2019 ANNUAL REPORT

innovations
in sustainable agriculture

NORTHEAST SARE
Sustainable Agriculture Research & Education
“This project led to my development of a new chapter in my thesis, and will definitely shape future projects and practices in the field of aquaculture.”

**Harrison Tobi**  
University of Massachusetts--Dartmouth, Falmouth MA  
Graduate Student Grant Recipient:  
“Parasite mitigation strategies in bay scallop aquaculture” (GNE17-161)

Photo courtesy of Harrison Tobi, University of Massachusetts--Dartmouth
About Us

The Northeast Sustainable Agriculture Research and Education (SARE) Program offers grants to farmers, educators, service providers, researchers and others to address key issues affecting the sustainability of agriculture throughout our region.

The Northeast region includes Connecticut, Delaware, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, West Virginia, and Washington, D.C.

We currently offer the following grant programs:
- Farmer
- Graduate Student
- Partnership
- Professional Development Program
- Research and Education
- Research for Novel Approaches
- State Programs

Northeast SARE is one of four regional SARE programs funded by the USDA National Institute of Food and Agriculture.

Northeast SARE's outcome statement:
Agriculture in the Northeast will be diversified and profitable, providing healthful products to its customers; it will be conducted by farmers who manage resources wisely, are satisfied with their lifestyles, and have a positive influence on their communities and the environment.
Succession planning is critical to the sustainability of businesses and non-profits. That’s also true for Northeast SARE, even though we’re a somewhat unusual organization that’s ‘owned and operated’ by a blend of university, government and citizen stakeholders. So when it came time to deal with the retirement of two key leaders on our team, David Holm and Janet McAllister, I thought about some advice that’s given to farmers when they face succession planning: Don’t put it off. Clarify your goals. Get support. Embrace change... of course, that was after my initial panic attack.

Why did I panic at first? Well, David has been the heart and soul of Northeast SARE for almost two decades. As program manager, he’s worked with Administrative Councils over the years to develop most of our grant programs, define the procedures that make them run smoothly, and create the policies needed to clarify any concerns. Janet hasn’t been with SARE for quite so long, but she’s been central to the positive transformation of our Professional Development Program. In the past, it focused on educational activities and program content; now it focuses on educational outcomes and supporting agricultural service providers in the design and delivery of effective programs. In short, two pairs of big shoes to fill. Thankfully, they both gave us a lot of notice before retiring.

Associate director David Holm and PDP Coordinator Janet McAllister served on Northeast SARE’s leadership team for a combined 30+ years before stepping into retirement.
So we got to work, revising the position descriptions to clearly reflect our goals for new hires. We had support from our Administrative Council and staff, both of whom helped draft search plans and offered up nominees to serve on search committees. And after making two excellent hires, I find myself embracing their questions, looking at some new ways of doing things, and, along with the outgoing folks, mentoring the next generation of leadership.

That next generation is Katie Campbell-Nelson, who’s been on the job as Professional Development Coordinator since September 1, and Heather Omand, who starts as Associate Director at the beginning of February.

Katie has spent over a decade in adult education. Most recently, she served as the vegetable extension educator and state coordinator of the SARE PDP program in Massachusetts. She has taught college students, beginning farmer programs, served as a mentor for a whole farm planning course for women, helped dairy farmers with manure management, and even worked with golf course superintendents on fungicide resistance management. Katie holds an M.S. in Plant and Soil Science from UMass Amherst. She recently acquired 84 acres of land to steward with her partner in Greene County, NY.

Heather has served as the Marketing and Business Specialist for the Maine Organic Farmers and Gardeners Association since 2014. In that role, she developed and managed farm viability education and outreach programs, including a technical assistance grant program for farmers. She has also served on the leadership and grant review committees for statewide food system organizations such as Slow Money Maine and the Maine Technology Institute. Heather holds an M.B.A. from the University of Maine. Heather, her husband, Tyler, and young son, Atom, have a small farm that produces fruits, nuts, and a variety of specialty crops.

Please join me in welcoming the new members of Northeast SARE’s leadership team!
In the vineyard industry, the task of communicating to customers is often left to winery sales and hospitality staff who may not know much about the farming end of the business. Whitney Beaman of Bedell Cellars in Cutchogue, NY recognized that educating winery employees who hold customer-facing roles (including tasting room, wine club and wholesale staff) is key to engaging consumers on the environmental practices behind sustainable winegrowing.

With funds from a Northeast SARE Farmer Grant, Whitney created an online Sustainable Wine Professional course as a method to train wine professionals and interested consumers about sustainable winegrowing. She worked closely with Long Island Sustainable Winegrowing, a nonprofit that provides education and third-party certification for sustainably farmed vineyards on Long Island, that includes 23 producers and over 1,000 acres of vineyard (half of the Long Island wine region).

The online course was modeled after California’s Sustainable Winegrowing Ambassador Course and builds upon VineBalance, the NY Guide to Sustainable Viticulture Practices. Course content was written at an introductory level and includes information on sustainable viticulture, organic and biodynamic farming practices.

Employees on 12 Long Island farms took the course. All farms said the course changed the way these wineries train their sales and hospitality staff. Four of the vineyards now require sustainability training for all of their staff. One participant, Ami Opisso, General Manager at Lieb Cellars, said, “The training was overwhelmingly effective at demystifying the standards and benefits of sustainable winegrowing, and I can already see my staff communicating and educating about it in a more informed and confident manner.”
“The most valuable result of this project was the relationships, conversations, and connections that happened as part of this food hub work...A major lesson learned from this project is that collaborating with important stakeholders, like the Co-op Food Stores, actively participating in the project means that tangible action steps were possible.”

Beth Roy
Vital Communities
Partnership Grant Recipient:
“A farmer collaboration initiative”
(ONE17-305)
Salmonella enterica is the most common cause of foodborne illness in the United States. Since Salmonella has been a food safety concern for vegetables produced on the Eastern Shore of Maryland with surface water and sediments identified as possible reservoirs for these bacteria, University of Maryland student Angela Ferelli conducted a Northeast SARE Graduate Student Grant project to better understand the food safety risks of Salmonella presence in irrigation water for vegetable crops.

