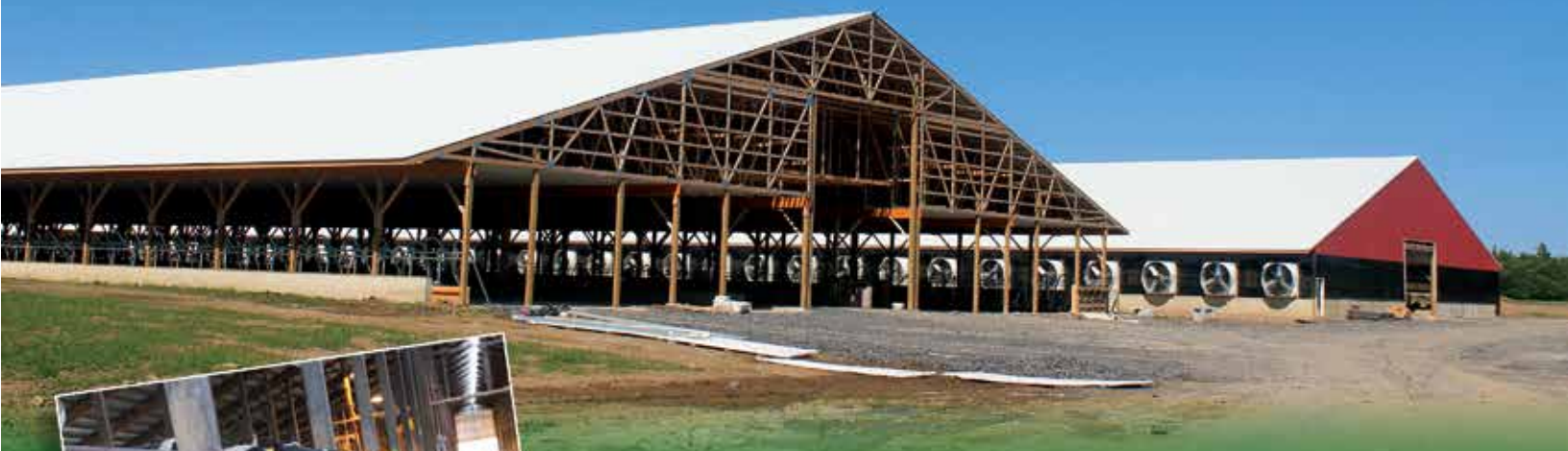
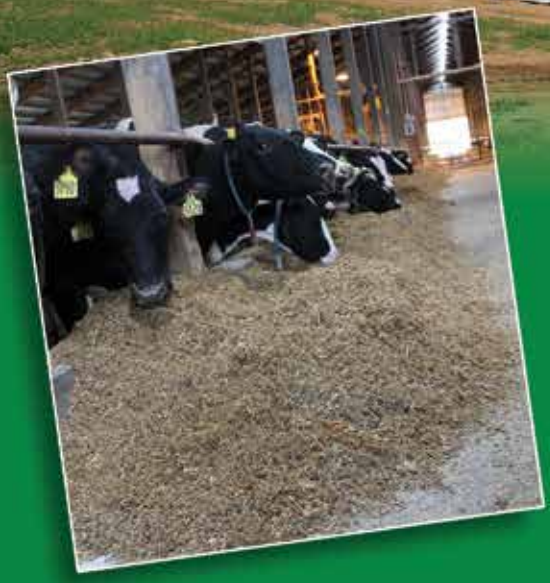
Northern New York Agricultural Development Program

Farmer-Driven Research • Real-World Results

2025 ANNUAL REPORT

BUILDING INTO THE FUTURE





The New York State Legislature established and funds the Northern New York Agricultural Development Program to grow northern NY's unique farms and food economy. The NYS Department of Agriculture and Markets administrates the funding.

Farmer-Driven Research • Real-World Results
www.nnyagdev.org

Demand for milk in NYS is predicted to increase 35% by 2030.

November 2025

Working Together for NY Agriculture

New York State Assembly Agriculture Committee 2025
Chair: Donna A. Lupardo

"The Northern New York Agricultural Development Program is a model for strategic investment in cutting-edge research, focusing on farm sustainability, local foods, and more. The North Country is a vitally important part of the state's agricultural economy and certainly merits this type of investment ($300,000, 2025-2026 NYS Budget)."
— NYS Assemblywoman Donna A. Lupardo, Assembly Agriculture Committee Chair

Members: Didi Barrett • Ken Blankenbush** • Marianne Buttenschon • Catalina Cruz • Brian Cunningham
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Special thanks to Assemblyman Billy Jones for advocating for NNYADP funding throughout his Assembly terms.*

New York State Senate Agriculture Committee 2025
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Members: George M. Borrello • Samra Brouk • Patricia Fahy • Nathalia Fernandez
Pamela Helming • Peter Oberacker • Christopher Ryan • Lea Webb

***Northern NY Legislators above and William A. Barclay, Scott Gray, Joseph A. Griffo, Matthew Simpson, Daniel G. Stec*

"The NNYADP is vital to the success of our local farm economy - from research that improves herd health and crop resilience to innovations that protect our natural resources and expand market opportunities."
—NYS Assembly/Ag Committee Member/NNY representative Ken Blankenbush

