

New York (Cornell University) Annual Report - FY2021

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Contributing Organizations

Cornell University

Executive Summary

Overview

Cornell University Executive Summary

At Cornell University, Federal Capacity Funds are administered strategically to address a wide range of issues in New York State and beyond and foster the integration of applied research and extension programming.

Cornell University Agricultural Experiment Station (Cornell AES), New York State Agricultural Experiment Station (AgriTech at NYSAES), and Cornell Cooperative Extension (CCE) work collaboratively to determine planned programs that align with NIFA priority areas and direct funds to individual research and extension projects as well as projects that integrate these two domains. The approach used to integrate the work of the two experiment stations and CCE is designed to serve the citizens of New York State and improve the human condition through excellence in scholarship—linking research, non-formal teaching, and extension to "real life" challenges and opportunities. Director-level staff from Cornell AES, AgriTech at NYSAES, and CCE meet regularly throughout the year to discuss innovative approaches to relevant issues, research and extension projects, and new opportunities.

Extension and research leaders communicate with stakeholders, who provide input and inform priority-setting for use of Federal Capacity Funds. Stakeholders review proposals submitted through an internal competitive process by which faculty may apply for Federal Capacity Funds for projects with research and extension components matching current priorities. In addition, we have 36 active Program Work Teams comprised of extension educators, faculty, and stakeholders from across New York State who work together to develop, implement, and evaluate priority programs.

University-wide strategic plans have reinforced the land grant research and extension mission. The David M. Einhorn Center for Community Engagement advances Cornell University's mission through community-engaged learning—preparing and inspiring students, faculty, staff, and community partners to work together to solve the world's most difficult problems. The Center works closely with Cornell academic departments and Cornell Cooperative Extension to increase opportunities for community-engaged research, learning, and service projects. A liaison position is in place to strengthen the collaboration among Cornell students, faculty, and staff, and the CCE association offices across the state—thus supporting the development of new university links with association offices and facilitating opportunities for other extension units on campus to strengthen and diversify engagement in New York communities. University-wide internships connected to the David M. Einhorn Center for Community Engagement in addition to the annual CCE internship opportunities.

The College of Agriculture and Life Sciences (CALS) and the College of Human Ecology (CHE) continue to reinforce the bridges between science and practice, campus-community partnerships, and leadership and outreach. The CHE Bronfenbrenner Center for Translational Research is dedicated to expanding, strengthening, and accelerating the connections between research, policy, and practice to enhance human development and well-being. Both colleges along with the Industrial Labor Relations School of Cornell University and the Cornell University College of Veterinary Medicine are committed to research, teaching and extension, and the need to translate knowledge for public purpose.

This plan documents the intentionally planned program connected to Federal Capacity Fund projects, programs, and initiatives collectively considered by CCE, Cornell AES, and AgriTech at NYSAES.

Each organization is described below to better explain our unique system at Cornell University.

Cornell University Agricultural Experiment Station

The Cornell University Agricultural Experiment Station (Cornell AES) – an integral part of three colleges – advances research on food and agriculture systems, the environment, applied economics, and community and individual development. By doing so, Cornell AES improves people’s lives and contributes towards Cornell’s Land Grant mission of discovery, engagement, and advancement of learning.

Cornell AES links Cornell's world-class research facilities with one of the nation's most comprehensive statewide cooperative extension systems. Through this engaged, interactive system we address pressing issues that directly affect the health and welfare of the state and beyond. Many of today's most urgent societal concerns – from childhood obesity to invasive species to global climate change – are not bound by state or national boundaries. With more than 130 years of experience identifying, quantifying, and responding to emerging issues in an ever-changing world, Cornell AES directs some of the most important projects in the state.

The station directly manages roughly 2,600 acres of farms, orchards, vineyards, and forests, and includes the university compost facility, eight farm operations, and over 127,000 square feet of plant growth facility space—providing critical research services to scientists. Our student-run organic farm, Dilmun Hill, is a model of a student-run agricultural operation and engaged, experiential student leadership that has been emulated by other organizations and universities. Every aspect of our operation - from staff development to forest management to field practices - is viewed through the lens of sustainability.

AgriTech at New York State Agricultural Experiment Station

Agriculture and food are multi-billion-dollar industries in New York and underscores the value that New York State Agricultural Experiment Station (NYSAES) brings to improving the health of the people, environment and economy of the state and beyond. Established in 1880, AgriTech at NYSAES in Geneva, New York develops cutting-edge technologies essential to feeding the world and strengthening New York State economies.

From developing safe and nutritious foods to pioneering means to preserve the environment, AgriTech at NYSAES serves millions of New York consumers, agricultural producers, food businesses and farm families throughout the state. AgriTech at NYSAES helps New Yorkers capitalize on new food and agricultural opportunities and is uniquely positioned to translate state-of-the art research into industry innovation and economic growth.

Cornell Cooperative Extension

Cornell Cooperative Extension (CCE) extends Cornell University's land-grant programs to citizens all across New York State. With a presence in every county and New York City, CCE puts research into practice by providing high-value educational programs and university-backed resources that help solve real-life problems, transforming and improving New York families, farms, businesses, and communities.

County associations of Cornell Cooperative Extension work with their local boards, committees, and volunteers to influence decisions on program priorities and delivery. Our county extension associations and multi-county programs are separate 501(c) 3 organizations under the general supervision of Cornell University as agents for the state of New York. Extension works on and off-campus engages a program development process that relies heavily on community input to identify issues of local importance. Often research is informed by the two-way flow of information and experience. There is at least one CCE location in every county of New York State.

Facilities are fully equipped to deliver events and instruction through various modes including face to face hands-on workshops, webinars, online coursework, and on-demand videos to remote audiences. Additionally, we support 22 youth camp facilities running 21-day camp operations and 10 resident camp operations.

While 2021 was another unprecedented year for families, communities, farms, and businesses, CCE staff throughout the state continued to work collaboratively to develop educational programs to build community support systems, empower youth, lift our elders, connect urban and rural communities to agriculture and healthy fresh foods, help local businesses thrive as they boost local economies, protect

precious natural resources from a rapidly changing climate, support youth and family enrichment, and assist new your state residents in moving forward. During 2021 programs reached 900,000 participants directly through events and programs, including online programs and on-demand learning in effort to meet community needs.

Critical Issue: Youth Development/Children, Youth, Families

Youth Development/Children, Youth, Families

Description: Projects focus on life skill development, STEM opportunities for youth, human development, and the quality of home and work environments. For Hatch or McIntire-Stennis supported research there should be a connection with agriculture and food industries.

Program emphasis areas include: Youth Competence, Youth Contribution, Youth & Volunteer Leadership, Parenting, Human Development (Individual and Community), Economic Security, and Indoor Environment.

- Science Emphasis Areas
 - Family & Consumer Sciences Youth Development

Program participation in direct education events:

- Adult participants: 140,771
- Youth participants: 177,207
- Volunteers: 5,606

Overall indications of program success:

- 22,166 youth demonstrated a deeper understanding and appreciation of complex food systems and their impact in those systems.
- 17,527 youth indicated development of environmental literacy.
- 14,347 youth applied knowledge and skills in programs, projects and activities to foster an inclusive and diverse learning environment.
- 17,719 youth demonstrated that they increased their ability to express their ideas confidently and competently.
- 20,204 youth demonstrated they gained new STEM skills
- 6,479 youth demonstrated improved college and career-readiness skills.
- 14,665 parents/relative caregivers reported experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.
- 3,449 youth lead community service projects in partnership with adults using skills learned in 4-H.
- 2,969 program participants reported that they are practicing improved money management skills such as comparison shopping, paying bills on time, paying more than minimum payment, checking credit report, and reviewing and understanding bills/statements as a means to meeting financial goals.

Note: "Highlight" research projects are included below--since they termed 9/30/2021, this system does not have a systems-based ability to highlight them, as is the case for active projects.

Effects of Maternal Choline Supplementation on Infant Cognitive Development (NYC-199300)

Principal Investigator: Barbara Strupp

The Need

Choline is an essential nutrient critical for fetal brain development. Extensive animal studies have shown that the amount of choline a mother consumes during pregnancy has lifelong effects on her offspring's memory, attention and emotion regulation, and that higher choline intake can offer protection against numerous disorders, including autism, Down syndrome and Alzheimer's disease. Despite its importance in fetal development, choline is not currently part of a standard prenatal vitamin regimen, and more than 90% of pregnant women in the U.S. consume less than the current recommended amount (450 mg/day). Further, results from a prior human feeding study conducted at Cornell suggest that the current daily choline recommendation for pregnant women is not high enough, and perhaps should be doubled. A recent study by this Cornell group (Strupp, Canfield and Caudill) demonstrated that when pregnant women

consumed a little over twice the recommended choline intake (930 mg/day), their children showed faster information processing as infants and performed better on a task requiring sustained attention at 7 years of age, as compared to children born to mothers who consumed the current recommended amount.

The Approach

This study recruited a group of pregnant women to participate in a randomized, controlled trial in which half the women received 25 mg/day in choline supplements, and half received 550 mg/day during their second and third trimesters of pregnancy. These women continued to consume their normal diets (typically containing 300-350 mg choline/day) to more closely approximate the conditions that would be seen if choline was added to a prenatal vitamin regimen. The researchers then tested infants' attention, memory and emotion regulation at 4, 7, 10 and 13 months of age. Attention, or information processing speed, was assessed based on infant eye movements in reaction to animated images. Significantly, this type of infant reaction time has been found to predict a child's IQ through adolescence.

The Impacts

This is the first randomized controlled human trial demonstrating the benefit of a choline supplement (on top of a usual diet) during pregnancy on a measure predictive of child cognitive performance. Children of mothers who consumed more choline did show improved information processing speed: Reaction time for infants born to choline-supplemented mothers was, on average, 22.3 milliseconds faster than for infants born to mothers in the control group. Potential impacts on memory and emotion regulation are still being analyzed. These findings provide further evidence of the importance of increased choline intake during pregnancy. Few prenatal vitamins include choline, and current recommendations for choline intake during pregnancy are not adequate to support optimal fetal brain development. The researchers support efforts to increase maternal choline intake during pregnancy, as the nutrient could provide lifelong, population-wide improvements in child cognitive and emotional development.

Critical Issue: Agriculture and Food Systems

Agriculture and Food Systems

Description: Projects support a NY food and agriculture industry) that is diverse, sustainable, and profitable, and that produces a safe, reliable, and healthy food supply.

Programmatic outcomes for this issue are organized around: Business Management, Agriculture/Natural Resources Enterprises Labor, Producer Alternatives/New Ventures, General production Practices, and Agricultural Environmental Management.

- Science Emphasis Areas
 - Sustainable Agricultural Production Systems

Program participation in direct education events:

- Adult participants: 296,688
- Youth participants: 9,030
- Volunteers: 548

Overall indications of program success:

- 2,458 producers, horticulture business persons, and/or natural resource managers modified existing practices and/or adopted new production practices or technologies to address current issues and improve yield efficiency, consistency and/or quality and/or conservation of resources.
- 1,926 participants documented that they have applied knowledge and skills gained from extension programs to existing business operations.
- 1,122 participants reported improved agricultural/horticultural business profitability attributed at least in part to program participation.
- 1,772 producers, horticulture business persons, and/or natural resource managers reported improved ability to anticipate and respond to environmental and market variations through alternative production management strategies.
- 444 participants documented that they adopted innovations in food enterprises including production, allied services, processing, and distribution.
- 304 participants demonstrated knowledge gains related to needs of potential employees and/or availability of qualified employees.

Note: "Highlight" research projects are included below--since they termed 9/30/2021, this system does not have a systems-based ability to highlight them, as is the case for active projects.

Leafroll Disease in Vineyards (NYG-625451)

Principal Investigator: Marc Fuchs

The Need

Leafroll disease is one of the most widespread and economically damaging viral diseases of grapevines. It occurs everywhere in the world where grapes are grown. Leafroll reduces yield, delays fruit ripening and alters fruit chemistry, which affects juice and wine quality. Leafroll disease costs New York growers between \$25,000 and \$40,000 per hectare, depending on the level of disease incidence and impact. In California, losses range from \$29,902 to \$226,405 per hectare. Despite the fact that leafroll disease has been recognized as a threat to grape production for several decades, management strategies to control the virus are lacking.

The Approach

For decades, grape growers have been advised to remove and replant visibly infected vines; however, because of the way leafroll disease spreads and because vines can take up to a year after infection to show symptoms, this project investigated the effectiveness of spatial roguing – a technique in which growers remove not just the visibly infected vine, but also two vines on either side of it. Leafroll virus is spread by mealybugs who feed on an infected grapevine and acquire the virus, then crawl along the vine canopy and vineyard trellis system to spread it to the neighboring vines. In New York, the mealybug species that spreads leafroll virus never leaves plants and never flies when carrying the virus, so removing grapevines within crawling range of mealybugs is expected to provide better long-term virus control than single vine removal. The researchers partnered with a winery in New York to document presence of leafroll virus and mealybugs, and to test the effectiveness of spatial roguing and mealybug insecticide management, alone and in combination.

The Impacts

Spatial roguing was highly effective in reducing virus incidence quickly; meanwhile, insecticides did very little to limit the number of newly infected vines. Roguing reduced virus incidence from 4% in 2016 to nearly zero by 2020-2021; during the same period, in untreated vines, virus incidence increased from 5% to 16%. Insecticides applied from 2016-2020 reduced mealybug populations to almost zero, while they grew 57 to 257 times higher in untreated vines; however, despite reductions in mealybug populations, insecticides contributed relatively little in limiting the number of newly infected vines (even one surviving mealybug can spread the virus to a new plant). This study was the first to explore the effectiveness of spatial roguing in reducing incidence of leafroll disease in a commercial vineyard in the U.S. and beyond. The findings confirm spatial roguing as a cornerstone of leafroll disease management.

Managing Spotted Wing Drosophila (NYG-621454)

Principal Investigator: Gregory Loeb

The Need

Since it entered the continental United States in 2008, the invasive fruit fly spotted wing drosophila (SWD) has cost farmers millions of dollars in lost fruit and increased management costs. Just in New York in 2012, SWD caused \$5 million in damages. The pests are a particular threat to berries, but they also cause damage in grapes, cherries and peaches. Unlike most fruit flies, SWD attacks fruits just as they're ripening, with females laying eggs in intact and marketable fruit. Insecticide is currently the main management tool for SWD, requiring at least weekly applications during fruit ripening and harvest periods. This is expensive, disruptive and sometimes inadequate to control pests; in California, where warmer weather benefits pests, SWD has already begun developing insecticide resistance. Fruit growers need alternative approaches to control SWD and protect their crops.

The Approach

This project sought to understand and manipulate SWD behavior to reduce infestation in fruit crops. Specifically, the researchers studied how SWD uses odors to find or reject food sources, in order to interrupt the pests' capacity to colonize susceptible crops; certain odors may mask a food source, smell repellent to SWD or attract the insects to a kill site. This type of management tactic has been developed most successfully against biting insects (especially the chemical DEET as a mosquito repellent). Thus far, there has been less success in using insect repellents in agricultural systems. This project continued working to discover new compounds that are repellent or attractant to SWD, and to test these compounds in the lab and under realistic field conditions.

The Impacts

The most promising compound discovered through this project is 2-pentylfuran (2pf) as a

repellent for SWD and other fruit flies (the researchers have applied for a patent for this chemical). In lab testing, 2pf released at rates greater than 2 milligrams per hour significantly reduced SWD egg laying in raspberries. In field testing with natural SWD populations, 2pf released at over 10 mg per hour reduced SWD infestation up to 60%, though reduction levels varied among trials. The researchers have begun working with a commercial partner to develop an automatic aerosol spray system for 2pf, which will be tested under field conditions in summer 2022.

Critical Issue: Climate Change

Climate Change

Description: Projects develop and/or implement practices to reduce impacts to agriculture from climate change and/or to use agriculture and forestry practices to mitigate climate change. Special consideration is given to projects that will develop implementable strategies, linked to agriculture and forestry, for meeting New York's new law on reducing use of carbon-based fossil fuels and lowering greenhouse gas emissions.

Programmatic outcomes for this issue are organized around: Climate Change, Water Resources, Biodiversity, and Natural Resource Protection.

