ILLINOIS NUTRIENT LOSS REDUCTION STRATEGY

2023-24

PARTNER PROGRAM AND PROJECT UPDATES

Agriculture

Illinois Department of Agriculture

Illinois Environmental Protection Agency

Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

4R Field Day

The Illinois Fertilizer & Chemical Association has continued hosting annual 4R Field Days, promoting continued research on practices outlined in the Illinois NLRS and best management practices. Lowell Gentry, John Pike, KJ Johnson, Dan Schaefer and Jason Solberg of IFCA have assisted with the coordination and implementation of the field days and have presented on various topics during the field days. The 4R field days were hosted on Sept. 7, 2023, and Sept. 5, 2024. Partnerships for these field days include the 4R Field Day Alliance, Illinois Soybean Association, Illinois Corn Growers Association, and the Illinois Nutrient Research and Education Council.







5-Year Soil Health Transition

The Illinois Corn Growers Precision Conservation Management team, PCM, has been working with participating farmers in the 5-Year Soil Health Transition, 5YT, program to complete new enrollments and prepare current participants for adapting to soil health management systems. Conservation Specialists work with individual farmers to review new management practices, compare them with conventional practices, and evaluate the financial and logistical considerations of implementing them.

Eight PCM specialists are assisted by project lead Jim Isermann. PCM Director Greg Goodwin and Illinois Corn Growers Association Director of Water Quality Laura Gentry oversee the PCM program and integration of the 5YT program with PCM.

Overall, the program helps farmers understand what is occurring in terms of gains in soil health over a five-year period. The specialists facilitate this learning through conducing soil health assessments, and field checks including soil sampling which provides a dataset that is communicated back to the farmers to understand how practices are affecting their soils and cash crop. The program also conducts grower meetings to facilitate peer-to-peer learning opportunities and demonstrations to help farmers visualize what is occurring by focusing on soil health. This program currently has about 61 producers enrolled. Over the next one to two years, data from this program will be used to demonstrate changes as a result of adopting soil health practices in anonymous, aggregated data summaries.

For more information, see precisionconservation.org.





Edge-of-Field Partnership for Saturated Buffers

The Saturated Buffer Partnership was established in 2019 as a five-year collaboration between Illinois Farm Bureau, Illinois Land Improvement Contractors Association Inc., Southern Illinois University Carbondale, and Illinois USDA Natural Resources Conservation Service. Extended for another five-year term, the goal of this partnership is to install a saturated buffer each year and to support research into the impact of saturated buffers on water quality at each site for the duration of the collaboration period and beyond. The first saturated buffer was installed in the spring of 2019 in Moultrie County. In June 2023, the Saturated Buffer Partnership installed their second saturated buffer to coincide with a Sangamon County field day. Looking forward, the group is looking to install their third saturated buffer in fall of 2024.

For more information, see illica.net/projects or Ilfb.org/nlrspractices.

Edge-of-Field Partnership for Woodchip Bioreactors

The Woodchip Bioreactor Partnership was established in 2017 and is a multi-year collaboration between Illinois Farm Bureau, Illinois Land Improvement Contractors Association Inc., University of Illinois, and Illinois USDA Natural Resources Conservation Service. The goal of this partnership is to install a woodchip bioreactor each year and to support research into the impact of woodchip bioreactors on water quality at each site for the duration of the collaboration period and beyond. In previous years, the partnership has installed woodchip bioreactors in Bureau, Henry, McDonough, and Sangamon counties. A field day was held in Sangamon County and attendees were able to see the woodchip bioreactor and saturated buffer just after installation.

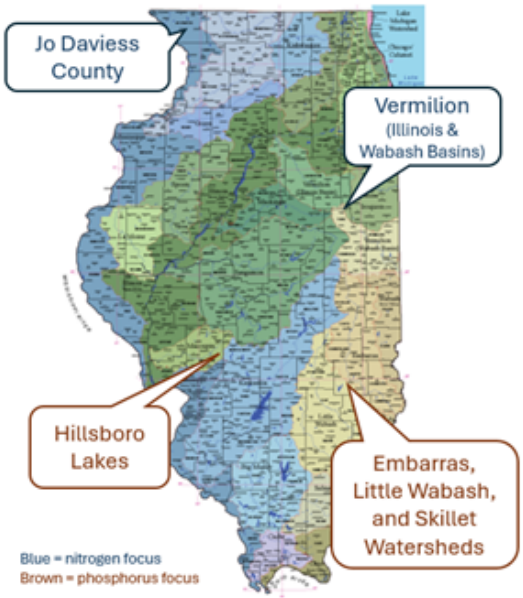
In May 2023, partners of the Woodchip Bioreactor Partnership participated in a planning meeting with Henry County, which also brought together farmers with existing bioreactors to review data and talk about future research needs.

In 2024, the partners finalized the installation of their sixth woodchip bioreactor in McLean County. Plans to host a field day in summer 2025 are pending.

For more information, see illica.net/projects or Ilfb.org/nlrspractices.

Farmer-Led Advances in Soil Health

American Farmland Trust, AFT, is leading a coalition of diverse partners to launch farmer-to-farmer networks in Illinois. The Farmer-Led Advances in Soil Health, Illinois FLASH, program will pair farmer groups with local conservation professionals to identify and prioritize conservation needs and to provide guidance for successful implementation of conservation practices. Local professionals will also facilitate leadership training and support for farmers willing to serve as FLASH leaders and conduct outreach to other farmers.



AFT has partnered with the Sand County Foundation to secure approximately $4 million in financial assistance from the Regional Conservation Planning Partnership, RCPP, program of USDA Natural Resources Conservation Service. Funding will be used to increase use of conservation practices that improve soil health and retention of nutrients on farmland. The resulting improvements in water quality will help meet goals identified in the Illinois Nutrient Loss Reduction Strategy, NLRS. Applied practices will also lower greenhouse gas emissions, sequester carbon in the soil, and build farms' resilience to the impacts of climate change.

The coalition has identified potential FLASH groups and is engaging with farmers willing to serve as leaders for local farmer networks. Initial geographic targets, shown on the map, align with priorities identified in the Illinois NLRS, with plans to expand to other watersheds in future years.