Northern New York Agricultural Development Program

Co-Chairs: Joseph Giroux, Plattsburgh, 518-563-7523
Jon Greenwood, Canton, 315-386-3231
Jon Rulfs, Plattsburgh/Peru, 518-572-1960, 518-643-7958
https://www.nnyagdev.org

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Adjunct: Oneida County: Mark Savage, Boonville • **Oswego County:** Bruce Gibson, Lacona, (plus 2 farms in Jefferson County)

"The value that Northern New York Agricultural Development Program research brings to our region's farms and economy has also benefited New York State, the Northeast, and elsewhere in the U.S. Project results have helped enhance farm-employee relations and provided insight to positively impact farm sustainability." *—NNYADP Co-Chair Jon Rulfs, Plattsburgh/Peru, NY*

Growing NY's Farms & Foods Economy

The New York State Legislature established the Northern New York Agricultural Development Program in recognition of northern NY's unique opportunities to be a thriving agricultural economy. This 2025 annual report highlights how the NNYADP is advancing that mission through " Funding, Fusion, and Farmers".

$1,174,569,000
NNY Region's Total Agricultural Sales: 2nd Highest in NYS

"A Profile of Agriculture In New York State," NYS Comptroller's Report, Thomas P. DiNapoli

Funding, Fiscal Efficiency, Return on Investment

The New York State Legislature funds the NNYADP — in any given year through the leadership of the Assembly and/or Senate Agriculture Committee — making possible the research that supports the region's agricultural sales and sustainability, local foods security and accessibility, natural resource stewardship, and farm-based economic security.

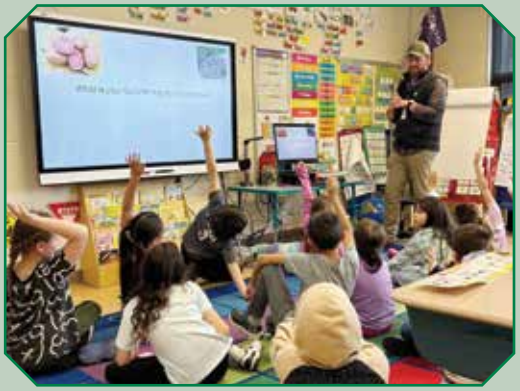
The NNYADP applies its State funding with fiscal efficiency and return on investment (ROI), with 95-98.5% of funding going directly to research and results delivery. For recent examples of ROI by the region's diverse farming sectors, see NNY Agricultural Economic Growth Indicators on page 11.

"The Northern New York Agricultural Development Program is a model for strategic investment in cutting-edge research, focusing on farm sustainability, local foods, and more. The North Country is a vitally important part of the state's agricultural economy and certainly merits this type of investment *($300,000, 2025-2026 NYS Budget)*."
— NYS Assemblywoman Donna A. Lupardo, Assembly Agriculture Committee Chair

Fusion: Fine Details, Big Picture Farming

This report highlights examples of how NNYADP projects:

- evaluate water quality in tandem with crop production goals (page 4)
- take a whole-farm approach to reducing greenhouse gas emissions (p 7)
- blend multiple datasets to enhance dairy and crop efficiencies (p 5)
- field-test crops and product potential for adaptability to NNY's unique microclimates & many soil types (p 4, 8-10)
- evaluate high tunnel crop production in tandem with enterprise budget development (p 9)
- include consumer preferences with new product development (p 9)
- apply ingenuity and cost consciousness to a DIY maple project (p 10)
- benefit the agricultural economy of NNY, statewide & nationally (p 4-11).



Well Done, Tony LaPierre! Congratulations, Mike Murphy!
At the New York Farm Bureau (NYFB) 2024 annual meeting, NNYADP Farmer Committee member Tony LaPierre of Rusty Creek Farm, Chazy, was honored for his NYFB service since 2017. Tony continues to serve with the NNYADP Farmer Committee. Above: NNYADP Farmer Committee member Michael Murphy, production manager at Childstock Farms, Malone, talks with a school class about potato farming. He is a newly-elected member of the NYFB Board of Directors.

Farmers: Focused on Sustainability

"We need the Northern New York Agricultural Development Program's new ideas and research that prove out what may otherwise be just a 'sales pitch.' This kind of research helps enhance cow health and farm economics."
— Dan Chambers, Chambers Farm, Heuvelton

NNYADP Co-Chairs Joe Giroux, Jon Greenwood, and Jon Rulfs are among the 80 farmers who volunteer with the NNYADP Farmer Committee, representing the many sectors of the region's agricultural economy.

"The funding from the New York State Legislature drives our shared mission to continue to grow and maintain northern New York's unique landbase, agricultural and natural resources as a farm-based economic powerhouse for our communities and for New York State." *— NNYADP Co-Chair Joe Giroux, Plattsburgh*

Photo Credits: Cover: Brian P. Whattam (BPW, 2); p3: CCE Franklin County; p4: Laura Klaiber (2), BPW; p5: BPW; p6: Stephen Ausmus/USDA ARS; BPW, Michael Basedow; p7: Subha Srinivasagan, Quirine Ketterings; p8: Elisabeth Hodgdon, Michael Davis; p9: Mike Farrell, Catherine Monserrate; p10: Adam Wild (3); p11 clockwise from top: BPW (2), Kara Lynn Dunn, BPW (2), Jim Ochterski, BPW, Elisabeth Hodgdon, Matthew Ryan, Michele Ledoux.
Editor: Kara Lynn Dunn. Special thanks: William Woodruff.

