January 2018 Annual Report: 1 of 4

Northern New York Agricultural Development Program

Farmer-Driven Research • Real-World Results • Practical Application

Co-Chairs:
Jon Greenwood, 315-386-3231 • Joe Giroux, 518-563-7523 • Jon Rulfs, 518-572-1960

Research news/reports/updates: www.nnyagdev.org • RSS • Email/Text

Critical Research for NNY

- **Ag Environmental Conservation**
- **Dairy Cow-Calf Health**
- **Disease/Pest Monitoring & Management**
- **Emerging Crops**
- **1st-Ever NNY Bee Health Survey**
- **IPM for Apple Growers**
- **Revitalizing Cold-Hardy Grape Production**
- **Maple Efficiency Enhancement**
- **NNY Climate Challenges**
- **Updating Crop Nutrient Guidelines**
- **Maintaining Water Quality**

1st-EVER NNY BEE HEALTH SURVEY

VALUE: Bees = multi-crop pollinators; NNY honey industry >$2.36 million.

RESEARCH: Varroa mites, the most detrimental and widespread parasite of bee colonies, were significantly higher in bee colonies in NNY than other NY regions. This project identified key parasite/pathogen levels in NNY hives to inform beekeepers about factors influencing bee health, winter colony loss & best protective practices.

AG ENVIRONMENTAL STEWARDSHIP: Tile Drainage

VALUE: Tile drainage is a critical agronomic practice for soil, manure & nutrient management, erosion & runoff control, crop production & farm sustainability.

RESEARCH: 7-12% return on investment in 5-10 years is possible for tile drainage use on some farms.

"Installing tiles has saved me thousands of dollars in annual costs, improving the soil, reducing compaction, and making it easier to plant and harvest crops."

— St. Lawrence County farmer Kevin Acres

AG ENVIRONMENTAL STEWARDSHIP: Dairy Farm Water Quality

VALUE: NNY dairy industry ~$486.9 million. Water quality is critical to maintain healthy, productive dairy cows and milk production; 3 lbs water/cow = 1 lb milk. Attention to water quality may increase forage digestibility & cow productivity, preventing the loss of 5.5-14.2 lbs milk/cow/# of poor water factors.

RESEARCH: On-farm trials on NNY dairy farms measured mineral concentration and solubility of the farms' water supply and calculated ideal ranges for developing rations for lactating and dry cows.

"This (NNYADP) research indicated that positive and negative relationships between water quality and mineral content and the fiber digestibility of various forage types should be considered when developing dairy cow rations."

— Miner Institute Director of Research Katie Ballard

"Water quality deserves consideration for the nutrients the water can provide in dairy ration formulation, and for potential negative nutritional and palatability factors that could inhibit water consumption."

— Miner Institute Forage Lab Director Kurt Cotanch

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Responding to NNY Climate Challenges

Best Practices Reduce Costly Heat Stress in Cows

Managing heat stress can reduce NYS' dairy industry's estimated $23 million/year loss in lower milk production/components and animal health/reproductivity.

With an NNYADP grant, Miner Institute evaluated heat abatement systems for keeping cows healthy & comfortable and maintaining milk yield on hot days. Best practices learned at Miner and Clinton & Franklin County dairy farms were presented at the 2018 American Dairy Science Association meeting.

"The higher producing cows appear to be more sensitive to heat stress. Providing maximum heat abatement measures over stalls and feed alleys helped keep the cows more comfortable, hold production steadier, and maintain milk fat percentage." *— Miner Institute Director of Research Katie Ballard*