The first conservation practices will be installed in 2025, with a total goal of 24,000 acres installed by 2029.

For more information, see farmland.org/flash.

Field Advisor

In 2024, Field Advisor, previously known as ILSoyAdvisor, introduced its new logo and brand identity. This rebranding effort brings Field Advisor in closer alignment with the Illinois Soybean Association, ISA, parent brand and highlights the growth and expanded focus of ISA's Agronomy Team. This change reflects Field Advisor's commitment to providing Illinois soybean producers with the most up-to-date agronomic information and resources to enhance yield and profitability.

Field Advisor is dedicated to delivering the latest agronomy information and on-farm research from local experts. Covering a wide range of topics, including soybean, wheat, and corn crop conditions, pest and disease management, cover crops, soil health and fertility, weather outlooks and agricultural technology, Field Advisor is an essential resource for farmers aiming to optimize their operations. In 2024, Field Advisor blog posts that touched on or linked to Nutrient Loss Reduction Strategy topics or videos and webinars, had over 6,500 views.

The online platform features contributions from the ISA Agronomy team, Illinois Soy Envoys and other statewide partners. Content is available in various formats, including videos, articles, podcasts, webinars and more, which are easily accessible on FieldAdvisor.org. An extensive archive allows users to quickly find information when they need it most.

Field Advisor's Crop Report is a go-to source for timely updates on field and crop conditions across the Corn Belt. Regional experts provide valuable insights, including field observations, disease alerts and pest sightings, helping farmers stay ahead of potential challenges.

Field Advisor is also home to ISA's research hub, featuring ISA checkoff-funded projects that cover significant agronomy topics such as soil health, fertility management, cropping systems and weed management. This research is essential for advancing farming practices and ensuring the long-term sustainability of agriculture in Illinois. Learn more at FieldAdvisor.org/current-projects.

Government Relations Policy Initiatives

Loyal to the Soil is a government relations event led by Illinois Soybean Association in partnership with University of Illinois Extension, American Farmland Trust, Illinois Stewardship Alliance, the Illinois Environmental Council and other organizations. Participants informed legislators and changemakers about the role that organizations like Illinois Extension and Soil and Water Conservation Districts, as well as state programs like Illinois Department of Agriculture's Fall Covers for Spring Savings, have in protecting the environment and achieving conservation goals.

Illinois Ag Retailer Survey

The Illinois Ag Retail Survey officially began in 2023 with the goal of tracking nutrient management practices by the agricultural industry to help improve and understand future impacts of conservation

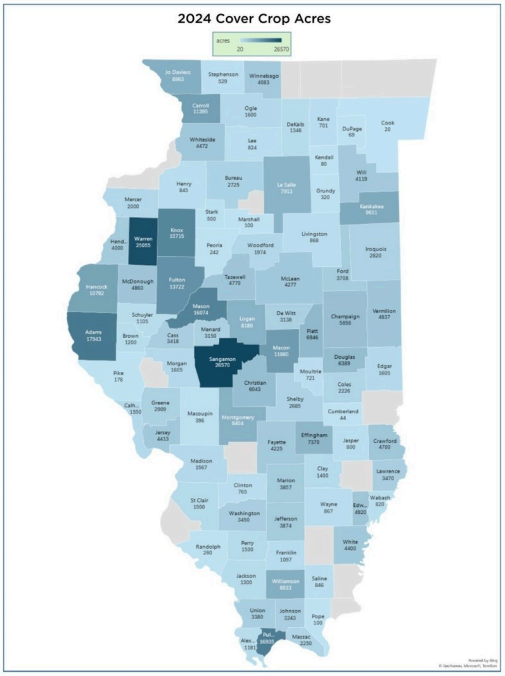
practices and remediation techniques on water quality throughout Illinois. The survey program was first introduced by Iowa Nutrient Research & Education Council, who had been conducting its own ag retail survey within Iowa for several years. With funding from the Illinois Council on Best Management Practices, Illinois Fertilizer and Chemical Association and several agricultural industry partners worked together to develop a similar survey for Illinois. The survey program is currently funded through an Illinois EPA grant.

In January through March, survey liaisons visit randomly selected agricultural retail facilities to collect information on nutrient practices from anonymous, randomly selected fields. In 2023, the Ag Retail Survey program collected data from 917 fields. In 2024, 922 fields were surveyed for the program.

Illinois Corn Growers Cover Crop Coupon Program

The Illinois Corn Growers Association partners with participating cover crop seed dealers across Illinois to support conservation efforts and soil health. IL Corn Growers members can receive a discount on cover crop seed purchases, with the discount provided directly by the seed company at the point of sale. This program makes it more affordable for farmers to implement cover crops, enhancing sustainability and soil productivity across Illinois farms.

Illinois Cover Crop Initiative



American Farmland Trust, AFT, continued the Illinois Cover Crop Initiative, ICCI, in 2024, a partnership with National Fish and Wildlife Foundation, USDA Natural Resources Conservation Service, and Archer-Daniels-Midland. ICCI provided up to a $25 per acre financial incentive to Illinois farmers planting cover crops. Additional incentives were available for ADM customers to implement no-till and/or provide data for emissions scoring.

AFT enrolled almost 400,000 acres in 2024, reaching farmers across the state. Counties with the greatest acres enrolled include Sangamon, Warren, and Adams. The map nearby summarizes acres enrolled by county.

For 2024, AFT utilized NLRS data to estimate load reductions achieved through the ICCI. Cover crops planted through the program reduced nitrogen loads by 1.14 million pounds, and reduced phosphorus loads by over 99,308 pounds. These values are based on county average baseline loads multiplied by cover crop acres planted multiplied by the reduction coefficient for cover crops.

Nutrient Reductions Achieved by Cover Crops Enrolled in the ICCI program

	Nutrient Load Reductions
Phosphorus	99,308 lbs
Nitrogen	1,141,261 lbs

AFT also provided technical support to producers in 2024 by answering questions about cover crops and the enrollment process. This support included fielding telephone calls, emails, text messages, a monthly newsletter, field days, and virtual Cover Crop Coffee Chats. This work resulted in direct one-to-one engagement with over 1,126 Illinois farmers.