Angela was particularly interested in learning about the ability of Salmonella to survive in irrigation water over time and its potential to transfer from water to crops.

She collected water samples from local non-tidal rivers, tidal rivers, ponds, and reclaimed waste water sources, recorded their physicochemical characteristics (like pH, dissolved oxygen level, oxidation reduction potential, etc.), and inoculated them with several strains of Salmonella to assess bacteria survivability over a 90-day period.

To determine the potential of Salmonella transfer from water to vegetables, tomatoes were used as the study crop. Salmonella was inoculated into non-tidal fresh water samples that were then inoculated onto tomatoes and monitored over time.

Results suggested that Salmonella persistence in water was driven by water type. In her study, Angela found that Salmonella can enter into “viable but non-culturable” (VBNC) states in non-tidal fresh water samples as well as with some types of Salmonella enterica (called “serovars”) in reclaimed wastewater and pond water samples. VBNC is one type of survival mode for Salmonella when it becomes stressed. Essentially, the bacteria becomes dormant or “sleeps” until environmental conditions (some of which are unknown) become ideal for its growth, making it more tricky to detect Salmonella levels in water.
She found that *Salmonella* transfer from water to tomato was driven by *Salmonella* type, suggesting that individual strains of the bacteria act differently. By correlating physicochemical measurements of the water with *Salmonella* results, her research also revealed potential opportunities for physicochemical measurements to be used as indicators of foodborne pathogen transfer success onto tomato.

Angela suggested that more research is needed to evaluate the factors that influence *Salmonella*’s ability to transfer to tomatoes, including environmental triggers that may increase the risks of the transfer to occur. She also proposed that additional research is needed to develop rapid tests and other methods to predict food safety risks to crops.

Angela said, “This project continued to reinforce our belief that the ‘one size fits all’ approach [to implement food safety practices on the farm] is not stringent enough to adequately curb food safety risk for fresh fruit and vegetable production. The various factors that influence the variability of *Salmonella enterica* persistence in the environment do so in a serovar specific manner, and this differential effect extends not only to survival in the primary reservoir (in this cases water) but also to niche transfer (in this case tomato). We must continue to investigate *Salmonella* ecology and *Salmonella enterica* movement through the farm-to-fork continuum in a more nuanced fashion, to devise strategies that are effective to the most successful serovars under given environmental conditions in various ecological niches.”

Angela received her PhD in 2019 and now works as a University of Maryland Agent Associate. She plans to continue this research to complement her work conducting farmer education programs and providing technical assistance to farmers in the areas of Good Agricultural Practices and Food Safety Modernization Act Produce Safety Rule compliance.
Maine leads project using winter ecology to manage small ruminant parasites

For many small ruminant operations, grazing is central to farm profitability. However, grazing livestock increases risks of losses due to parasite-infested pastures. *Haemonchus contortus*, Barber pole worm, is a particular threat to sheep and goat farms throughout the Northeast region. Although *H. contortus* (as a subtropical parasite) has adapted to northern climates, Jim Weber of the University of Maine conducted a [Northeast SARE Research and Education Grant](http://www.northeast.sare.org) project to determine if northern New England farmers could use winter ecology to better manage this pest. The team conducted a cold-tolerance study of *H. contortus* and found that parasites originating from sheep living in northern climates were more tolerant of cold conditions than parasites from sheep on farms in the Deep South, indicating that these parasites are indeed adapting to local conditions.

To help producers better manage these parasites, Jim and his team tested a number of control measures including adjusting dewormer timing, simulating reduced photoperiods, increasing parasite monitoring, and evaluating livestock stocking rates and grazing management.

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Small ruminant producers learn how to use FAMACHA and fecal egg counts to determine *H. contortus* parasite loads in their sheep and goats with guidance from Jim Weber (appears in the photo above on right) and his team. Photo courtesy of Jim Weber, University of Maine.
A major emphasis of the project was teaching farmers methods to measure and effectively manage parasite populations on their farms. More than 400 farmers from Maine, New Hampshire and Vermont participated in the project’s seminars, workshops and field days where they learned research results and received hands-on microscope training to identify and count parasite species in manure samples from their livestock. They also learned how to use FAMACHA, a technique to easily identify animals that may have *H. contortus* infestations.

122 farmers implemented non-chemical methods--improving rotational grazing systems, using Spring-time determinations of dewormer efficacy, and basing use of dewormers on individual fecal egg counts--to control *H. contortus* infestations in their flocks during the grazing season. As a result, the project team estimated that over 4,000 lambs on farms in northern New England had reduced exposure to *H. contortus* parasitism, reducing rates of lamb death, and likely increasing weight gain for lambs destined for the meat market.

Three experts join Northeast SARE’s administrative council

In 2019, three professionals joined Northeast SARE’s Administrative Council (AC), the leadership team that makes policy and grant decisions for the program.

Deb Grantham of the Northeastern Integrated Pest Management (NE-IPM) Center, Marian Jordan of the USDA Natural Resources Conservation Service (NRCS), and Alex Soroka of the US Geological Survey (USGS) filled AC seats that have affiliations set by statute.

After 25 years as an Extension educator at Cornell University, Deb was named director of NE-IPM in 2018 where she provides leadership for the Center and works closely with its stakeholders to advance IPM throughout the region.

Marian has worked for NRCS across the U.S. and is currently an NRCS District Conservationist in Vermont where she works with local conservation partners to promote the NRCS conservation programs and to implement conservation practices. She also conducts quality assurance reviews for program compliance.

As a physical scientist at the USGS Maryland-Delaware-DC Water Science Center in Baltimore, Alex primarily focuses on the interactions between agricultural practices and water quality.

Northeast SARE staff are thrilled to have these experienced professionals on the AC.
As more people of color choose farming and agricultural careers, Cooperative Extension and other agricultural service organizations must expand their ability to serve culturally diverse groups. Pennsylvania saw a 16% increase in Hispanic and Latinx farmers and farmworkers, inspiring Elsa Sanchez of Pennsylvania State University to conduct a Northeast SARE Professional Development Grant project aimed at increasing understanding of the challenges and concerns these farmers face and developing strategies to better engage this community in Extension agricultural programs.