WATER QUALITY

On-Farm Tile Drainage Research: New Side-by-Side Results

The new phase of NNYADP-funded on-farm tile drainage (TD) research has begun establishing a basis for evaluating how field crop production practices interact with TD to impact crop production and farm environmental stewardship goals.

This research focused on side-by-side trials at a working dairy farm in Clinton County is being conducted by Miner Institute Research Scientist Laura Klaiber. Early work collected data from one tiled and one untiled field managed under the same production practices. From 2018 to 2022, analysis of water samples from surface runoff and subsurface tile drainage showed the tiled field regularly produced more total drainage than the untiled field, but the amount of surface runoff was substantially less, **an important factor when trying to reduce soil erosion.**

For this new phase of research, the untiled field became fully instrumented in December 2023 to monitor surface runoff and drainage from tile installed in June that year.

NNYADP tile drainage research evaluates water samples from TD and surface runoff for:

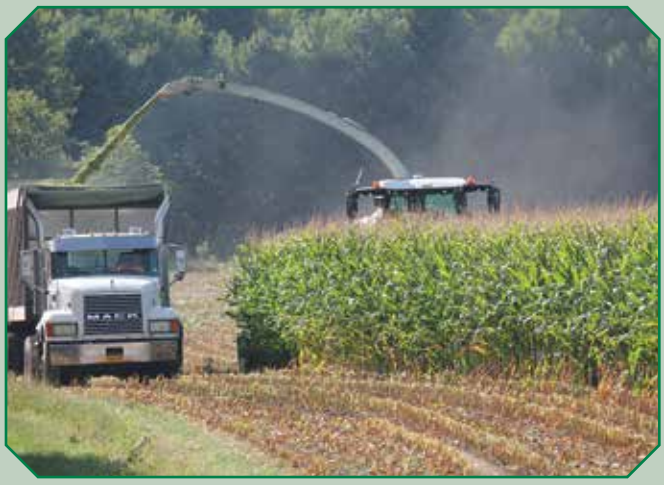
- **SRP: soluble reactive phosphorus**
- **TP: total phosphorus**
- **Nitrate-N (nitrogen)**
- **Amm-N: ammonium-N**
- **TN: total N**
- **TSS: total suspended solids (an estimate of erosion), and**
- **Rates of drainage.**

High Nutrient Retention and Use Efficiency

In 2024, despite the tile generating 88% of the total drainage from the newly-tiled field, the lower SRP and total P concentrations in the TD water samples resulted in disproportionately low nutrient losses relative to the volume of drainage. As with previous years, total P losses remained below 1.0 lb/acre and total N losses remained below 20 lb/acre in both fields, **reflecting high nutrient retention rate and use efficiency by the corn silage crop.**

Data from the newly-tiled and longer-tiled fields showed nearly identical rates of surface drainage. Weather-driven (rain, snowmelt) events impacted TD differences between the fields. The newly-tiled field appears to have a consistently higher water table, influencing consistent tile flow during much of the year in between weather events, while 90 percent of the TD flow from the longer-tiled field occurred during the weather-driven events. Only so much can be inferred from a single monitoring period alone. These data show the underlying complexity of environmental systems as the fields are only separated by a roadway, yet still have **meaningful differences**. Because of this natural complexity and variability in the landscape, projects such as these are designed to run for multiple years so that **relationships can be developed across the different weather patterns, field conditions, and production strategies**.

This work continues to build a data-based understanding of the multiple factors that influence nutrient retention and runoff, water quality, and crop success. Key field management practices for attention are no-till corn production and the use of fall-planted cover crops to reduce the amount of time there is bare soil in the field.



CROPS: Corn Seed Cost vs. Yield Comparison

Commercial corn seed sells at various price points. With an NNYADP grant, Miner Institute Forage Agronomist Allen Wilder compared corn seed hybrids for silage yield and quality by price. Higher-priced corn seed cost approximately $173/unit more than the budget-priced corn purchased for the trial. When accounting for added tonnage produced by the higher-priced corn, the cost would break even with a standing corn value of $36.3/ton. The lower priced hybrid group cost less, but had slightly lower yield potential.

The Bt-traited packages for this trial averaged $129/unit. With low pest pressure in the test plots during this single-season trial, Bt-traited seed represented a loss of approximately $54/acre. More details are in the project report posted under Crops Research at nnyagdev.org.