For more information, see farmland.org/icci.

Illinois Farm Bureau NLRS Priority Watershed Work

Throughout 2023 and 2024, supporting watershed planning efforts in Illinois Nutrient Loss Reduction Strategy priority watersheds was a significant area of focus for Illinois Farm Bureau, IFB, and County Farm Bureaus, CFBs. IFB has a vested interest in supporting a variety of projects across these watersheds, regularly providing technical, financial, education and outreach resources to the efforts. By collaborating with CFBs and other local point and nonpoint source stakeholders, IFB can effectively work on a variety of watershed planning and implementation projects across the state. Without a watershed plan in place, stakeholders within the watershed have a decreased chance of receiving funding from certain state and federal programs for implementing conservation practices. In 2023 and 2024, IFB primarily worked in the Mississippi North Central (Flint/Henderson) watershed and the Embarras River watershed.

The Mississippi North Central watershed lies in parts of six counties in northwestern Illinois and covers 1.5 million acres. The watershed has been identified as an NLRS priority watershed, IFB and local CFBs provided in-kind support of sub-watershed prioritization via continued implementation of Illinois EPA Section 319 grant. IFB, along with Hancock, Henry, Knox, Warren-Henderson and Mercer CFBs, continued work on a watershed plan that includes implementation of conservation practices in one to two high-priority sub-watersheds.

Implementation of the IEPA 319 grant was officially awarded to the Mercer Soil and Water Conservation District and its partners in 2022, marking the beginning of watershed inventory characterization and analysis work. Work in this region continued in 2023-24, continuing data modeling of sub-watershed prioritization, stakeholder engagement, and implementing Illinois EPA-approved education strategy.

The Embarras River watershed, located in southeastern Illinois, covers 1.5 million acres across 12 counties. In spring 2021, Illinois EPA announced that stakeholders were successful in securing funding to update the Embarras River Watershed Management Plan, set to expire in 2021, as well as to create watershed plans for two sub-watersheds, the Slough and Polecat Creek.

In 2023-24, IFB and their partners worked together to provide watershed and sub-watershed planning updates and gather feedback on these updates. In-kind and financial support was provided to Richland, Lawrence, Crawford, Champaign, Coles, Edgar, Douglas, Jasper, Cumberland, and Clark CFBs. These donations were used for the continued implementation and education of farmers and landowners about the various conservation practices and programs they can access to help reach watershed goals. Stakeholders worked to provide updated information to local landowners and farmers throughout 2023. Update meetings were held in both sub-watersheds to support continued farmer and landowner engagement and provide updates about the character of the sub-watersheds.

In 2022, collaborators, including IFB, Coles SWCD, and Northwater Consulting, focused on writing and submitting the updated Embarras River Watershed Management Plan and individual plans for both sub-watersheds. Drafts of the three plans were submitted to Illinois EPA in early fall 2022 and finalized by early 2023. Once finalized, these plans can be used to leverage additional funding sources that can help stakeholders implement high-priority watershed improvement projects.

Throughout 2023-24, IFB also provided in-kind and financial support for various USDA Natural Resources Conservation Service Region Conservation Partnership Programs, RCPP, across the state. IFB supported the Kankakee River RCPP with outreach and education through Ford-Iroquois, Kankakee, and Will CFBs. IFB provided support to the Lake Decatur and Lake Springfield RCPPs by providing outreach on best management practices to meet watershed goals. This work included Ford, Mclean, Champaign, DeWitt, Macon, Piatt, Shelby, and Sangamon CFBs. Finally, IFB supported the Rend Lake RCPP assisting in presentations and outreach on conservation practices in alignment with watershed priorities. Jefferson and Franklin CFBs collaborated on this work.

Illinois Fertilizer and Chemical Association supported Nutrient Research & Education Council Projects

Illinois Fertilizer and Chemical Association, IFCA, continues to be a partner in several Nutrient Research & Education Council funded research projects, assisting with the management and implementation of all nutrient, crop protection and cover crop applications as well as any tillage practices performed. IFCA is also involved with the development and execution of several outreach events focused on sharing the research findings from the NREC projects.

Listed below are the NREC projects IFCA helps to coordinate:

Nitrogen management systems in tile-drained fields: 4R plus – rate source, time, place, and cover crops: Lowell Gentry of IFCA is a Co-PI on this program, along with Dan Schaefer of IFCA acting as a cooperator on the project. This NREC-funded project, which began in 2015 and concluded in 2023, researched replicated tile drainage under a corn-soybean rotation with varying nitrogen rate applications, split fertilizer nitrogen rates, and cover crops to study tile nitrate loads. The project concluded that moving fall N application to the spring and growing cereal rye before soybean may reduce nitrogen loss in intensively tile-drained watersheds in Illinois.

Published Results: https://acsess.onlinelibrary.wiley.com/doi/full/10.1002/jeq2.20530

Evaluating nutrient loss reduction strategies: Longer cover crop rotation paired with a bioreactor: Lowell Gentry of IFCA is a Co-PI on this project, along with Dan Schaefer of IFCA acting as a cooperator on the project. This nine-year study, beginning in 2016, was developed to test the effectiveness of a longer rotation with cover crops in combination with a bioreactor to decrease tile nitrate loss. Findings showed that tile nitrate was reduced by 50% under the diverse rotation compared to the conventional rotation.

Published Results:
https://www.frontiersin.org/journals/environmental-science/articles/10.3389/fenvs.2025.1506113/full

Validating the Maximum Return to Nitrogen recommendation to reduce tile nitrate loss in conventional and cover cropping systems: IFCA assists in the implementation of this project, which seeks to help validate the Maximum Return to Nitrogen rate by evaluating corn yield and tile nitrate loss from three nitrogen rate treatments using a replicated tile drainage site in Macon County.

Scaling up conservation agriculture by growing cover crops ahead of soybean and moving fall fertilizer nitrogen application to spring: Dan Schaefer of IFCA assists as a senior personnel PI for this project, which began in the fall of 2024, and focuses on incentivizing producers to plant cereal rye cover crop ahead of soybean and move fall fertilizer nitrogen application to spring during the corn phase for the Black Slough watershed, a portion of the Embarras River watershed in Champaign County.