Twenty-five Extension agricultural educators participated in a series of three professional development trainings taught by a social psychologist, a specialist in Latinx community studies, and a panel of service providers that work closely with the Latinx community. Participants also visited farms, met one-on-one with Hispanic and Latinx farmers and farmworkers, and surveyed participants of the Spanish session of a regional fruit and vegetable conference to better understand farmer needs and learn ways to make them feel more welcome at Extension programs.

As a result of the project, 15 educators learned new information to better serve Hispanic and Latinx clientele and 12 educators were able to connect with 65 farmers and farmworkers during the project period. Guidance on strategies to effectively connect with Hispanic farmers was published in a journal article, expanding the reach of project lessons learned to educators and agricultural service providers across the U.S.
PARTNERSHIP PROJECT: ONE16-264

Project expands leafy green production in WV’s Eastern panhandle

The Eastern Panhandle region of West Virginia is the fastest growing area in the state and is adjacent to large, diverse populations like Washington, D.C. and Baltimore. To meet the emerging demand for fresh produce from regional wholesale markets like hospitals, school districts and other institutional buyers, Lewis Jett of West Virginia University conducted a Northeast SARE Partnership Grant project to evaluate the feasibility of year-round leafy green production.

During the two-year project, 90 varieties of bibb, romaine and crisphead lettuces and 20 varieties of spinach were evaluated for marketable yield, quality, color and stress tolerance. To provide better control over growing conditions (especially given the challenges of field production in an erratic climate observed in the Mid-Atlantic region during spring through fall), all trials were conducted in unheated high tunnels located at the university research center as well as on two collaborating farms.

As a result of the trials, Lewis and the team identified cultivars that work best for year-round production of lettuce and fall-spring production of spinach. Fact sheets were created that include best management practices for Mid-Atlantic production of lettuce and spinach, including cultivar selection, row cover management, economics and pest management.

The project also established connections with institutional markets, namely a local Veterans’ Administration Hospital and WV’s Hardy County School District. By working closely with institutional buyers, the team learned that sequential lettuce plantings (every 3 to 4 weeks) are key to meeting the ongoing needs of these markets. Lewis and the team plan to use lessons learned from the project to improve the efficiency of leafy green production and expand this model to additional growers and institutional buyers throughout West Virginia.

Left: The project identified promising lettuce cultivars for year-round production, including, from top to bottom, Sierra, Cherokee, Magenta and Monte Carlo, among others. Photos courtesy of Lewis Jett, West Virginia University.
Pollinator buffers improve poultry farm sustainability & neighbor relations

Like many farms across the region, Hill Farms, Inc. in Houston, Delaware has seen an increase in residential development surrounding their farm. Because maintaining positive neighbor relations is important to this poultry operation, owner Tina Hill conducted a Northeast SARE Farmer Grant project to install a mixed vegetative buffer adjacent to their poultry houses. Tina was interested in creating a buffer that was cost-effective, provided habitat for pollinators, was aesthetically pleasing and reduced odor, dust and noise from the poultry houses. Because the Hills raise vegetables, Tina was also interested in ways to attract native pollinators to the farm in lieu of renting honeybee hives.

A number of early-, mid- and late-season ornamental perennials were installed to provide nectar throughout the season. Clover and sunflowers were also planted to provide additional pollinator habitat and floral resources. During spring establishment, the plantings were irrigated, mowed and weeded, but were maintenance-free during the rest of the season.

A group of FFA students were recruited to provide pollinator counts and found that the number and diversity of pollinators in the vegetative buffer exceeded those found in the grass only control.

Tina said, “The results of the pollinator plot have been mostly positive. Many visitors to the farm have commented on the pretty wildflowers and
The economics of cover cropping

In 2019, the national SARE Outreach office published the technical bulletin, *Cover Crop Economics: Opportunities to Improve Your Bottom Line in Row Crops*.

The 24-page document draws on yield and economic data gathered through five years of national cover crop surveys to address economic returns that may be expected from cover crops on commodity farms under various management scenarios.

The bulletin is available online at: [www.sare.org/Learning-Center/Bulletins/Cover-Crop-Economics](http://www.sare.org/Learning-Center/Bulletins/Cover-Crop-Economics).
Each year, Northeast SARE grant coordinators take stock of competitive grant projects completed from October 1 to September 30 to assess project outputs and outcomes. In 2019, eighty-seven projects were completed, totaling $3,635,319. They included 31 Farmer Grant projects, 24 Graduate Student Grant projects, 15 Partnership Grant projects, 10 Research and Education projects, and 7 Professional Development Grant projects.

Because farmers are core to our competitive grants, staff calculated that 476 farmers were directly involved in project research conducted, primarily hosting research trials on their farms. Collectively, the projects created 295 fact sheets, articles, curricula and other educational tools. They offered 221 workshops and field days, 131 online trainings, 381 on-farm demonstrations and tours, and provided 2,179 consultations to farmers.

In total, these projects trained 11,682 farmers and 4,045 agricultural service providers. As a result, 2,656 farmers made on-farm changes based on what they learned.

Through their efforts, project leaders formed 332 new collaborations and working partnerships, strengthening our sustainable agriculture community. And they secured 51 new grants, totaling $7.1 million, to build on their work in the future.
During the 2019 grant cycle, Northeast SARE funded 120 new competitive grant projects throughout the Northeast, totaling $5,928,748. An additional $646,588 was awarded to State SARE programs housed at land grant universities across the region to conduct professional development and SARE outreach. See the following 2019 awards, listed by state of project coordinators (note that many projects involve multi-state programming). Find more information about these and other SARE-funded projects by searching project name, number or coordinator on SARE’s national database at: projects.sare.org/search-projects.

