

Spring 2017

On the Go:

SIU-Carbondale Nutrient Research Review

Discussions on driving nutrient management issues influencing southern Illinois farmers drew a crowd of nearly thirty farmers and other industry leaders and stakeholders to a meeting held at the SIU-Carbondale Campus last month. Illinois Nutrient Research and Education Council (NREC) members and SIU College of Agriculture faculty and representatives shared key initiatives under way in nutrient management and nutrient research. Presenters shared key research priorities, strategies, and overall NREC goals with southern Illinois farmers, while together, they surfaced issues and needs in nutrient management specific to the region.



Attendees, who varied from farmers to ag retailers to County Farm Bureau staff, heard from SIU researchers, SIU President and NREC's Executive Director. The meeting culminated with discussion results from six roundtables:

Gypsum: NREC does not currently have any funded research on gypsum but the Council recognizes this as a priority issue for Southern Illinois. Farmer attendees shared their concerns with the Council members and discussed the need for research and a better understanding of how Phosphorous interacts with gypsum and the impact it has on water quality.

Phosphorous: Discussion focused on soil tests for P and the most effective application methods and the presence of P on no-till ground.

Cover Crops: Probably, the most intense discussion, farmers want to know more about seeding and termination of all types of cover crops, plus what are the best cover crop options for southern Illinois. Researchers emphasized that cover crops serve other purposes beyond nutrient management, including weed and erosion control.

Outreach and Education discussion:

Farmers are very interested in connecting NREC research with NRCS

programs and want to make sure research is tied to real-world applications.

General Research: Measure, local, economics. Participants are particularly interested in having researchers include an on-farm component of their work and to measure water quality. They also would like to learn their return on investment for nutrient strategies.



Equity in funding and understanding Southern Illinois:

As expected, southern Illinois farmers want to make sure the unique growing conditions of their region is included in research projects.

Southern Illinois farmers indicated they appreciated the efforts made to help them meet the State's Nutrient Management Strategies. NREC expects to keep the dialogue flowing with farmers, researchers, legislators and county Farm Bureaus to help advance the goals established, and to continue to advance efforts to serve southern Illinois farmers' nutrient management needs.

How does it all fit together?

NREC's funding addresses seven research priorities:

1. The impact of N management systems on efficiency of N use.
2. Determine factors impacting release and/or tie-up of organic and fertilizer nitrogen (mineralization immobilization, nitrification, denitrification, leaching, and plant uptake).



3. Cover crops: Evaluate the feasibility, economics and best management practices of growing cover crops to address nitrogen and phosphorus loss as well as crop productivity.
4. Evaluate the utilization of N from DAP and/or MAP in comparison to Triple Superphosphate (TSP) for both fall and spring application.
5. Evaluate the agronomic and environmental benefits of tillage and the placement and timing of phosphorus applications.
6. Tile drainage: Evaluate drainage water management practices such as managed drainage (controlling flow) and the impact of tile spacing and depth on nutrient loss from a field.
7. Bioreactors, buffers and saturated buffers: Practical approaches to installing these systems in areas where drainage ditches are the conduit for tile drainage.

Six new projects are being funded in 2017.

Here is how they fit within NREC's research priorities.

Priorities 2 and 3: Dr. Shalamar Armstrong (Illinois State University) is conducting a long-term evaluation of nitrogen application timing and cover crop impacts on N Fertilizer and crop production on tile drained fields.

Priority 3: Lowell Gentry (University of Illinois/UI) is working with Dan Schaefer with the Illinois Fertilizer and Chemical Association to learn how to best manage cereal rye as a cover crop before corn. They are working with two farmers to ensure the cover crop plantings, fertilizer treatments, and termination are performed in accordance with the work plan to assure quality data collection.

Priority 3: Dr. Jonathan Coppess (UI) is developing a web-based decision support tool for cov-

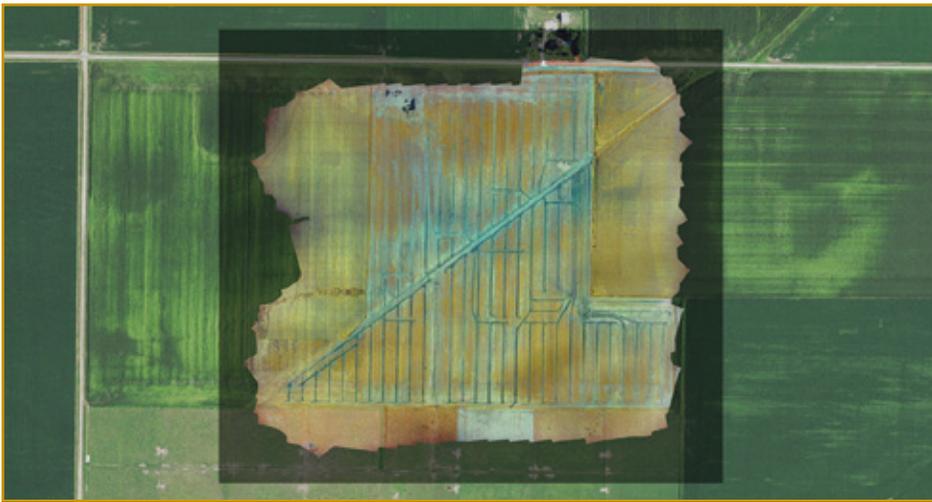
er crop management. Ultimately, the tool will give farmers, researchers, extension educators, and others in the industry data and information about cover crops in a practical, visualized format.

