Northern New York Agricultural Development Program

2022 Annual Report

Real-World Research & Results Year'round for NY's Farms & Foods Economy

Established by
the New York State Legislature, 1961

Funding for the NNYADP is supported by the NYS Legislature
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https://www.nnyagdev.org

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Northern New York Agricultural Development Program
Growing NY's Farms & Foods Economy

The New York State Legislature's establishment of a dedicated agricultural research program in northern NY in 1961 has steadily returned on investment with the ever-expanding and evolving farm-based economy across the state's six northernmost counties, NY's states #2 region for total agricultural sales.

Legislative support of the Northern New York Agricultural Development Program (NNYADP) provides for real-world, practical research addressing today's challenges and opportunities. NNYADP projects are enhancing agricultural environmental stewardship with on-farm tile drainage research (p. 4), whole farm nutrient balance assessment (p. 5), and the biocontrol nematode application science built here and now a wide-use crop pest management tool (p. 9). Entrepreneurs (p. 7, 10, 11) have been inspired to establish new businesses and marketing channels, introduce new products, and try new technologies to meet the farming and food needs of our local rural communities and cities beyond.

This report highlights recent NNYADP research results; their value locally, statewide and nationally; and how projects are responding to the region's unique climate, soils, natural resources, farming communities and economic growth potential. Find NNYADP reports, resources, videos, and more: www.nnyagdev.org.

NNYADP Program Hallmarks

- **Fiscal Efficiency:** ~95-97.5% of funding consistently goes directly to research and results transfer
- **Publicly-accessible project reports: www.nnyagdev.org**
- **Serving New York State's #2 region for total agricultural sales**
  - **. #2 region in total farm acreage: 1.1+ million acres**
  - **. Only region to gain agricultural acres 2007-2017**
  - **. #1 region for maple production, and**
  - **. #1 Christmas tree production county (Lewis)**

  (Office of NYS Comptroller's Profile of Agriculture in New York State, 2019)
- **Unprecedented agricultural water quality/tile drainage research** Results presented throughout New York State, the Northeast, nationally
- **NNYADP Farmer Committee grassroots acumen targets timely research with proven results**
- **First-trials/groundbreaking research** establishes feasibility (e.g., food hubs potential) or foundational database resources (p. 4, 5, 6, 7, 8)
- **Highly visible research results:** farm field days; crop congresses; regional, state, national conferences; Extension events; stakeholder groups
- **Broad media attention:** Adirondack Almanack • Adirondack Daily Enterprise • Ag Daily • American Agriculturist • American Maple Digest • ATTRA News • Boonville Herald • British Corn News • The Bullvine • CCE County newsletters/ E-news • Cornell Field Crops Blog • Country Folks/Grower • Cowsmo • Dairy Agenda Today • Dairy Business • Eastern Dairy Reporter • e-Dairy News • Farmers Friend • Farms.com • Fresh Plaza • Fruit Growers News • Hay & Forage Grower • Hoard's Dairyman • Inform NNY • International Horti-Daily • June Dairy Month • Lancaster Farming • Lowville Journal • Madison County Courier • Malone Telegram • Maple News • Miner Institute Farm Report • Morning Ag Clips • News 10 Albany • New York Ag Connection • NNY 360 • North Country Ag Advisor • OMAFRA Field Crop News (Canada) • On Pasture • The Packer • Peru NY Gazette • Plattsburgh Press Republican • PRO-DAIRY News • Spudman • Sun Community News • US Ag Network • Vegetable Growers News • WAMC Radio • Watertown Daily Times • WETM TV Elmira • Wild Sage News • WUTR TV Utica • WWNY TV, Watertown • WWTI TV, Watertown

NNYADP Farmers Committee Adds New Members

The NNYADP Farmer Committee welcomed new members in autumn 2022. These new members represent from the next to the 5th generation of family farms with interests spanning from dairy and field crops to diversified local foods, including maple, wine grapes, sweet corn, small-scale beef, NYS-Certified seed potato production, and growing greens for downstate markets. Their experience and enthusiasm will add to the proven acumen of the Committee to prioritize research needs for timely grant awards.