**Connecticut**

**FARMER GRANT: FNE19-925**

**Honey Plant Intercropping on Christmas Tree Farms**

Richard Cowles, Humming Grove Farm, Broad Brook CT

$10,032

**FARMER GRANT: FNE19-939**

**Tree Regeneration and Establishment Strategies in Silvopasture and Sugarbush Systems**

Joseph Orefice, Hidden Blossom Farm, Union CT

$13,450

**FARMER GRANT: FNE19-944**

**Winter Triticale and Red Clover Double Cropping Field Trials for a 3-Year Production Cycle**

Craig Stearns, Willard J. Stearns & Sons Inc., Storrs CT

$14,824

**GRADUATE STUDENT GRANT: GNE19-213**

**Use of Lactic Acid Bacteria to Control L. monocytogenes on Apples under Simulated Commercial Conditions**

Deepa Kuttappan, University of Connecticut, Storrs CT

Advisor: Mary Anne Amalaradjou

$15,000

**GRADUATE STUDENT GRANT: GNE19-221**

**Importance of Environmental Factors on Plantings of Wild-Simulated American Ginseng**

Karam Sheban, Yale University, New Haven CT

Advisor: Marlyse Duguid

$15,000

**STATE PROGRAM: NECT17-001**

**Nutrition’s Role in Sustainable Livestock Production Practices**

Joe Bonelli, University of Connecticut, Storrs CT; Program Associates: Rachel Bespuda and Jean King

$75,110

2019 awards on the map

- Farmer Grant
- Partnership Grant
- Graduate Student Grant
- Research and Education Grant
- Research for Novel Approaches Grant
- Professional Development Program Grant
- State Program
Delaware

**GRADUATE STUDENT GRANT: GNE19-203**
**Improving Limitations to Market Growth of Biodiesel and Renewable Hydrocarbon Diesel Produced from Low-value Feedstocks**
Shehu Isah, Delaware State University, Dover DE
Advisor: Gulnihal Ozbay
$15,000

**GRADUATE STUDENT GRANT: GNE19-210**
**Do Soil Health Practices Impact Subsurface “Legacy” Phosphorus Losses from Soils on the Delmarva Peninsula?**
Lauren Mosesso, University of Delaware, Newark DE
Advisor: Amy Shober
$14,713

**GRADUATE STUDENT GRANT: GNE19-217**
**Microbial Inoculants for the Improvement of Alfalfa Crop Productivity and Health**
Amanda Rosier, University of Delaware, Newark DE
Advisor: Harsh Bais
$12,453

**GRADUATE STUDENT GRANT: GNE19-219**
**Soil Microbiome Impacts on Floral Rewards and Implications for Pollinator Nutrition**
Grace Savoy-Burke, University of Delaware, Newark DE
Advisor: Deborah Delaney
$14,984

**PARTNERSHIP GRANT: ONE19-344**
**Cost Benefits of Common Insecticide Practices Used to Prevent Soybean Pest Problems in Delaware**
David Owens, University of Delaware, Georgetown DE
$28,221

**STATE PROGRAM: NEDE17-001**
**Beginning Farmer Workshops**
Dan Severson, University of Delaware, Newark, DE
$16,321

**STATE PROGRAM: NEDSU17-001**
**Cover Crop and Soil Health Training for Agriculture Service Providers in Delaware and the Eastern Shore of Maryland**
John Clendaniel, Delaware State University, Dover, DE
Program Associate: Jason Challandes
$83,332

Maine

**FARMER GRANT: FNE19-921**
**Evaluating Alternative Malting Barley Varieties and their Acceptance in the Northeast Craft Brewing Community**
Jacob Buck, Buck Farms, Mapleton ME
$14,509

**FARMER GRANT: FNE19-932**
**European Corn Borer Detection in Local Hopyards**
Ryan Houghton, The Hop Yard, Portland ME
$6,247

**FARMER GRANT: FNE19-936**
**Using Shading to Control Algal Biofouling on a Floating Oyster Farm**
Jordan Kramer, Winnegance Oyster Farm, Portland ME
$12,805

**FARMER GRANT: FNE19-940**
**Development of a New Seaweed Growing System for Nori Production in the Northeast**
Sarah Redmond, Springtide Seaweed LLC, Gouldsboro ME
$15,000

**FARMER GRANT: FNE19-946**
**Developing Management Options for Staph aureus on Organic Dairies**
Katie Webb Clark, Reed Farm, Windsor ME
$13,157

**GRADUATE STUDENT GRANT: GNE19-194**
**Analyzing Early Growth Characteristics and Anchorage Force to Improve Cultivation Tolerance in Carrots**
Rebecca Champagne, University of Maine, Orono ME
Advisor: Eric Gallandt
$14,683

**GRADUATE STUDENT GRANT: GNE19-218**
**Automated Net Return Mapping: Using Inexpensive Technology for Maximizing Profit of Small-Scale Farms**
Johnny Sanchez, University of Maine, Orono ME
Advisor: Eric Gallandt
$14,806

**PARTNERSHIP GRANT: ONE19-334**
**Maine Climate Resilience Training Program**
Ryan Dennett, Maine Organic Farmers and Gardeners Association, Unity ME
$29,787

**PARTNERSHIP GRANT: ONE19-341**
**Expanding Quahog and Oyster Polyculture in Maine**
Marissa McMahan, Manomet, Brunswick ME
$29,575

**RESEARCH AND EDUCATION GRANT: LNE19-374**
**Nutrient and Weed Management Strategies for Organic Wild Blueberry Growers**
Lily Calderwood, University of Maine, Orono ME
$199,828

**RESEARCH AND EDUCATION GRANT: LNE19-377**
**Building Social Sustainability on Farms through Online and In-Person Education**
Leslie Forstadt, University of Maine, Orono ME
$197,676
Robert Friedman of Robariah Farm discusses kosher poultry processing with CT-MA-RI SARE project coordinator Rachel Bespuda.