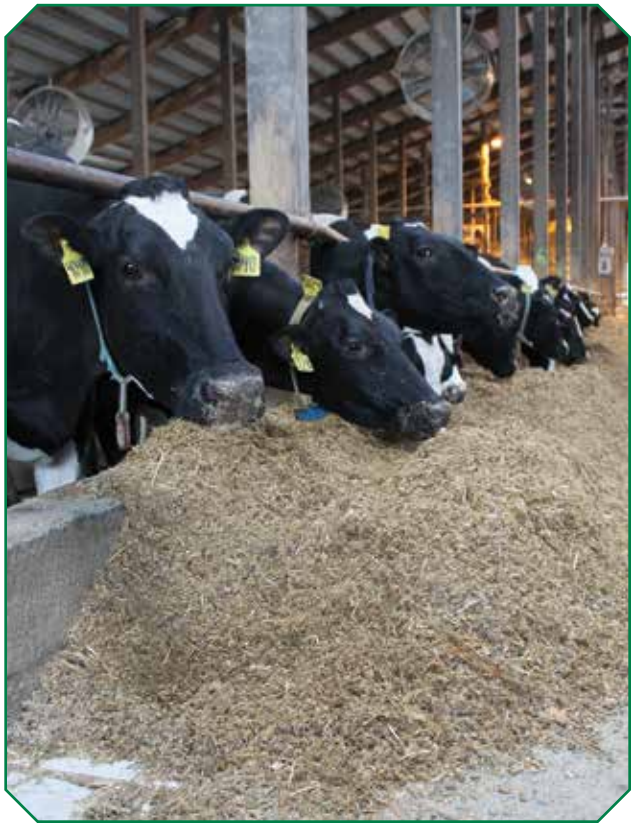
Corn Seed Purchasing Considerations

- Low-cost corn seed is not commonly grown in NNY.
- Weigh cost vs. yield potential and yield needed to meet farm's feed inventory.
- Select diverse set of hybrids and planting dates to offset potential weather-related risk.
- Monitor local pest pressure trends/predictions; use Bt-traited seed as part of IPM approach.

Pilot Project: How Farm-Specific Environment Impacts Forage Value in Dairy Diet and Milk Production

First-year results of proof-of-concept field trials are promising for a data networking system analyzing multiple parameters of plant performance in tandem with those for forage quality, milk production, and farm economics.

With an NNYADP grant, Cornell PRO-DAIRY Dairy Forage Systems Management Specialist Joe Lawrence implemented the first test of his idea that crop trials' performance data of fewer varieties at multiple farm locations can provide valuable information about the impact of the growing environment on crop performance in a more efficient (less costly in terms of time, labor, and analysis) manner than larger variety trials that are limited in the number of locations feasible to conduct them. The initial results prompted a second year of trials in NNY with NNYADP support and added statewide trials with NY Corn and Soybean Growers funding. The University of Vermont is a project collaborator.



"One measured value of fiber or fiber digestibility explains only in part how a forage will perform in the dairy cow diet. Evaluating multiple measurements that include environmental factors allows for more precise analysis and understanding of how feed may be utilized by the cow. Additionally, the system will help identify when environment, growing conditions, and/or management practices may be constraining a crop's value as dairy feed source."
— Cornell PRO-DAIRY Dairy Forage Systems Management Specialist Joe Lawrence

In Year One, trials of two varieties each of corn, soybean, and alfalfa were planted at two farms in Lewis County and one site in Essex County.

- Site-specific balanced diets for lactating cows were developed with each location's forages: 64.6% forage content for the Lewis County sites, 52.8% forage content for the Willsboro location.
- A base diet established for a 1,600-pound Holstein cow with a goal of 97 lbs. of milk, 4.24% fat, and 3.2% protein was compared to the diets formulated for the individual farms.
- Milk production in lbs. per dry matter was 97 lbs/cow for the Lewis County sites, 86.4 lbs/cow for the Willsboro location.
- Lower nutritional value of the forages grown at the eastern location influenced a higher total feed cost with lower milk production in contrast to the western sites that achieved higher milk production at a lower total feed cost.

Table 8: Change in Predicted Milk Production with Trial Forages vs. Base Diet. "Field Crop Performance Network Development Pilot Project" report.

Change in milk production: Forage change only, no adjustment to other diet ingredients		Lowville	Willsboro
	MP allowable milk, lbs	+2.5	-2.9
	ME allowable milk, lbs	+3.9	-3.4

Key: *MP: metabolizable protein; ME: metabolizable energy.*

Economic Impact of Diet Optimization: An additional $1.06 in income over feed cost was recorded with the diet optimized for the farm-grown forages value of the Lewis County sites.

"This is a substantial difference highlighting that with the same crop* genetics and best production practices, the growing environment has a significant impact on the feed value of the crop.** ***The comparison also highlights the importance of rebalancing the dairy diet to optimize the value of the farm-grown forages." — Joe Lawrence

COVER CROPS, BIOCONTROL, PRODUCT TESTING

Late-Season Cover Crop Data

Dairy and vegetable farms in Croghan, Mooers, and Plattsburgh hosted 2 seasons of trials of 14 cereal rye varieties. Key findings:

- **Emergence:** Generally consistent across varieties & planting dates.
- **Biomass production:** Elbon, ND Gardner, Rymin, Wren Abruzzi did well across site-year & planting dates, indicating stable performance under NNY's varied growing conditions.
- **Lower precipitation** at one site with less snow cover produced lower biomass.
- **Winter survival** varied by site: 9% to >70%.
- **Marginal planting date:** A more productive variety may determine whether sufficient biomass will be achieved to suppress weeds and provide other benefits.

This NNY cover crop data is added to the national Cover Crop Breeding Network.

Fall-Planted Cover Crop Benefits

- Reduce soil erosion, weeds & nutrient runoff
- Filter surface and groundwater
- Add organic matter to soil
- Sequester carbon in soil
- Provide additional forage

NNY-BORN BIOCONTROL SUCCESS
Regional, National Impact Keeps Growing

More than 75,000 acres in northern New York are now protected by the nature-based solution developed here over 30 years' time. In 1986 entomologist Elson Shields, Ph.D., and Research Support Specialist Tony Testa began the quest to manage alfalfa snout beetle (ASB), an invasive pest destroying alfalfa crops and negatively impacting milk production on regional dairy farms. Their efforts discovered and pioneered the use of native-to-NY persistent biocontrol nematodes (PBN) first for managing ASB, then weevils in berry crops in Clinton County. Over time, NNY farmers reported additional positive impact of the biocontrol application on corn rootworm (CRW) reduction.

