Precision Agriculture for Field Crops Nutrient Management Research and Education

Quirine Ketterings

Aristotelis Tagarakis, Emma Long, Pilar Berenguer, Rachel Berenguer, Sheryl Swink, Angel Maresma, Karl Czymmek, Agrinetix (Josh Cawley/Rich Wildman), Mike Hunter, Mike Stanyard, Elson Shields and Magdeline Laba

Nutrient Management Spear Program
323 Morrison Hall
Cornell University, Ithaca NY
Projects

- **Yield monitors for forage**
  - Updating of yield potential database (Sheryl Swink)
  - Evaluation of accuracy and precision (Emma Long)

- **Field spatial variability; implications for sampling**
  - Phosphorus (Scott Grandt)
  - Organic matter and Illinois Soil Nitrogen Test (Angel Maresma)
  - Corn stalk nitrate test (Pilar Berenguer and Rachel Breslauer)

- **On-the-go nitrogen management**
  - Crop sensors (Aristotelis Tagarakis)

- **Field management zones**
  - Organic matter, EC, pH, etc. (Rachel Breslauer)

- **UAS for nutrient management decision making**
  - Soil properties, yield, nitrogen management (proposal stage)
Field spatial variability
On-the-Go N Management

Crop sensors

• Calibration for NY
  o Reference strips (0N, NR)
  o Timing of scanning
  o Timing of N applications

• Mode of scanning
  o Mounted on field equipment
  o Aerial imagery
  o UAS
The vision of the Cornell University’s Nutrient Management Spear Program is to assess current knowledge, identify research and educational needs, conduct applied, field and laboratory-based research, facilitate technology and knowledge transfer, and aid in the on-farm implementation of beneficial strategies for field crop nutrient management, including timely application of organic and inorganic nutrient sources to improve profitability and competitiveness of New York State farms while protecting the environment. For more information about our program activities see the latest (9-22-2014) Program Report.

News
- 2/6/2016: New Impact Story: Ag Science Student Anne Mills Experiences Field Research with Collaborative Internship.
- 1/19/2015: New Agronomy Fact Sheet: Red Clover for Quality Forage for Dairies.

Featured Links
- New York On-Farm Research Partnership
- Cornell Nutrient Guidelines for Field Crops
- Agronomy Factsheets
- Impact Statements
- Nutrient Management Tutorials
- Nitrogen Management on Dairy Farms

Featured Articles
- New York P Index Survey: What Caused Impressive Improvements in the NYS P Balance?
- State, Regional and farm-scale nutrient balances: Tools for enhanced efficiency of whole-farm nutrient use.

Jobs and Scholarships
- NMSP Summer Internships: Located in Ithaca, NY. Email: qmk2@cornell.edu to inquire.
- 2015 Climate Change and Dairy Production Systems Research Internships: Located in Madison, WI, State College, PA, or Ithaca, NY.
- 2015 Colleen O. Daly/ACS Scholarship Fund for Professional Women in Crop Management: Unique Scholarships for Female Cornell Undergraduate Students with a Passion for Agronomy.

Events
- 2015 North American Manure Expo, Chambersburg, PA, July 14 (Tour Day) and July 15 (Expo Day), 2015.
Abstract

The mission of the Cornell Nutrient Management Spear Program is to assess current knowledge, identify research and educational needs, conduct applied, field and laboratory-based research, facilitate technology and knowledge transfer, and aid in the on-farm implementation of strategies for field crop nutrient management, including timely application of organic and inorganic nutrient sources to improve profitability and competitiveness of New York State farms while protecting the environment. Precision agriculture technology plays an important role. Our current work focuses on assessment of accuracy and precision of forage yield monitoring equipment, assessment of field spatial variability and its implications for plant and soil sampling as tools for nutrient management, development of a New York algorithm for sensor-based on-the-go nitrogen management, evaluation of use of field management zones for yield and resource allocation and responsiveness of crops, and we are exploring options for use of unmanned aerial systems for more time efficient and effective decision making at the field level. Contact: Quirine M. Ketterings, Cornell Nutrient Management Spear Program (http://nmssp.cals.cornell.edu).