Integrating tillage, soil carbon dynamics, and tile nitrate loss: Lowell Gentry, IFCA, is a cooperator on this project, which consists of two tile-drained field sites in Piatt and Champaign counties that are used to determine tile nitrate loads under different tillage regimes in a corn/soybean rotation. The study is investigating nitrate loss under four treatments: strip-till with cover crops, strip-till without cover crops, no-till, and conventional tillage.

Nitrogen rate research & NREC project partnership: Dan Schaefer of IFCA continues to coordinate with the University of Illinois, ag retailers and growers throughout the state to implement randomized, replicated nitrogen rate trials along with nitrogen strip trials to help feed data to the MRTN calculator.

Illinois Nutrient Research & Education Council

Since 2012 the Illinois Nutrient Research & Education Council, NREC, has been Illinois agriculture's primary investment in nutrient research. Created by state statute, NREC works closely with the Illinois Department of Agriculture to collect an assessment of $1.25/ton of bulk fertilizers. Eighty percent of this assessment serves as the funding source for nutrient research and outreach projects. Since its founding, NREC has invested over $43 million in research.

The Council consists of nine voting members and four advisory members. The voting members, appointed by the Director of IDOA, represent farmer member organizations (3), fertilizer retailers (3), certified crop advisors (1), specialty fertilizer retailer (1) and a designee from the Illinois Department of Agriculture. Advisory members are also appointed by the Director of IDOA and represent the Director of the Illinois Environmental Protection Agency (1), a federal or state research station (1), and members

of environmental organizations (2). The Council also has two full-time employees, an Executive Director and a Research Manager.

NREC operates separately and parallel to the Illinois Nutrient Loss Reduction Strategy, NLRS. It supports the work of the Illinois NLRS in several key areas: review of practice removal rates and consideration of practices not currently in the strategy, funding of the USDA-National Agricultural Statistics Survey's survey on NLRS practice awareness and adoption, and service on multiple standing committees. With the help of funded researchers and support from other stakeholder groups, Illinois NREC successfully submitted "saturated buffers" as an accepted practice recommended by the NLRS. In addition, much of the research used to add water and sediment control basins, WASCOBs, to the strategy was funded by NREC.

Each year, the Council issues an request for proposals and then evaluates the submitted proposals to determine where to make investments. NREC is committed to identifying products and practices which address the agronomic, economic, and environmental needs of Illinois farms.

NREC funds research projects in four main categories, with specific issues identified in each of the categories:

- Applying and understanding the 4Rs — identifying conservation practices and expanding the understanding of these practices related to more efficient fertilizer applications and use of those nutrients for crop production.
- Capturing excess nutrients in the field, primarily using cover crops, with a focus on finding the most economical strategies for adopting nutrient-capturing methods on a wide scale.
- Mitigating the loss of excess nutrients to water supplies through edge-of-field practices — woodchip bioreactors, wetlands, saturated buffers, water and sediment control basins, and other practices designed to capture nutrients before they enter water supplies.
- Studying other nutrient management issues, including the impact of tile depth and spacing, the use of gypsum and drainage water management, and emerging topics, such as dissimilatory nitrate reduction to ammonium for nitrate retention and the use of biochar to remove phosphorus from drainage water.

In 2023 and 2024, Illinois NREC invested $4million and $4.1 million respectively into nutrient research projects. Each of those years also included an additional $50,000 for outreach and education activities. Research partners for 2023 and 2024 included University of Illinois, Southern Illinois University, Western Illinois University, Purdue University, and the Illinois Fertilizer and Chemical Association. Findings from this funded research are regularly highlighted in professional journals, webinars, farmer meetings, and other Extension activities. Each year, NREC publishes an annual report of the research findings, and all of the reports are available on its website, illinoisnrec.org.

NREC also invests in education-based projects that incorporate research findings and effectively promotes conservation practice implementation to farmers and crop advisers. NREC partners with others in the industry to focus on knowledge transfer and usefulness of the generated data. NREC publishes periodic "Investment Insights," which focus on individual research projects and provides a one-page summary of the work and findings. In addition, it posts project videos on its YouTube channel and utilizes its other social media platforms to widely distribute research data.

NREC holds an annual Investment Insight LIVE event where it brings together academic partners from across the state to share and discuss research findings, ideas, and concepts to move nutrient research forward. In addition, many of the 40-plus students who contribute to NREC-funded projects present their work and interact with stakeholders and other researchers at the event's poster session. Agriculture media outlets are invited to the event to help disseminate information and amplify what NREC is doing to advance nutrient management research.

For more information, visit illinoisnrec.org.

Illinois STAR

Saving Tomorrow's Agriculture Resources, STAR, was developed in 2017 as a grassroots initiative by the Champaign County Soil and Water Conservation District. It was created in response to the Illinois Nutrient Loss Reduction Strategy, NLRS, as a simple, farmer-focused roadmap for adopting conservation practices that improve water quality and soil health, while also recognizing producers' successes. Conservation professionals and farmers across the state helped develop the STAR Tool and Ratings through participation in the Illinois STAR Steering and Science Committees. Together, they produced a field evaluation form and a scoring system that generates a 1- to 5-STAR Rating at the field level.

The STAR Rating system has proven to be an effective tool for evaluating conservation progress over time. The STAR Tool consists of a Field Form, a scoring system that produces the 1-5 STAR Rating, the Conservation Innovation Plan, CIP, feature, and a Resource Database that connects users to relevant technical, educational, and financial assistance.

The overarching STAR Framework includes the Tool and builds on it by providing an implementation structure that includes a network of state-level Affiliates and trained local STAR Navigators who offer technical assistance, and a suite of report formats that help communicate conservation progress to landowners, lenders, and other stakeholders. The STAR Framework also provides structure for producer incentive programs. Illinois STAR has successfully implemented Producer Reward Payment Programs and paid farmers for improved or outstanding (5-STAR) STAR Ratings in partnership with organizations such as Siemer Milling Company, The Nature Conservancy, and ADM.