Massachusetts

FARMER GRANT: FNE19-916
Evaluation of Electrolyzed Water as a Low-Cost, Organic Method to Reduce Contamination in Indoor Production of Gourmet Mushrooms
Elizabeth Almeida, Fat Moon Mushrooms, Westford MA
$15,000

FARMER GRANT: FNE19-926
The Impact of Mushroom Extracts on Honey Bee Health
Willie Crosby, Fungi Ally, Hadley MA
$15,000

FARMER GRANT: FNE19-929
Bringing Local Back to Kosher: Continuing Pioneering Research to Create a Commercial Processing Facility
Robert Friedman, Robariah Farms, Deerfield MA
$15,000

FARMS PROGRAM: NEME17-001
Strengthening Knowledge, Skills and Networks for Soil Security in Maine
Ellen Mallory, University of Maine, Orono ME
Program Associate: Tom Molloy
$46,663

GRADUATE STUDENT GRANT: GNE19-193
Understanding Agrihoods: An Exploration into the Growing Trend of Farm-to-Table Communities across the United States
Benjamin Breger, University of Massachusetts, Amherst MA
$14,932

GRADUATE STUDENT GRANT: GNE19-200
Identifying Mechanisms behind Interacting Stressors on Wild Bees to Inform Pollinator-Friendly Agricultural Landscapes
Alison Fowler, University of Massachusetts, Amherst MA
Advisor: Lynn Adler
$14,932

PARTNERSHIP GRANT: ONE19-332
Improving Producer Cooperatives: Best Practices in Marketing, Distribution and Governance
Margaret Christie, Community Involved in Sustaining Agriculture, South Deerfield MA
$23,750

PARTNERSHIP GRANT: ONE19-354
Measuring Soil Health and Carbon Sequestration in an Emerging Chestnut Agroforestry System
Keith Zaltzberg, Regenerative Design Group, Greenfield MA
$18,700

RESEARCH AND EDUCATION GRANT: LNE19-376
Growing the Specialty Mushroom Industry in the Northeast
Willie Crosby, Fungi Ally, Montague MA
$98,796

RESEARCH FOR NOVEL APPROACHES GRANT: LNE19-386R
Creative Farm Business Models to Address Employee Hiring, Training and Management Barriers
Kevin Cody, New Entry Sustainable Farming Project, Beverly MA
$159,988

RESEARCH FOR NOVEL APPROACHES GRANT: LNE19-390R
Reframing the Sustainable Farming Narrative to Help Northeast Farmers Effectively Activate Consumers
Michael Rozyne, Red Tomato, Plainville MA
$175,412

RESEARCH FOR NOVEL APPROACHES GRANT: LNE19-393R
Farming Tautog as a High Value Fish while Reducing Invasive Crab Populations
Daniel Ward, Ward Aquafarms, North Falmouth MA
$149,179
Maryland

GRADUATE STUDENT GRANT: GNE19-197
Farming in the Face of Climate Change: Planting Alternative Crops in Salt-intruded Fields
Elizabeth de la Reguera, University of Maryland, College Park MD
Advisor: Katherine Tully
$14,995

GRADUATE STUDENT GRANT: GNE19-206
Novel Application of Existing Beekeeping Equipment to Combat Inter-colony Transmission of the Varroa Honey Bee Parasite
Kelly Kulhanek, University of Maryland, College Park MD
Advisor: Dennis van Engelsdorp
$14,976

GRADUATE STUDENT GRANT: GNE19-207
Plant Growth Promoting Rhizobacteria to Benefit Kale Production: Resilience to Drought Stress, Salinity and Microbial Food Safety
Xingchen Liu, University of Maryland, College Park MD
Advisor: Shirley Micallef
$15,000

GRADUATE STUDENT GRANT: GNE19-209
Healthy Soils, Healthy Farmers: Assessing Farmers’ Soil Contact Activities and Soil Contamination on Urban and Rural Farms
Sara Lupolt, Johns Hopkins University, Baltimore MD
Advisor: Keeve Nachman
$15,000

New Hampshire

GRADUATE STUDENT GRANT: GNE19-198
Improving Biopesticide Efficacy of Apple Diseases through Co-application with Natural Products
Liza DeGenring, University of New Hampshire, Durham NH
Advisor: Anissa Poleatewich
$14,685

PARTNERSHIP GRANT: ONE19-349
NH Community Food Ambassadors for Mobile Farmers Markets
Matthew Thorne, Organization for Refugee and Immigrant Success Manchester NH
$30,000

PROFESSIONAL DEVELOPMENT GRANT: ENE19-155
Improving Professional Capacity to Deliver Farm Succession Planning Assistance in New England
Shemariah Blum-Evitts, Land for Good, Keene NH
$101,021

STATE PROGRAM: NENH17-001
Tech-transfer for NH Beekeepers
Olivia Saunders, University of New Hampshire, Conway NH
Program Associate: Jill Tomlinson
$44,381
New Jersey

FARMER GRANT: FNE19-931
Cold Storage of Eastern Oysters, Crassostrea virginica, to Reduce Winter Mortality in an Increasingly Variable Environment
Elizabeth Haskin, Betsy’s Cape Shore Salts, Cape May Court House NJ
$14,845

FARMER GRANT: FNE19-933
Using Demographic Information to Identify Specialty Crop Markets
Michelle Infante-Casella, Rutgers University, Clarksboro NJ
$40,000

STATE PROGRAM: NENJ17-001

FARMER GRANT: FNE19-942
Sweet Potato Production: Growing Slips/Cuttings For Distribution to Local Farmers
Peter Bump, Pete’s Plentiful Produce, Sodus NY
$2,302

FARMER GRANT: FNE19-922
Reduced Till and No-Till Planting of Vegetables in a Vetch/Triticale Cover Crop
Jean-Paul Courtens, Roxbury Farm, Johnstown NY
$15,000

FARMER GRANT: FNE19-930
Quantifying Nutritional Value and Best Practices for Woody Fodder Management in Ruminant Grazing Systems
Steve Gabriel, Wellspring Forest Farm, Trumansburg NY
$14,920

FARMER GRANT: FNE19-919
Establishing a Cooperative Business Model for Marketing and Selling Kunekune Pork Products
Jennifer Bassman, Heritage Haus Farm, Berkshire NY
$13,807

GRADUATE STUDENT GRANT: GNE19-201
Antibiotics in the Dairy Farm Environment: Understanding Antibiotic Transport to Improve Farm Sustainability
Christine Georgakakos, Cornell University, Ithaca NY
Advisor: Todd Walter
$11,782

GRADUATE STUDENT GRANT: GNE19-204
Elucidating the Role of Microarthropods in Nitrogen Cycling
Ashley Jernigan, Cornell University, Geneva NY
Advisor: Kyle Wickings
$14,715