- Science Emphasis Areas
 - Agroclimate Science Environmental Systems
 - Sustainable Agricultural Production Systems

Program participation in direct education events:

- Adult participants: 92,948
- Youth participants: 7,298
- Volunteers: 698

Overall indications of program success:

- 20,483 consumers, residents, agricultural/natural resource producers, organization and business representatives, and/or local government and community leaders documented that they modified existing practices or technologies and/or adopted new practices to protect/enhance natural resources and/or enhance biodiversity.
- 1,463 consumers, residents, agricultural/natural resources producers, organization and business representatives, and/or local government and community leaders demonstrated knowledge gains about the causes and implications of climate change and adaptive or mitigation strategies.
- 94 agricultural/natural resource producers, organizations, and business representatives documented that they adopted recommended adaptation strategies for production agriculture and natural resource management, including invasive species, pest management, pollutant loads, wetlands, emergency preparedness, etc.
- 513 consumers, residents, agricultural/natural resources producers, organizations and business representatives, and/or local government and community leaders documented that they modified existing practices or technologies and/or adopted new practices to protect/enhance water resources.
- 363 instances were documented where consumers, residents, agricultural/natural resource producers, organization and business representatives, and/or local government and community leaders improved and/or protected water resources.
- 35 agencies/organizations/communities documented that they adopted recommended climate mitigation practices and policies.

Community and Economic Vitality

Description: Projects empower entrepreneurship and workforce development, agriculture and food systems development, community and economic development, and community sustainability and resilience which address social determinants of health. For Hatch and McIntire-Stennis supported research these activities must have a connection to agriculture and food industries.

Program emphasis areas include: Community and Economic Development, Community Capacity Building, Community Sustainability and Resiliency Decision-Making, Land Use and Energy, Land Use and Public & Residential Spaces, and Agriculture and Food Systems Development.

- Science Emphasis Areas
 - Education and Multicultural Alliances Environmental Systems
 - Family & Consumer Sciences Human Nutrition
 - Sustainable Agricultural Production Systems Youth Development

Program participation in direct education events:

- Adult participants: 163,426
- Youth participants: 15,224
- Volunteers: 5,689

Overall indications of program success:

- 86,355 residents plan to initiate steps to support environmental stewardship and sustainable community – 14,331 residents have begun practicing management tactics in homes, lawns, gardens and landscapes. that support environmental stewardship and a sustainable community
- 1,560 residents are enrolled as active Master Gardener volunteers.
- 105 communities instituted new or enhanced participatory processes related to community and economic vitality.
- 100 agriculture/horticulture/natural resource business professionals are better prepared to deal with disasters and emergencies.
- 141 communities planned for and have implemented initiatives on community-based agricultural economic development, land use, energy, workforce development, business, and entrepreneurial development and assistance, non-profit sector development, and/or other elements of sustainable growth.
- 9 communities implemented projects that enhanced community sustainability and/or protect public health and community well-being through sound environmental management.

Note: "Highlight" research projects are included below--since they termed 9/30/2021, this system does not have a systems-based ability to highlight them, as is the case for active projects.

Personal Protective Technologies for Current and Emerging Occupational and Environmental Hazards (NYC-329834)

Principal Investigator: Fatma Baytar

The Need

Agricultural workers who come into contact with pesticides, insecticides or other harmful chemicals require personal protective coveralls (PPC) to prevent exposure. According to the National Institute for Occupational Safety and Health, more than 13 million workers in the United States are exposed to dangerous chemicals at work, and skin diseases are the second most common occupational illness. If workers do not have properly fitting PPC, their safety is at risk, as badly designed and sized coveralls may expose them to contamination through tears, or even become caught in machinery. The need for better-designed PPC has only increased since the COVID-19 pandemic, when many more workers (especially in medical settings) have begun wearing them.

The Approach

This project tested PPC design and sizing on agricultural workers in active postures. Researchers used 3D body scans and participant feedback to analyze fit of disposable coveralls: Body scans of 35 total male and female participants were analyzed in three different poses (standing, reaching overhead and stepping up) while wearing minimal clothing, wearing two commercially available coveralls and wearing a novel coverall design developed at Cornell. The project team also compared their 3D body scan data against virtual body and garment prototypes, in hopes of improving virtual fit simulations for the benefit of clothing designers and manufacturers; human fit testing is far more expensive than simulated testing. Though these comparisons were done with protective coveralls, the improvements in fit simulations could be applicable to many types of garments.

The Impacts

The two commercial designs were significantly bulky on participants, which increases risk of coveralls being caught on tractors or machine components. However, the commercial designs were too tight at critical areas, such as under the arm and around the hips and knees – areas that are frequent sources of discomfort and tears under the stress of necessary movements. Women experienced more fit issues than men, as unisex coveralls seem to have been designed for male bodies; women particularly struggled with tightness at the hips and with overly long torso components, which made the crotch of the coveralls fall low – creating hazards for tearing and tripping. The Cornell-designed coveralls were more tightly fitting overall, but they contained pleated sections under the arms, around the hips and at the knees to compensate for movement stress. This research uncovered significant shortcomings in commercially available coveralls and suggested some solutions that could better protect agricultural, medical and other workers who require personal protective coveralls.

Critical Issue: Environment, Natural Resources, Sustainable Energy

Environment, Natural Resources, Sustainable Energy

Description: Projects lead to improved use of the state's available land resources for agriculture and forestry industries, renewable energy production from agriculture or forest resources, and energy conservation and renewable energy that benefits agriculture and food systems.

Program emphasis areas include: Bioenergy, Producer Energy Alternatives/Conservation, Consumer energy Alternatives & Costs, Community Energy Planning, Waste Management and Energy, Environment & Natural Resources

- Science Emphasis Areas
 - Bioeconomy, Bioenergy, and Bioproducts Environmental Systems

Program participation in direct education events:

- Adult participants: 122,219
- Youth participants: 11,341
- Volunteers: 1,794

Overall indications of program success:

- 1,005 consumers reported that they adopted appropriate energy cost control and/or conservation practices
- 28,971 agricultural/natural resource producers, organizations and business representatives, community leaders, and/or residents documented that they modified existing practices or technologies that will assist with natural resources management and the environment
- 2,668 agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents demonstrated knowledge gains about waste management and reduction
- 433 consumers reported savings on energy costs attributed to adopting alternative energy sources
- 416 consumers reported savings on energy costs attributable to adopting energy conservation measures
- 1,299 agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented that they reduced costs through improved waste management practices
- 1131 agricultural/natural resources producers, organization and business representatives, community leaders, and/or residents documented that they modified existing practices or technologies and/or adopted new practices to manage and reduce waste
- 1,005 consumers reported that they adopted appropriate energy cost control and/or conservation practices

Note: "Highlight" research projects are included below—since they termed 9/30/2021, this system does not have a systems-based ability to highlight them, as is the case for active projects.

Controlling Agricultural Nutrient Runoff With Wetlands Without Producing Greenhouse Gases (NYC-147309)

Principal Investigator: Joseph Yavitt

The Need

Since 1900, New York state has lost 60% of its wetlands as land was cleared for agriculture. Wetlands help improve water quality, store carbon, prevent soil erosion and provide habitat for many species. Cleared wetlands quickly lose agricultural productivity, as soils erode away. When farmland is abandoned and unmanaged, it can become cattail marshes, which are far less beneficial than forested wetlands. Wetland restoration, while beneficial for many reasons, can also lead to increased production of greenhouse gases like methane and nitrous oxide: As re-emerging wetlands trap more organic materials, the microorganisms that thrive in wet soils consume those materials and release more climate-disrupting greenhouse gases.

The Approach

This project sought to better understand the role of alder trees in restoring wetlands while mitigating greenhouse gas emissions. Alder trees work symbiotically with soil bacteria: The bacteria pull nitrogen from the atmosphere and make it available to the trees, and the trees give back sugar to the bacteria, benefiting both partners. The researchers took soil samples at the site of a wetland restoration project near Ithaca, New York, that includes abandoned agricultural land and is located near active crop cultivation and animal agriculture. They sampled three areas: an undisturbed wetland, a previously farmed returning wetland and a present-day farm. After analyzing those soil samples, the researchers mimicked soil microbial interactions in laboratory studies to understand how soil microorganism activity and growth rates react in the presence of alder trees, other plants that can use atmospheric nitrogen (“nitrogen-fixing plants”) and plants that don’t use that type of nitrogen as effectively.

The Impacts

Soil carbon storage in the undisturbed wetland site was much higher (>7.3%) than at either of the other sites. Soil carbon levels in the returning wetland were only comparable to levels at the active farm: 3.5% and 3.4%, respectively. Alder trees do help mitigate greenhouse gas emissions as wetlands recover; even though the soil microorganisms were producing more nitrogen, the trees were taking it up before it could be released into the atmosphere. Wetlands reforestation with nitrogen-fixing plants like alder trees also aids soil recovery, but slowly: The researchers project that restored wetlands at the site will need 26-32 years of tree growth to recover to 90% of their original capacity.

Critical Issue: Nutrition, Food Safety/Security, Obesity

Nutrition, Food Safety/Security, Obesity

Description: Projects lead to childhood obesity prevention; improved youth, family and community nutrition; and food security and food safety.

Program emphasis areas include: Healthy eating and Active Living, Food Resource Management, Decision Makers/Policy Education, Food Security and Hunger, Food Safety and Consumers, Food Safety and Producers/Processors/Retailers/Food Service Providers, and Food Safety and Decision Makers.

- Science Emphasis Areas
 - Family & Consumer Sciences Food Safety
 - Human Nutrition

Program participation in direct education events:

- Adult participants: 257,185
- Youth participants: 156,180
- Volunteers: 8,735

Overall indications of program success:

- 41,169 children and youth demonstrated knowledge or skill gains related to healthy eating and active living – 18,888 documented to have applied recommendations.

- 18,128 program participants adopted food resource management practices.
- 17,059 parents/caregivers and other adults demonstrated knowledge or skill gains related to healthy eating and active living – 13,167 documented to have applied recommendations.
- 6,622 consumers demonstrated knowledge or skill gains related to reducing food safety and/or foodborne risks and illnesses including recommended purchasing, handling, storage, and preparation practices - 6,405 consumers documented increased application.
- 2,085 program participants have acted to improve their food security status – 1,806 households documented status improved.
- 4,896 producers/processors/food service providers documented that they implemented new and/or increased application of ongoing safe food production, processing, storage, handling, marketing, and preparation practices.

Note: "Highlight" research projects are included below--since they termed 9/30/2021, this system does not have a systems-based ability to highlight them, as is the case for active projects.

Improving the Nutritional Quality of Sweet Corn (NYC-149429)

Principal Investigator: Michael Gore

The Need

Many American diets don't provide enough critical micronutrients like carotenoids (provitamin A, lutein and zeaxanthin), tocopherols (vitamin E and antioxidants), iron and zinc. The non-provitamin A compounds lutein and zeaxanthin are particularly important in delaying onset of age-related macular degeneration – a leading cause of irreversible blindness in elderly populations of Western societies. Improving the nutritional quality of crops through plant breeding – called biofortification – is a cost-effective and sustainable way to help address nutritional deficiencies.

The Approach

Sweet corn is one of the most consumed vegetables in the United States and a natural target for micronutrient biofortification. Despite its importance to plant function and human health, the genetics underpinning nutrient levels in fresh sweet corn kernels were largely unknown. This project involved mapping the genome of sweet corn to identify genes responsible for variations in micronutrients of fresh kernels, including provitamin A, vitamin E, iron and zinc levels. The findings of this genetic mapping study were used to develop and test crop-breeding prediction models, with the goal of aiding rapid and cost-effective development of biofortified sweet corn, appropriate for growing in New York and the Northeast. In initial breeding trials, as sweet corn kernels become higher in carotenoids, they become more orange; this could serve a promotional benefit, as consumers already identify orange vegetables (carrots, sweet potatoes) with eye health, and because consumers are increasingly seeking new colors, shapes and varieties in their produce.

The Impacts

The researchers successfully identified key gene associations – some unidentified before this work – responsible for concentrations of micronutrients in fresh sweet corn kernels, including vitamin E, provitamin A, iron, zinc, lutein and zeaxanthin. Initial modeling suggested that selecting for more zinc might also increase cadmium to dangerously high levels, but the researchers were able to learn how to select against cadmium while still increasing zinc. Collectively, these results will help enhance breeding efforts centered on improving the nutrition of fresh sweet corn kernels, with benefits to seed companies, growers, processors, consumers and rural communities in New York state and beyond.

Merit and Scientific Peer Review Processes

Updates

None

Stakeholder Input

Actions to seek stakeholder input that encouraged their participation with a brief explanation

Actions to Seek

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

Gaining stakeholder input and encouraging stakeholder participation is a system-wide expectation of all levels and units. Across the system, all of the stakeholder participation methods listed are employed; no single unit uses them all.

Cornell AES, NYSAES and CCE leadership works to identify external stakeholders that provide guidance by reviewing funding support requests.

In addition, we have 36 active Program Work Teams (PWTs). PWTs are made up of extension educators, faculty, and stakeholders who work together to determine, develop and implement priority programs within PWTs and to advise research and extension leadership as needed. PWTs are expected to nurture research-extension integration, to encourage campus-field interactions and collaborations, to take multi-disciplinary approaches, to evaluate their efforts, and to involve their external members in all aspects of their work. More than 1,500 individuals were involved in the work of these teams in 2021.

Beyond this state-level stakeholder input structure/process, each of Cornell Cooperative Extension's county extension associations continue to work closely with local stakeholders via participation in their local governance structures, i.e. board of directors, and advisory committees. In 2021, nearly 2,000 board and committee volunteers from diverse backgrounds participated and assisted in the direction, priority setting programs throughout the state, and over 12,600 volunteers assisted with program delivery adding to stakeholder involvement.

In local CCE offices, stakeholder input is sought from all audiences including under-represented or under-served audiences. One of the strategies used for gaining input and developing working relationships with new audiences is by networking and partnering with organizations that do have existing and strong relationships with target groups. Local boards of directors and advisory committees also recruit an intentionally diverse membership representative of the people and the needs in the community.

Effective involvement of youth in program determination and implementation is a priority. Our local advisory committees are expected to include youth members as part of the needs assessment and decision-making structure. In 2021, more than 890 youth reported serving in appropriate leadership, governance and program delivery roles statewide.

Methods to identify individuals and groups and brief explanation

Methods to Identify

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Across all levels of the system, all of the techniques listed were used; the mix of methods varied from site to site and program to program. All of our units are expected to have active and diverse advisory processes and to intentionally consider audiences not currently served. The activities of extension and research leadership, stakeholders, and PWTs are described in other questions in this section. Needs assessments, focus groups, and user surveys are conducted at the individual level of program units as well as in our PWTs.

As a method of tracking program needs and input received, CCE educators are expected to submit narrative reports of efforts including efforts intentionally planned to engage underserved populations. For the 2021 reporting year, over 23% of the 422+ impact statements were submitted exemplifying programming intended for underserved audiences: 4-H programs reaching new audiences through afterschool programming and working with other organizations, food and nutrition programs helping mothers, families and food pantry clients to cook well balanced, affordable meals, parenting programs focusing on families in high stress situations, energy education work with low income families, resiliency and hope building strategies for families everywhere, and agricultural programs focused on working with farm workers to build skills, and ensure food safety practices.

Methods for collecting stakeholder input and brief explanation

Methods to Collect

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

All of the techniques listed were used in 2021 but methods varied site to site and program-to-program across the system. Structures and processes for aggregating data are addressed in this section. The most active data gathering occurs through local advisory bodies, PWTs, and within the proposal review process. Web-based surveys, interactive webinars, and responses to social media also provide programmatic feedback.

A statement of how the input will be considered and brief explanation of what you learned from your stakeholders

How Considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

The stakeholder input process for statewide program development jointly utilized by Cornell AES, AgriTech at NYSAES and CCE was established in 2001.

Stakeholders and PWTs work to improve program focus, relevance, and planning activities. Stakeholder input informs Federal Capacity Fund priorities and provides project-specific input on the relevance and value of the proposed work. Stakeholders provide input that informs decisions around funding of current extension and research projects, contributing ratings of perceived relevance to New York State among other rating criteria. Statewide applied research and extension priorities are updated annually, communicated to faculty and staff, and used as a consideration in funding decisions.

County associations of Cornell Cooperative Extension work with their local boards, committees, and volunteers to influence decisions on program priorities and delivery. County extension associations and multi-county programs are separate 501(c) 3 organizations under the general supervision of Cornell University as agent for the state of New York. Their local plans of work are established under guidance of stakeholders in local advisory structures and governing boards and are in alignment with the statewide plan of work.

Stakeholders help to frame and shape plans of work, funding proposals, programs, and educational activities. System- wide Cornell Cooperative Extension Associations and PWTs have affirmed a commitment to the plan of work priorities and have elevated needs and opportunities to make use of campus resources for educational programs. Feedback from stakeholders is sought in a variety of ways,

welcomed, and considered for planning.