Since 2017, the STAR program has inspired interest beyond Illinois, and in September 2023, National STAR officially launched as a nonprofit organization, www.STARconservation.org, to provide a consistent, standardized tool across multiple regions and production systems. As part of this transition, the Champaign County Soil and Water Conservation District and the Illinois Department of Agriculture partnered with National STAR as its Illinois STAR Affiliates. These organizations serve as state-level partners committed to recognizing, inspiring, guiding, and rewarding producers as they incorporate more conservation practices, using tools and guidance developed by National STAR. Illinois STAR continues to be supported by in-state Steering and Science Committees and is implemented by a full-time Illinois STAR Coordinator and part-time Assistant Coordinator.

Illinois' STAR Science Committee plays a critical role in ensuring that the STAR Tool reflects locally relevant natural resource concerns and conservation priorities. The committee includes a broad range

of conservation professionals, academic researchers, agency representatives, and farmers. For example, in earlier years, Illinois STAR offered multiple versions of the Field Form based on region. After review and input from the Science Committee, it was determined that a single form could effectively capture the necessary information and thereby simplify use while maintaining rigor. More recently, the Science Committee added a new version of the Field Form specifically for fields growing wheat and double-cropped wheat.

The STAR Tool is currently available annually in Illinois for producers growing corn, soybeans, wheat, small grains, hay, or pasture. It is accessible at www.STARTool.ag.

An Urban Agriculture Field Form is in development, with additional forms for specialty crops planned for future release. STAR for Grazing Lands will be released for the western region in September 2025 with expansion to the Midwest region in 2026. By 2025, the STAR Tool is expected to be available in nine states. Each affiliated state's STAR Science Committee adapts field forms and scoring systems to reflect local natural resource concerns and conservation priorities.

Farmers use the STAR Tool by completing a short Field Form through www.STARTool.ag detailing their current management practices. Each field is then assigned a STAR Rating, accompanied by a Score Report that summarizes reported practices and the associated points. The report is a useful communication and planning tool, often used in discussions between producers, landowners, conservation professionals, lenders, and supply chain partners. Producers may also request a complimentary STAR field sign displaying their STAR Rating for a given crop year.

To support continuous improvement, farmers are encouraged to complete a Conservation Innovation Plan, CIP, using a follow-up questionnaire in the STAR Tool. This CIP asks about the farmer's goals, barriers, and areas of interest. Based on their responses, the Tool generates a customized list of relevant financial, technical, and educational resources that can be saved or printed.

STAR Navigators are trained local conservation professionals, typically SWCD staff or staff from partner organizations, who are trained to support producers in using the STAR Tool and accessing conservation resources. Navigators receive administrative access to fields within their designated region or project. They assist STAR Tool users in their area and help connect farmers to technical assistance and cost-share programs. STAR exists to support farmers, so protecting farmer data is of the utmost importance. All STAR Navigators sign and uphold STAR's Data Privacy Policy and Data Use Agreement. STAR emphasizes farmer data ownership and confidentiality as core principles of the program.

The STAR Tool includes a verification component to ensure accuracy and build trust in the reported conservation practices. Fields are randomly selected for verification, which is conducted in partnership with trained conservation professionals. This process not only strengthens STAR's credibility with partners and funders but also allows farmers to receive recognition or rewards with confidence that the data is reliable and grounded in field-level assessments.

Beyond individual farm use, the STAR Tool also supports program implementation and outcome reporting. For example, IDOA's Partners-for-Conservation, PFC, program requires a soil health assessment for all state-funded cost-share practices. The STAR Field Form fulfills this requirement by

assessing detailed, field-specific information about management practices that impact soil health, such as tillage, nutrient application, cover cropping, and crop rotation.

The Siemer Milling Company, SMC, Producer Rewards Payment Program, PRPP, offers another example of effective STAR Tool integration. Launched in 2023 with one producer, the program expanded significantly in 2024, with 13 growers submitting fields and 10 qualifying for payments based on their adoption or maintenance of conservation practices. In total, $65,422 was awarded to participating farmers. Based on this success, SMC has committed $75,000 annually for the next three years to continue supporting producers who prioritize soil health and sustainability.

In 2023, 1,175 fields covering 66,672 acres were evaluated using the STAR Tool. Approximately 91% of those fields were in corn or soybean production, with an average STAR Rating of 3.45. The most commonly reported practices included soil sampling, diverse crop rotations, reduced fall nitrogen (limited to MAP/DAP), reduced tillage, and participation in soil health education. Less common practices included the presence of constructed wetlands, bioreactors, saturated buffers, and the inclusion of hay in crop rotations. Only 1.9% of fields used full-width tillage with two or more passes following no fall tillage. Additional analysis of 2023 data showed that smaller fields and those planted in wheat scored higher STAR points. Results also indicated significant variation by county, and that participation in conservation programs was correlated with improved outcomes.

For more information, see IllinoisSTAR.org or STARConservation.org.

Illinois Sustainable Ag Partnership

The Illinois Sustainable Ag Partnership, ISAP, brings together member organizations who work collaboratively to encourage the adoption of sustainable and profitable production practices that improve soil health and restore local waters. ISAP's programs are based on a combination of academic and on-farm research data, employing a train-the-trainer approach that results in a cadre of professionals who are able to inform and influence producers across the state.

ISAP's members include: Savanna Institute, American Farmland Trust, Illinois Nutrient Research & Education Council, Precision Conservation Management, The Wetlands Initiative, The Association of Illinois Soil & Water Conservation Districts, Illinois Central College, Midwest Dairy, Agricultural Drainage Management Coalition, The Nature Conservancy, Illinois Corn Growers Association, Certified Crop Adviser, The Zea Mays Foundation, Illinois Farm Bureau, Illinois Soybean Association, Illinois LICA, Saving Tomorrow's Agriculture Resource, and University of Illinois Extension.

Production Risk Management	Soil Health & In-field Management	Water Quality & Edge-of-Field Practices	Network of Practitioners
Risk Management Conference	Advanced Soil Health Training	Advanced Conservation Drainage Training	Conservation Story Map
Climate Adaptation	Technical Resources	Agricultural Conservation Planning Framework	Alphabet Soup
Ecosystem Markets			Illinois Cover Crop On-Farm Network

ISAP's programs fall into four pillars: Production Risk Management, Soil Health & In-field Management, Water Quality & Edge-of-Field Practices, and Network of Practitioners.