With NNY's farmers and custom applicators' cooperation, Shields and Testa refined their protocols to make PBN application more farmer- and applicator-friendly. The PBNs can now be held in solution for 14 (NNYADP, 2022) to 30 days (NYFVI, 2025) if weather or other scheduling issues delay application.

John D. and John E. Peck in a field of alfalfa restored to full production at Peck Homestead Farm where the PBN protocol first proved successful.

Today, more than 125,000 acres in the U.S. and Canada have received PBNs. Young farmer Mary DeBeer established DeBeer AgriService in 2016 to rear, supply, and apply PBNs across NY's northern region. To meet national demand, in 2019 Shield's son and military veteran Keegan Shields established Persistent BioControl in Texas and completed a new PBN rearing facility in Iowa in 2025. PBNs are being applied, or tested, for management of ASB, CRW, and pests in cotton, grape, hops, pecan, wheat, woody ornamentals, and athletic and turf fields in multiple states.

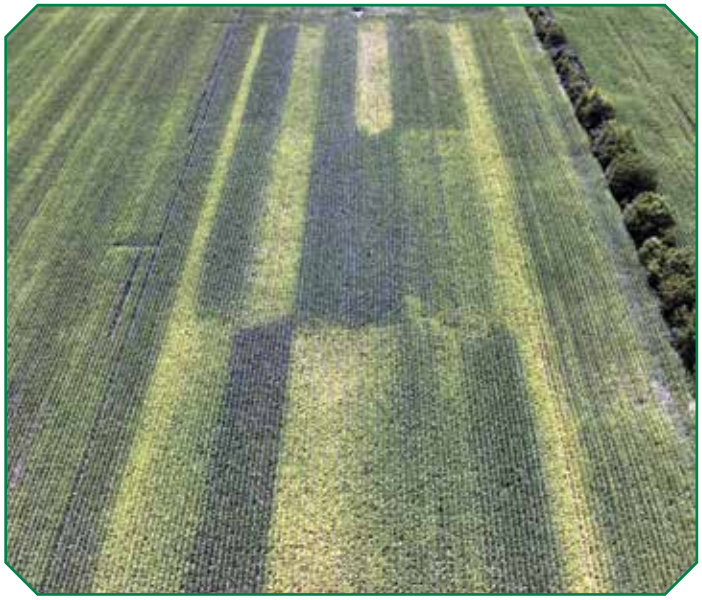
"The steadfast funding and morale support from the farmers of the Northern New York Agricultural Development Program through the early years gave us the time to develop the science behind this biocontrol and prove it would work." ***— Elson Shields, Ph.D.***

The NNYADP also supported the development of ASB-resistant alfalfa, now commercially available.

PRODUCT TESTING
Late Thinning Season Help?

Northern NY's variable spring temperatures challenge apple growers, particularly during traditional apple thinning times: petal fall and when fruit reach 12mm diameter. Thinning, by equipment or hand, is needed to achieve an optimal number of apples per tree to maximize crop value, and for return bloom the following year. Tree fruit specialist Mike Basedow with Cornell's Eastern NY Commercial Horticulture Program is testing a new product (Accede) said to work well under cooler temperatures and slower drying conditions. **Data from trials with 3 apple varieties at 3 commercial orchards in NNY** have shown some efficacy at 20mm fruit size, giving growers an additional late thinning window and may reduce the amount of hand thinning needed. As with other thinning materials, weather conditions before and after use impact success. More data is coming in spring 2026.

"Having a feasible rescue thinning material would be particularly valuable in northern New York orchards as growers had poor thinning results with some other thinners in 2018-2020 and 2022 in some of their most valuable varieties (Honeycrisp and Gala). It is critical to evaluate new products under Northern New York's conditions before recommending use here on a commercial scale."
— Eastern NY Commercial Horticulture Program Tree Fruit Specialist Michael Basedow



Efficient manure application can reduce or eliminate imported fertilizer cost and support crop yield that translates to milk income and/or cash crop sales.

THE VALUE OF MANURE: Not Just N, P and K*

Manure sources today are more diverse than they were in the 1990s when manure value crediting systems were designed. In New York, since 2022, NNYADP grants have contributed to research that evaluates different manure sources and their ability to improve yield and reduce reliance on synthetic fertilizers. This effort is led by Quirine M. Ketterings, Ph.D., Director of the Cornell Nutrient Management Spear Program (NMSP) and Juan Carlos Ramos, NMSP on-farm research coordinator. The team is documenting and evaluating current-day manure sources, application methods and timing, and related crop yields on NNY dairy farms.

"This project is documenting just how valuable manure is as an on-farm resource. It's more than just N, P, and K. Its ability to release nutrients both immediately and slowly over time make it a two-season asset."
— Dairy farmer and NNYADP Co-Chair Jon Greenwood

The most recent field trials compared nitrogen (N) rates and evaluated the use of a Manure Calculator app for estimating N, P, and K credits from various manure sources. Some highlights:

- Manure addition can increase yield across sites.
- Data show carry-over yield benefit from previous year's manure application.
- For one NNY farm, in the 2nd year since application, yield was 2.7 tons more when manure was applied with a return at the most economic rate of N application of $152 per acre.