Congratulations! *In December 2021, NNYADP Co-Chair Jon Greenwood received New York Farm Bureau's Distinguished Service to Agricultural Award.*

NNYADP Tile Drainage Research: Protecting NY's Water Quality

"The NNYADP has prioritized development of a real-world data-based foundation to guide and evaluate best management conservation and agricultural guidelines to protect both water quality and sustainable crop production." — Jon Greenwood, dairy farmer, NNYADP Co-Chair

On-Farm Side-by-Side Trials: Developing A Data-Based Foundation for Conservation & Crop Success

To understand the complex processes of the movement of water and nutrients over and through soil and how the use of tile drainage influences that process, the farmer-driven NNYADP and Miner Institute initiated agricultural nutrient transport and water quality research in 2012. The New York State Department of Environmental Conservation provided land for the start-up trials. Today, this unprecedented research is focused on on-farm side-by-side trials producing data year'round from tile-drained and undrained fields. Project leader Laura Klaiber, a nutrient management specialist, has presented the progressive details of this research at regional, state, and national conferences of farmers, soil and crop scientists, agronomists, natural resource conservation professionals and citizen interest groups.

"The tiling of farm fields has received heightened scrutiny along Lake Champlain and in watersheds throughout the nation due to concerns about how it may influence the amount of runoff and the levels of nutrients such as phosphorus or nitrogen that could be transported into nearby waters. With these trials in northern New York, we now have data with promising and important implications for phosphorus reduction efforts."— Laura Klaiber, Nutrient Management Specialist

Very little research nationwide has focused on identifying the potential impact on water quality that may occur when the primary pathway of runoff changes from the surface to below ground. Klaiber's project includes analyzing surface runoff and tile drainage water samples for nutrient removal rates alongside field production data that measures fertilization/ nutrient application rates and crop uptake of nitrogen and other nutrients.

Climate, Extreme Weather Events, Winter ...

"With a changing climate and more frequent extreme weather events, growing conditions for farmers are now more challenging than ever. Research is critical to provide guidance that our farmers can use to adapt to these challenges and continue to grow high quality crops in a manner that also preserves our natural resources," says Klaiber.

Project collaborators: NYS DEC, Lake Champlain Basin Program, Cornell University, State University of New York, University of Vermont, New England Interstate Water Pollution Control Commission, and agricultural and environmental consultant firms.

NNYADP Agricultural Stewardship Project Results Coming in Early 2023

- **Quantifying Long-Term Agronomic and Water Quality Impacts of Tile Drainage in NNY Corn Fields: Phase 5**
- **On-Farm Evaluation of the Value of Manure**
- **Economic Feasibility of Co-Digestion of Manure and Food Waste on Northern NY Dairy Farms**

Edge-of-Field (EOF) Research Results Widely Presented

NNYADP edge-of-field research to quantify nutrient and sediment transport beyond farm fields in the Lake Champlain region began in 2018. Successive project results have been presented to Crop Congresses, the Lake Champlain Basin Program, Vermont legislative committee and agriculture advisory groups, Southern Extension and Research meetings, and national conferences. In September 2022, Natural Resources Conservation Service NY named Lake Champlain as its Priority Watershed for EOF water quality monitoring.

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NNYADP Ag Environmental Research: Whole Farm Nutrient Management Efficiency

Whole farm nutrient mass balance (NMB) research with NNYADP grant support is progressively identifying, defining, and field-testing ways to more efficiently, measure, monitor, and adapt to the diverse factors and interactions, including the generation of greenhouse gas emissions, that impact agricultural environmental stewardship goals.

Since 2015, farms participating in NNYADP whole farm NMB assessment have received farm-specific reports of their NMBs per acre and per hundredweight of milk produced, plus an "opportunity table" of their specific farm's key performance indicators and statewide benchmarks.

Side-by-side no-till cover crop trials on a NNY farm to evaluate winter rye, oats, and brassicas for conservation and soil health benefits.

2017-2020: A new approach to phosphorus (P) management was introduced to score fields for risk of P loss and guide manure applications. 2019 rollout of NY Phosphorus Index 2.0 in northern NY incentivized use of beneficial management practices (BMP), particularly in high risk P-loss areas, and creates opportunity for more fields to receive BMP-guided manure N applications.

2018-2020: Identified yield-stability management zones. Technology-assisted mapping and use of satellite & automated drone imagery showed promising results for developing a mapping tool that will give all farmers access to yield estimates for zone-based field management to drive more efficient allocation of nutrient resources (manure, fertilizer), reducing the risk of environmental and economic losses.