GRADUATE STUDENT GRANT: GNE19-208
Characterization of Diversity in Traditional Northeastern Dry Bean Varieties and Potential for Genetic Improvement
Kristen Loria, Cornell University, Ithaca NY
Advisor: Michael Mazourek
$14,932

GRADUATE STUDENT GRANT: GNE19-220
Maximizing Colostrum’s Benefits and Reducing Antibiotic Use through Physiological Feeding Management of Dairy Calves
Kasey Schalich, Cornell University, Ithaca NY
Advisor: Vimal Selvaraj
$14,877

GRADUATE STUDENT GRANT: GNE19-212
Increasing Consumer Acceptance of Baby Leafy Greens Grown in a Controlled Environment
Regina O’Brien, Rutgers University, New Brunswick NJ
Advisor: Beverly Tepper
$15,000

GRADUATE STUDENT GRANT: GNE19-214
Ecological Urban Farming: Adaptation of No-Till, Compost Mulching and Perennial Hedgerows for the NYC Ecosystem
Orion Ashmore, Project EATS Help Sec Farm, New York NY
$14,987

GRADUATE STUDENT GRANT: GNE19-208
Establishing a Cooperative Business Model for Marketing and Selling Kunekune Pork Products
Jennifer Bassman, Heritage Haus Farm, Berkshire NY
$13,807

GRADUATE STUDENT GRANT: GNE19-208
Sustainable Wine Professional Course
Whitney Beaman, Bedell Cellars, Cutchogue NY
$14,842

FARMER GRANT: FNE19-918
Quantifying Nutritional Value and Best Practices for Woody Fodder Management in Ruminant Grazing Systems
Steve Gabriel, Wellspring Forest Farm, Trumansburg NY
$14,920

FARMER GRANT: FNE19-933
Establishing a Cooperative Business Model for Marketing and Selling Kunekune Pork Products
Jennifer Bassman, Heritage Haus Farm, Berkshire NY
$13,807

FARMER GRANT: FNE19-929
Sustainable Wine Professional Course
Whitney Beaman, Bedell Cellars, Cutchogue NY
$14,842

New York

FARMER GRANT: FNE19-917
Ecological Urban Farming: Adaptation of No-Till, Compost Mulching and Perennial Hedgerows for the NYC Ecosystem
Orion Ashmore, Project EATS Help Sec Farm, New York NY
$14,987

FARMER GRANT: FNE19-929
Reduced Till and No-Till Planting of Vegetables in a Vetch/Triticale Cover Crop
Jean-Paul Courtens, Roxbury Farm, Johnstown NY
$15,000

FARMER GRANT: FNE19-930
Quantifying Nutritional Value and Best Practices for Woody Fodder Management in Ruminant Grazing Systems
Steve Gabriel, Wellspring Forest Farm, Trumansburg NY
$14,920

FARMER GRANT: FNE19-933
Establishing a Cooperative Business Model for Marketing and Selling Kunekune Pork Products
Jennifer Bassman, Heritage Haus Farm, Berkshire NY
$13,807

FARMER GRANT: FNE19-922
Sweet Potato Production: Growing Slips/Cuttings For Distribution to Local Farmers
Peter Bump, Pete’s Plentiful Produce, Sodus NY
$2,302

FARMER GRANT: FNE19-942
Healthy Soil for Urban Farm Production: Building from Scratch
Kyle Rittenburg, VINES Urban Farm, Binghamton NY
$13,624

FARMER GRANT: FNE19-924
Reduced Till and No-Till Planting of Vegetables in a Vetch/Triticale Cover Crop
Jean-Paul Courtens, Roxbury Farm, Johnstown NY
$15,000

FARMER GRANT: FNE19-930
Quantifying Nutritional Value and Best Practices for Woody Fodder Management in Ruminant Grazing Systems
Steve Gabriel, Wellspring Forest Farm, Trumansburg NY
$14,920

FARMER GRANT: FNE19-933
Establishing a Cooperative Business Model for Marketing and Selling Kunekune Pork Products
Jennifer Bassman, Heritage Haus Farm, Berkshire NY
$13,807

FARMER GRANT: FNE19-929
Sustainable Wine Professional Course
Whitney Beaman, Bedell Cellars, Cutchogue NY
$14,842

PARTNERSHIP GRANT: ONE19-345
Alternative and Organic Management Practices to Control Oriental Beetle in Commercial Blueberries
Dean Polk, Rutgers University, Bridgeton NJ
$29,848

PROFESSIONAL DEVELOPMENT GRANT: ENE19-157
Training Agriculture Service Providers on the Nitty-Gritty Details of No-Till and Cover Crop Practices for Greater Implementation
Bridgett Hilshey, North Jersey Resource Conservation and Development, Asbury NJ
$148,966
GRADUATE STUDENT GRANT: GNE19-223
Identifying Tomato Varieties with Resistance to Current Aggressive Strains of the Leaf Mold Pathogen
Martha Sudermann, Cornell University, Geneva NY
Advisor: Christine Smart
$14,797

PARTNERSHIP GRANT: ONE19-337
Creating Goat Artificial Insemination Video Training Materials
Betsy Hodge, Cornell Cooperative Extension, Canton NY
$9,086

PARTNERSHIP GRANT: ONE19-351
Postharvest Handling of Garlic for Control of Pests and Disease
Crystal Stewart, Cornell University, Johnstown NY
$29,968

PARTNERSHIP GRANT: ONE19-353
Biological Control of Chestnut Weevil
Denis Willett, Cornell University, Geneva NY
$29,684

RESEARCH AND EDUCATION GRANT: LNE19-372
Identification and Remediation of Compaction on Northeast Pasture Soils
Fay Benson, Cornell Cooperative Extension, Cortland NY
$95,906

RESEARCH AND EDUCATION GRANT: LNE19-382
Tarping to Advance Reduced Tillage Systems on Small-Scale Vegetable Farms
Anusuya Rangarajan, Cornell University, Ithaca NY
$199,962

RESEARCH AND EDUCATION GRANT: LNE19-383
Biological Control of Corn Rootworm in Conventional and Organic Corn Production
Elson Shields, Cornell University, Ithaca NY
$199,199