** Nitrogen, phosphorus and potassium*

REDUCING GREENHOUSE GAS EMISSIONS

How do greenhouse gas (GHG) emissions, individual farm nutrient use, and biodiversity interact to impact farm and farm environmental sustainability? That is the focus of NNYADP-funded research by the Cornell NMSP (see left), Champlain Valley Agronomics, and Miner Institute. This work is supported by data from NNY dairy farms.

This research is helping farmers to begin identifying, selecting, and implementing sustainable practices that simultaneously add to their farms' environmental stewardship, production efficiencies, and profitability.

Recent project results include calculation of GHG emissions and the potential for removal at the whole farm level. While additional farms and years of data collection are needed, the identified practices that can reduce GHG emissions are:

- reduced tillage
- improved nitrogen management
- use of cover crops
- covering liquid manure storage
- installing anaerobic digesters.

The NNY data are added to a statewide database that indicates that efficient manure management and homegrown feed production can also help lower carbon dioxide, methane, and nitrous oxide emissions.

"When we reduce fertilizer and feed purchases without impacting crop yield and milk production, it not only benefits the nutrient balances and GHG emission intensity of farms, but would also contribute to improvements in farm economics. Key is the discovery of where such reductions can be made."
— Quirine M. Ketterings, Ph.D., NMSP Director

NNYADP Co-Chair Jon Rulfs of Adirondack Farms, standing far left, and Eric Beaver of Champlain Valley Agronomics, standing far right, talk with a group about the importance of nutrient management and whole farm nutrient balance assessment.

INNOVATIVE PEST MANAGEMENT

Proof-of-Concept Trials Show Ground Barrier May Help Reduce Swede Midge Damage

Landscape fabric, above, and silage tarp were tested for swede midge suppression.

Three vegetable farms in northern New York hosted the first season-long trials of a new way to manage swede midge (SM). SM is an invasive fly that causes significant economic damage in brassica crops (broccoli, kale, cauliflower, and Brussels sprouts). Cornell Cooperative Extension Vegetable Specialists Elisabeth Hodgdon, Ph.D., and Christy Hoepting tested Hoepting's theorized approach of using ground barriers over previously SM-infested soil to prevent the pest's spring emergence. Larval feeding makes plants unmarketable. The larvae overwinter in the soil to emerge the following spring to produce multiple generations until a killing frost. Traps can capture 100-200 midges/week. All three growers participating in this NNYADP-funded research had previously experienced as much as 100% crop loss to SM.

The Results: Trap captures of SM at each of the participating farms did not exceed 50 midges.

Chicory Hill Farm, Antwerp

SM had damaged nearly 100% of broccoli crop. Silage tarp applied mid-April-July 22, 0 damage in June, but by fall cabbage, cauliflower, broccoli, and lacinato kale impacted. "Even with the damage we saw it was still less overall than that we experienced in the year before."
— Chicory Hill Farm owner Allen Funk

Riverside Farm, Cape Vincent

SM had damaged ~80-90% of organic kale crop. With silage tarp over previously-infested kale ground April-mid-July, SM damage 0 in June, 44% in July, 32% in October. Hodgdon notes that some of the kale plants appeared to outgrow early SM damage, resulting in fewer symptoms in October versus July. "This trial showed us that using a ground barrier is one more practice we can use in an integrated pest management system." *— Riverside Farm owner Carly Basinger*

Full And By Farm, Essex

SM was a persistent problem for 10 years, damaging sprouting broccoli (~100%), kale, mustard greens, and Brussels sprouts. April-October: with landscape fabric over previously-infested ground, only twice did SM count exceed the economic threshold of 7 males/week. No crop damage in June, July, or the fall.

"In Essex, grower Sara Kurak also used floating row cover over most of her brassica crops to manage flea beetles during each crop cycle and so the impact of the ground barrier must be considered in tandem."
— CCE Vegetable Specialist Elisabeth Hodgdon, Ph.D.

With these NNYADP project results, Hoepting and Hodgdon secured Northeast Sustainable Agriculture Research and Education funding to expand on-farm demonstrations of ground barrier use for SM management statewide.

NEW CROPS DEVELOPMENT

Chestnuts, Cold-Hardy Pecan Trials Added

NNYADP trial's 1st hazelnuts.

The NNYADP's cold-hardy nut crops research suite now includes pecans and chestnuts at the Willsboro Research Farm in Essex County. Five seedlings each of three chestnut lines have been established at the Willsboro Research Farm in Essex County along with six seedlings of two cold-tolerant pecan varieties. They join American and hybrid hazelnut plantings varieties planted in 2023-24. One of the hazelnut seedlings produced the trial's first nuts in 2024.

Alongside these new-for-NNY crops are NNYADP trials of the high-antioxidant, high-phytonutrient "super fruits" of juneberry, honeyberry, aronia, and elderberry that represent significant economic value. Regional growers are now harvesting sales of these berries: fresh-picked, u-pick, and value processed into jams and jellies.

Project collaborators with project leader Willsboro Research Farm Manager Michael H. Davis, Ph.D, include:

- Regional growers now producing their own crops of "super fruits"
- SUNY Plattsburgh Associate Professor/botanist Michael Burgess, Ph.D.
- Cornell University Horticulture Professor Marvin Pritts
- New England Interstate Water Pollution Control Commission (NEWIPCC) Agronomist Myra Lawyer working with the Lake Champlain Basin Program.