2019: Nitrogen (N) uptake efficiency research evaluated indicators of N efficiency. Trial data showed site-to-site differences were much greater than seed variety-based differences, highlighting a need to better understand how field management and growing conditions impact N use.

2021: Initial soil sampling showed pH, organic matter, slope and altitude to be important drivers for yield and yield stability of corn grain and silage. High resolution soil information collected using Veris technology showed promise as a way to identify drivers for yield.

2021-2022: Whole-farm evaluation of the 6 most relevant/promising sustainability tools shows key performance indicators for assessing opportunities to improve nutrient use and reduce carbon footprints of dairy farms.

First Micro-Nutrient Database for Soybean Growers:

Earlier NNYADP projects produced data and insight on the use of double cropping for nutrient use efficiency and quality forage production, and an assessment of plant tissue nutrient levels in soybeans resulted in the first-micro-nutrient database for NNY soybean grows.

"The support of northern New York's farmers and crop consultants helped spark the implementation of whole farm nutrient balance assessments as a comprehensive way to identify opportunities for more precise nutrient applications and improvements over time with the goal to make farms in northern New York and statewide more economically viable and environmentally sustainable.

"I have been involved with these and other NNYADP agricultural environmental projects through my leadership role for the Cornell Nutrient Management Spear Program for the past 21 years and many of the advances made in agriculture and environmental management to date are there because of the continued support from NNYADP and the farmers in northern NY."
— Quirine M. Ketterings, Ph.D., Director, Cornell Nutrient Management Spear Program (at right)

NNYADP Stewardship Project Results Coming Soon

- **Precision nutrient management using satellite-derived yield maps and yield stability base management zones**
- **On-farm evaluation of nutrient value of manure**

Alfalfa-Grass Research Results: Even 5% Can Boost Milk Production

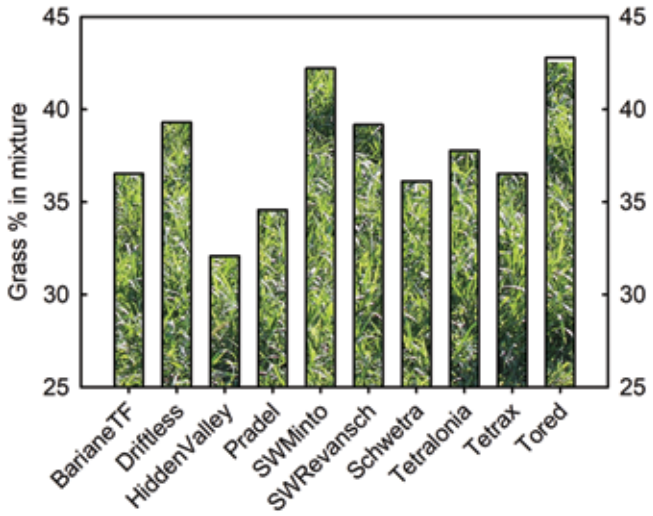
Northern New York's climate is a "constant variable" for farmers. With spring harvest accounting for as much as half of the total forage crop yield fed to lactating dairy cows, recent NNYADP crops research responded to farmer interest in growing winter-hardy perennial grasses in combination with alfalfa as the dairy industry's traditional go-to crop for highly-digestible, high-protein forage for milk production.

"Adding as little as five percent grass in an alfalfa-grass seeding will significantly increase the fiber digestibility of that forage mix compared to an all-alfalfa crop, and a one percent unit increase in fiber digestibility can bring from 0.5 to more than one pound of milk production per cow per day."
— NNYADP alfalfa-grass project leader Debbie J.R. Cherney, Ph.D., Cornell University Animal Science

Cherney's trials on regional farms included the first trials in North America of one Wisconsin-bred and several European-bred varieties of perennial meadow fescue with the potential to greatly improved the quality of alfalfa-grass mix crops.

"Grass quality and yield are significantly impacted by region. Since the consequence of too much grass in the mix is greater than the consequence of having a mostly pure alfalfa stand for harvest as lactating dairy cow feed, our data supports meadow fescue seeding rate in an alfalfa-grass mix not greatly exceeding 1 lb. per acre," Cherney points out. Her optimal percentage for an alfalfa-grass mix is 20-30 percent of a high quality grass.

In addition to seeding rate, Cherney also recorded data on fertility requirements, fiber content, fiber digestibility, and lignin value.



