

## *NNYADP Research Ideas 2023*

### **AGRICULTURAL ENVIRONMENTAL STEWARDSHIP**

- 1) Water quality, e.g., continue research on value of tiling, tile drainage and nutrient management: monitor nutrient loss through tile drains on various soils and on operating farms across NNY.
- 2) Air quality, e.g., greenhouse gas emissions and burning plastics.
- 3) Animal methane management.
- 4) Carbon neutrality, carbon solutions. (*See also 15 under Livestock*)
- 5) AG plastics: proper disposal, prevention/remediation of improper disposal.
- 6) Threats to/loss of productive farmland due to development.
- 7) Impact of increase of property and school taxes due to property values and influx of urban buyers.
- 8) Hedgerows to attract beneficial insects and birds to reduce or eliminate use of pesticides.
- 9) Practical solutions to keep cattle out of rivers, creeks, and streams.
- 10) Storage covers for manure pits in NNY.
- 11) With solar farms on the increase, uses for the land under arrays; what crops will grow best under the arrays of NNY. (*See also 18 under Dairy*)
- 12) Water quality
- 13) Climate stress on agricultural animals.

### **DAIRY**

- 1) Factors influencing calf health.
- 2) Factors influencing all stages of cow health.
- 3) Cow comfort.
- 4) Climate stress impact.
- 5) Air quality, water quality.
- 6) Dairy labor/workforce.
- 7) Culling best practices.
- 8) Raising replacements in NNY: management, training, costs calf to breeding age.
- 9) Feed efficiency, rumen/gut development in ad lib and acidified milk/MR fed calves.
- 10) Technology, automation: what new technologies are available for dairy farms.
- 11) Farm economic decision-making tools: tools that can deal with interactions between different areas of management – health, nutrition, repro, genetics, etc.
- 12) Whole herd reproduction performance, management, and economic impact on farm profitability.
- 13) Manure management, digesters, nutrient condensing/dewatering technology.
- 14) Mastitis problems and prevention.
- 15) Opportunities to reduce antibiotic usage.
- 16) Relevant issues or opportunities beneficial for dairy producers in NNY.
- 17) Milk components compared to feed efficiency. Costs to get higher components. Milk vs. cheese production: is there a difference to reach better components for cheese production
- 18) Grazing dairy sheep in solar arrays.

### **FIELD CROPS: (include economic and environmental impact in all crop research proposals)**

- 1) Forage crops: optimal seeding rates, cool season, warm season, drought-tolerant...
- 2) Climate, extreme weather events • Seasonal survivability in NNY.
- 3) Alfalfa: Alfalfa-grass mix opportunities • Identify perennial grass species less competitive in mixture with alfalfa • Low lignin alfalfa varieties - are they suitable for NNY growing conditions.

- 4) Crop rotation efficiency.
- 5) Alternative cash crops that may be viable in NNY.
- 6) Double cropping forage crops: risk, economics, species, planting date, nutrient management for optimal yield and forage quality mixture with alfalfa.
- 7) Pest and disease management: Monitoring • Management in NNY forage, grain, corn, soybean crops • seed treatment • IPM • Snout beetle management: ASB-resistant alfalfa breeding, continue on-farm biocontrol nematode plots, alternative methods for encouraging farmer adoption • Corn rootworm management with biocontrol nematodes in corn • Continue research in beneficial nematodes.
- 8) Weed control – economics and yield data.
- 9) Cover crops - cultural, mechanical, chemical methods for termination • Seed for planting with corn and other seed mixes • Seed coated rye for timed germination • Successful establishment best practices • Follow up initial studies: yields/quality; application rate for manure; manure injection vs. surface tillage; impact of soil type on cover crops; etc.
- 10) Identify opportunities for increased energy efficiency in NNY crop production systems.
- 11) Can we recover any of the dry matter left in field after corn grain harvest?
- 12) Bale management: Wrap evaluations, number of times around? Color? What makes a better bale?
- 13) Feed values: Digestibility of BMR forage sorghum.
- 14) Cropping systems: Are strip till and no-till cropping systems viable in NNY?
- 15) Land application of whey – what is the on-farm impact?
- 16) Soil health: prevent compaction, erosion, improve soil health • Develop winter spreading guidelines • Impact of nutrient losses/value to soil health of cover crops • Evaluate soil amendments for improved crop production • Create computerized soil management program based on recent nutrient management and soil health research.
- 17) Manure management: Proper use of manure spreading plans, incorporation of manure into soil, rates of application, manure application options to reduce losses and improve nutrient use efficiency.
- 18) Test custom drag hose operations – how to minimize compaction and get higher silage yields. Would moving sand through them be feasible (given that sand bedding leads to less mastitis)?
- 19) Development of no-till hay or pasture establishment guidelines-impact on erosion and nutrient losses.
- 20) Precision agriculture and use of drones in NNY crop production.
- 21) Work to increase production of organic grains for local processing, to meet local food demand.
- 22) Nutrient management: Identify nutrient mass balances that work well on NNY farms • Evaluate enhanced efficiency nitrogen sources used in crops in NNY • Develop methods to accurately predict crop nutrient requirements, enhance efficiency and protect soil and water resources • Continue evaluation of corn yield potential database on NNY farms • Is foliage fertilizer beneficial for field crops on a larger scale in NNY?
- 23) Relevant issues that would be beneficial for field crop producers in NNY.
- 24) Trial of perennial strains in NNY.
- 25) Effect of dragline and cover crop incorporation at same time results.
- 26) Marker development for hay and other field crops.
- 27) Encouragement of good land use, for growth other than solar farms.
- 28) Need value products that generate revenue in long term.