TANDEM RESULTS: PRODUCTION & ECONOMICS

96' x 30' High Tunnel	Sugar Cube Net Income	Tasty Bites' Net Income
2023-2024 Average		
Double Leader (200 plants per tunnel)	$1,897.32	$1,885.32
Mesh (200 plants per tunnel)	$2,202.11	$1,690.11
Untrellised (160 plants per tunnel)	$2,624.67	$1,841.32

96' x 30' High Tunnel	2023 Net Income	2024 Net Income	Average Net Income
Sugar Cube, DL	$2,233.75	$1,560.89	$1897.32
Sugar Cube, Mesh	$930.44	$3,473.78	$2,202.11
Sugar Cube, Untrellised	$2,602.47	$2,646.86	$2,624.67
Tasty Bites, DL	$2,231.75	$1,538.89	$1,885.32
Tasty Bites, Mesh	$1,928.44	$1,451.78	$1,690.11
Tasty Bites, Untrellised	$1,853.37	$1,829.2	$1,841.32

High Tunnel Project Provides the Numbers

Crop production data evaluated in tandem with comparative enterprise budgets form a powerful tool to help growers decide which crops may best fit their farm business. This is how Cornell University Regional Vegetable Specialist Elisabeth Hodgdon, Ph.D., and Agricultural Business Specialist Lindsey Pashow frequently present their NNYADP-funded local foods research.

Hodgdon and Pashow most recently evaluated 3 high tunnel growing systems with 2 different varieties of melons over 2 years.

- **In both years,** each system: untrellised, vertical mesh, and double leader resulted in net profit, however, factors such as labor and expenses for each type of system must be carefully considered.
- **Enterprise budgets** were extrapolated for full production load in a 30x 96-foot high tunnel and include fixed costs for land and equipment and 30 variable costs.
- **Net income range** in 2024: $1,451.78: mesh-grown Tasty Bites 200 plants/tunnel to $3,473.78: mesh-grown Sugar Cube 200 p/t.
- **2-year average net income range:** $1,690.11: mesh-grown Tasty Bites 200 p/t to $2,624.67: untrellised Sugar Cube 160 p/t.
- **Highest yield systems/marketable fruit:** 2024: 13.3 lbs: untrellised Sugar Cube; 2023: 9.63 lbs/plant untrellised Tasty Bites.

High tunnel production research helps market growers overcome NNY's short spring-to-fall growing season and weather extremes. NNYADP high tunnel research has evaluated more than a dozen crops, including consumer favorites, winter crops, and crops not traditionally tunnel-grown.

"We often compare the net income opportunity of the crops we trial for high tunnel production with that for consumer-popular and profitable high tunnel-grown tomatoes. A skilled high tunnel tomato grower with strong markets and pricing may prefer to continue with that crop; however, if a grower has multiple tunnels, an interest in diversifying crop offerings, and local marketing potential for melons, melons may be a profitable option."
— Agricultural Business Specialist Lindsey Pashow, Harvest NY

NEW PRODUCT POTENTIAL

Bottling Shelf-Stable Aspen, Beech & Birch Sap Beverages

100 consumer panelists judged sap beverage samples at the Cornell Sensory Evaluation Lab.

Maple producers hesitant to tap other tree species, due to low sugar content, have new information to consider. With an NNYADP grant, Cornell University maple specialists Adam Wild and Aaron Wightman and food scientist Catherine Monserrate, Ph.D., developed recommendations for producing shelf-stable and refrigerated aspen, beech, and birch sap beverages. They used equipment typically found in NNY sugaring operations and adapted procedures for processing and preserving maple sap as a bottled beverage to fit the other species' unique sap compositions.

"We wanted to see if we could bottle the sap of other tree species without the expense required to concentrate the sap. Our effort suggests that small-scale production is feasible."
— Cornell Maple Program Co-Director Aaron Wightman

This NNYADP-funded research is believed to be the first to:

- report aspen and beech sap composition,
- validate pectin in beech sap, and
- develop a protocol (using an enzyme treatment) to filter out the gel-like pectin that forms during beech sap and syrup processing and leads to sediment or cloudiness in the final sap beverage.

For details on "Bottled Aspen, Beech and Birch Saps," and "Reducing Pectin in Beech Sap", see the Research: Maple, Beech, Birch & Honey tab at nnyagdev.org.

DIY Sap Cooling Innovation Responds to NNY Regional Warming Trend

The quality and flavor of maple syrup is directly related to sap quality.

Periods of increasingly warmer temperatures in a maple sugarbush can cause microbes to proliferate and degrade sap quality. With warming trends in northern New York, Uihlein Maple Research Forest Director Adam Wild proposed a DIY (do-it-yourself) project for chilling and storing maple sap.

"Having the ability to chill and hold maple sap to prevent spoilage would also eliminate the need for immediate boiling which would save labor and add flexibility, especially for producers with off-farm jobs," Wild pointed out.

Climate models predict warming in northern New York, with average temperature increasing up to 4.5ºF by the end of the century (EPA, 2016).

Success: Wild received an NNYADP grant and was successful in building different DIY sap chillers that effectively cooled and maintained sap quality..