Priorities 6 and 7: Dr. Laura Christianson (UI) is assessing how drainage water management and saturated buffers reduce N loss and how these practices might fit within the Illinois Nutrient Loss Reduction Strategy. Her work will include an economic evaluation of these two practices.

Priority 7: Dr. Christianson is also testing novel full-size bioreactors to maximize nitrogen removal from drainage water while limiting land removed from production. Her plan is to design and build four new types of denitrifying bioreactors in Illinois: two ditch bioreactors, one high-flow booster bioreactor and one heat-enhanced bioreactor.



A new tile drainage research site was installed on a farm near Pana, IL in the fall of 2016. Photo courtesy of Dennis Bowman, University of Illinois Extension.



A bioreactor is installed at the Pana, IL location. Photo courtesy of Dennis Bowman, University of Illinois Extension.

In the Know: Research project status

Researchers have bioreactors under development in four locations. The first is tentatively expected to be installed at the Monmouth Research

A longer crop rotation (corn-soybean-wheat) with cover crops can greatly decrease tile nitrate loss compared with a conventional corn-soybean rotation.

Station and showcased during a presentation that Dr. Laura Christianson will be making

at the July 26 Field Day. The intent is to have attendees see inside the bioreactor before it gets covered up. As an alternative, a working model will be on display.

The combination of two Illinois Nutrient Loss Reduction Strategy scenarios (cover crops and woodchip bioreactors) nearly eliminated tile nitrate loss from 200 acres in the first year.

Researchers are in the third year of experiments being conducted in Urbana to assess the N fertilizer source impacts on corn yields and greenhouse gas emissions. A computer model is currently being developed to predict soil N concentrations using data from N-tracking and N-Watch sites. A new tile drainage research site was installed at the Dudley Smith farm last fall near Pana in Christian County.

Trials are established and off to a good start for this year, with periodic updates published on the University of Illinois' IPM Bulletin. <http://bulletin.ipm.illinois.edu/>

Dr. Sarah Lovell is in the beginning of year four for her project and is developing a design manual for integrating productive shrubs/trees into working landscapes. A web site shows updates on the project: http://multifunctionallandscape.com/Multifunctional_Buffers.html

Outreach Earlier this spring researchers were quite busy with outreach prior to the fertilizer and planting season. That included the Illinois Fertilizer and Chemical Association (IFCA) and GROWMARK jointly hosting a Spring Nitrogen Management Webinar with Dr. Emerson Nafziger on March 31

where he shared information from his Corn Nitrogen Research project and N Tracking project. Nearly 200 CCAs and farmers listened to the webinar and the recording.

In April, IFCA prepared a bulletin for all farmers and landowners in the Lake Springfield Watershed explaining the new Maximum Return to Nitrogen recommendation specific to this watershed. The Sangamon County SWCD mailed the bulletin to over 500 people in the watershed.

In Robinson for the Crawford and Lawrence County Soil and Water Conservation Districts (SWCD) meeting, attendees learned about Phosphorus and the Embarras River. Lowell Gentry ended his talk with data from one of our NREC projects that shows the immediate and substantial reduction in tile nitrate following cover crop growth after wheat in a corn-soybean-wheat rotation.

A highlight from last year was that cereal rye after corn reduced tile nitrate loads by 40% and did not decrease the subsequent yield of soybean.

This fall researchers will be presenting their results at the Soil Science Society of America annual meetings in Tampa. Dr. Arai will share what they have learned from their Douglas County field site where they have been measuring tile N and P losses from 36 individual tiles. Thus far, they have found that soil test P was related to dissolved P loss in individual tile laterals across the field. They also learned that lower areas of the field that ponded were also related to tile P losses. This helps them to understand where on a field P is coming from, and what it is related to.

On the Go:

June 13: Dan Schaefer is presenting information on Illinois Nutrient Research Projects at The Fertilizer Institute and IPNI national 4R Nutrient Stewardship Summit in Minneapolis. Go to <https://www.tfi.org/conference/4r-nutrient-stewardship-summit> to see the agenda and to register.

June 27: Northern Illinois NREC meeting in Princeton – mark your calendar

July 12: Dan Schaefer and Lowell Gentry are participating in a Douglas County Farm Bureau and Douglas County SWCD NREC project tour at the Douglas County site.

July 26: Monmouth Research Station Field Day

August 16: Iroquois County- Cover Crop Program

September 12: Illinois Fertilizer and Chemical Association (IFCA) is hosting a 4R Field Day in conjunction with Mosaic and the TFI Nutrient Stewardship Council. It will include a tour of the Piatt County and Douglas NREC project sites with presentations on several NREC projects on site at the Piatt County location.

Illinois agriculture's investment in the safe, efficient use of crop nutrients.



801 E. Sangamon Avenue
PO Box 19281
Springfield IL 62794
309-212-0047

www.illinoisnrec.org