Reducing Risk of Winter-Related Dairy Cow Mastitis

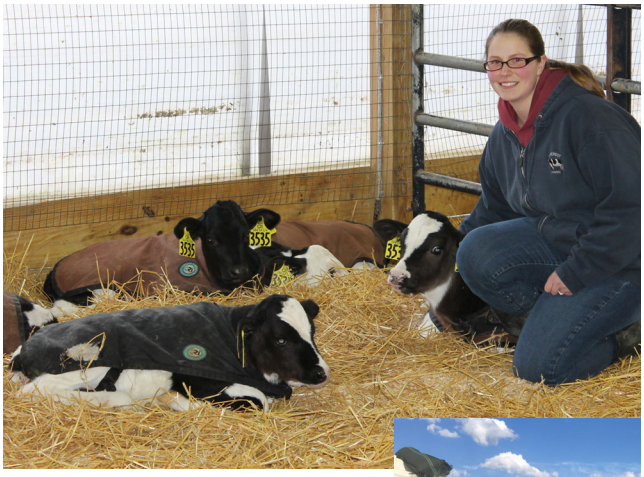
Winter uniquely challenges cow care on NNY dairy farms. Identifying risks and measures for managing the impact of cold temperatures can reduce chapping of dairy cow teats and lessen conditions for mastitis development. NNYADP-funded research evaluating two types of udder applications to reduce chapping and for mastitis prevention in cold weather with 331 Holstein cows at Miner Institute indicated a powdered treatment significantly increased risk of *Staph* (63%) and *Strep* (223%) infections vs. traditional iodine solution.

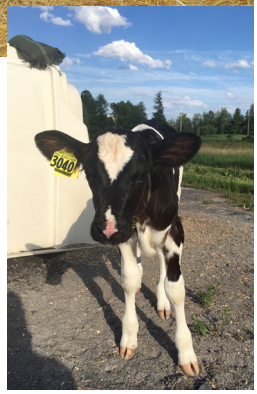
Preventing Winter Respiratory Illness in Calves

VALUE/RESEARCH: Respiratory illness in calves can negatively impact weight gain, age at first calving, 1st lactation milk production and farm revenue/costs.

A study with 426 calves located across 27 NNY dairy farms Nov 2016-Jan 2017 identified cold weather factors & recommendations for dairy calf managers. Impact of on-farm changes is being evaluated in winter 2017-18.

". . . the wide swings in temperatures in NNY are potentially more of a detriment because animals, young and mature, do not have time to properly acclimatize."
— Project leader Kayla Hultquist, Miner Institute





Nutritional Strategy for Managing Heat Stress in Calves

VALUE/RESEARCH: Heat stress accounts for ~$253,000 annual losses of young (birth-1 yr) dairy animals across New York State.

NNYADP funded a study with calves 2-57 days old, evaluating how nutrition can help reduce heat stress, increase feed efficiency, and provide for proper growth and immune response in young dairy animals.

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Research Highlights & Economic Value Indicators

UPDATING CORN PRODUCTION GUIDELINES

VALUE:
NNY corn grain/silage ~$106.9 million

RESEARCH:
NNYADP farmers prompted research into how advances in corn breeding & production practices are impacting crop yields and the need to update associated nitrogen application guidelines for production and cost efficiency.

Over the 3-year study, 1/3 of NNY fields tested yielded <90% of yield potential, while 26% yielded >110% of expected yield potential.

EMERGING PEST: Western Bean Cutworm

VALUE:
NNY corn grain/silage ~$106.9 million

RESEARCH:
9 of the 10 highest 2016 trap counts for WBC moths were in St. Lawrence, Jefferson, Franklin & Lewis counties. NNY farm trials in 2016-2017 evaluated corn seed modified to manage WBC but reportedly not working adequately elsewhere. NNY trials showed one seed trait successful, one not.

"The farmers and farm advisers in Northern NY were frontrunners in the database re-evaluation that started in 2013." — Dr. Quirine M. Ketterings, Cornell University

DEVELOPING WINTER-HARDY ALFALFA

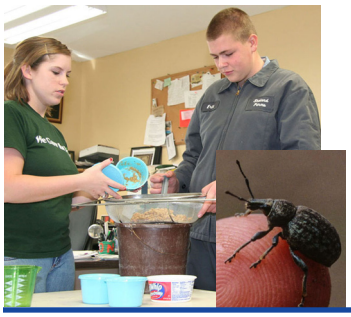
"The harsh winter conditions typical in Northern NY make winter survival an essential trait in alfalfa variety selection for regional growers."
— Dr. Julie L. Hansen, Cornell School of Integrative Plant Science

VALUE: $135/ton DM for milk production, $180-300/ton sold; alfalfa-grass ~$2085/ac

RESEARCH: With NNY on-farm plots, Cornell forage breeders are developing alfalfa varieties to produce more forage into fall with improved winter survival under NNY conditions & micro-climate areas. Separate trials are developing alfalfa for resistance to brown root rot & snout beetle.