Production Risk Management ISAP's biennial **Risk Management Conference** highlights the use of soil health and conservation drainage practices as tools to mitigate production risk. In August 2024, the conference dove into subjects around pest management, herbicide resistance, changing weather, and sustainability metrics in the supply chain.



In July 2024, the Illinois Sustainable Ag Partnership released a new resource to connect Illinois farmers with programs offering financial incentives for conservation practices. The **Financial Incentives Database**, or FIND Tool, includes information for over 60 financial incentive programs available to Illinois farmers who want to implement conservation practices. Users can filter the list based on location, production type, and conservation practice they are interested in adopting. With funding from the Illinois Soybean Association, ISAP aggregated information across the network for various incentive programs. The purpose of the tool is to search as an educational resource for farmers and farm advisors. ISAP does not endorse any particular program or company included in the database.

Soil Health and In-Field Management ISAP revamped the Advanced Soil Health Training to launch the new Soil Health Leadership Program to support farmers, advisors, and conservation professionals who are looking to sharpen their skills within conservation agriculture. The program brings together diverse participants working together to improve agricultural environmental stewardship.

In April 2024, ISAP selected a new cohort for the Soil Health Leadership Program, an 18-month soil health training program facilitated by Jim Isermann, ISAP's Soil Health Specialist. The cohort completed two sessions, focusing on soil health demonstrations, cover crop, no-till management, species selection, water quality, and edge-of-field practices

Water Quality and Edge-of-Field Practices ISAP's Water Quality and Edge-of-Field programs highlight practices like saturated buffers, constructed wetlands, controlled drainage, and bioreactors, which are designed to capture and treat high levels of nitrate-nitrogen from tile flow. With funding provided by One Good Idea, ISAP installed a woodchip bioreactor on Brian Corkill's corn and soybean farm near Galva. ISAP's Water Quality and Edge-of-Field practices pillar continues ISAP's commitment to maximize agricultural productivity potential while reducing environmental impacts.

Network of Practitioners ISAP leads the Alphabet Soup, a program that provides training and networking opportunities for agronomists, researchers, educators, conservation practitioners, and industry partners. In August 2024, more than 60 agriculture and conservation professionals gathered on Ag Day at the Illinois State Fair to connect, collaborate, and learn from one another.

For more information, visit ilsustainableag.org.

Lake Decatur Watershed Management Program

Lake Decatur is the water supply for the City of Decatur and the Village of Mt. Zion. The lake is approximately 3,090 acres large and was constructed 1920-23. The watershed spans 926 square miles over seven counties and is primarily agricultural. Over 30 million gallons per day is drawn from the reservoir for industry and residents.

Sediment and excess nutrients from the watershed have been long-standing issues for the city's water treatment facility. After the City of Decatur completed a $98-million dollar dredging program in 2019, which reclaimed 30% of the lake's holding capacity, the decision was made to significantly expand the watershed management program. There has been a watershed management effort in place for a long time, but it gained significant traction when the city's water utility took the lead. The goal is to align efforts and secure funding to implement projects that reduce sediment and nutrient delivery to waterways and the lake.

Watershed-based plans outline the overall condition of the watershed, set objectives and identify project opportunities, guide voluntary efforts, and help secure funding to improve and protect water quality. The city's extensive stream and lake monitoring program tracks nutrient and sediment dynamics, measuring changes over time to evaluate progress toward key goals. Education and outreach efforts are supported by the city and its partners. The figure below shows key strategies and a chronology of actions since 2020.

	2020 - 2023	2024	2025	2026	2027 - 2028
Baseline Assessment & Long-term Strategy	Completed April 2021				
Watershed Planning	The Bluffs; Friends, Wildcat, Willow Branch, Sand Creek	Camp Creek	Big & Long Creek	Finley Creek, Goose Creek	
Grants & Funding	$250,000 (319); $9.8M (RCPP)	$447,000 (319)	$603,000 (319)		
Implementation	Section 319 Grants				
	Regional Conservation Partnership Program (RCPP) Grant				
	City-Funded Cost-Share				
Water Quality Monitoring	2020 onward →				

Grant funding has been a key element of watershed efforts. Decatur received numerous Illinois EPA Section 319 grants as well as a $9.8 million USDA Natural Resources Conservation Service Regional Conservation Partnership Program, RCPP, award. The RCPP is underway and includes an additional $10 million in partner contributions.



2024 Cover Crop

The Illinois Fertilizer & Chemical Association continues to focus on supporting Illinois NLRS priority watersheds through existing and new programs. IFCA has partnered with the City of Decatur and its Lake Decatur Watershed Management project's USDA NRCS Regional Conservation Partnership Program grant. IFCA provided expertise and tools to determine agency ranking criteria and to create landowner agreements. IFCA also implemented nitrogen rate trials within the watershed, targeted landowner outreach, provided training and coordination with partnering ag retailers, showcased strip till demonstration, and provided equipment for cover crop planting.

The RCPP, awarded in late 2022 completed its first round of grower and landowner contracting in 2024. The signup was robust with $5.89 million obligated covering 31 applications out of 51 submitted. A breakdown of acreage by practice, cumulative over five years includes:

1. Cover Crops: 37,063 acres or an average of 7,413 acres per year.
2. No-Till: 1,930 acres or an average of 383 acres per year.
3. Reduced till: 24,771 acres or an average of 4,554 acres per year.