## **LIVESTOCK**

- 1) Grazing livestock: Pasturing strategies • Drought feeding strategies • Season extension • Cover crops as emergency forage for harvest or grazing • Summer annuals for grazing.
- 2) Intensive grazing management for dairy, beef, sheep, goats • Optimal grazing strategy for NNY, demonstrate benefits.
- 3) Guidelines on warm season pasture/grazing options for NNY.
- 4) Value-added opportunities, e.g., dairy beef, cost benefit analysis tools for converting from dairy to beef or other livestock production.
- 5) Develop USDA-graded feeder cattle markets to increase profitability.
- 6) Identify and select optimum dietary ingredients for NNY goat and sheep production.
- 7) Internal parasite control for sheep and goats in NNY.
- 8) Develop no-till pasture seeding guidelines for NNY.
- 9) Research/demonstrations on benefits (increased gain) on improved pastures.
- 10) Sheep grazing for hire, in vineyards.
- 11) Regional livestock marketing/infrastructure development.
- 12) Sheep / meat goat feeding trials on farms; creep feeding on pasture or not, labor, costs vs. increase gain?
- 13) Relevant issues that would be beneficial for livestock producers in NNY.
- 14) Silvopasture for drought forages.
- 15) Pasturing and hay production strategizing for carbon sequestration.

## **LOCAL FOODS and HORTICULTURAL CROPS**

- 1) Marketing: Evaluate current marketing resources and needs in Lake Placid, Plattsburgh, Malone, Canton, Watertown, and Lowville • Followups to local food hub feasibility study? • Local marketing strategies: what and how can I sell my produce, not just grow it.
- 2) Develop guidelines to be used by investors and granting agencies for each market region to evaluate proposal characteristics that have the best chance of success. Hold classes on “Types of Cooperation/Organization” for farmers and marketers to facilitate the movement of food around the NNY region.
- 3) Cold hardy grapes: research, demonstration, outreach on variety testing, best management practices (trellising, canopy management etc.) and business management with growers in St. Lawrence and Champlain Valleys • Assess economic impact of establishing vineyards, wineries, and associated tourism on local and regional NNY economies • Frost mitigation spring and fall • Organic vineyards under NNY conditions • Nutrient applications and management—what’s best under NNY soil and climate conditions?
- 4) Biocontrol nematodes: Adapt technology to other cropping systems. e.g., root weevils that attack all berries and black vine weevil that attacks ornamentals; stone, palm fruits (nematodes); and hops • Evaluate use in apple orchards to combat plum curculio.
- 5) High/Low Tunnels/Season Extension: Techniques to grow fruit/vegetables year’round • Crops beyond traditional tomatoes and winter greens; melons and other nontraditional crops for summer tunnels • Greenhouse and high tunnel production such as grafting on to cold hardy rootstocks and row covers inside tunnels • High priority: Energy conservation in greenhouses: heat sinks, solar gain, insulation, economics of cold season growing, not using energy and keeping it warm, etc. • More on appropriate use and management of caterpillar/low tunnels. Is adding light to tunnels cost effective? • How to get vegetable crops to ripen earlier for fresh market sales.
- 6) Fertility management for vegetables.

- 7) Drip irrigation for increased yield and economic return (helpful for GAPs compared with overhead irrigation).
- 8) Pest and Disease Management: Emerging threats for NNY vegetable production • Dealing with unprecedented increases in disease and insect pests both long standing and invasive that are becoming commonplace • Efficacy of organic pesticides, bio-pesticide products/side-by-side trials • Disease-resistant vegetable varieties for cold climate • Biological controls (garden slugs), predators for leaf moth.
- 9) Weed management in vegetable crops: conventional and organic • Reduce use of herbicides between rows in plasticulture systems • Feasibility of inter-row cover crop under NNY conditions • Cover cropping for weed management, fertility, and control pests.
- 10) Soil Health: amendment/improvement options • Manure management • Cover crops for short rotations • Practical methods for in-field measurement of nitrate, N.
- 11) Deer management.
- 12) Food Safety: Design for packing/post-harvest handling (GAPS, Coolbot); post-harvesting facility materials, control temperature • GAP, food safety implementation for NNY climate/farms.
- 13) Honey production: Enhancing pollination, threats to honeybees and other pollinators.
- 14) Trail Nematodes for garden slugs - Europe has a nematode not allowed in U.S, trail predators for leek moths.
- 15) HASCAP requirements for juneberries, honeyberries, etc.
- 16) Table grapes - seedless for fall sales and for juice, wine grapes for jelly.
- 17) Pollination research for all insects.
- 18) Hydroponics - LED lighting in enclosed buildings.
- 19) Conservation tillage/no-till production for vegetables.
- 20) Relevant issues beneficial for local foods and horticultural producers in NNY
- 21) Transplant chestnuts, hardy pecans, etc.

#### **MAPLE PRODUCTION and FORESTRY PRODUCTS**

- 1) Controlling native and non-native interfering vegetation in the sugarbush.
- 2) Research on alternative tubing systems.
- 3) Maple tree regeneration - dealing with damage to sugarbush regrowth by deer.
- 4) Enhancing natural vacuum with smaller tubing.
- 5) Maple decline and potential invasive insects in sugarbushes.
- 6) Climate change adaptation and tapping recommendations.
- 7) Feasibility of a bulk syrup processing facility.
- 8) Birch, walnut and other tree syrup production as complementary enterprises for maple producers.
- 9) Value-added maple confections to enhance maple sales.
- 10) Research on fertilization of sugarbush soil: any benefit to be gained? Liming?
- 11) Relevant issues that would be beneficial for maple producers in NNY
- 12) How to educate beginning producers on grading, density, quality, etc.
- 13) Issue of too much substandard maple syrup getting sold.
- 14) Opportunities for other value-added maple products.