Highlighted Results by Project or Program

Critical Issue

Agriculture and Food Systems

Agriculture and Food Systems

Project Director

Celeste Carmichael

Organization

Cornell University

Accession Number

7000091

2020 Fruit Farm Business Summary Participant Farms Use the Customized Individual Farm Report to Assess Farm Financial Performance; Lake Ontario Fruit Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Fruit farm crops are capital-intensive, requiring a multitude of high operating expenses. In addition, expenses and revenue vary widely from farm-to-farm, year-to-year, and block-to-block. Expenses and revenue may accrue over multiple years for the crop production from one year. Also, in any given year, some acreage may not be in production yet because it has been recently planted. It is difficult for a grower to know from their accounting books the true expenses of growing their crop and the true profitability of their crops without further analysis.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The Lake Ontario Fruit Farm Business Summary serves as a tool to understand the true financial performance of the fruit farm. By analyzing the business books for a particular crop year, financial metrics are standardized which leads to understanding of true financial performance. Two transformations are key to this process: expenses and revenue are adjusted using the accrual method to represent the performance of the specific year of crop, and all acreage on the farm is accounted for to measure the performance per bearing acre (for apples, bearing acreage production is defined as above 150 bushels per acre).

Briefly describe how your target audience benefited from your project's activities.

The expense categories per bearing acre for the farm are compared side-by-side with the benchmark. Deviations from the benchmark serve as a starting point to examine expenses and understand potential for increasing profit margins. Follow-up consultation with the farm to review the reports generate discussion about the state of operations on the farm and business strategies. Feedback from the thirteen participants for the 2020 Summary is very positive – the analysis and meetings give insight into true farm performance and positive feedback for profitable management practices.

Briefly describe how the broader public benefited from your project's activities.

When Cornell Cooperative Extension Lake Ontario Fruit Program specialists work with producers individually with tools like the Farm Business Summary, management and accountability practices can be adjusted as needed to enhance performance and profitability. When farm profitability is strong, the local and regional economy is fueled by creating and retaining jobs.

Assessment and Update of Corn Yield Potential Database Using Yield Monitor Data to Refine Nitrogen Guidelines

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Farmers, farm advisors, and university staff have, for a long time, recognized the need to document corn grain and silage yields for their own farm management, as well as the need to update statewide databases that are the foundation for land grant university nutrient management recommendations for corn. Given a growing number of choppers have now joined the fleet of combines with yield monitors, more farmers are collecting yield information than ever before. We worked with farmers and farm advisors on documentation of farm specific yields (annual per farm, per field, per soil type within a field, as well as multi-year reporting), updating of the statewide soil-specific corn grain yield database, and generation of a new statewide-specific corn silage yield database.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The intended outcome of the project has been an updated Cornell corn grain yield database and a new corn silage database that takes into account realistic yield data and ranges in yields for the major agricultural soil types in New York. Recognizing that updates are only possible when multiple farms participate with data submission for multiple years, we included all data through the 2020 growing season in the assessment (about 230,000 acres). Individual farmers, donating their yield data to the project, received their personal farm report with yields that year and any other year for which data were submitted, yields per field and per soil type on the farm. We recently started to generate multi-year reports as well that show yield potentials per field. Many of the farms who participated with three or more years of data, are now making use of the multi-year report to determine feasible, realistic yields for each of their fields, and for soil types across their farm.

After the first draft of the yield data summary (data through 2019) was shared with the NMSP internal advisory committees (Cornell faculty/staff and Cornell Cooperative Extension educators) and the NMSP external advisory committee (state agencies, consulting firms, farmers, etc.), the general consensus was that yield potentials for all soil types in New York needed to be updated, and that a model had to be determined to convert from the outdated values to new values for both corn grain and corn silage. We also concluded the 2020 growing season needed to be included. The new yield databases were developed and shared with crop advisors and nutrient management planners in the state.

Briefly describe how your target audience benefited from your project's activities.

Each of the farms received their own yield reports and when at least three years of data were shared, farmers also received their multiyear reports. Summary findings were shared with larger audiences through extension talks. The approach was shared across state boundaries, in extension talks for the Mid Atlantic region, the Northeast region soil and plant analyses group, and at ASA/SSSA/CSSA annual meetings.

Agricultural and environmental sustainability require matching crop inputs such as nitrogen (N) and phosphorus (P) from fertilizer and manure for optimizing production and minimizing off-site environmental impact. Research shows that N losses from farm fields are primarily driven by application rates that exceed crop N uptake and needs and that high-yielding fields often require lower rates of N inputs. Farmers, farm advisors, and university staff have long recognized the need to document corn grain and silage yields and update the Cornell University database that is the foundation for Land Grant University N fertility guidelines and yield-determined P removal estimates. With a growing number of silage harvested now joining the fleet of corn grain combines equipped with yield monitors, and with a recently developed standardized protocol for data cleaning and processing, we now have the opportunity to update the existing corn grain yield potential database and develop a new corn silage yield database across the soil and geographic regions in New York.

This statewide collaborative project generated a database of over 230,000 acres of corn yield data. Data were collected by farmers and custom harvesters and cleaned of errors using a standardized data cleaning protocol and Yield Editor. Headlands were removed (not representative for the soil type). Yields per soil type within a field were derived by overlaying the soil survey maps and field yield maps. Yield histograms were derived for 58 soil types with sufficient grain data and 66 soil types with silage data. Segmented line models were fit to the data and new yield potentials were derived based on these models for all 600 soil types in New York, for silage and grain. New nitrogen guidelines were derived using the updated yield potentials, adjusting guidelines for a lower need for N per unit of output when yields exceeded 155 bu /acre at 85% dry matter, or 17 tons/acre at 35% dry matter. Findings were shared with crop advisors and nutrient management planners at December extension meetings for use in planning starting 2022.

Briefly describe how the broader public benefited from your project's activities.

The Corn Yield Potential project, which connects Cornell faculty, Extension staff, farmers, and consultants, makes use of field knowledge and campus research to help collaborators to better understand farm-specific yields (annual per farm, per field, per soil type within a field, as well as multi-year reporting), updating of the statewide soil-specific corn grain yield database,



Benchmarking Calf Growth and Performance on Northern New York Dairy Herds; North Country Regional Ag Team

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

According to several 2019 Agricultural Needs Assessment surveys distributed by CCE across the North Country, dairy producers identified a common theme that is limiting their calves' success. That theme being "You can't manage what you can't measure." Several dairy producers across the North Country think that their calves are growing and performing well, but have no way of quantifying this information and have no way of comparing their performance to industry gold standards.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

With this information, the CCE North Country Regional Ag Team Dairy Specialists organized a peer-to-peer discussion group consisting of 8 farms across the North Country. Early on it was emphasized that the goal of the discussion group was not to be a competition, nor was it designed to rank the 8 participating farms, but rather to encourage discussion, and for participants to learn from one another. The more specific objectives of the group were to: 1) measure transfer of passive immunity among newborn calves, and 2) calculate average daily gain across the pre-weaning period.

Briefly describe how your target audience benefited from your project's activities.

The results from this discussion group sparked great discussion amongst the participants, with one calf manager saying, "the info is really rich, and we can use it to make improvements on our farm. I'm interested in what the other farmers are doing and this feedback from them is helpful". Additionally, this project motivated some farms to implement changes to their feeding and management strategies to achieve better calf growth and performance. Continued follow-up with these farms has demonstrated huge improvements in both passive transfer and average daily gain. This is a great example of how CCE North Country Regional Ag Team Dairy Specialists work one-on-one, as well as in a group setting, with producers across the North Country on calf management. Lastly, this is a good example of how peer-to-peer discussion groups and benchmarking can be beneficial for dairy farmers.

Briefly describe how the broader public benefited from your project's activities.

When Cornell Cooperative Extension North Country Regional Ag Team Dairy specialists work with local dairy farms to facilitate peer to peer learning, and connect participants with relevant resources, relationships are built, and practices are improved as needed. Healthy farm economics and support, supports the local and regional economy.



CCE Dairy Podcasts Expand Virtual Learning Capabilities; South Central NY Dairy & Field Crops Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The pandemic significantly limited gatherings of people for workshops and regional educators were faced with challenges of providing educational opportunities for dairy farmers in a virtual setting. Virtual learning opportunities prior to this challenge were limited; regional dairy educators knew there were more ways to reach additional producers with a little effort.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

CCE Regional Dairy Educators across the state collaborated to create podcast series to expand virtual learning opportunities for dairy farmers. The first podcast series entitled, Dialing into your Best Dairy, was created. There are eight episodes in the series that focus on strategies and best practices that high performing herds use to be successful. A second series was created, entitled, Troubleshooting Herd Health Issues, which focuses on looking into health issues on dairies and includes 16

episodes. The dairy educators worked together to create content, record, edit each recording and produce each episode. Soundcloud hosts the podcast, and was shared via Cornell PRO-DAIRY's e-leader email list, as well as in team blog posts, YouTube Channels, and newsletters.

Briefly describe how your target audience benefited from your project's activities.

Between SoundCloud and YouTube there have been over 6,700 plays through the fall of 2021. Hoard's Dairyman Intel, a weekly e-newsletter, featured the podcast in several different articles. Hoard's reaches several thousand people weekly across the nation, and highlighted many of our episodes as they were released weekly. The podcast series were also highlighted as one of the top dairy podcast series in the US.

Briefly describe how the broader public benefited from your project's activities.

When the Cornell Cooperative Extension South Central NY Dairy & Field Crops Program seeks new ways to deliver learning opportunities, more producers are able to tune in to land grant resources related to the dairy industry that are intended to enhance management practices and support farm viability. Healthy farm economics supports the local and regional economy.



Cornell Cooperative Extension Increases Urban Food Yield with Integrated Pest Management

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

New York State is home to the nation's largest and most diverse city; New York. With over 8 million residents and iconic high-density skyscrapers; few would imagine the Big Apple as a burgeoning agriculture scene. However, New York City is home to 1,200 community gardens, 490 school gardens, 30+ community farms and a growing for-profit commercial urban agriculture sector.

The majority of New York City's 30+ urban farms are diversified vegetable operations. They deal with many of the same pest and disease pressures as rural farms but are also subject to pest pressures that are uniquely urban. For example, Two Spotted Spider Mite, has been found at damaging levels on at least 75% of NYC vegetable farms. This pest shortens the growing season for tomatoes by an average of four weeks. Cabbage whitefly, a recent arrival in North America, severely limits marketability of many brassica crops and has caused substantial crop losses of collards, kale, and broccoli on at least 40% of NYC urban farms since 2019. Not only are these pest complexes unique to the city (compared to rural farms), but urban farmers are also limited in their capacity to use typical control measures such as insecticides (organic or conventional).

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Cornell Cooperative Extension Harvest NY Urban Agriculture Specialists Sam Anderson and Yolanda Gonzalez provided technical assistance to 21 urban farms through phone and video calls, texts, emails, and farm visits. Insect and mite pests of vegetable crops were the foremost topic at many sites. CCE HNY successfully landed a Northeast SARE Partnership Grant to work with urban farmers on IPM strategies for Two Spotted Spider Mite, especially on tomatoes, developing a farmer-friendly scouting program and releasing biocontrols on five urban farms. Further the team partnered with NYS IPM to monitor populations of natural enemies on urban farms, create habitat for biocontrols; and lead workshops on pests of NYC vegetables and relevant IPM strategies. The team coordinated six educational sessions on urban ag pests and IPM practices, drawing over 130 participants. To further advance integrated pest management in this unique environment, through a new NESARE project, a trial exploring the effectiveness of biocontrols against cabbage whitefly will be implemented in 2022, the first ever of its kind. This has significant implications not only for NYC urban farms, but for rural vegetable farmers across New York—such as the state's 12,000 acres of cabbage—which may face these novel pests as their range expands with a warming climate.

Briefly describe how your target audience benefited from your project's activities.

In year one of the project most sites' tomatoes had succumbed to mites by the last week of August; after implementation of biocontrols, most farms achieved one to two additional weeks of yield from their tomatoes, representing additional revenue of \$500 to \$1,500 for each farm. Not only does this represent increased revenue for the urban farms, increased yields mean more local fruits and vegetables available to New York City residents.

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension's Harvest NY program has helped New York City's urban farms tackle the unique challenge of implementing integrated pest management (IPM) in a city. Specialists provided technical assistance, educational resources, and research partnerships that resulted in sustainable solutions that increased farm revenue and community access to healthy, fresh vegetables.



Deploying Laser Scarecrows in Sweet Corn to Reduce Bird Damage; Eastern NY Commercial Horticulture Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Ask any sweet corn grower what their biggest production issue is and I can confidently say that controlling birds just before and at harvest is it. Birds can destroy nearly an entire sweet corn planting if left unattended resulting in thousands of dollars being lost. Current strategies used by many growers include the use of propane cannons, bird distress and/or predator calls, air dancers and actual shooting of birds with shotguns. These all have their limitations and timing is critical – too late or too early and they may not work and most often we see a reduction in control the longer these strategies are used in the same field or farm. Most of these use some type of noise mode of action such as a loud cannon blast or amplified distress call of an injured bird. Over the years these types of noise controls have created issues with the grower and the public located around these sweet corn fields. Many towns and municipalities have instituted noise ordinance where these types of deterrents cannot be used at all or only during certain times of the day that do not necessarily align with what is needed to control the birds. It has also led to strained tensions between farm owners, neighbors and authorities.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Chuck Bornt, Cornell Cooperative Extension Vegetable Specialist with the Eastern NY Commercial Horticulture Program has been working with fellow University of Rhode Island researcher Dr. Rebecca Brown and former Cornell University Extension Specialist Ali Nafchi to develop and evaluate the use of specialized "laser scarecrows" to deter birds from sweet corn and reduce damage, especially in areas where noise deterrents cannot be used.

Briefly describe how your target audience benefited from your project's activities.

So far, we have been able to deploy 6 of these units on or around farms in the Capital District over the last 2 years. Research so far indicates that the scarecrows do significantly reduce bird damage, especially when they are allowed to be used with other devices such as the air dancers or propane cannons. In most fields, we are able to obtain 90% or better control by reducing the amount of damaged ears. Two farms that had one of these inexpensive units in 2018 were convinced by the preliminary results of the University of Rhode Island smaller units, that they purchased commercial units. They are also still using the smaller units in smaller fields that are not covered by the larger commercial units.

Briefly describe how the broader public benefited from your project's activities.

When the Cornell Cooperative Extension Eastern NY Commercial Horticulture Program specialists work with growers and communities, innovative solutions like Laser Scarecrows in Sweet Corn to Reduce Bird Damage can be developed and tested to meet the needs and concerns of stakeholders including neighbors to farms farm.



Development of a Weed Identification Network for New York State

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Weed management is a priority issue for Northeastern farmers, particularly with increases in organic production, interest in small-scale and urban farming, and herbicide resistant weeds. Weed management remains the major challenge for organic farmers that impacts yields, and herbicide resistant weeds are a growing problem for conventional farmers. Better weed identification is likely to increase yields through improved weed management practices. With the recent losses in weed science labs in New York including the Bellingier and Hahn labs at Cornell, there is a need to create a regional hub for weed

identification in New York. We propose developing a network for weed identification in New York, where CCE educators and certified crop advisors (CCAs) funnel difficult weed identifications to Cornell's Weed Ecology and Management Lab. This project developed a Weed Identification Network for New York State.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The NYS Agricultural Weed ID Network project built a network of Cooperative Extension educators and Certified Crop Advisors, who helped identify knowledge gaps in their grower networks. Cornell Cooperative Extension educators and Certified Crop Advisors, covering a majority of New York's agricultural districts were recruited. The network identified 50 samples across the three years; we identified over 100 mystery weeds from around the state and country, positively identified a new Palmer amaranth infestation, identified the first woolly cupgrass infestation, and identified the first woolly cupgrass infestation in New York.

The Network also provided weed identification trainings to network participants across the state, including weed seedling ID. Our ability to conduct workshops was reduced due to the COVID pandemic, but we did see an increase in participant knowledge. Because this objective was hampered by the pandemic, we pivoted to providing more online materials for long-term training resources, producing an expanded website with materials requested and vetted by our extension network. <https://blogs.cornell.edu/weedid/>

The NYS Agricultural Weed ID Network also created outreach materials for weed identification that are timely and relevant, including materials for 4-H to reach youth in farming areas. Success was defined as the production of 10 outreach tools. We produced 51 individual species profiles, a 4-H education module, a grass ID key, and identification resources, a mustard identification key and associated species pages, a guide to early spring rosette-forming weeds, maps to Palmer amaranth and waterhemp infestations, a guide to the identification of Palmer amaranth and waterhemp, four pdf resources for "Top weeds of" major New York commodities (no-till and tillage field crops, tree fruit, and muck onion vegetables), and a key to harmful weeds. The resources from this project will be maintained on Cornell's website, and we are pivoting the network we developed to shift towards active management of weeds in the face of climate-driven change.

Briefly describe how your target audience benefited from your project's activities.

Recipients of weed identification services often expressed their gratitude and their intention to use the information received to update their weed management plan. We sought feedback on our "Top weeds of" commodity pdfs from extension professionals and growers and incorporated their insights to produce more effective products. We received 21 participant surveys, with 36% reporting that they intended to use the information received in their farm management.

Briefly describe how the broader public benefited from your project's activities.