4. Nutrient Management: 33,114 acres or an average of 6,623 acres per year.
5. Harvestable perennial grasses: 298 acres.

Two completed Illinois EPA Section 319 grants have resulted in a series of sub-watershed plans that are guiding implementation efforts and helping to fund structural practices that result in measurable improvements to water quality. A 2025 grant will be used to update an outdated sub-watershed plan and construct additional, high-priority practices. To date, the following has been achieved:

1. Actionable sub-watershed plans for Sand Creek, Willow Branch, Wildcat Creek, Camp Creek and Friends Creek. A plan for the "bluffs" or the area immediately adjacent to the lake was developed without grant funding in 2021.
2. 747 feet of streambank and bed stabilization, 6.1 acres of wetland creation, 2,152 feet of shoreline stabilization, four water and sediment control basins, one pond, one grade control structure, and a 0.3 acre grassed waterway. It is estimated these practices generate the following annual nutrient and sediment reductions to Lake Decatur:
3. 1,519 pounds nitrogen.
4. 397 pounds phosphorus.
5. 705 tons of sediment.



Section 319 Grant Funded Shoreline Stabilization

In addition to the RCPP and Illinois EPA Section 319 grants, a dedicated city cost-share program has been established. Numerous practices have been completed since 2022, focusing primarily on structural measures recommended in sub-watershed plans. This has included grass waterways, water and sediment control basins, ponds, streambank stabilization plus one year where a limited acreage of cover crops were offered. It is estimated these cost-share investments have resulted in the following annual nutrient and sediment load reductions:

- 1,922 pounds nitrogen.
- 163 pounds phosphorus.
- 242 tons of sediment.

The watershed model Decatur is executing took significant investment to develop, but that investment has supported other strategic decisions about watershed management. Decatur is working with farmers cooperatively, and that is making a difference in adoption rates of new conservation practices. A farmer advisory board meets regularly to discuss and develop outreach strategies and provides technical assistance to producers transitioning to new management systems. Despite recent successes, watershed stakeholders and program participants are still needed and being sought to expand participation and deliver results beyond 2024. To learn more about Lake Decatur's watershed management efforts, please visit decaturil.gov/547/Protecting-Lake-Decatur.

Mackinaw River Program

Conservation planning in the Mackinaw River watershed began 35 years ago when the river was selected as a priority site by The Nature Conservancy due to high quality stream and riparian habitats that support numerous fish, mussel, and plant species, many of which are state threatened and endangered. This effort resulted in the Mackinaw River Watershed Management Plan, which was completed in 1998 by the tremendous volunteer effort of a diverse group of watershed stakeholders that included TNC.

Since the completion of the watershed plan, TNC has engaged with partners on implementation and long-term water quality monitoring in the Mackinaw River watershed to understand how implementation of conservation practices affects water quality at multiple scales, and to gain insights related to outreach, practice delivery, and partnerships that can inform TNC and partner work on other programs and in priority watersheds. TNC projects include the Franklin Research and Demonstration Farm in Lexington, a constructed wetlands project in Money Creek watershed, the primary tributary that feeds into Lake Bloomington drinking water reservoir, and the Paired Watershed Study in the headwaters of the Mackinaw River.

TNC partnered with the McLean County Soil and Water Conservation District to support a cover crop project in the Paired Watershed from 2019 to 2024. In 2023 and 2024, an estimated 1,360 and 1,400 acres of cover crops were planted in the treatment watershed, respectively, of which 24% in 2023 and 37% in 2024 were supported by the project. Collectively these projects include research on infield practices (cover crops, spring nitrogen application), critical edge-of-field practices (the design and efficacy of constructed wetlands to treat tile drainage water) and stacked infield and edge-of-field practices and their synergies for water quality. This research provides hard data on practice design and efficiency of these Farm Bill conservation practices that address nutrients in tile drainage water. Near the end of 2024, The Nature Conservancy, TNC, in Illinois scaled back on intensive implementation and monitoring of conservation practices associated with a 24-year Paired Watershed project and a 20-year Franklin Research and Demonstration Farm project designed to assess effectiveness of agricultural conservation practices to reduce nutrient losses from agricultural lands and improve water quality at farm and watershed scales.

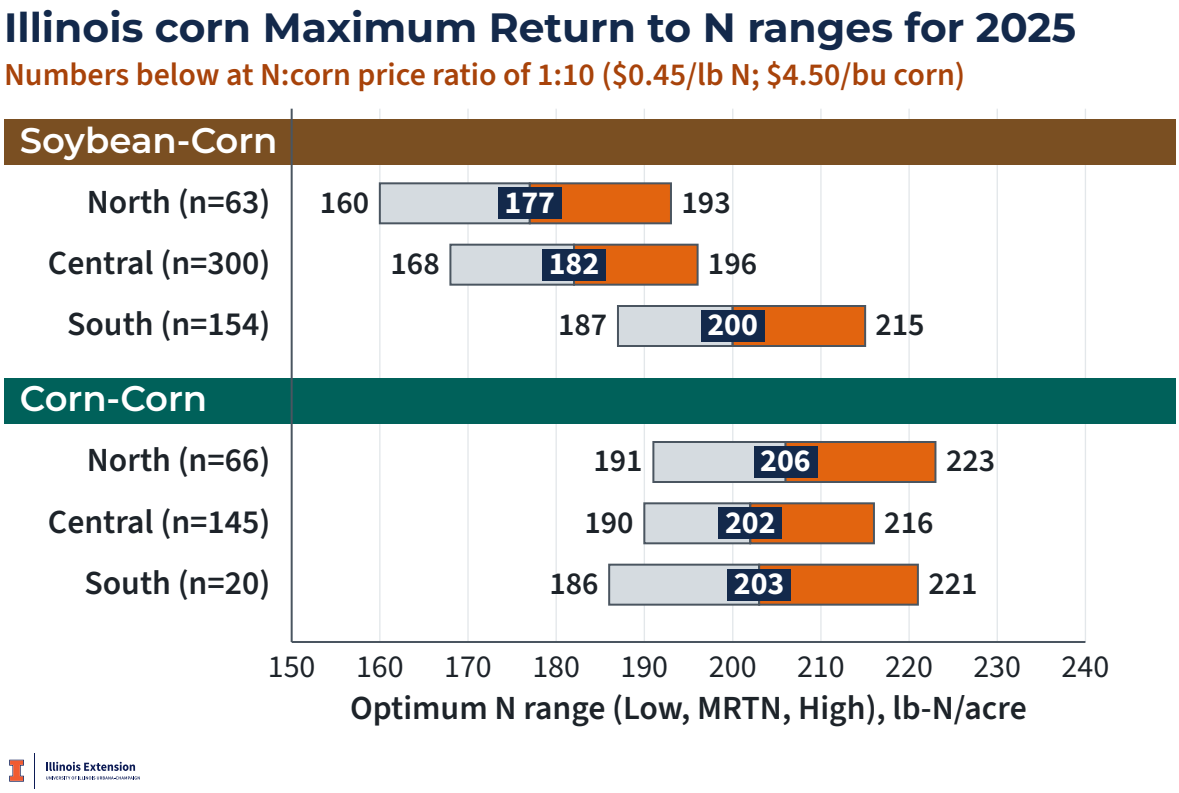
Increased intensity of precipitation events and nutrient losses associated with climate change will require additional assessments of single and multi-practice capacity to meet nutrient loss reduction goals. TNC will continue monitoring hydrology in the paired watershed as this long-term data set could provide insights into hydrological changes related to changing precipitation patterns.