PARTNERSHIP GRANT: ONE19-327
Two-spotted Spider Mite IPM for Urban Agriculture
Samuel Anderson, Cornell University, Brooklyn NY
$20,836

PARTNERSHIP GRANT: ONE19-328
Training Northeast Farmers to Confront and Dismantle Racism and Inequity in Food and Farming Systems
Caitlin Arnold, National Young Farmers Coalition, Hudson NY
$26,712

PARTNERSHIP GRANT: ONE19-330
Demonstrating Soil Health Improvements through Adoption of Interseeded Cover Crops and Grazing
Janet Britt, Agricultural Stewardship Association, Greenwich NY
$28,600

PARTNERSHIP GRANT: ONE19-336
Developing Integrated Pest Management Strategies to Reduce Damage from the Invasive Allium Leaf-miner on Organic Farms
Ethan Grundberg, Cornell University, Middletown NY
$29,943

PARTNERSHIP GRANT: ONE19-337
Impact of Biochar on Moisture and Nutrient Retention in Long Island Nurseries
Deborah Aller, Cornell Cooperative Extension, Riverhead NY
$83,949

PARTNERSHIP GRANT: ONE19-351
Sustainable Management of Fire Blight in Apples using Plant Growth Regulators and Plant Defense Activators
Kerik Cox, Cornell University, Geneva NY
$118,125

RESEARCH FOR NOVEL APPROACHES GRANT: LNE19-384R
Control of Cucumber Downy Mildew through Nighttime Application of Ultraviolet Light Before and After Infection
Mark Rea, Rensselaer Polytechnic Institute, Troy NY
$198,745

PROFESSIONAL DEVELOPMENT GRANT: ENE19-156
Spawning a Network of Northeast Mushroom Educators serving Urban and Rural Farmer Audiences
Yolanda Gonzalez, Cornell Cooperative Extension, Brooklyn NY
$144,938

STATE PROGRAM: NENY17-001
Baskets to Pallets II: Establishing a NYS Leadership Team of Wholesale Marketing Specialists
Violet Stone, Cornell University, Ithaca NY
$55,555

Pennsylvania

FARMER GRANT: FNE19-945
Farmer-Built Grain Pearling Machine
Nigel Tudor, Weatherbury Farm, Avella PA
$14,748

GRADUATE STUDENT GRANT: GNE19-195
Purification and Testing of Corn-based Biopesticide
Debamalya Chatterjee
Pennsylvania State University, State College PA
Advisor: Surinder Chopra
$15,000

GRADUATE STUDENT GRANT: GNE19-199
Development of Microbial Communities to Suppress Tomato Foliar Pathogens
Hanareia Ehau-Taumaunu, Pennsylvania State University, University Park PA
Advisor: Kevin Hockett
$15,000
“What started as the advisory board for the [project] has become a region-wide network of technical service providers, researchers educators and practitioners convening around support for the development of agroforestry systems in the Northeast and mid-Atlantic regions.”

Tracey Coulter
PA DCNR Bureau of Forestry
Professional Development
Project Co-Recipient: “Northeast Advanced Agroforestry Training for Natural Resource and Agricultural Educators” (ENE15-134)
INNOVATIONS

GRADUATE STUDENT GRANT: GNE19-202
Mitigation of Heat Stress in Dairy Cattle by Dietary Supplementation of Octanoic Acid
Longfei Han, Pennsylvania State University, University Park PA
Advisor: Chad Dechow
$15,000

GRADUATE STUDENT GRANT: GNE19-214
Defining Mechanisms Underlying Mite Tolerance and Honey Bee Survival
Allyson Ray, Pennsylvania State University, University Park PA
Advisor: Christina Grozinger
$14,998

GRADUATE STUDENT GRANT: GNE19-215
Using Protective Cultures to Control Listeria monocytogenes in Microbiomes from Small-Scale Dairy Production Facilities
Maria Laura Rolon, Pennsylvania State University, University Park PA
Advisor: Jasna Kovac
$14,940

GRADUATE STUDENT GRANT: GNE19-216
Assessing the Effects of Neonicotinoid Treatments on Pumpkin on Bee Visitation and Pathogen Transmission
Ginamaria Roman Echevarria, Pennsylvania State University, University Park PA
Advisor: Margarita Lopez-Uribe
$11,435

GRADUATE STUDENT GRANT: GNE19-222
Optimization of Greenhouse Crop Pollination through Artificial Homeostatic Control of Bumblebee Hive Temperature
Hannah Stewart, Pennsylvania State University, University Park PA
Advisor: Rudolf Schilder
$13,931

GRADUATE STUDENT GRANT: GNE19-225
Development of a Robotic Pruning System for Sustainable Apple Production
Azlan Zahid, Pennsylvania State University, Biglerville PA
Advisor: Long He
$15,000

PARTNERSHIP GRANT: ONE19-339
Placing Green Strategies for Maximizing Corn Emergence
Zachary Larson, Pennsylvania State University, Martinsburg PA
$29,526

PARTNERSHIP GRANT: ONE19-340
Maximizing Pollination Services for Blueberry Production in Pennsylvania
Margarita Lopez-Uribe, Pennsylvania State University, University Park PA
$29,575

PARTNERSHIP GRANT: ONE19-346
Producing Quality Poultry Bedding with a Trailer Mounted System
Wesley Ramsey, Penn Soil RC&D Council, Warren PA
$29,993

Rhode Island

FARMER GRANT: FNE19-923
Viability of Hogging Down Corn and Peas as Swine Feedstock
Ben Coerper, Wild Harmony Farm, Exeter RI
$9,673

FARMER GRANT: FNE19-927
Evaluation of Microclover Black Beauty as a Semi-Permanent Cover Crop and Living Mulch in Organic Tomato Production
John Eidson, Sodco Inc., Slocum RI
$4,228

FARMER GRANT: FNE19-943
Effect of an Indigenous Soil Microbial Inoculant on Soil, Soil Microbial Community and Leaf Nutrient Density
Rebecca Roberts, Endless Farm, Johnston RI
$12,323