This chart shows the grass percentage for 10 perennial grasses in the NNYADP 2021 alfalfa-grass mix trial.

Insight from the latest NNYADP alfalfa-grass research has been presented to farmers, crop consultants, dairy nutritionists, and extension educators in New York, Wisconsin, Utah, and Mid-Atlantic states.

Research Fits Farm's Forage Fine-Tuning

The side-by-side research trials of alfalfa-grass % mixtures at Garden of Eden dairy farm in Philadelphia, NY, "perfectly dovetailed with my changing crop plan," says dairy farmer Michael Kiechle.

After poor growing years in 2019-2020, all his reserve forage for his cows had been fed out. So Kiechle decided to add the perennial grass fescue to his alfalfa-timothy-red clover mix. In 2021, his 4-cut mixed-crop harvest rebuilt his forage stockpile such that in June 2022 he still had bags remaining.

In 2022, Kiechle planted an entirely alfalfa-fescue mix.

NNYADP Crops Research Results Coming in Early 2023

- **Economic Feasibility of Co-Digestion of Manure and Food Waste on NNY Dairy Farms**
- **The Effect of Western Bean Cutworm Damage on the Nutritional Quality & Aerobic Stability of Corn Silage**

NNYADP Crops Research: Updating NY's Corn Guidelines

Northern NY's corn silage & grain crops have a combined value of ~$172.8 million *(Oct. 2022).*

NNYADP Farmers Prompt Timely Re-Evaluation of Cornell Corn Guidelines

- As a result of research, at NNYADP request, to re-evaluate Cornell's corn yield potential database and associated nitrogen (N) and phosphorus (P) guidelines, nutrient applications can now be more efficiently adjusted based on field-specific, soil type-specific potentials.
- A preliminary evaluation of the use of cover crops in corn silage systems considers opportunity to reduce N fertilizer use and costs, while adding environmental benefit.
- NNYADP foundational research on corn crop yield and N, P, and potassium levels provided baseline data for developing optimal operating zone benchmarks to guide nutrient use over time.

"A high-quality forage that is high in starch content is only good if the starch is available to your cows."
— Allen Wilder, Miner institute Forage Agronomist

Corn Harvest Research Suggests Need for Guidelines by Type

While preliminary in nature, recent NNYADP research conducted by Miner Institute Forage Agronomist Allen Wilder evaluating how kernel processing impacts different types of corn hybrids suggests the following:

- Different guideline may be needed re: optimal kernel processing of floury hybrids to better indicate starch availability
- Floury hybrid processing increased starch digestibility and soluble starch pool of corn silage despite lower-than-desired 70-or-higher kernel processing score.
- Feedout of floury hybrid silage, particularly in initial stages of fermentation, may allow larger particles of starch to be fully digested in cow rumen.
- Floury-type hybrids may be an option for feeding corn silage soon after ensiling. More data is needed: while max in-vitro starch digestion plateaued at 90 days, actual starch digestion in the rumen may benefit from longer fermentation as greatest soluble starch was not reached until 135 days in this trial.
- Heavily-processed vitreous corn hybrid starch content during fermentation showed consistent numerical decline. Hypothesis that this was due to degradation into other pools of soluble starch or sugar was not supported. More research is needed re: the lost starch.
- This research project was one of the first to utilize the soluble starch analysis developed by Cumberland Valley Analytical Services, Inc. to quantify the starch that readily moves into suspension in an aqueous environment such as cow rumen.

NNYADP Results Coming in Spring 2023: Identifying Key Drivers of Nutrient Efficiency Data Systems

- **Interactions among soil, seed, animals, climate, equipment, and farm management practices are complex.**
- **Many and diverse data collection and reporting systems have challenged the agricultural sector.**
- **NNYADP research, begun in 2021, is focused on identifying the most effective suite of data systems and tools to guide efficient nutrient management in support of environmental stewardship, quality crop and milk production, and farm sustainability.**
- **NNYADP project results in early 2023 will identify the key drivers for each of six prioritized data systems.**

Veteran-Owned Farm Expands to Meet Demand

Since purchasing a wooded acreage in 2010, former U.S. Marine Justin Tucker and his wife Kelli have steadily built a thriving diversified farm business. They cleared land, built a house and barn, added livestock and crops. Public demand has taken them from a tiny freezer to chests to a large walk-in, and, in 2021, to an on-farm store they built with glass-front display cases. Everything sold here is raised on the 160-acre Tucker's Black Angus Ranch, North Lawrence, NY.