Effective weed management starts with weed identification; different weeds are best controlled with different management methods. When farmers and producers, families, CCE educators, and others make use of the NYS Weed ID Network and website to properly identify weeds and management practices, decisions are made that are likely to positively impact the environmental and family or farm economics.



Finger Lakes Grape Program Assists in Disaster Declaration, Giving Growers Access to Capital and Saving Farms

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

In early May, 2020, a significant portion of the Finger Lakes region was hit with a late cold snap, which resulted in significant bud damage in many Concord vineyards, particularly around Keuka Lake where the coldest temperatures were found. ConCORDs were affected more than other varieties in the area because they emerge from dormancy earlier and more rapidly when warmer temperatures arrive in late winter and early spring. Some vineyards in the area estimated the damage to be greater than 50%, which resulted in the loss of crop yield of that amount or more. This translated to hundreds of dollars per acre in lost revenue for these growers in 2020.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Shortly after the frost event, local representatives from USDA's Farm Service Agency contacted the Finger Lakes Grape Program to ask if the damage was significant enough to warrant a disaster declaration for portions of the region. The Finger Lakes Grape Program conducted field surveys in multiple vineyards in Yates and Steuben counties to document the extent of the frost damage and passed that information to the local FSA offices.

Briefly describe how your target audience benefited from your project's activities.

Based on the information gathered by the Finger Lakes Grape Program and representatives of Constellation Brands, and with help from the NY Wine & Grape Foundation, the USDA approved a disaster declaration for Concord growers in the Finger Lakes region. This declaration allowed growers who were significantly affected by frost damage to have access to low-interest financing from USDA, which helped them to continue to maintain their vines and their businesses until they received payment for the 2021 harvest. Local FSA representatives indicated that several growers took advantage of this program.

In 2021, we learned that one of the larger grape growers in the region experienced so much loss due to the frost that he was about to start selling off equipment and a significant amount of vineyard acreage. However, he was able to secure one of these loans from FSA as a result of the disaster declaration, and was able to continue farming all of his vineyards in 2021, which ended up being a higher profit year for Concord growers.

A very similar experience was reported by the CCE Lake Ontario Grape Program.

Briefly describe how the broader public benefited from your project's activities.

Viticulture and viniculture continue to be growing segments of New York state's economy, yet one closely connected with environmental and market variations. When weather created potential hazards for the vineyards. CCE's regional grape teams assisted growers and producers with timely alerts and updates to practices, helping farm businesses to exercise precautions and change practices. This educational intervention led to better use of time, money and human capital, reducing production risks, and helping to retain and create agricultural jobs, profitability, and market access to New York State wines.



Improving Workplace Relations between Farmers and Latino and Foreign-born Employees

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Labor shortages, turnover and poor workplace communications are critical concerns for farmers. Foreign-born workers are often confused about how raises, bonuses, and benefits relate to their performance. This project facilitates open communication between farmers and workers to develop farm specific approaches and tools to address communication, training, safety, turnover and production concerns.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Interviews with farmworkers form the basis for organizing workplace communication activities around specific topics. During year three, we organized and conducted 15 workshops for farmworkers in 7 counties on topics including how to improve workplace communications, how to navigate in rural communities, and how to link with legal support. These workshops provided educational support to 48 farmworkers.

We observed that our efforts to improve communication between farmworkers and their employers led to an increased understanding of and commitment to the farm business. This was particularly important throughout the pandemic when COVID health and farm safety guidance changed regularly. The open channels for direct communication with trusted professionals developed by the CFP reassured farmworkers that during this period of transitions and uncertainty their questions and concerns would be addressed in a timely manner. This critical communication and referral system provided a safety net for workers and their family members as they navigated through illness, periods of quarantine, school and daycare closings, and changing health and safety regulations. As a result, worker turnover decreased. Once workers understood their value to a particular farm, they were less likely to seek employment elsewhere. Workers were also interested in gaining a greater understanding of the content of the recently passed Farm Laborers Fair Labor Practice Law. This legislation recognizes their important role in the success of our food and agriculture system, they demonstrated a greater investment in their work and community life. This investment is also reflected in the desire to obtain ITINs, in order to prepare themselves and their

children for a positive future. As farmworkers understand the protections US laws offer them, they become increasingly invested in rural communities, their children's school life, and interested in obtaining better English language skills to participate in community life. The CFP received requests from 129 workers for free virtual English language lessons in 2021.

Briefly describe how your target audience benefited from your project's activities.

Our primary audience for this effort includes farmworkers (originating from Mexico, Guatemala, Jamaica and other parts of Central America), farm managers and owners. Through our workshops we were also able to share information with CCE extension educators, agency representatives from the NYS Department of Ag and Markets, NYS Department of Labor, and various farmworker health, education, and legal services providers. This year we developed training videos that form part of the new staff orientation curriculum for all new Cornell Cooperative Extension staff. After two years of developing workplace communication materials, in the latter part of 2021 we focused on outreach and providing other service agencies with access to our training videos, educational videos in Spanish, our website, the CFP's bilingual service directory designed to be cell-phone friendly, and distribution of our hotline number. Using the networks of the Western NY Farmworker Serving Agencies, Working Together, Cornell Cooperative Extension, the New York State Vegetable Grower's Association, the Migrant Clinicians' Network, and many more, the work funded by this grant can be widely distributed to thousands of farmworkers and farm employers across the nation.

The open channels for direct communication with trusted professionals developed by the CFP, reassured farmworkers that during this period of transitions and uncertainly their questions and concerns would be addressed in a timely manner. This critical communication and referral system provided a safety net for workers and their family members and as they navigated through illness, periods of quarantine, school and day care closings, and changing health and safety regulations. As a result, worker turnover decreased. Once workers understood their value to a particular farm, they were less likely to seek employment elsewhere. Workers were also interested in gaining a greater understanding of the content of the recently passed Farm Laborers Fair Labor Practice Law. This legislation recognizes their important role in the success of our food and agriculture system, they demonstrated a greater investment in their work and community life. This investment is also reflected in the desire to obtain ITINs, in order to prepare themselves and their children for a positive future. As farmworkers understand the protections US laws offer them, they become increasingly invested in rural communities, their children's school life and interested in obtaining better English language skills to participate in community life. The CFP received requests from 129 workers for free virtual English language lessons in 2021.

This effort has positively impacted the lives of hundreds of under-documented farmworkers in the North East, empowering them to lead more fulfilling work and personal lives in their adopted communities.

Briefly describe how the broader public benefited from your project's activities.

When communication is improved between farmworkers and their employers there is an increased understanding of and commitment to the farm business. This was particularly important throughout the pandemic when COVID health and farm safety guidance changed regularly. With support from the Cornell Farmworker Program and Cornell Cooperative Extension worker turnover decreased, benefiting farmworkers, their families, and the farms that they work on.

<https://cals.cornell.edu/global-development/our-work/our-initiatives/cornell-farmworker-program>



NY Fruit Farms Share Lessons Learned for Business to Thrive During COVID-19; Lake Ontario Fruit Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The onset of the COVID-19 crisis in March 2020 threw the operations of fruit farms into question for the 2020 season, especially those with direct marketing to the public, such as farm markets and pick-your-own operations. Many fruit farms determined that they would be able to open, following guidance from NYS and materials from Cornell University such as the Best Management Practices for U-Pick and the NY Forward Business Reopening Safety Plan templates for farms. Still, farm owners ran into challenges they could not have anticipated, such as large crowds. At the end of the year, there were many lessons learned by every farm. It would make sense to share those lessons with each other so all could benefit going forward.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Cynthia Haskins of the NY Apple Association organized a track of sessions for apple growers at the virtual 2021 Empire Producers Expo in January. She contacted me to organize and host a session on January 13 called “Apple Grower Roundtable: Dealing with COVID-19,” and put me in touch with Jessica Johnson of the NY Vegetable Growers Association to coordinate. I invited four apple growers from around New York State to participate on the panel. (Warren Abbott, Abbott Farms, Baldwinsville, NY; Mark Lagoner, Lagoner Farms, Williamson, NY; Amy Machamer, Hurd Orchards, Holley, NY; Alec Moore, Reisinger’s Apple Country, Watkins Glen, NY). In a Zoom meeting in the evening, these panelists shared with 25 other farms their challenges and their innovative solutions.

Briefly describe how your target audience benefited from your project's activities.

A challenge for all of the U-Pick operations was crowd control. Numbers were high: people were eager to get out of the house and do something outdoors that was safe and healthy. Associated problems with crowds were managing people during check-in and check-out, and preventing people from over-picking unripe fruit that would be better to let ripen. The panelists’ most interesting answers were to the question, “Of all of the changes that you made to the way you operate, which things are you going to keep doing, post-pandemic?” Answers included: we are going to keep our prices high and not undercharge; we are going to keep multiple check-out stations out in the orchard, where people are picking; and, we are going to keep selling by a fixed price for larger take-away containers, and do away with weighing purchases in arbitrarily-sized bring-your-own containers. All on the panel agreed that the most important quality they brought to the crisis was an ability and willingness to adapt quickly to unpredictable circumstances, and that they would need this character for the 2021 season, since they have learned that one never knows what the future holds.

Briefly describe how the broader public benefited from your project's activities.

When the Cornell Cooperative Extension Lake Ontario Fruit Program specialists bring together farm owners and operators to learn from one another and listen to needs collectively, relevant challenges, like working on crowd control in U-pick business during the pandemic, can be approached and addressed safely and effectively. This approach helped the broader public to continue to access fresh foods for families and communities through the pandemic.

 **Partnering with the Providence Farm Collective to Bring Programming to Minority and Low-Resource Farmers; Southwest New York Dairy, Livestock & Field Crops**

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

There are large populations of immigrant and refugee farmers in WNY. The populations in Erie County are supported by a group called the Providence Farm Collective, which provides land, knowledge, and resources to 8 ethnically diverse community groups to allow them to farm culturally significant crops. Those crops are then either sold or shared with their communities. While Providence Farm Collective is well versed in vegetable production, farmers had approached them with requests for classes on the production of livestock.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The PFC was awarded a SARE grant titled, “Developing a Beginning Farmer Training Program for Western New York’s Minority and Low-Resource Farmers”. I was invited to teach 8 1.5 – 2 hour sessions on livestock topics for beginning farmers. Following the council of each of the communities’ leaders, curriculum was developed for the following species: meat chickens, goats, hogs, honeybees, and specialty mushrooms. Students who participated in the meat chicken classes raised a batch of 25 slow-growth meat chickens (broilers) from chicks through processing. They then sold them to their local community. Those participating in the specialty mushrooms class were provided hands-on learning through making mushroom bags to take home and grow in their houses. The goats, hogs, and honeybees curricula connected farmers with successful local producers through field trips.

Briefly describe how your target audience benefited from your project's activities.

Between 3 and 20 students were present at each of the classes. The variability in attendance was due to the timing of the classes and if they overlapped with market days, other workshops, or school/work schedules. The classes most highly attended included the chicken and mushroom workshops. Students who attended all 4 classes gained the knowledge and permission of PFC to grow chickens within their communities. The chicken project inspired and empowered the communities

to raise chickens on their own, including one farmer who grew out 75 of his own birds alongside those on the project. He was able to sell all of the broilers he processed, further proving the community need for locally produced, culturally significant chicken. The students who took the mushroom class had success with their trial bags and went in together on a larger order of mushroom spawn and supplies to expand their enterprise. Those who attended the field trips are interested in learning more about their species of interest and potentially integrating the rearing of these species with other crops being raised at PFC or at satellite farms within their communities.

Briefly describe how the broader public benefited from your project's activities.

When the Cornell Cooperative Extension Southwest New York Dairy, Livestock & Field Crops team offers opportunities for beginner farmer training to minority and low-resource farmers, a “new generation” of individuals who know how to grow and produce food emerges. As individuals acquire technical information to invest in their small business which will lead to growth and stability for their businesses that can further contribute to the local economy through investing in jobs and the tax base.



QuickBooks for Farmers Course Meets a Growing Need for Virtual Farm Accounting Education; South Central NY Dairy & Field Crops Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Many farm businesses manage their own financial record keeping using QuickBooks software, yet few have formal training in bookkeeping or farm accounting. Understanding basics farm accounting principles, including transaction types and financial reports, helps producers set up and manage farm bookkeeping systems that are accurate and efficient, and provide useful information for financial analysis and decision-making. Access to information about a farm's financial performance helps operators make better business decisions, secure access to capital, and, ultimately, mitigate financial risk.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

After offering a successful in-person QuickBooks for Farmers class in 2019 and 2020, COVID forced the team to take its QuickBooks class online in 2021. Over the summer, our Farm Business Management Specialist developed and launched an online school using the Teachable platform. This platform is available to all team members for future development of additional online courses.

Briefly describe how your target audience benefited from your project's activities.

Our initial disappointment at not being able to meet in person in 2021 quickly disappeared when we realized that the online course format removed barriers to participation, including travel time, equipment availability, and software access, allowing us to reach more students. The online format also provided a winning combination of structure and flexibility, a key component of successful adult education programming. Students who wanted a structured, interactive course were able to complete each week's content in advance of the weekly webinar, participate in online forums and webinar discussions, and submit assignments for feedback. At the same time, students who needed more flexibility could work through the course material at their own pace and view the webinar recordings at their convenience.

Briefly describe how the broader public benefited from your project's activities.

As Cornell Cooperative Extension South Central NY Dairy & Field Crops Program specialists pivoted programs to be virtual during the pandemic, they found the audiences were ready to adapt to the new format. When farm businesses adapted to online teaching and learning strategies like learning how to use QuickBooks software with the guidance of Extension specialists, they were more able to apply the farm accounting principles for accurate and efficient financial decision making. Healthy farm economics and support, supports the local and regional economy.



Successful Development and Implementation of Peel Sap Analysis for Managing Bitter Pit Risk in Honeycrisp in New York State; Lake Ontario Fruit Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

There is a great need by the NY apple industry to improve bitter pit mitigation strategies of Honeycrisp trees via early detection and effective nutrient management.

NY growers can get a much higher wholesale price on 'Honeycrisp' than most other varieties. However, 'Honeycrisp' is highly susceptible to bitter pit, a physiological disorder related to calcium (Ca) deficiency. Based on reports from packing houses, industry representatives, and fruit extension agents in New York, Michigan, Pennsylvania and Washington, it is estimated that growers lose about 15~25% of the 'Honeycrisp' crop to bitter pit on average and up to 60~80% in extreme cases, which causes significant economic losses to New York apple growers.

It is highly desirable to assess bitter pit risk in the early or middle part of the growing season so that mitigation measures can be implemented in a timely manner to reduce the risk at fruit harvest and during postharvest storage.

Our research and extension team has developed significant expertise of tree nutrition, nutrient management/monitoring, and developed new analytical skills in order to better serve the NY apple growers. All this research has been led by Dr. Cheng and in close collaboration with Dr. Robinson and CCE regional fruit extension programs.

In the last five years, we started a series of nutrition studies and the development of a diagnostic tool to improve the understanding of Honeycrisp nutrient requirements.

Our main goal is to provide the peel sap test to all NY fruit growers who have established or will plant 'Honeycrisp' orchards in the coming years.

Compared with Other Methods for Nutrient Analysis, the Peel Sap Method is Simpler, Quicker, More Sensitive, Accurate, and More Environmentally Friendly.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

We delivered statewide timely fertilization programs for young and established orchards to promote growth, improve yield, and fruit quality (via 2021 NY Fruit School, farm visits, newsletter, fruit facts, e-alerts, technical tours, Fruit Quarterly magazine, other media publications).

We educated NY growers about the importance of pre-plant nutrients, maintenance & corrective programs, leaf & tissue analysis, fertigation, and foliar sprays.

We worked closely with Dr. Cheng, Dr. Robinson, Dr. Watkins, Dr. Rutzke, Scott Henning, and several growers of Lake Ontario Fruit Company in Orleans County, to develop the peel sap analysis for early prediction of bitter pit on Honeycrisp from 2017 to 2019.

The peel sap test was launched to the entire WNY apple industry in July 2020. This effort helped us to develop more key industry partnerships in the Lake Ontario region (C. VanAcker and E. Skellie).

In 2021, we successfully expanded the CCE effort on using fruit peel sap analysis for assessment of bitter pit risk in 'Honeycrisp' from the Lake Ontario region to the entire state (Lake Ontario, Hudson, and Champlain production regions).

Briefly describe how your target audience benefited from your project's activities.

Over 250 fruit peel sap samples were received from growers in 2021. They were analyzed and recommendations were made to growers within 7 to 10 days to allow for implementation of strategies to mitigate bitter pit before fruit harvest. This also helped us to fine tune the 'passive bitter pit' evaluation which gave greater information prior to storage of Honeycrisp.

Additional research efforts were also made to test the peel sap method in both Michigan and Washington in 2021, with the objective of offering the test to Honeycrisp growers in the two states in the coming years.

Briefly describe how the broader public benefited from your project's activities.