Wild's "DIY-build" trials adapted a refrigerated dairy milk cooling tank and a typical sap holding tank with glycol chillers. He modified window air conditioning units to cool non-toxic, food-grade inhibited propylene glycol (used by food and beverage facilities).

Components:
Glycol; a plastic picnic cooler; submersible pump; temperature controllers; miscellaneous parts, such as pipe wrap insulation, wire nuts, etc.; and scrap wood and castor wheels for a cart to hold the unit.

Cost Estimates:
Depending on the size of the A/C used, $280-$550 with a used unit and up to $1,200 with a new and larger A/C unit. Similar commercial glycol units cost $3,000 or more.

Above: DIY glycol chiller connected to cooling plates on 1,500-gallon insulated dairy tank. Right: Smaller DIY chiller connected to cooling plate submerged into open top sap collection tank.

Chilled glycol pumping through lines in DIY-adapted milk tank was cold enough to cause condensation frost.

"Both DIY glycol chilling systems were extremely effective at chilling the glycol solution quickly and are a viable option for making a low-cost chiller."
— NNY Maple Specialist Adam Wild

Tips from "Cooling Maple Sap in a Warming Climate: How-To Guidelines for Building Your Own Chiller"

- Store maple sap close to freezing to prevent microbe growth. Higher concentrated sugar sap can be stored at a lower temperature before freezing.
- Low-cost equipment, e.g., Wi-Fi outlets and digital thermometers allow remote control and monitoring of a sap chilling system.

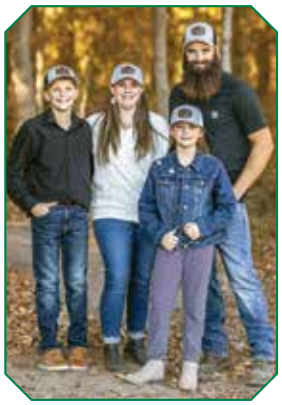
NOTE: ***See project report and complete DIY guidelines for more valuable information and safety tips.***

"This project shows glycol chillers to be an effective way to cool maple sap to maintain sap freshness. Glycol chilling can be less expensive than refrigeration and add flexibility to a maple operation. These chillers add options for chilling sap with a plate heat exchanger, submersible cooling plate, or wrapping the outer wall of a tank with flexible copper lines. Thank you to the NNYADP for making this timely 'experiment' possible." ***— Uihlein Maple Research Forest Director Adam Wild***

Northern New York Agricultural Economic Growth Indicators

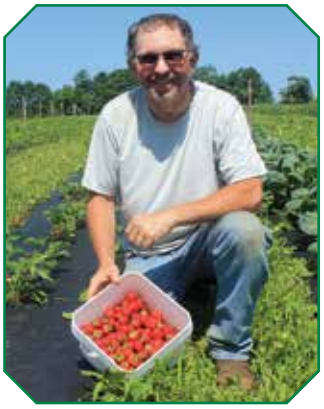
Farm Expanding, Mannsville: Tim & Renee Alford established Locust Hill Dairy in 1975 in Jefferson County with 39 cows. In 2015, they built a 2nd dairy in neighboring Oswego County; in 2025, Locust Hill Dairy added 2 barns to a 3rd dairy acquired in 2021 (Jefferson County).

Farm to School Connections: Cornell Cooperative Extensions in Franklin and Essex counties have received more than $180,000 in grants to help 14 schools increase local foods sourcing.



Sweet Addition, Copenhagen: Snyder's Sugar Shack, run by 4th-generation farmer Mara Snyder, her husband Mike and two children, built a Maple & More Store in 2024. Mara is a 2025 Northern New York Emerging Leaders "20 Under 40" honoree.

Young Farmers, Century-Old Business, Potsdam: Connor and Allyssa Hardiman are in their 10th year at St. Lawrence Nurseries established in 1923. They grow "Cold-Hardy Plants for Cold-Hardy People" (fruits, vegetables, nuts, timber trees) and added a new cooler and collaboration with a beekeeper in 2023.



Grower Adds Berries, Constableville: Road's End Orchards and Tangled Moose Winery, Lewis County's first garlic farm, adapted its cropping plan to meet local demand with u-pick strawberries in 2025.

Dairy Expanding, Copenhagen: 4th & 5th-gen members of the Moser family added a new barn at the main farm in 2025. Doug and Patty Moser were named Distinguished Farmer Award winners at the 2025 Lewis County Fair.

NY's Largest, Watertown: CWT Farms International completed a 49,000-square-foot chick hatchery at the Thousand Islands International Agriculture and Business Park in 2025. It is the largest hatchery in New York State, with a reported 1 million-plus-eggs weekly capacity.

New Produce Auction, Copenhagen: Local farmers started the Tug Hill Produce Auction in 2025, with fresh produce from farms in 5 counties available to local and wholesale buyers. Auction coordinator Wayne Zehr proxy-buys for restaurants.

16 NNY Farms Receive $3.3+ million in 2025 New York State Dairy Modernization Grants: Dairy modernization projects will help regional farms (Clinton County: 2; Jefferson: 4; Lewis: 6, St. Lawrence: 4) meet a predicted 35% increase in demand for milk in New York State by 2030.

Northern New York
AGRICULTURAL DEVELOPMENT PROGRAM
Farmer-Driven Research • Real-World Results

The New York State Legislature established the Northern New York Agricultural Development Program to grow Northern NY's unique farm, foods & forest economy.

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