NNYADP Dairy Research: Animal Health, Workforce Education

Transition Cow Feeding Management for Cow and Calf Health

The transition period from pre-calving to post-delivery for dairy cows is a time of increased nutrient demand for dairy cows. NNYADP research collected and analyzed a broad range of transition period data from 10 farms to reveal opportunities to develop different feeding management strategies to enhance cow and calf health.

Additionally, the researchers' preliminary evaluation of the relationships among different metabolic health indicators through the transition period was one of the first to apply the Metabolic Health Index adapted by the Overton Lab at Cornell University to identify cows that may be at higher risk of post-calving health issues. This research establishes a foundation to begin developing a statistically-accurate tool that dairy farmers and consultants can use to track the impact of transition cow feeding management.

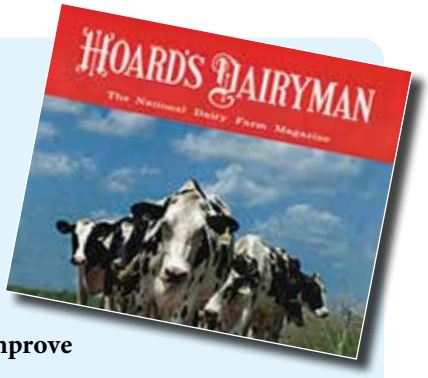
Dairy Worker E-Learning Project Completed

The NNYADP has issued the final report for its three-year Dairy Worker E-Learning pilot project designed to develop an e-learning (smartphone, laptop, desktop) dairy worker training system. The Phase III report is believed to be the first publication showing a pre-training quantification of dairy workers' educational needs as related to the dry-off procedure. This new system provides an alternative/augmentation to face-to-face training.

The e-modules developed by Paul D. Virkler, a veterinarian with Quality Milk Production Services, Canton, NY, and his team identified farms' highest priority needs related to milking parlor responsibilities, equipment operations, and dairy cow health. This project identified and addressed literacy and language barriers, and brought to light some workers lacking any experience with milking cows upon arrival at farms. Phase III focused on reducing unwarranted antibiotic use with a module on proper collection of aseptic milk samples for culturing for specific pathogens.

This project's cumulative results documented a quantifiable gain in employee knowledge and associated implementation of best practices in the milking parlor to support animal health and milk quality. Phase I and II modules are being migrated to the Phase III platform that proved to be more user-friendly, allowing easier access for dairy farms to all three modules.

NNYADP Research Noted by *Hoard's Dairyman*



Two NNYADP dairy projects were featured in issues of "*Hoard's Dairyman, The National Dairy Farm Magazine*" in May 2022:

Inside-the-front-cover article, "**E-Training proves the need for refresher courses**" by Paul D. Virkler, D.V.M. and Wolfgang Heuwieser, D.V.M. on the dairy worker e-learning project (see above), print edition, May 2022, Vol. 167, No. 7.

NNYADP 2022 dairy project preview: **"Evaluating kefir as a probiotic supplement to improve dairy calf health,"** Hoard's Dairyman E-News, May 19, 2022.

Research Results Coming in Early 2023: **• Kefir as a Probiotic Supplement for Holstein Dairy Calves • Economic Feasibility of Co-Digestion of Manure and Food Waste on NNY Dairy Farms**

Biocontrol Project Success Reaching More Growers Locally & Nationally

"Considering that our initial focus was on saving our alfalfa crops, look at how the science created here in northern NY is reaching to help alfalfa, corn, berry, and now hops farmers in New York and across the U.S."
— NNYADP Co-Chair Jon Greenwood

Everyone helps harvest hops at Hopenhagen Farms in Copenhagen (Lewis County), NY.

Biocontrol Protocol Continues Expanding Reach

A long-term commitment by the NNYADP with the support of the NYS Legislature provided the time needed to create the science that led to a nature-based solution for the highly destructive alfalfa snout beetle (ASB) destroying crops and causing milk production losses. Over time, Cornell University entomologist Elson Shields and Research Support Specialist Tony Testa adapted their protocol for using native NY nematodes as a biocontrol for ASB into a multi-crop pest management tool sought by growers nationwide.

At last estimate, more than 35,000 acres in northern NY have received biocontrol nematodes (BN) applications to manage ASB and corn rootworm (CRW). In 2022, BN were applied to manage CRW in NY, Illinois, Iowa, Nebraska, Wisconsin, and Eastern Colorado.