When the Cornell Cooperative Extension Lake Ontario Fruit Program works with growers directly to respond to the needs the apple industry as it has in studying diagnostics for nutrient requirements for Honeycrisp apples, growers gain insights for production and management that provides the public with a more consistent product taste and quality.

Climate Change

Climate Change

Project Director

Celeste Carmichael

Organization

Cornell University

Accession Number

7000092



Compost: Make it and use it to Build Soils, Reduce Drought Conditions, Reduce Contamination and Store Carbon

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Institutions, restaurants and grocery stores, municipalities and livestock operations have a common need; they all must manage organic residual (OR) materials or residual products derived by composting, fermentation, or digestion. The result is a variety of soil amendments, including compost. University scientists, Cornell Waste Management Institute (CWMI), Cooperative Extension, and agricultural consultants are being called on to evaluate these products and comment on their value or make recommendations about their use. What is their potential fertilizer replacement value? Do some products improve soil condition better than others? Are some products more suited to one type of cropping system or another? Can these products make soils healthier for growing food by binding heavy metals? While there is a growing database of OR available for use, there was no coordinated effort to conduct quality assurance or quality control of these products, nor is there a robust means to evaluate their benefits, such as fertilizer replacement value or soil quality improvement.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

CWMI developed tools/mechanisms to characterize composts for specific uses to increase both the production and use of composted materials. CWMI worked on OR blends that support different settings and audiences' settings and marketing compost for turf management, landscape construction, improving farm soils and erosion control etc.

Through conferences, workshops, and trainings, CWMI reached over 1,320 people with a total of 4,370 contact hours. CWMI's reach continued to expand as we worked with Extension educators from 45 counties and Extension, Ag & Markets, Soil and Water Conservation Districts, Natural Resources Conservation Service - USDA, the New York State Department of Environmental Conservation, Department of Transportation, and Environmental agencies from most states. The CWMI website, Blog, and eCommons received over 750,000 hits. All resource materials and videos are accessible through eCommons, Cornell's digital repository: <https://ecommons.cornell.edu/handle/1813/2146>.

Briefly describe how your target audience benefited from your project's activities.

Participants in this program included farmers, horticulture producers, Extension staff, Master Gardeners/Composters, homeowners, communities, universities, agencies, botanical gardens, and other garden programs.

Through partnerships, collaborations, and consistent communication, markets for compost in turf management, landscape construction, improving farm soils and erosion control for watershed protection increased. CWMI lead efforts for consulting with individuals and organizations to better manage soils contaminated by past practices in order to minimize health impacts. There was also improved soil fertility and carbon stored through an increase in the use of compost and organic residuals in all soil applications (agriculture, horticulture, roadsides, homes, and turf).

Briefly describe how the broader public benefited from your project's activities.

When Cornell Waste Management Institute works with Cornell Cooperative Extension to investigate community, enterprise, and organizational needs related to organic residuals, and leads educational efforts and technical training, the result is better management of organics, reduced municipal waste streams, and increased capacity for producing quality products from organic residuals.



In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Black and pale swallow-worts are highly invasive plant species that negatively impact agricultural and natural lands. In 2017, a leaf-feeding moth (*Hypena opulenta*) was approved for release as a biocontrol agent in the US. The Cornell Department of Natural Resources and the Environment worked with Cornell Cooperative Extension, researchers, land managers and landowners to establish a standard monitoring protocol and a recording system in order to track releases and ultimately inform our understanding of the effectiveness of this agent in controlling swallow-wort.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The Swallow-wort biocontrol in NYS project has included: informing the public about invasive swallow-worts, developing a monitoring protocol, creating a submission form for monitoring, establishing demonstration sites for educational purposes, and training land managers in the use of biocontrol.

Inform public and private land managers and landowners about invasive swallow-worts, as well as the availability of the new biological control agent *Hypena opulenta*. This past year, New York Invasive Species Research Institute Director Carrie Brown-Lima provided updates to the Partnerships for Regional Invasive Species Management (PRISM) network and all stakeholders on this project and swallow-wort biocontrol during monthly statewide calls, as well as at NYS Invasive Species Council Meetings. Collaborator Sharon Bachman shared up-to-date information via a talk at the 2021 North American Invasive Species Management conference, and Audrey Bowe of NYISRI gave a poster presentation at the 2021 New York Invasive Species Summit to share the project and recruit potential additional partners to participate in future releases and monitoring. We finalized swallow-wort outreach material and additionally, working with our CCE and Western New York partners, we held an in-person training to share results of the project.

Develop a simple standardized monitoring protocol to assess the survival and effectiveness of this swallow-wort biocontrol agent that can be utilized by landowners and land managers. In previous years, we worked with researchers to establish simple and standardized protocols for land managers to use in assessing survival of *Hypena opulenta* after release as well as monitor surrounding vegetation. We tested out and modified these protocols based on feedback from the 2021 field season. In 2021, we also added an additional type of monitoring: a survey to assess whether *Hypena opulenta* released in 2020 was able to overwinter as pupae at our field sites and emerge in the spring. To do so, we facilitated meetings to promote communication among a regional group of researchers working on swallow-wort in Canada, Rhode Island, Michigan and New York to agree upon a standardized method (and thus comparable) for surveying overwintering success.

Create an online submission form within the framework of the existing iMapInvasives database to record and store all *Hypena opulenta* release and monitoring data. In 2021 we created and vetted online submission forms using the ArcGIS Survey123 app that can be used to enter and share data pertaining to releasing, monitoring or assessing swallow-wort biocontrol. We had multiple meetings with iMapInvasives to discuss and develop these. Moving forward, we will use these templates as a starting point for wider discussions on capturing release and monitoring data for all biocontrols, not just for swallow-wort, and incorporating this into work that iMapInvasives and the New York Natural Heritage Program is doing to ensure that management “success” can be documented.

Establish *Hypena opulenta* demonstration cages in swallow-wort infestations throughout the state for training purposes. In 2021, we expanded our release sites and partnerships to cover 6 sites across northern, central and western New York. At each site, we met up with partners to establish or conduct vegetation monitoring at erect insect release cages. Our partners included over 20 staff and volunteers from the following organizations: St. Lawrence Eastern Lake Ontario PRISM, New York State Parks, Town of Clarence, Orleans County Soil & Water Conservation District, Thousand Islands Land Trust. Cages were monitored by trained partners and collaborators to assess the success of the initial releases, and data shared online.

Train land managers who plan to release the agents to identify swallow-wort and the biocontrol at all life stages as well as to use the monitoring protocol and enter the data into the online biological control release and monitoring form in the iMapInvasives database. In 2021, we worked with new and existing partners to conduct field releases and monitoring. To ensure the longevity of this project, we also finalized outreach materials and resources which will support the continuation of this approach when we are no longer able to provide in-the-field training or support. These include Survey123 monitoring forms that can be used in the field for easy monitoring and will integrate the data into the iMapInvasives database for long-term data storage. We also now have outreach materials including a “pocket guide” for monitoring moth establishment, informational pamphlets on swallow-wort, site signage and site agreement templates for establishing sites. Additionally, collaborator Maggie Mahr of CCE Yates developed a series of short videos sharing background on the project and instructions for monitoring. To tie all of the resources together and provide additional guidance, we developed the “Practical Guide to Releasing & Monitoring *Hypena opulenta*” publication which can be distributed to all statewide collaborators for future *Hypena opulenta* releases

Briefly describe how your target audience benefited from your project's activities.

Through presentations at various venues as well as working directly with our partners, we engaged with a range of professionals and citizens in New York and the surrounding region. Working directly with partners, we trained over 15 individuals from various organizations and regions on swallow-wort vegetation and biocontrol release monitoring. In July 2021, CCE Erie County also organized a gathering for community members at our demonstration site in the Town of Clarence in Western New York where we shared the project and visited a release in July 2021. With the conclusion of this project, we now have a package of resources that will facilitate the successful release and monitoring of swallow-wort biocontrol. We are partnering with the Eastern Lake Ontario Swallow-wort Collaborative and our other PRISM partners, as well as through CCE to advertise these materials and maintain a list of interested land-owners and organizations who would like to be included in the program once swallow-wort biocontrol agent availability is secured.

Briefly describe how the broader public benefited from your project's activities.

The Swallow-wort biocontrol in NYS project allows for better tracking and monitoring of black and pale swallow-wort, an aggressive invasive plant that disrupts the natural ecology and may overgrow native plants. When invasive species are monitored and managed early, negative ecological and economic impacts can be reduced.



Enhancing the Resilience of New York Communities through a Master Climate Volunteer Program

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

There is a need for adult climate change education and increased support of communities that are working on climate change at the local level. If we are to maintain the ability of our communities to function and even thrive in the face of climate change, citizens must understand why climate change poses such an extreme and imminent risk and be empowered with the knowledge and tools to act. Extension Master Volunteer programs forge a clear and ongoing link between scientists and front-line communities through well-trained volunteers who can serve as community opinion leaders for climate action.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

The Cornell Climate Stewards program was developed and piloted to train community members on climate science, climate change mitigation and adaption, best practices for communities to adopt to become resilient to climate change, communication, local government processes, and other related climate topics. A virtual train-the-trainer program was held over eight days in 2021 for CCE County Educators and New York Sea Grant Extension staff. In 2021, the program was piloted in six counties: Dutchess, Monroe, Kings (Brooklyn), Seneca, Tompkins, and Ulster. Fifty-two program participants were trained using the curricula and are now working on projects to assist their local communities to address climate change. In the first year of the program, we created a team that included NY Sea Grant Extension Specialists, Cornell professionals, and Cornell students who met regularly to plan and develop new materials, PowerPoint slides, videos, activities, and case studies for the climate change master volunteer curriculum (re-named Cornell Climate Stewards, following stakeholder input). We

developed a core team of Cornell Cooperative Extension (CCE) Educators to advise us on the curriculum in development and held our first training with this team at the end of year 1 to review the draft curriculum. Fifty-three trained participants are now working on individual volunteer projects to assist their local communities in addressing climate change.

Briefly describe how your target audience benefited from your project's activities.

Over three years and through COVID, a Cornell Climate Stewards Program was created. Curriculum was vetted twice with extension educators (CCE and New York Sea Grant) and agency experts. Curriculum then needed to be edited to fit a virtual format for both the training of the trainers and the piloting with community members in the six participating counties. After these COVID-19 related adjustments, fifty-two participants from across the state (Western NY, Central NY (Finger Lakes), Hudson Valley and New York City, completed the Cornell Climate Stewards training and are now working on projects to assist their local communities to address climate change. <https://climatestewards.cornell.edu/>

Briefly describe how the broader public benefited from your project's activities.

When trained volunteers from the Cornell Climate Stewards Program support their communities to become “Climate Smart Communities” by planning and implementing climate change mitigation, adaptation, and education projects at the local level, community members can build climate change literacy and solutions together, building a collective understanding and game plan.

Critical Issue

Community and Economic Vitality

Community and Economic Vitality

Project Director

Celeste Carmichael

Organization

Cornell University

Accession Number

7000096



Cornell Cooperative Extension Programs Advance Health Initiatives, Working on Vaccination Education and Addressing Social Determinants of Health

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

New York State communities continue to face widening health disparities, inadequate and inaccessible health care, and a lack of access to science-based health information. To address these challenges, public health researchers and practitioners have increasingly focused on the complex role of social factors in determining health outcomes. Cooperative Extension’s mission, and its 100-year history of improving community health outcomes through educational programming, position Extension very well to promote health and well-being by addressing the social determinants of health. Cornell Cooperative Extension educators have the knowledge, skills, and both academic and community relationships to improve community resilience, reduce (socioeconomic, geographic, and racial health) disparities, and advance health equity.?

At the national level, Extension’s community and public health work is focused on rural populations and communities. In New York State, our work is statewide and includes rural, suburban and urban populations and communities.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Statewide efforts for CCE’s Health and Wellbeing | Social Determinants of Health education programs seek to support and develop CCE staff so that they may partner with local health departments and healthcare systems to facilitate community health needs assessments and community health improvement plans, design educational programs that address the specific health needs of communities, provide professional development and support community-based coalitions and partnerships

that improve health outcomes and address health inequities. Specific topic work includes community resilience, vaccination resistance, nutrition, opioid use disorder, accessing community resources, public health essentials, parenting, and positive youth development.

During this last year a statewide community and public health workgroup was established, and it is working toward becoming a CCE Program Work Team. Grant funded projects were implemented including: the Rural Health and Safety Education grant and the CDC Vaccination Education Grant. The Rural Health and Safety Education grant is rolling out a comprehensive public health corps curriculum of the Cornell Master of Public Health (MPH) program to extension educators. Initial partner counties include: CCE St. Lawrence, Steuben, and Sullivan and the campus partner is the MPH program.?? The grant is using/promoting the use of the curriculum: <https://www.ny.gov/programs/citizen-public-health-training-program>? Other counties are seeking funding to build teams of collaborating community groups - <https://www.ny.gov/programs/new-york-state-public-health-corps>. The CDC vaccination education grant is working with CCE Delaware and Cayuga on a 9-month project to conduct a rapid community needs assessment on why rural adults age 21-55 are disproportionately NOT accessing COVID-19 and other vaccinations.? Other counties are also seeking funding to provide leadership for community engagement and local needs assessment work where educators engage with members of the community to better understand/educate about vaccination hesitancy.? The grant is using the needs assessment guidance found here: <https://www.cdc.gov/vaccines/covid-19/vaccinate-with-confidence/rca-guide/index.html>? CCE Association staff also assisted with contact tracing, helping with volunteer management for vaccine distribution , volunteering for vaccination, and promotion of vaccination education and clinics for the agricultural community - focusing on Hispanic workforce and farmworker vaccinations.

Staff also reported an increase in intentional partnership building to support community determinants of health work including creating healthy schools and breastfeeding coalitions, working on funded partnership programs (including lead prevention, vector-borne disease programs, water quality issues, sodium reduction and reducing sugary beverages), and partnerships with WIC.

Briefly describe how your target audience benefited from your project's activities.

Increased staff capacity and awareness has led to additional opportunities for county programs networked with local agencies and organizations. The need for and impact of vaccination education programs was demonstrated this year. For CCE Associations working on this work, families and farms participated in vaccination education programs and indicated aspirations to track/stay up to date with family vaccinations.

Briefly describe how the broader public benefited from your project's activities.

When Cornell Cooperative Extension Associations assist local community public health organizations, the community benefits from Extension's signature skills and community partnerships/collaborations. Encouraging healthy behaviors helps reduce health care costs by helping prevent chronic health conditions and providing safe environments throughout a person's life span. Trained nonformal educators and facilitators are critical to help change risky or unhealthy youth, family and community behaviors.



Farm to School Programs Promote Agriculture and Local Foods and Nutrition

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Interest in connecting the dots between local producers and school districts continues to grow. Farm to School is an effort that can help enhance the local economy and farm business, support the understanding of food systems in the community, provide healthy fresh food to youth.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Cornell Cooperative Extension's Farm to School programs in K-12 schools and early care and education sites engage young people in hands-on learning and empower school nutrition professionals to source and promote healthy, local food for school meal programs. Program design differs by location but may include procuring and promoting local foods, cultivating school gardens, and engaging students in agriculture, food, health, and nutrition education.

A peer-to-peer staff and stakeholder group, the Farm to School (F2S) Program Work Team has grown its membership to 161 members, representing an array of farm to school stakeholders from CCE, local farms, not-for-profits, public schools, and other entities. Members are using a listserv to ask and answer questions and share resources on a regular basis. In addition to recruitment and retention of new members the group has:

- Launched a new website on the Cornell College of Ag and Life Sciences platform, www.farmtoschoolny.com and here: <https://cals.cornell.edu/cornell-cooperative-extension/join-us/new-york-state-farm-school>. The site includes farm to school resources, including a map to find F2S coordinators by county, CCEs Harvest NY's NYS Foods Database for the 30% Initiative, and other useful resources and links.
- Hosted two educational webinars In March 2021, focused on adapting Farm to School during COVID, one webinar focused on procurement and the other webinar focused on programming. These recordings are available on the website.
- Partnered with NYS School Nutrition Association to compile an e-magazine *Fresh Bites* edition dedicated to Farm to School and the 30% initiative. [Fresh Bites: NY 30% Incentive Program Guide \(nyschoolnutrition.org\)](https://www.nyschoolnutrition.org/).

County/Regional Farm to School programming has emerged based on local needs and relationships. Examples include:

- **Erie County** held it's first 4H Dairy Steer Auction at county fair, schools purchase beef raised by youth, access to local and affordable beef.
- **Essex County** adapted creative ways to continue F2S education during COVID, expand F2S to Farm to Institution program.
- **CCE Regional Harvest NY Team** added and maintained F2S coordinator support, assisted F2S supply chain stakeholders, procured NY food products for students, created resources
- **Oneida County** developed F2S website that provides access to database of resources for teachers, parents and students, procuring local foods, training school cafeteria staff, introducing students to agriculture and careers in ag, helping ag businesses produce value-added products.
- **Ulster County** facilitated communication between food service directors and local producers, developing Harvest of the Month or NY Thursday campaign.
- **Warren County** adapted and tailored programming to meet needs of students in the program based on existing F2S curriculums, students participated in free and reduced lunch.

