Program (ORDP), 4/1/2019-3/31/2020, \$10,150 (Hoepting)
- Focus on Early Season Fungicide Use for Improved Control of Botrytis Leaf Blight and Stemphylium Leaf Blight, and reducing fungicide use overall, New York Onion Research and Development Program (ORDP), 4/1/2019-3/31/2020, \$12,730 (Hoepting)
- **Optimizing Herbicide Weed Control and Crop Safety in Transplanted Cabbage**, New York Cabbage Research and Development Program (CRDP), 4/1/2019-3/31/2020, \$7,000 (Hoepting)
- **Nitrogen for Northeast Winter Greens Sustainable Inputs**; Towards Sustainability Foundation (TSF), \$10,000 (Reid; Hodgdon, ENY Commercial Horticulture Program; Davis, farm manager)
- Enhancing the Sustainability of Foliar Disease Control by Decision Support Systems for the New York Table Beet Industry, NYS Specialty Crops Block Grant, 12/01/2019-11/30/2020, \$99,551 (Pethybridge, Kikkert)
- Towards a Durable Management Strategy for White Mold in Dry Beans in New York in Year (2019/20): The Status of Fungicide Sensitivity within the *Sclerotinia sclerotiorum* Population, NYS Dry Bean Endowment, 4/1/2019-3/31/2020, \$8,000 (Pethybridge, Kikkert)
- Evaluation of Alternatives to Quadris for Early Season and Root Disease Control of Table Beet in New York, New York State Vegetable Research Association/Council, 4/1/2019-3/31/2020, \$25,000 (Pethybridge, Kikkert)
- Optimizing the Fungicide Recommendations for White Mold Control in Processing Baby Lima Bean in New York (2019/20), New York State Vegetable Research Association/Council, 4/1/2019-3/31/2020, \$17,000 (Pethybridge, Kikkert)
- Revisiting the Fungicide Sensitivity of *Sclerotinia sclerotiorum* Populations Causing White Mold in Snap Bean in New York (2019/20), New York State Vegetable Research Association/Council, 4/1/2019-3/31/2020, \$17,000 (Pethybridge, Kikkert)
- Educating Produce Growers & Workers in the Farm Food Safety Aspects of Efficient Reasonable Cleaning of Wash-Line Equipment, Northeast Extension Risk Management Education Grant, \$44,267 (Hadad)

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