Trials on a northern NY farm in 2013-2014 showed the effectiveness of BN on black vine weevil (BVW) and strawberry root weevil, both closely related to ASB and difficult to control with conventional pesticides. Rulfs Orchard owner Bob Rulfs estimated that the weevils had been causing as much as $30,000 in annual berry crop loss.

This past summer in the Pacific Northwest, Certified Crop Advisor Bo Isham of AgIdaho Consulting established a farmer-funded trial application of BN on four 10-acre plots of hops. Isham explains, *"Nearly every acre of hops in Idaho (9,694 acres in 2021) has some degree of infection by black vine weevil, without any viable control options. In the spring of 2023 we will assess our trial plot application with the hope that by spring of 2024 the hops' crown health will be improved by having reduced both BVW feeding and secondary pathogens, namely fusarium, phytophera, and rhizoctornia."*

Biocontrol nematodes can be simply applied with just an ATV (on an Essex County farm, above) or by commercial sprayer. Inset: alfalfa snout beetle.

Additionally, an independent grower in Idaho has applied BN to 200 acres of hops and another 100 acres of corn for management of CRW and wireworm.

The hops industry adds roughly $185 million to Idaho's state economy. New York State once produced nearly all the hops in the US (c. 1849). The craft beer industry in New York State is estimated at $5.4 billion annual value, in NY: $130.4 million, 26 breweries, 349 jobs, $34.58 million in wages (New York State Brewers Association 2018 Economic Impact by County survey).

Project Builds Alfalfa Snout Beetle-Resistant Alfalfa

NNYADP-funded plant breeding trials that successively developed alfalfa varieties with increased resistance to alfalfa snout beetle, giving farmers an adjunct to applying biocontrol nematodes. This research by Cornell plant breeders Don Viands, Ph.D.; Julie Hansen, Ph.D., and Jamie Crawford attracted a seed company's commercial-scale interest. At right, ASB-resistent alfalfa field trials at Grace-Way Farm in Lowville (Lewis County).

NNYADP field trial at Grace-Way Farm; inset: examining next-generation greenhouse trial of ASB-resistant alfalfa.

NNYADP Local Foods / Horticultural Crops Research

"Specialty fruits that will successfully, sustainably, and profitably grow under Northern New York's unique growing conditions provide growers with additional income opportunities." — Michael H. Davis, Ph.D.

Four "Firsts" for NNYADP "Super Fruits" Research

NNYADP high-antioxidant, high-phytonutrient "super fruits" trials have recently produced "firsts" for all four fruits under study: juneberry, aronia, honeyberry, and elderberry. This research is evaluating how well these perennial, cold climate-adapted fruits could fit into northern growers' cropping plans, fresh market sales, and value-added processing opportunities. Here are highlights points with quotes from project leader and Willsboro Farm Manager Michael H. Davis, Ph.D.

JUNEBERRY, estab. 2013

"For the first time since we established this research, we had ripe juneberry fruit by the end of June. The fruit was available the earliest it has ever been here, and with yield comparable to the previous year."

ARONIA , estab. 2017

"*Our four fruiting varieties and two ornamental varieties of aronia all began flowering on May 14, fifteen days earlier than in the previous year, and had excellent fruit yields with only one exception for which there was no obvious explanation for the dropoff.*"

NNYADP grants established NY's first wild-cut and commercial juneberry varieties nursery with the help of SUNY Plattsburgh botanist Michael B. Burgess, Ph.D. (left) and Michael H. Davis, Ph.D.

HONEYBERRY, estab. 2018

"*All 15 varieties of honeyberries here flowered much earlier and for a longer time period (2nd week in April through 2nd week in May). Additionally, we have now recorded our first honeyberry fruit yields.*"

Commercial fruit growers and family farms now applying NNYADP research to their own on-farm "super fruit" plantings, include • Bush Gardens, Carthage • Cedar Knoll Farm, Lowville • Cross Island Farms, Wellesley Island (above) • Essex Farm CSA, Essex • Northern Orchards, Peru • Strong Roots Community Farm, Akwesasne, Mohawk Nation.