GRADUATE STUDENT GRANT: GNE19-192
Best Management Practices for Small-scale Egg Producers
Julie Bosland, University of Rhode Island, Kingston RI
Advisor: Becky Sartini
$14,901
Andrew Chamberlin of the University of Vermont records an ag engineering podcast with farmers. Photo credit: Andrew Chamberlin

**2019 ANNUAL REPORT**

**RESEARCH AND EDUCATION GRANT: LNE19-381**
**Expanding Opportunities for Sustainable Management of Small Ruminant Gastrointestinal Parasites**
Katherine Petersson, University of Rhode Island, Kingston RI
$242,071

**STATE PROGRAM: NERI17-001**
**Season Extension with Caterpillar Tunnels on Rhode Island Farms**
Heather Faubert, University of Rhode Island, Kingston RI
$20,500

**Vermont**

**FARMER GRANT: FNE19-920**
**Comparing Management-Intensive Rotational Grazing Strategies to Enhance Land Regeneration and Farmer Livelihood**
Brandon Bless, Bread and Butter Farm, Shelburne VT
$13,108

**FARMER GRANT: FNE19-921**
**Modular Meat Processing Facility for Small Grazing Operations**
Brian Leach, Haystack Farmstead, Pawlet VT
$14,745

**FARMER GRANT: FNE19-941**
**Nutritional Contribution of Forage on Pasture-Raised Pigs**
Alessandra Rellini, Agricola Farm Panton VT
$3,328

**GRADUATE STUDENT GRANT: GNE19-205**
**Impacts of Silage Tarps on Soil Arthropods, Soil Properties and Crop Yields**
Eva Kinnebrew, University of Vermont, Burlington VT
Advisor: Gillian Galford
$15,000

**PARTNERSHIP GRANT: ONE19-329**
**Increasing Yield and Carbon Sequestration of Hemp Production with Understory Companion Crops**
Eric Bishop-von Wettberg, University of Vermont, Burlington VT
$20,224

**PARTNERSHIP GRANT: ONE19-333**
**Developing Pest and Fertility Best Practices for Industrial Hemp**
Heather Darby, University of Vermont, Saint Albans VT
$29,973

**PARTNERSHIP GRANT: ONE19-335**
**Mycoremediation of Phosphorus in Agricultural Runoff using Mycorrhizal-Plant Associations**
Josef Gorres, University of Vermont, Burlington VT
$29,981

**PARTNERSHIP GRANT: ONE19-343**
**Anaerobic Soil Disinfestation to Control Soilborne Pathogen *Rhizoctonia solani* in VT Field Conditions**
Deborah Neher, University of Vermont, Burlington VT
$30,000

**PARTNERSHIP GRANT: ONE19-348**
**Building a Resilient Farmer Network in the Face of Climate Disruption**
Beth Roy, Vital Communities, White River Junction VT
$29,917

**PARTNERSHIP GRANT: ONE19-350**
**Supporting Local Agriculture via Clinical Research: Human Studies with Elderberries to Improve Biomarkers of Obesity**
Patrick Solverson, University of Vermont, Burlington VT
$29,998

**RESEARCH AND EDUCATION GRANT: LNE19-373**
**New England Cider Apple Program: Optimizing Production for High-Value Markets**
Terence Bradshaw, University of Vermont, Burlington VT
$229,314
“We have demonstrated that by replacing insecticide sprays with long-lasting insecticide-treated nets on pheromone-baited apple trees, we eliminate the need for insecticide applications and protect apple fruit from injury at least as well as, and in some cases better than, standard grower programs. Pheromone lures used in these trials are now commercially available as well.”

Tracy Leskey
USDA Agricultural Research Service
Research and Education Grant Recipient:
"Building attract-and-kill systems for management of the brown marmorated stink bug in apple orchards" (LNE14-334)
Washington, DC

STATE PROGRAM: NEDC18-001
Enabling New Agripreneurs through UDC’s Farmer and Service Provider Training Program
Christopher Callahan, University of Vermont, Bennington VT
$129,567

RESEARCH AND EDUCATION GRANT: LNE19-379
Pre- and Post-Harvest Strategies for Leek Moth Control on Diversified Vegetable Farms
Victor Izzo, University of Vermont, Burlington VT
$102,799

West Virginia

GRADUATE STUDENT GRANT: GNE19-196
Characterization of Novel Long Non-coding RNAs and Their Roles as Indicators of Oocyte Quality in Cattle
Jaelyn Current, West Virginia University, Morgantown WV
Advisor: Jianbo Yao
$14,884

PARTNERSHIP GRANT: ONE19-338
Preserving the Past for the Future: Evaluating Production, Processing and Marketing of Appalachian Heritage Beans
Lisa Jones, West Virginia University, Morgantown WV
$29,356

PARTNERSHIP GRANT: ONE19-342
Implementing Beginning Farmer Training in Geographic Areas via WV Collaborative Regional Alliance for Farmer Training
Spencer Moss, West Virginia Food & Farm Coalition, Charleston WV
$29,067

PARTNERSHIP GRANT: ONE19-347
Advancing Walnut Syrup Production for Increased Profitability and Farm Income Diversification
Michael Rechlin, Future Generations University, Franklin WV
$26,685

RESEARCH FOR NOVEL APPROACHES GRANT: LNE19-387R
A Novel Phosphate Sorbent to Reduce Non-point Source Pollution and Increase Plant Production
Lian-Shin (Lance) Lin, West Virginia University, Morgantown WV
$199,813

STATE PROGRAM: NEWVSU17-001
Growing Grant Writing and Management Capacity with WV Ag Service Providers to Support Our Ag Community
Barbara Liedl, West Virginia State University, Institute WV
$16,664

Additional Projects

PROFESSIONAL DEVELOPMENT GRANT: ENE19-154
Building the Resiliency of Farms through Farm Law Education of Agriculture Professionals
Rachel Armstrong, Farm Commons, Duluth MN
$155,725

PROFESSIONAL DEVELOPMENT GRANT: ENE19-158
The Soil Life Short Course: Empowering Agriculture Professionals to Recognize, Quantify and Conserve Beneficial Soil Animals
Eric Lee-Mader, The Xerces Society, Portland OR
$114,618