Briefly describe how your target audience benefited from your project's activities.

Cornell Cooperative Extension is uniquely suited to make and facilitate connections and any needed education in this area. Farm to Schools is a program that connects local producers to local schools. In some counties, F2S has been expanding and increasing access to food as well as resources for institutions and staff to use. Many counties procured food, educated students on agricultural careers, and trained school staff. Programmatic outcomes include:

- Increased access to healthy and affordable food for schools
- Local producers connected to schools and institutions

- New F2S programs developed in more counties

- Students participated in experiences focused on agricultural sector and careers

Schools were equipped with resources that can help them work with local producers to bring healthy foods to their students

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension's Farm to School programs in K-12 schools and early care and education sites engage young people in hands-on learning and empower school nutrition professionals to source and promote healthy, local food for school meal programs. Through Farm to School Cornell Cooperative Extension helps connect producers and school districts to provide access to healthy, fresh, local foods at school, and support the local food system and economy.



Taste NY Helping Local Businesses profit and Locavore Movement Grow

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The agricultural industry in New York State continues to grow at an exceptional rate. The state boasts more than seven million acres of farmland and 36,000 farms. The dairy industry is the largest part of New York's agricultural industry. The state has more than 4,000 dairy farms, is the fourth-largest producer of milk, and is the largest producer of yogurt, cottage cheese, and sour cream. It is the second-largest producer of apples and maple syrup in the country, and the top honey producer in the Northeast. Additionally, the state ranks first in the U.S. for the number of hard cider producers, second in craft distillers, third in breweries, and fourth for the total number of wineries. Taste NY was launched in order to help budding producers to understand marketing and production, and to encourage and serve the locavore movement. Cornell Cooperative Extension was sought as a partner in this work for our link to the local agricultural community, and our reputation for nonformal education in the community. Taste NY and the connected educational efforts can help turn good ideas and products into locally purchased items.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Taste NY was launched by the governor in 2013 to promote New York's food and beverage industries. Since then, Taste NY stores across the state have expanded with over 70 locations across the state and 12 sites are operated by Cornell Cooperative Extension, complete with extension education for producers and consumers. Taste NY highlights the quality, diversity, and economic impact of food and beverages grown, produced, or processed in New York State. Taste NY aims to create new opportunities for producers through events, retail locations, and partnerships.

In 2021 nearly 10,000 producers turned to Cornell Cooperative Extension to consider how to market and sell products through Taste NY stores. With roughly \$4 million in sales annually, the CCE Taste NY stores are helping New York agricultural entrepreneurs and producers to launch into big business. Over 1,000 participants reported improved business profitability attributed at least in part to program participation, and over 1,900 participants documented applying new knowledge or skills gained to strengthen existing business operations. These individuals were participants in Cornell Cooperative Extension's Ag Economic Development educational programs that are connected to Taste NY stores.

Several Cornell Cooperative Extension Associations are working in support of this effort, acting as a liaison between farmers and retail stores to increase the NYS value add product. Activities range from building sustainable business practices to growing the locally grown movement. Cornell Cooperative Extension helps agricultural businesses with many aspects of product development, including assessing local needs, branding, and retail sales, as well as increasing farm production and sustainability practices. The intended effort is building a community where people can buy and create local products, enhancing community sustainability and driving economic impact through a multiplier effect. On the front-end Taste NY stores offer physical stores, curbside pick-up, and online platforms for ordering.

Briefly describe how your target audience benefited from your project's activities.

The agricultural industry in New York State continues to grow at an exceptional rate. The state boasts more than seven million acres of farmland and 36,000 farms. The dairy industry is the largest part of New York's agricultural industry. The state has more than 4,000 dairy farms, is the fourth largest producer of milk, and is the largest producer of yogurt, cottage cheese and

sour cream. It is the second largest producer of apples and maple syrup in the country, and the top honey producer in the Northeast. Additionally, the state ranks first in the U.S. for the number of hard cider producers, second in craft distillers, third in breweries, and fourth for the total number of wineries. Taste NY and the connected educational efforts can help turn good ideas and products into locally purchased items.

See one store's example: [2020 Taste NY Impact Statement - Todd Hill](#)

Briefly describe how the broader public benefited from your project's activities.

When local agricultural producers are provided educational support from Cornell Cooperative Extension and a direct opportunity to pilot sales through Taste NY, good ideas and products turn into locally purchased items, enhancing the local economy and assisting local small businesses.

Critical Issue

Environment, Natural Resources, Sustainable Energy

Environment, Natural Resources, Sustainable Energy

Project Director

Celeste Carmichael

Organization

Cornell University

Accession Number

7000093



Increasing Understanding of Issues Around Large-Scale Solar Development

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The rapidly evolving landscape of large-scale solar development (>25MW) across NYS has brought concerns from various stakeholders, including municipalities, farmers, and other community members. As the state rolls out the Climate Leadership and Community Protection Act, these developments are rapidly increasing. All of which has brought some misunderstandings and outright spread of misinformation.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Cornell Cooperative Extension Staff and Stakeholders on the Community and Energy PWT and local and regional Ag Educators raised their understanding of the issues through collaboration with campus researchers and by collecting print and online resources and presentations. The group then developed a larger scale professional development conference to raise the system's knowledge and understanding of the issues.

Briefly describe how your target audience benefited from your project's activities.

In early April 2021 a two-half-day remote conference was held, bringing in experts to speak on topics including a general overview of the Climate Leadership and Community Protection Act and the Office of Renewable Energy Siting, research on co-siting solar with sheep and agricultural products, legal considerations for landowners thinking about legal considerations for landowners thinking about leasing their land, land assessments, municipal tools for protecting Ag land, solar siting, and local and regional impacts of large-scale solar development. Over the two days we had 123 unique attendees including 66 Ag educators and 19 executive directors. Continued meetings are occurring (weekly through the summer and biweekly since ~September) continued information to the system through the PWT and an Ag & Solar listserve that was created. A resource library is in development.

On a statewide scale, it is important to note that Cornell Cooperative Extension has seen an increase in the number of staff reporting work on energy related issues. While staff across the state ramped up to be ready for solar farm community education issues, educators in Broome, Cortland, Dutchess, Oswego, Schoharie and Otsego, Tompkins, Ulster, and Yates and educators in the Eastern NY Commercial Horticulture and North Country Regional Ag Team reported offering programming and discussion opportunities for communities who are addressing solar farm issues. In 2021 87 communities documented assessing local energy development proposals, including solar farms, with the assistance of Cornell Cooperative Extension staff.

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension Associations across New York State are inherently listening for needs and urgent situations where facilitation and connections to land grant universities could provide clarity. When Extension educators from across the state organize to provide venues for local communities to learn and listen together, faculty and staff better understand the issues at hand, and residents and communities have a non-biased arena to learn and share to make reasonable decisions that benefit the community, environment and economy.



Sustainable Energy Education

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The economic impacts of the pandemic continue to plague families, businesses, farms, and communities, accelerating the need for energy transition and cost mitigation. This momentum adds to the initiatives happening across New York to enhance clean energy and energy conservation including adoption of a clean energy agenda that calls for 100% clean power by 2040, sets New York on a path to carbon neutrality across all sectors, and accelerates the climate infrastructure buildout already underway. New York's goal is to achieve 70% renewable energy by 2030, and reducing greenhouse gas emissions 85% by 2050 <https://www.nyserda.ny.gov/About/Publications/Program-Planning-Status-and-Evaluation-Reports/Strategic-Outlook>.

To achieve the educational component of these goals, New York State Energy Research & Development Authority (NYSERDA) is working with Cooperative Extension Associations in many regions of the state to train volunteers, and on energy conservation practices as well as eligible energy programs that provide lower costs, reduce reliance on fossil fuels and oil, conserve energy, and create safer indoor environments.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

CCE associations are currently leading the work in energy education and outreach in 4 of 10 of the state's economic development regions through the [Community Energy Engagement Program](#). Through our current work we reach tens of thousands of residents a year--mostly households with limited income--through outreach at food lines, through key partnerships, and through media, and help thousands of these with energy-related questions and connecting them to programs that help them reduce their energy use, save money on their bills, cut their carbon emissions, and transition to clean energy. NYS through the CLCPA is ramping up the energy transition, and there is increasing funding and resources to help with both the shift (incentives for households), training for the workforce, and resources for educators (like CCE staff).

The goal of this project is to develop a Cornell Cooperative Extension programs across NY. Project objectives are to:

- increase the number of CCE county associations engaged in EE/RE extension programming,
- expand the number of energy-related partnerships with Cornell University faculty and programs and with key collaborators around the state, and develop and test approaches that are effective, appropriate and scalable for use across the state.

In 2021 Cornell Cooperative Extension Educators in Chemung, Cortland, Delaware, Dutchess, Madison, Schuyler, Sullivan, Tompkins, and Yates counties provided learning opportunities in many delivery modes intended to reach specific audiences on the following sustainable energy initiatives:

Consumer Education:

- Community Energy Engagement Program
- Access to NY energy programs
- Reducing reliance on oil
- Social media outreach
- Work with low-income communities
- Hold community events

Energy Conservation:

- Workshops
- Help individuals make decisions about upgrading their homes
- Conduct energy auditing
- Earn grant awards to fund energy efficiency projects

Clean Energy:

- Interactive campaigns to encourage clean energy use
- Demonstrations clean energy with tiny house

Briefly describe how your target audience benefited from your project's activities.

Households have been able to access new technologies that improved the quality of air and reduced energy costs. There have been increased awareness and practice of energy conservation/clean energy practices. Utility bills have decreased.

Overall indications of program success:

- 1,005 consumers reported that they adopted appropriate energy cost control and/or conservation practices
- 416 consumers reported savings on energy costs attributable to adopting energy conservation measures
- 433 consumers reported savings on energy costs attributed to adopting alternative energy sources

- o 200 agricultural/natural resource producers, organizations and business representatives, community leaders, and/or residents documented that they modified existing practices or technologies that will assist with natural resources management and the environment
- o 87 communities documented that they assessed local energy development proposals and/or the relationships between current policies and regulations and energy conservation

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension Associations across New York State are offering Energy Education programs to households, businesses, farms, and communities. When participants change practices to opt for cleaner energy or conserve energy, they are helping NYS to make progress towards creating a healthier climate and often saving money.

Critical Issue

Nutrition, Food Safety/Security, Obesity

Nutrition, Food Safety/Security, Obesity

Project Director

Celeste Carmichael

Organization

Cornell University

Accession Number

7000094



CCE's Seed to Supper Program Adapts and Assists Families in 2021

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Seed to Supper is a comprehensive beginning vegetable gardening curriculum designed for adults gardening on a budget. The program has been adopted by Cornell Cooperative Extension of New York State as a shared program of Oregon Food Bank's Seed to Supper Program. Partners across New York, including CCE Master Gardener Volunteer Programs, are working to train volunteer Garden Educators who will then teach the Seed To Supper curriculum to interested community members. The courses highlights practical, low-cost techniques for building, planning, planting, maintaining, and celebrating the harvest of a successful vegetable garden.

In the wake of Covid-19, the 2021 Seed to Supper growing season was challenged by delays and uncertainty, prompting unforeseen modifications, but also novel innovations to the program. The protocols and precautions that emerged in response to the pandemic had a huge effect on how each county rolled out their program. Recruitment efforts, scheduling, and attendance were all seriously impacted by Covid restrictions, nevertheless, counties found ways to pivot on short notice and come up with creative solutions. Many of the adaptations to the program, such as digital learning formats, outdoor demonstrations, and modified scheduling were responses that turned out to have unexpected positive outcomes. The flexibility built into the S2S program allows counties to go beyond the basic framework of the curriculum and come up with programs that are uniquely adapted to the situation at hand as well as the needs of their communities.

Adapting the program successfully is a collaborative effort; counties rely on partnerships with local community organizations to create effective programs. Community partners help to recruit participants, design the program, and deliver the curriculum. Since they often uniquely understand the barriers, obstacles, and opportunities within the community, involving engaged and committed community partners brings sensitivity and life to the program, and draws it closer to the goal of empowering people and communities through gardening.

Each county faces vastly different circumstances - including the populations they serve, the community partners they work with, and the resources available to them. Working with the basic framework provided by S2S, each county responded to their unique situation differently, coming up with new approaches and creating a wide array of distinct strategies for delivering the program. Every county displayed creativity, ingenuity, and flexibility, so there is much to learn from each of them.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

There is a vast array of lessons learned from each county in 2021, but they can be categorized into 4 groups: Retention, Session Format, Scheduling, and Community Partners. Each of these areas is recapped below.

Retention:

Attracting the target audience, and then maintaining consistent participation is often the foundation of an impactful program. There are several key takeaways from counties that had good retention of participants:

- Working with community partners who understand the community helps to get the word out to the target audience and lead to more sign-ups.
- Providing materials, seeds, and other 'giveaways' at each session can incentivize participants to come back week after week. Timed appropriately, (i.e. providing seeds at the right time of year for them to be planted, and coordinated with the lesson), can be encouraging and motivating to participants.
- Consider barriers that prevent participation, such as internet access (if sessions are held online), childcare (especially for mothers with young children), and language. Proper planning can help to overcome these barriers.

Session Format:

The way that the S2S curriculum is implemented varies from county to county. 2021 had many adaptations:

- Since many counties could not hold programs inside due to Covid protocols, hybrid models were used that included holding sessions outdoors and utilizing digital learning platforms.
- Outdoor sessions allowed for live demonstrations and

hands-on practice in the garden, which participants appreciated, but they are also subject to weather and other unforeseen circumstances.

- Varying the activities keeps the sessions interesting and fun. Switching between presentations, demonstrations, hands-on work, and cooking are great ways to keep participants engaged.

Schedule:

Considering the difficulty of holding programs indoors, many counties adapted the schedule, truncating or condensing the sessions. Some of the scheduling adaptations promoted participation while others seemed to deter. Successful adaptations included:

- Number of sessions: Too few sessions (two or less) seem to deter participation as there is not an opportunity to make-up a missed class. Several counties had success with 3 - 6 sessions.
- Session Length: 1.5 - 2 hours seems to be ideal
- Time of day: programs during the day often conflict with participants working schedules. Keeping participants schedules in mind during after-hours times or weekends worked best.

- Outdoor sessions are great, but are also subject to weather delays or other unforeseen conditions, so it's important to be flexible and have a backup plan.

Community Partners:

Community partners are often the bridge to the community. Forming successful partnerships requires trust and strategic planning from the outset, but strong collaboration produces programming that is likely more comprehensive, community focused, and reaches the target audience. Key takeaways included:

- Assessing the strengths of all partners involved, and divide tasks accordingly, including recruiting participants and teaching sessions.
- Working with public libraries, food banks, community gardens, 4-H clubs, MG volunteers, SNAP-Ed, affordable housing, and other non-profits expand the reach of the program and provide resources.
- Partnering strategically with organizations that are already working in the community, they will have the best info on barriers, opportunities, and assets.
- Building trust and mutual respect between Community Partners strengthens the program.

Briefly describe how your target audience benefited from your project's activities.

Impact reports completed by each county as well as surveys filled out by participants before and after the program offer valuable insight on the reach and impact of S2S. While there are many intangible benefits to gardening, the impact seen in S2S falls into three main categories: (1) Improved Health and Well Being (2) Confident and Self-Reliant Gardeners, and (3) Stronger Communities.

Through the program, participants were equipped with knowledge and gardening materials, allowing them to grow their own produce. At the end of the growing season, many reported eating a healthier diet, rich in home-grown vegetables and herbs, and feeling reduced stressed levels due to working in the garden, among other positive benefits.

Additionally, the program gave participants the hands-on experience and confidence they needed to grow some of their own food, reducing dependence on unhealthy food options, and increasing their ability to eat according to their preferences.

Finally, S2S brings together local organizations to achieve a common goal, which strengthens the program and the community. Participants reported getting to know their neighbors, and feeling a stronger sense of community and connection. While the most direct goal of S2S is to increase food security, the overall impact of the program reaches even further. Through gardening, participants learn not only to plant a seed and harvest their own food, but experience firsthand the joy of gardening leading to a greater sense of wellbeing, health, and connection to their community.

Post program evaluations indicate that 72% of participants intend to eat more vegetables, 93% learned basic gardening skills, 100% are confident that they can grow their own food, 95% indicated that they will grow their own food next year.

Quotes from participants supported survey data, including: “The seed to Supper course taught me fantastic gardening techniques, offered me seeds and plants to get started and made me a more confident gardener and helped me to provide myself and my family with fresh homegrown fruits and vegetables to eat!!! It gave me a confidence that I didn't have before. I feel empowered and already am looking to next year.”