ELDERBERRY, estab. 2021

"*We established our elderberry research plot with five American varieties and two European varieties. The plants are doing nicely without disease or insect problems.*"

With 95 percent of the elderberries consumed in the U.S. originating from plants imported from Europe, this fruit is not only a high phytonutrient-value crop, but has the potential to become a cash crop supporting the continued growth of elderberry production in the U.S.

"Interest in this Northern New York Agricultural Development Program-funded northern climate fruits research continues to grow. We answer numerous requests for information from growers across New York State and welcome visiting groups of farmers, gardeners, and students to tour the trials." – Michael H. Davis. Ph.D.

NNYADP Local Foods Research Results Coming in Early 2023

- **Winter Greens Production and Marketing Potential for NNY Farms**
- **Precision Apple Management: Utilizing Computer Models and Additional Thinning Materials for Precise Crop Load Goals**
- **and New Commercial Crops for NNY: Super Fruits**

Northern NY Maple Industry Has Grown to $20+ Million/Year Value

Alternative Maple Tubing: No Clogs? More Sap?

NNYADP first-time testing of 1/4" maple sap collection tubing showed the possibility that the larger-opening tubing and fixtures might make clogging less likely over time. However, Uihlein Maple Research Forest Director Adam D. Wild cautions, "We don't want to rush into recommendations until we see more data to be confident that plugging will not be an issue with the 1/4" system. The data from the Northern New York trials will tell us if that can be the case."

Top: Quarter-inch tubing on maple tree, left: boiling sap.

Wild designed trials to address an issue that arose with a popular shift to the use of 3/16" diameter tubing. Data has shown that sap production in that system drops off due to clogging as soon as the second year after installation.

Quarter-inch diameter tubing, with almost twice the aperture of 3/16" tubing, is not currently available to maple producers. Wild adapted 1/4" tubing used by other industries to test in the NNYADP trials.

"Over time, we would expect that the 1/4" tubing would produce higher sap yields and become an alternative option for producers using gravity-driven sap collection systems," Wild says.

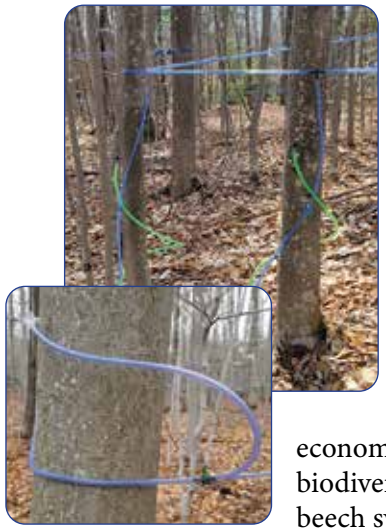
The next NNYADP maple research results are due in early 2023 with data comparing sap production and ease of flow through 1/4", 3/16", and 5/16" tubing systems.

Northern NY Maple Industry: Now $20+ Million/Year Value and Growing

Maple research commissioned by the farmer-driven NNYADP has supported growth of NNY's maple industry from $3.25 million in 2008 to more than $12 million in 2019 to now more than $20 million in 2022 with room yet to grow.

Educator-turned-Entrepreneur Promotes Tree Syrup Opportunities

In 2016, educator-turned-entrepreneur Michael Farrell established two sustainable forest enterprises. With nearly 7,000 acres, Forest Farmers and New Leaf Tree Syrups are considered New York State's largest such enterprises, with a modern sugarhouse in Lyon Mountain. As Uihlein Maple Research Forest Director, Farrell conducted NNYADP research that informed NY's maple producers about: *Growth potential of the NNY maple industry • Producer/landowner collaboration "how-to" • Climate change adaptation for maple • Cost-benefit analysis: leasing taps vs. timber • Ways to increase sap yields & profitability for gravity-fed & vacuum-driven systems.*



Beech Syrup Feasibility? Sustaining Northern Forest Biodiversity?

Articles in the *New York Times* and *Boston Globe* about consumer interest in beech syrup suggest that a recent NNYADP grant re: the feasibility of producing sap/syrup from American beech trees in northern NY is timely. While sugarmakers want to know if tapping beech trees can be economically feasible, land managers and biodiversity advocates are interested to learn if beech syrup production might give northern forest owners an incentive to keep the trees rather than remove them due to issues with beech bark disease and a root system that threatens to crowd out more marketable species.

Coming in Early 2023: **Year 1 NNYADP Beech Syrup Project Results**

Northern New York Agricultural Development Program

Farmer-Driven Research • Real-World Results

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