NNY CORN & SOYBEAN DISEASE MANAGEMENT

VALUE/RESEARCH: NNY corn grain/silage ~$106.9 million; NNY soybean ~$6.31 million. Crop scouting, sampling & testing have ID'd diseases not previously confirmed in NNY. Knowing the location of these & common crop diseases assists farmer variety & management decisions.



NNYADP SUPPORTS SCIENCE to BUILD MULTI-PEST SOLUTION

VALUE: $135/ton DM for milk production, $180-300/ton sold; alfalfa-grass ~$2085/ac

RESEARCH: NNYADP long-term commitment supported the science needed to develop a treatment (1-application) to reduce the alfalfa snout beetle populations devastating NNY alfalfa crops. The native nematode treatment is now helping control pests in other crops in NNY/NYS and is being trialed elsewhere in U.S.

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Emerging NNY Products/Sectors • "Super Fruit" & More

EMERGING PRODUCT: Birch Syrup as Maple Season Extender

Birch syrup sells for as much as $200/gal; gross revenue $20/tap; $80 half-gallon in NNY

NNYADP research showed season-extension profit potential for existing maple producers: identified prerequisites, e.g, # of birch trees and equipment sizing needed for sufficient sap & efficient use of commercial-scale maple producers.

EMERGING SECTOR: $10 Million Maple Potential for NNY

$10+ million potential per NNY maple specialist Michael Farrell, ~$47.40/gal ave.

NNYADP trials at Paul Smith's produced conclusive evidence that 3/16" tubing provides significantly more sap vs. 5/16" in a gravity-based collection system. Each added inch of vacuum = 5-7% more sap (avg).

". . . a way to develop an opportunity for extra income, extend our maple season. . . regional research is part of helping landowners discover untapped resources they may not be aware of or may be cutting down for firewood." *— Joy Herfurth, Brandy Brook Maple, Ellenburg Center*

ADVANCING COLD-CLIMATE GRAPE PRODUCTION: $4,413.51/acre

Delicate grape varieties do not grow well under harsh weather. In 2017-18, the cold-climate grape research nursery at Willsboro is evaluating new varieties selected with input from NNY grape growers and Cornell/USDA/national grape breeders.

PRECISION APPLE ORCHARD PEST MANAGEMENT: $16 million industry

High density apple orchards are valued at ~$15,000/acre**.** NNY's cooler climate delays apple pest emergence making real-time monitoring & IPM computer modeling critical to guide orchard treatments to reduce cost, time & labor, and enhance stewardship.

"IPM in small orchard blocks in 2015 was so successful that growers applied the practices to entire blocks in 2016, and are continuing to do so in 2017." — Tree Fruit Specialist Michael Basedow

EMERGING "SUPER FRUIT" JUNEBERRY: ~$3.25/pt, $5-7/qt., 8 oz jam/$8

Juneberry is a cold-hardy, antioxidant-rich fruit, yielding 5-8 lbs/plant at maturity under proper management. NNYADP established the 1st-of-its-kind Juneberry research nursery of wild-collected & commercially-available cultivars growing under NNY conditions. Substantive harvest data is expected in 2018 with additional on-farm trials.

VEGETABLES: Cherry Tomatoes: $14/plant, $3,491/ac

NNYADP-funded field trials showed the intensive system thought by growers to take too much time, actually takes less time to train & harvest.

"This research responded to growers struggling with controlling the rampant growth of the cherry-type tomato plants and questioning whether the time they spend pruning this vigorous tomato is worth the effort." *— Amy Ivy, CCE NNY Vegetable Specialist*

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