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension's Seed to Support program efforts enhance residents' skills and confidence in growing their own food. Access to an adequate, safe, affordable, locally grown food, particularly for low-income households in food deserts, leads to a healthier population, which in turn helps keep health care costs in check and our communities viable. Innovative, and intentional adaptations to programs, particularly during the pandemic, has allowed Seed to Supper's increasingly relevant work to continue to bring people together to invest in work for individuals and communities.



In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The goal of Cornell Cooperative Extension nutrition education programs is to improve the likelihood that families and youth will make healthy food and lifestyle choices that prevent obesity. A primary audience continues to be adults receiving supplemental assistance as adults with very low food security are 53% more likely to have a chronic illness, and have 47% more emergency room visits and hospital admissions.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Cornell Cooperative Extension has a number of food and nutrition education programs at work across the state – SNAP-Ed, EFNEP, local food and nutrition education programs, and youth educators work collectively to prevent obesity and the risk of diabetes, high blood pressure, and heart disease. Nutrition education programs are delivered in a number of ways – including workshops, one-on-one delivery, and social media campaigns.

The following examples are from Extension programs from across New York State.

- Steuben County: 4-H Cooking Camp with EFNEP held cooking classes for families to teach them about healthy cooking and recipes. This was done as a preventative measure for prevalent health issues related to obesity. They learned about planning and preparing healthy meals, grocery shopping for healthier foods, and the importance of physical activities.
- Rensselaer County – The Capital Region SNAP-Ed offers free nutrition lessons to schools that provide 60% free or reduced lunch to their students. This past year, they held 180 nutrition classes that reached about 730 students. Teachers and students committed to behavioral changes as a result of the class.
- Tompkins County – CCE Tompkins' Childhood Nutrition Collaborative identified the need to support the existing community through resources such as SNAP. They increased enrollment to the program by expanding SNAP outreach.
- Hudson Valley – CCE SNAP-Ed expanded programming to include those who are deaf/hard of hearing after being contacted by an agency about their interest in nutrition education
- Jefferson County – FreshConnect Food Box and CCE Jefferson County SNAP-Ed collaborated to offer nutrition lessons, food demonstrations, recipes, and resources on a weekly basis to 4 different senior housing sites.
- St. Lawrence County – CCE collaborated with the Department of Social Services to provide nutrition education and how it impacts daily living, especially in the pandemic when everyone is at home most of the time.
- South Western SNAP Ed – CCE Mobile Market brings fresh and nutritious food to community members who may not have access to a local grocery store or farmer's market.
- Fruit and Vegetable Prescription Program (FVRx) – multiple counties' SNAP-Ed programs have collaborated with the FVRx program to provide SNAP recipients with more access to fruits and vegetables. The program aims to reach those who are medically at risk or have a diet-related chronic disease, and those who struggle to purchase healthy foods for families. SNAP-Ed has worked to acquire funding and grants to provide vouchers for those in need.
 - South Central NY Fruit & Vegetable Prescription Program (FVRx) is working to impacts of high rates of food insecurity and diet-related disease by utilizing the region's agricultural resources. The FVRx program allows health care providers in the community to write prescriptions for fresh fruits and vegetables. Patients receive vouchers to spend at local farmers' markets, farms stands, and other retail options – giving additional

purchasing power to people who need it most. Participants receive support and education throughout the program, and can attend additional nutrition, cooking, gardening, and chronic disease self-management classes.

- The Fruit & Vegetable Prescription Program (FVRx) was launched as a pilot in 2017 at two primary care offices with funding from Care Compass Network. This summer it will be offered in 13 locations in Broome, Tioga, and Delaware Counties. The FVRx program is made possible by funding from the Mother Cabrini Health Foundation, and support from many local partners and Wholesome Wave.

Briefly describe how your target audience benefited from your project's activities.

Overall indications of program success:

- 41,169 children and youth demonstrated knowledge or skill gains related to healthy eating and active living – 18,888 documented to have applied recommendations.
- 18,128 program participants adopted food resource management practices.
- 17,059 parents/caregivers and other adults demonstrated knowledge or skill gains related to healthy eating and active living – 13,167 documented to have applied recommendations.
- 2,085 program participants have acted to improve their food security status – 1,806 households documented status improved.

Briefly describe how the broader public benefited from your project's activities.

Extension Nutrition Education Programs provide experiences and support to help individuals and families to make decisions that will provide better nutrition and ultimately health. Good decisions for nutrition and health for individuals and families reduce overall health care costs and contribute to personal well-being. With increased knowledge and self-confidence about nutrition, physical activity and living a healthy lifestyle, participants and other community members benefit by preventing or postponing the onset of disease, by healthy eating and active living.

Critical Issue

Youth Development/Children, Youth, Families

Youth Development/Children, Youth, Families

Project Director
Celeste Carmichael
Organization
Cornell University
Accession Number
7000095



4-H Geospatial Science and Technology

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Geospatial science and technology is pervasive in our everyday lives, in commerce, government and academic endeavors. International and US agencies recognize the value of geo info to meet sustainable development goals, create high tech jobs, support effective policy making, and improve citizen services.

In NY, state and local GIS equipped agencies provide for community wellbeing. While most are exposed to mapping applications through apps and directional software, the more technical side of geospatial science remains relevant but less accessible. There is a need for youth and youth educators to have opportunities and experiences with geospatial science and technology to enhance readiness in the classroom, for potential careers, and in their lives.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Over the course of the three years of this project, we have worked to build capacity among extension educators in geospatial science and technology through workshops, camps, training, and resource development. Specifically, the focus has been on GPS, Geographic Information Systems, remote sensing and community mapping concepts, and skills instruction. We collaborated with faculty to expand science content to include watershed management through the Roadside Ditch mapping Project. The 2020 CCE interns were instrumental in writing and pilot-testing the activities. The Soil Moisture unit had unexpected popularity and interest in the Soil Painting component of the curriculum. As a result of the input from participants, we shifted the focus of the soil unit to soil mapping and interpretation. Finally, we were able to successfully pilot an accessible chlorophyll extraction process and incorporate it into the Plants Glow! activity series. The synergy of this program with many existing extension initiatives leverages the power of the Cornell Cooperative Extension system to create a respected and effective capacity-building effort.

Despite the pandemic, the 4-H Geospatial Science and Technology Program team maintained regular communication with staff, 4-H GGLEAD youth club meetings, and engagement with a wide range of 4-H initiatives. Over 200 hours of workshops, Program Work Team collaborations, and support of New York and National 4-H projects. The team engaged with many groups leveraging existing opportunities to provide instruction and resources and to continue to build a geospatial community to support educators and youth.

- CCE Summer intern - hosted by CCE Broome

- NY STEM Camp, Soil Painting and Story Maps presentation

- NYSACCE4-HE conference planning, Professional Development Committee

- NYS GGLEAD 4-H Club, monthly virtual meetings with teens from around the state providing technical training

- National GGLEAD team, NY youth participation on national team

- National 4-H Task Force, NY educator participation

- 4-H Healthy Living Summit, mapping health data in a presentation by youth for youth

- Professional Development, attending 5 part 4-H Positive Youth Development training

- 4-H STEM PWT geospatial program representation

We also initiated partnerships with new faculty at Cornell representing:

- Cornell AgriTech, Drone and remote sensing applications in agriculture

- o CHE, Design and Environmental Analysis, Research on youth experiences in place-based recreation and learning

- o g, spatial thinking in Playful Plants garden experiences

- o SIPS, Soil and Crop Sciences, Translating digital agriculture concepts and applications into youth-focused geospatial activities

Briefly describe how your target audience benefited from your project's activities.

Youth, families, and Cornell Cooperative Extension staff have participated in workshops, events, and activities. The impacts and outcomes of the 4-H geospatial program indicate that there is more activity in families and communities, where there is professional and resources development.

Professional development for staff, volunteers and youth leaders was multiplied into communities and youth and families. Over 100 soil painting kits were prepared and distributed, 4-H youth presented at the National 4-H Healthy Living Summit presentation: Where's the Food?, youth experiences at camps and workshops indicated youth exposed to geospatial technology became more curious and interested.

In training sessions, we record specific immediate feedback from participants. In workshops with youth, we invite honest reflections in 1. Conversation and 2. Writing, observe participation levels, and as a teaching team review observation towards activity and workshop improvement.

Example successes:

- o A youth participant's parent reflected on her child's experience: Her daughter attended the NYS STEM Camp with youth from other counties. The girl had a great time and enjoyed the activities at NYS STEM Camp in the Art with Tech program. (VR, StoryMaps, Soil Painting) She even had a lab coat that says I love science on it, which she wore all day!
- o Geospatial Play Day for Youth at CCE Orange Education Center and 4-H Park. Youth learn by doing, creating a StoryMap to report on full day workshop. <https://storymaps.arcgis.com/stories/bc93f6bada48413db9b6440a83346927>
- o CCE/Office of Engaged Initiatives Summer Intern. A math major, Robert brought analytical skills and youth work experience to the development of chemistry activities for the Plants Glow! Curriculum.

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension professionals and the youth and families that they work with have access to geospatial science opportunities and experiences with Global Positioning System (GPS), Geographic Information Systems (GIS) and remote sensing (learning from a distance) that are intended to help spark interest in STEM topics and enhance readiness for the classroom and beyond. Youth who participate in mapping projects for resource inventory or community issue exploration are more likely to become informed citizen decision-makers and develop leadership and STEM skills for the future.



4-H Thriving Model Assists Programs in Reaching Youth Development Outcomes

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The 4-H Thriving Model describes the processes that we use to support positive youth development in 4-H. Creating and sustaining high quality developmental contexts in 4-H programs and designing activities that promote thriving are key to 4-H youth achieving developmental outcomes. This model was developed by Dr. Mary Arnold of Oregon State University is now being tested and adopted in states across the country as our 4-H theory of change. Ongoing staff professional development has helped educators to plan with the end in mind, tending to the developmental context of programs for Youth and Families.

The example below from one county builds on the 4-H Thriving Model and applies it to the virtual environment.

- o **From Cornell Cooperative Extension in Livingston County:** The pandemic has significantly and negatively impacted our traditional approach to providing this context from which to learn. We have not been able to meet in person for activities and programs, which makes offering hands-on learning and creating a sense of belonging so much more challenging. Adapting traditional activities to a remote platform creates difficulties with supplies and materials, planning effective instruction as well as guiding problem-solving. Without regular interactions with youth, our ability to develop relationships is also impacted, making that much more difficult as well. During the pre-vaccine months of the pandemic, many families were often confined at home, quarantined, and isolated from peers and opportunities. This isolation, combined with shorter daylight hours and cold winter weather can often lead to feelings of loss, trauma, and despair for many in our area.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

A fun, engaging 4 week series featuring cake decorating was developed. The goal was to purposefully foster the development context as much as possible within a remote setting and offer a fun topic that families could look forward to each week throughout one of the one coldest, darkest months of winter. To encourage exploration, kits were prepared for participants, including all the tools necessary to allow them to be fully hands on throughout instruction. To help create a sense of belonging, a volunteer was sought who could deliver the instruction while a 4-H staff member acted as host, keeping track of technical issues, asking questions of participants, observing, and making comments and overall making sure everyone felt seen, heard and part of the group. Building relationships would be fostered through the 4 week series, with multiple opportunities for everyone to interact with the instructor, host and each other.

Briefly describe how your target audience benefited from your project's activities.

The response was beyond expectation, with 46 participants, ages 5-16 registering. Each week, youth were engaged fully in exploration and hands-on learning with several parents practicing along with their kids. Further observations included a great deal of engagement that was fun and lighthearted, indicated by lots of smiling and laughter throughout. This low-stress approach offered a great backdrop for healthy risk-taking and exploration, a key feature of a growth mindset. Time set aside each week to share was included and quickly became a favorite part of each session. Whole families proudly held their creations up to the camera and told the group how they created their pieces, including struggles and triumphs in the learning. All youth were encouraged to share, and sessions went long for a few weeks to accommodate all youth that wanted the opportunity. Youth who appeared too shy to share the first week were eager to share by the final week. A post-series survey revealed 100% of respondents rated their feeling of belonging as a 5 out of 5.

Because the elements of the developmental context were purposefully cultivated (hands-on learning/sparks, sense of belonging, and building relationships), further thriving indicators were noted for some participants. A hopeful purpose paired with making contributions to others is noted in the following comment from a parent:

Thank you for this awesome experience! My kids loved it and it was fun watching them both enjoy an activity so much. My daughter already decorated brownies with some of the techniques that she learned, to deliver to a friend's parents who are going through a tough time. She was so proud of what she learned and using these skills to brighten someone else's day.

Briefly describe how the broader public benefited from your project's activities.

4-H programs are being built on the foundation of the Thriving Model to better shape programs that are thoughtfully planned with outcomes of youth in mind. Research indicates that when programs create an environment where youth feel supported and are offered new learning opportunities, they are more willing to challenge themselves, be in a growth mindset, to find purpose. These attributes are linked to academic or vocational success, civic engagement, employability, and overall happiness and wellbeing.



4-H UNITY Demonstrates that Connections, Caring, and Recognition Translate to Youth Empowerment

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

4-H Urban Neighborhoods Improved Through Youth (UNITY) promotes civic engagement, workforce preparation and asset development among high need youth, at-risk youth, 14-18 year old, in Endicott and Rochester, through Cornell Cooperative Extension's 4-H Signature Program, Youth Community Action. Using a two-generation approach, 4-H UNITY is working to address poverty, childhood obesity and food insecurity.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

UNITY's approach focuses on the needs of vulnerable teens and their parents together, with the unifying goal of strengthening families, improving the community, and breaking the cycle of generational poverty. UNITY combines 4-H youth development, civic engagement, STEM education, nutrition, and parent education to ensure teens demonstrate the knowledge, skills, attitudes, and behaviors necessary for fulfilling, contributing lives. UNITY's program model, five-year plan, and curricula are grounded in at-risk youth research and the ecological principles of working within the context of family and community. The UNITY team is committed to breaking the generational cycle of poverty and leveraging CCE-Broome's and CCE-Monroe's community networks to sustain UNITY in Endicott and Rochester. Participants meet weekly after school and complete summer employment experiences. Each county serves two cohorts of 12-15 teens for two years and then will repeat the two-year model.

Activity examples include:

- When Broome County's orders to 'shelter in place' during the COVID-19 NY Pause went into effect, the 4-H UNITY (Urban Neighborhoods Improved Through Youth) Teen Leaders decided they needed to do something to help their community. The 4-H UNITY Teen Leaders, students at Union-Endicott High School, had grown increasingly concerned as they saw other young people not practicing social distancing, not wearing masks, and not staying home. So the Teen Leaders decided to create #IStayHomeFor, a public service announcement (PSA) video. Check it out on YouTube at: <https://www.youtube.com/watch?v=KIUHqY7ulr0&feature=youtu.be> To create the video the UNITY Teen Leaders teamed with Teen Leaders and RootED. RootED is a Binghamton City School District program conducted by Cornell Cooperative Extension (CCE) of Broome County, aimed at helping young people succeed in school and in life. CITIZEN U is a sustained Children, Youth and Families At-Risk (CYFAR) project. The CITIZEN U Teen Leaders are Binghamton High School students.
- As part of her 4-H UNITY community improvement projects, one teen secured a grant from America's Promise to support the establishment of a Diversity Café at Union-Endicott High School. Her anti-racism workshops at NYS 4-H virtual conferences have also inspired other NYS 4-H programs in several other counties to start their own anti-racist programs for young people.
- The UNITY Endicott Teen Leaders initiated and/or completed several community improvement projects with the Union-Endicott High School, Endicott Proud, Endicott Mayor's Office, Endicott Police Department and Endicott Fire Department, including two virtual "Race and Reconciliation" workshops and a statewide virtual conference. The UNITY Endicott Teen Leaders initiated and/or completed several community improvement projects. These include:
 - Developed a public service announcement video about adjusting to New York State COVID-19 orders on the importance of social distancing and sheltering at home with #IStayHomeFor.
 - Teamed with CYFAR's sustained CITIZEN U project to distribute "Be the Spark," a coloring/activity book to support the social emotional well-being of young children during the COVID-19 pandemic by distributing 3,000 Be the Spark Coloring and Activity Book at meal sites sponsored by the school districts in Binghamton and Endicott. ("Be the Spark" was created the CITIZEN U Teen Leaders to raise awareness about the importance of good mental health and provide young people with a healthy outlet for social-emotional well-being.) Over 3,000 copies of "Be the Spark" were distributed, thanks to the collaboration of Binghamton and Union-Endicott schools.

