2025-26 Illinois NREC Funded NEW Projects

Illinois Soil-Test Phosphorus and Potassium Calibration Using a 4R (Source, Rate, Timing, and Placement) Approach	UI	Jones

Objectives:

1. Developing regional soil-test and plant tissue P and K interpretations for soybeans and corn using modern soil testing methods.
2. Providing calibrated P and K fertilizer rate guidelines based on 4R components and system-level factors (e.g., tillage, cover cropping, rotation).
3. Developing criteria for farm-specific economic and agronomic risk considerations based on ROI probabilities.

Enhancing Nitrogen, Phosphorus, and Sulfur Management in Winter Wheat-Soybean Double Crop Systems in a Regional Context Across Illinois	UI	Jones

Objectives:

1. Providing updated nitrogen fertilization guidance for Illinois farmers.
2. Assessing integrated nitrogen (N), phosphorus (P), and sulfur (S) management strategies to maximize profitability and minimize environmental losses.
3. Monitoring soil and plant nutrient status to improve understanding of nutrient dynamics.
4. Delivering actionable research findings to Illinois farmers.

Towards Illinois NLRS 2.0: Developing a fine-resolution and statewide watershed inventory of nitrogen and phosphorus budgets to inform targeted conservation in Illinois (Illinois Watershed N&P Inventory Project)	UI	Peng

Objectives:

1. Developing HUC-12 scale N and P budgets.
2. Analyzing spatiotemporal variations in N and P input-output relationships.
3. Identifying hotspot watersheds for targeted conservation.
4. Conducting outreach and extension activities.
5. Supplying results to the Illinois NLRS Dashboard.

Assessing the interaction of sulfur and nitrogen on corn yield and nitrogen use efficiency in Illinois	UI	Preza Fontes

Objectives:

1. Assessing S effects on corn yield and N use efficiency.
2. Field trials will be conducted at 6-8 sites in Illinois over three years.
3. Treatments will include various N and S rates in a randomized complete block design.
4. Data collection will involve soil and plant sampling, nutrient analysis, and yield measurements.
5. Outreach strategy includes presentations at extension events and publication in peer-reviewed journals.

Addressing Corn Nitrogen Management Risks in Illinois through Comprehensive Agronomic and Economic Research and Outreach	UI	Jones

Objectives:

1. Refining regional N fertilizer use guidance using on-farm trials.
2. Integrating 4R components with system-level characteristics like tillage, rotation, and cover cropping.
3. Addressing assumptions about soil N transformation and corn N uptake.
4. Demonstrating adaptive N management options through economic risk analysis and outreach.
5. Providing a final report with economic analysis.

Reducing nitrate-N losses by managing phosphate fertilizers: right time, right source – and right nitrification inhibitor?	UI	Margenot

Objectives:

1. Quantifying nitrate-N losses from fall vs. spring-applied MAP/DAP.
2. Evaluating biennial vs. annual DAP applications.
3. Assessing nitrification inhibitors (N-Serve® and Centuron®) for reducing nitrate-N losses.
4. Testing cover crops for mitigating fall-applied DAP losses.
5. Differentiating fertilizer-derived vs. native soil nutrient losses.
6. Co-quantifying P losses via subsurface drainage tiles.

System-based management to improve corn and soybean yields following cover crops	UI	Preza Fontes

Objectives:

1. Assessing impacts of tillage systems and cover crop planting methods on performance.
2. Evaluating alternative cover crop species and mixes.
3. Determining effects of tillage, planting methods, and species on yields.
4. Identifying optimum nitrogen rates for cover crop systems.
5. Analyzing economic implications of cover crop integration.
6. Communicating results through outreach and extension programs.
7. Providing a final written report addressing all objectives.

Harnessing polyphosphate-accumulating microbes to mitigate phosphorus losses from Illinois agroecosystems	UI	Kent

Objectives:

1. The overall objective is to determine if microbial processes can be managed to enhance phosphorus retention.
2. Specific objectives include evaluating PolyP prevalence, management influences on PolyP accumulation, and comparing phosphorus losses in field experiments.
3. The rationale highlights the urgent need for phosphorus conservation due to limited global supplies and increasing phosphorus loading into drainage systems.
4. The project addresses critical gaps in understanding PAOs in agroecosystems and proposes proactive nutrient management strategies.

Quantifying the "how much", "how old", and "for how long" of legacy sediment P in Illinois riverine systems for accurate targets and effective management on P loss reductions	UI	Zhou

Objectives:

1. Quantifying sediment P storage in streams, rivers, lakes, and floodplains.

2. Assessing sediment P release rates to surface waters.
3. Identifying sediment origins (streambanks, agricultural fields, non-agricultural fields).
4. Determining sediment age and residence time in waterways.
5. Estimating downstream mobility of P-bearing sediments.
6. Developing statewide estimates of sediment legacy P storage and release.
7. Identifying opportunities for in-channel conservation practices.
8. Integrating findings into the Illinois Nutrient Loss Reduction Strategy (NLRS).