- Met with “Visiting Professors” to develop a website to support struggling Endicott businesses affected by the pandemic.
- Presented a “Race and Reconciliation” workshop for the Today's Leaders Virtual Conference. UNITY led a thought-provoking conversation that began with, "What does the word race mean to you?" and continued with an open and honest discussion among the conference participants.
- Partnered with Visions Federal Credit Union and Taste NY at CCE Broome, to facilitate a virtual financial literacy training. Each Teen Leader received \$25 to open a savings account at the credit union.
- ■ Served as panelists for “Reflecting, Rethinking, and Responding to Support Student Wellness” presented by the School Mental Health Resource and Training Center, a program of the Mental Health Association in New York State.
- CCE Broome County’s 4-H UNITY Endicott was selected by Dr. Bonita Williams, National Program Leader Vulnerable Populations, NIFA/USDA, to represent the CYFAR Program in the National Academies of Science, Engineering and Medicine’s Form for Children Well-Being: Promoting Cognitive, Affective and Behavioral Health for Children and Youth, “Lived Experiences.”
- Hosted a series of UNITY Endicott’s “Family Engagement Dinners” in collaboration with CCE Broome's Nutrition Educators as an opportunity to cook together and enjoy a healthy nutrition lesson.

Briefly describe how your target audience benefited from your project's activities.

Evaluation indicates that the UNITY program inspires vulnerable youth to aspire to college, careers, and long-term community involvement. 100% of the 36 teens in the 4-H UNITY (Urban Neighborhoods Improved Through Youth) project have demonstrated a growth in communications skills, cultural competencies, complex food systems, leadership, and the ability to be active in community decision making. The approach focuses on the needs of vulnerable teens and their parents together, with the unifying goal of strengthening family well-being, improving the community, and breaking the cycle of generational poverty. Together, UNITY teen/parent teams have become community change agents and have conducted community improvement projects addressing critical USDA/NIFA goals.

Briefly describe how the broader public benefited from your project's activities.

When vulnerable teens and families are connected with caring adult staff in the Cornell Cooperative Extension UNITY program focused on strengthening family well-being, improving the community, and breaking the cycle of generational poverty through thoughtful and relationship building activities, UNITY teen/parent teams become community change agents and conduct community improvement projects addressing critical needs.



Building Organizational Capacity for Effective Youth Work

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

This project aims to build organizational support and capacity for positive youth development (PYD). Our two previous projects have focused on training for community educators, 4-H, and others who work directly with youth. Enhancing individual knowledge and competencies is an important first step. To really apply PYD principles and best practices in their work settings front-line staff need to have support from supervisors, program directors, and other organizational leaders. To our knowledge, however, there are currently no professional development opportunities and resources available for supervisors and administrators that focus on how to effectively apply and support PYD principles in organizations. How do we engage them in learning about PYD? Through our work with the NYS Advancing Youth Development Partnership, we learned that supervisors and organizational leaders are not likely to attend long (full day) training. Consequently, this project

proposes a different approach. We will develop, pilot, and assess a web-based toolkit for supervisors. This toolkit will contain a range of resources including best practice summaries, assessments, tools, and examples of supportive organizational policies. Additional capacity-building strategies will be identified by an advisory group composed of experienced youth professionals recruited from extension and other youth services organizations in New York State. The toolkit will be maintained by an established intermediary (ACT for Youth Center of Excellence), which will facilitate easy access and ensure widespread dissemination.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

During this final year of the project we were able to finalize the Supervisor's PYD Toolkit and post it online through the ACT for Youth Center for Community Action - http://actforyouth.net/youth_development/professionals/supervisors/ The toolkit provides foundational information on positive youth development and the need for organizational support to integrate and sustain a positive youth development approach in youth organizations. Using a very clear and research-based framework it gives supervisors and program directors strategies, tools and resources to promote positive experiences for youth in their agency, positive relationships and positive, supportive and inclusive environments. We were able to introduce the toolkit via webinars to groups of supervisors within the pregnancy prevention field and youth networks such as 4-H, youth bureaus and afterschool. Most importantly with the support of the NYS 4-H Office we were able to present the toolkit to Cornell Cooperative Extension state leadership and executive directors at a virtual leadership conference.

The toolkit was well received. Directors appreciated its accessibility and user-friendliness and expressed support to bring this to their agencies. Expected outcomes: 1) Supervisors and program leaders will develop a solid foundation in research-based PYD including strategies on how to apply best practices to youth program settings and create a supportive PYD infrastructure; 2) Educators and front-line staff will have increased capacity and opportunity to create effective PYD programs and settings; 3) Young people participating in extension and other youth programming will develop skills and competencies that prepare them for adulthood. Observed outcomes: 1) The toolkit was presented to the advisory group, several groups of supervisors within New York State youth networks (pregnancy prevention providers, 4-H, youth bureaus and afterschool network). The feedback was very positive. The tools and resources were rated as very practical, useful and easy to implement. Supervisors were excited to try them out in their own agencies repeatedly stating that having these resources fills a gap. Other positive youth development resources did not focus on supervisors. Unfortunately, we were not able to observe any outcomes at the organizational level. Due to the ongoing pandemic and the slow return to in-person youth programming recruiting pilot sites and observing changes in organizational practice and policy directly was not possible. Consequently, we were not able to observe outcomes 2 and 3.

The advisory group represents all major youth services networks in the state. They also represent metropolitan, urban and rural perspectives. This year the toolkit has been presented and discussed with a wide range of youth service providers utilizing the 4-H, youth bureau, afterschool and adolescent pregnancy prevention networks. These in turn represent the diversity of New York State and New York City.

Briefly describe how your target audience benefited from your project's activities.

Initially, we planned to do a pre-/post survey to assess the toolkit. As the toolkit evolved this did not seem feasible. The toolkit represents a comprehensive collection of tools, strategies, and resources that supervisors can choose from depending on their needs and expertise. Consequently, supervisors may make different selections and use different combinations of tools and resources. Instead, we added an organizational self-assessment that supervisors or program directors could use for their own benefit. We were hoping to evaluate some of the tools by recruiting pilot sites and gathering feedback from these sites, but due to the pandemic, we were not able to recruit pilot sites. The Risk and Thriving in Adolescence PWT has been supportive of the project and has been disseminating information about the project throughout the extension system and networks they are affiliated with.

The Advisory Group includes representatives of the Youth Bureaus and Network for Youth Success who are disseminating information about the toolkit as well. The afterschool network, NYS Network for Youth Success, will incorporate the Supervisor's PYD Toolkit in their orientation and training of new program directors. The toolkit is available on the ACT for Youth website at http://actforyouth.net/youth_development/professionals/supervisors/. It is linked to the statewide 4-H website. The project succeeded in addressing a real need in youth work and youth programming. Given the lack of youth work or youth development degree training of frontline staff has typically been the main approach to build a capacity for effective youth development work.

Reviewing the literature and drawing from our experience with the Advancing Youth Development Partnership we have learned that integrating and sustaining a positive youth development approach in a youth organization requires organizational support. With this project, we aimed to provide supervisors and program directors with tools to create to provide supervisors and program directors with tools to create organizational infrastructure and support for positive youth development. We succeeded in developing a comprehensive, easy-to-access, and user-friendly toolkit, a great new resource for supervisors and program directors. Although we have not been able to evaluate the toolkit as much as we had planned, the feedback from supervisors and directors has been very positive. We have succeeded in disseminating the toolkit widely within New York State and through the ACT website nationally. Two youth networks, 4-H and The NYS Network for Youth Success will integrate the toolkit into their professional development efforts. So we are hopeful that it will impact organizational practices and policies and ultimately improve outcomes for young people in New York State.

Briefly describe how the broader public benefited from your project's activities.

The Cornell Bronfenbrenner Center for Translational Research in collaboration with Cornell Cooperative Extension have developed tools and resources for supporting positive youth development (PYD) effectiveness within youth organizations. When supervisors and program leaders of youth serving organizations learn about and apply PYD to their organizational practice, the leaders can apply strategies, and tools to institutionalize a PYD approach into their organizations and support their staff in delivering effective youth programs. Supporting the leaders in youth serving organizations with PYD training has the potential to reach more youth and families with an intentional and long-lasting impact for the organizations.



CCE Parenting Education Programs – Supporting Families in Times of Uncertainty

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Healthy home environments foster healthy development in children. However, parenting is not a simple task, especially when there are so many factors that may affect the household such as divorce, abuse, negligence, COVID, or simply inexperience and uncertainty. Major areas of need in parenting surround upbringing in a non-traditional household, relationship building, and youth development during COVID.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Parent education programs provide an enormous breadth and depth of information to parents across the United States with the goals of enhancing parent-child relationships and strengthening families. Several types of parent education programs designed to meet the needs of various types of audiences; including workshops for parents, grandparents raising grandchildren, teens or entire families, are available and supported by the Cornell Parenting Project <https://www.human.cornell.edu/pam/engagement/parenting/professionals/cce>.

To foster healthy physical and mental growth of children, Cornell Cooperative Extension Associations offer programs that educate both parents and children on different aspects of creating a resilient and secure household. Associations from across New York State reported an increase in requests for parenting education programs this year.

Parenting education opportunities include workshops, support groups, and websites. These resources are often utilized by parents, caregivers (including aunts, uncles, and grandparents), military families, and families with divorced parents. Topics include: enhancing the relationship between the caregiver and child, health and nutrition, communication, budgeting, building life skills, and creating a healthy home environment. Due to COVID, there are also educational programs that teach caregivers about how to support their child while everything is remote. For example, Lewis County helped parents learn about how to use school technologies and help their child with school work.

In addition to these educational resources, some county programs also include home visits, where a professional from the program would check in with families to see how they were doing and continue to provide support.

Briefly describe how your target audience benefited from your project's activities.

Many parents and caregivers expressed relief and appreciation for the programs that CCE offered. The programs helped them understand healthier ways to parent, especially when going through stressful life situations including a pandemic. First-time parents and caregivers found the support groups to be reassuring as they felt that others were going through the same thing

they were, and they were able to ask for advice and discuss parenting topics. Overall, becoming equipped with the tools and skills needed to foster a healthy home environment is beneficial for the physical, mental, and emotional wellbeing of the children.

As a result of the programs delivered, over 16,000 parents and other adults providing parental care reported adopting developmentally appropriate and effective parenting behaviors and methods. And, Over 14,500 parents/ relative caregivers reported experiencing positive changes in parent-child relationships and parenting skills that they attribute to implementing new parenting behaviors and methods learned in parent education programs.

Briefly describe how the broader public benefited from your project's activities.

The healthy development of children is important not only for their own success in the future, but also for future generations. With a pandemic disrupting normalcy in families and in schools, it has been particularly important that parents and caregivers help ensure that their child experience proper physical, emotional, and mental growth, fostered in a healthy home environment. The resources that Cornell Cooperative Extension provides parents and caregivers informs them about topics and practices important in helping children develop and provides a sense of reassurance and relief for the parents.



Financial Management/Budgeting Education Helps Individuals and Families to Thrive

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

Financial literacy is critical in building intergenerational wealth and overcoming poverty. However, many families lack financial literacy and financial management skills because of the lack of resources to learn. CCE Consumer Family Sciences staff have resources, teaching experience, and community connections to deliver this type of programming to audiences needing support.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Multiple counties and programs work to provide financial literacy education to a wide range of individuals including parents, children, older adults, soldiers, and families. Topics include: making a spending plan, budgeting, checking and savings accounts, credit cards and interest, credit reporting, checkbook management, financial management, investing, reducing debts, financial fraud, and the importance of saving and setting goals. Financial literacy workshops and training target a variety of age groups ranging from young children to older adults. Some counties tie financial literacy education with parenting, so they targeted parents and families. Budgeting is also a big topic for older adults and families

2021 examples at work in county Associations:

- Yates County – TANF Life Skills 1:1 program partnered with Finger Lakes Works and presented 8 virtual workshops to individuals and family members that provided education, resources, and tools to help navigate financial needs. Introduced local food distribution sites, assisted with securing funding for rent assistance, and provided for the more urgent needs.
- Broome County – 4-H UNITY (urban) Teen Leader Program partnered with Visions Federal Credit union and Taste NY at CCE Broome to facilitate a virtual financial literacy training. Teen leaders received \$25 to open a savings account.
- Dutchess County
 - Through their RAPP (Relatives as Parents Program), the county offered trainings and workshops about parenting and financial literacy.
 - Financial Literacy for Youth (FLY) provided financial literacy education to 180 youth this past summer. Lessons focused on psychology of money, making a spending plan, checking and savings, credit cards and interest, and credit reporting. The program has since been expanded to work with younger kids and older adults.

- o Albany County – CCE Albany partnered with the Albany County Summer Youth Employment Program to provide financial literacy education to teens in the county and surrounding towns. Specific topics include basic money management, importance of saving, setting goals, and planning for their future.
- o Jefferson County – Fort Drum Financial Readiness Program assists Soldiers and Families in developing a sound financial plan for success and safety in the future. Such plans entail developing and maintaining a family budget, reducing debts, improving credit, planning through saving and investing, and resolving consumer complaints. The program holds classes on budgeting, checkbook management, and financial management. The program team worked with 1,965 in-processing soldiers to create individual budgets and provided information on budgeting, investing, and retirement to 924 soldiers.
- o Essex County – as part of the Supporting Healthy Families program, families were taught about parenting and budgeting.

Briefly describe how your target audience benefited from your project's activities.

Cornell Cooperative Extension Financial Literacy Education Programs help to equip individuals, families, and youth with the skills and resources necessary to budget, plan, and develop healthy spending habits. For youths, they are taught the foundations of financial literacy and budgeting, which will set them up for further learning in the future. For adults, they can utilize the skills they learned so far and apply them to their daily lives.

Briefly describe how the broader public benefited from your project's activities.

Cornell Cooperative Extension Financial Literacy Education Programs help individuals and families to change money management patterns. Individuals, families, and youth can develop their financial management skills which in turn can grow assets, that can be reinvested back into the community. More resources and programs will be available in communities where there is an understanding money management, helping people to live more comfortably.



NYS 4-H Horse Program Initiative

In 2-3 sentences, briefly describe the issue or problem that your project addresses.

The NYS 4-H Horse Program is offered throughout the year and is intended to encourage and educate both youth and adult participants about horses and horse-related opportunities in New York State. Topics and programs vary widely and may include educational competitions for youth, training and educational workshops for youth and adults, and exposure of the public to Cooperative Extension programs related to horses.

Briefly describe in non-technical terms how your major activities helped you achieve, or make significant progress toward, the goals and objectives described in your non-technical summary.

Educational events had to be adapted due to COVID-19 concerns, and new educational opportunities were created to adjust to the changing needs of participants.

- o A new "Advanced Equine" program was created and will be implemented in 2022. This program is designed to give dedicated youth a more in-depth learning experience to better understand equine industries and sciences. Fifteen youth were selected from across the state to participate in this program.
- o Despite Covid-19 complications, state-level educational events were held safely in-person in addition to virtual options. Fundamentally 4-H promotes learning by doing, this program seeks to continue hands-on learning but has found value in offering virtual options.

- o This year we were able to reach a broader audience with virtual study sessions to prepare youth for educational contest

Advisory Committee Leadership. This program relies on the NYS 4-H Horse Education Advisory Committee (HEAC) to lead, promote and advise. HEAC is made up over 30 stakeholders and meets twice annually.

Volunteer support. Volunteers are vital to the NYS 4-H Horse program. It is estimated that there are 486 volunteers donating approximately 2 hours per week, equaling over 24 FTE per year. In addition, there are approximately 35 volunteers that assume state-level positions comparable to middle managers; it is assumed that they donate about 5 hours per week, equaling another ~4.4 FTE per year. The total estimated volunteer FTE equals over 28 FTE per year. At the rate of \$15 per hour, that is an estimated \$873,600 per year in volunteer time.

Briefly describe how your target audience benefited from your project's activities.

The horse is a wonderful 'magnet' for children through which many things can be taught and learned. Many youths involved in the 4-H Horse Program attend educational programs beyond high school, many attending college programs. Youth involved in the program have gone on to become veterinarians, animal scientists, teachers, extension educators, agricultural industry specialists, or other high achieving professionals and become productive adult citizens that are involved in their communities. The NYS 4-H Horse Program has one of the highest numbers of youth enrollment, albeit having numbers drop over the last few years. Unlike other equestrian youth organizations, the NYS 4-H Program does not require participants to own or lease a horse. This creates a more inclusive and equitable offering. The impact the NYS 4-H horse program offers to youth across the state is difficult to quantify.

Briefly describe how the broader public benefited from your project's activities.

Despite Covid-19 complications, the NYS 4-H Horse Program found safe opportunities for hands-on learning in person and in-depth learning online creating experiences for youth and volunteers who identify horses as a wonderful “magnet” for youth learning. 4-H alumni who participate in 4-H Horse program opportunities and events, indicate that horses attracted their interest and allowed them to learn skills, knowledge, and caring which stayed with them for a lifetime.

Type	Projects / Programs
Projects / Programs without a Critical Issue	0
Not Provided	