Key partners for the Mackinaw River watershed projects include the McLean County Soil and Water Conservation District, McLean County USDA Natural Resources Conservation Service, University of Illinois Urbana-Champaign, and Illinois State University. For more information, see nature.org/en-us/get-involved/how-to-help/places-we-protect/the-mackinaw-river-watershed.

Nitrogen Rate Trials

The Illinois Fertilizer and Chemical Association, IFCA, continues to implement nitrogen rate trials throughout Illinois on an annual basis through a grant funded by the Nutrient Research & Education Council, NREC. There are two different types of nitrogen rate trials performed. One is a full-rate trial, looking at six different rates of nitrogen, ranging from zero pounds of nitrogen to 250 pounds, replicated three times. The second, referred to as a strip-trial, focuses on applying a nitrogen rate strip 50-60 pounds higher or lower to the field's normal nitrogen rate. This allows for more insight into how much corn yield is gained or lost by using higher, or more modest, nitrogen rates.

The program is led by Dr. John Jones with University of Illinois and performed by IFCA staff working with agriculture retailers and growers. The data generated from these trials, detailing yield response to varying nitrogen rates, will update the University of Illinois' Maximum Return to Nitrogen recommendation tool for fertilizer nitrogen application rates in Illinois for corn.



For more information see https://www.cornnratecalc.org/.

Nutrient Stewardship Grant Program

The Illinois Farm Bureau, IFB, Nutrient Stewardship Grant Program was established in 2015 with guidance and support of the Illinois Agricultural Association, IAA, Board of Directors. The program was developed with the goals of Illinois Nutrient Loss Reduction Strategy in mind, providing County Farm Bureaus, CFBs, and IFB members with several avenues of support to initiate locally-led projects to address nutrient loss, water quality, and soil health.

Since 2015, the IAA Board of Directors has committed more than $1.25 million to the program, with $175,000 being committed each year in the 2023 and 2024 program years. Countless additional support is brought to projects in the form of in-kind and matching support from CFBs and other partners. Through this program, IFB serves as an active partner on all projects, bolstering CFBs and their external partners to develop projects that address farmer needs for research, education and outreach, support to implement best management practices for nutrient loss reduction, and success in documenting their progress.

To date, funds have been awarded to 160 projects across 75 Illinois counties. The projects developed through the program often vary depending on local farmer interest. For example, funding may be used to support meetings and educational seminars, or it may be used to initiate multi-year data collection and analysis projects. Project partners often prioritize practices recommended by the Illinois NLRS, ranging from in-field practices like nitrogen management and cover crops, to edge-of-field practices like woodchip bioreactors and saturated buffers.

Through work in this program and other efforts, IFB supports several research initiatives across the state. For example, IFB connects farmers with researchers to develop on-farm research trials. These connections provide researchers with opportunities to reach farmer audiences, create peer-reviewed research publications, and more. Research topics range from monitoring several woodchip bioreactors and saturated buffers to implementing cover crop test plots, to conducting several types of water and soil testing, to other water quality and soil health projects.

In 2023, $175,000 was awarded to 18 CFBs implementing projects across the state. Accounting for partnerships, 23 CFBs were supported in 2023 to implement Nutrient Stewardship programs. Project partners included private consultants, community colleges, university staff, wastewater treatment facility staff, drinking water supply staff, and many others. These projects included hosting Nutrient Stewardship Field Days and other education events, supporting regional watershed planning, implementing cover crop test plots, conducting water quality and soil health testing, and developing research publications. An overview of all projects is in Table 1.

2023 marked the eighth year of the program, with $175,000 being awarded to 23 CFBs working together on 18 projects. Projects in the program once again involved numerous project partners who supported a wide range of projects centered on the priorities of the NLRS. Projects in 2023 ranged from engaging in watershed planning efforts, developing on-farm research and demonstration projects, supporting several water quality improvement projects, hosting Nutrient Stewardship Field Days, and evaluating several nitrogen management practices.

For more information, see ilfb.org/FieldDays.

Table 1. 2022-23 Nutrient Stewardship Grant Projects Overview

CFB(s):	Project overview:	Project reach, impact, or deliverables, where applicable:
Green & Calhoune	Cover crop and strip till research plot to investigate soil function, improved weed management, and improved nutrient management.	Field day = 35

CFB(s):	Project overview:	Project reach, impact, or deliverables, where applicable:
Montgomery	Assist local SWCD to reduce nutrient loading and sedimentation in Hillsboro Lake via education of farmers on conservation and BMP practices. Also, educate on soil health and increases productivity.	Field Day = 45
Will, Cook	Partner with Cook SWCD to broaden knowledge to farmer and non-farmer community regarding issues facing agricultural industry. Focus: Nutrient stewardship, carbon market, soil health.	Field Day 1 = 40 Field Day 2 = 60 Field Day 3 = 45
Washington	Investigate variable rate cover cropping for both economic and environmental implications. Investigate the effects of cover cropping on nitrogen capture and leaching.	Field Day = 40 Data Collection and presentation
Clinton	Influence of cover crops and manure management on reducing nutrient losses and improving soil health. Forage mixes, yield, and quality data.	Field day 1 = 65 Field Day 2 = 90 Publication of data Manure Testing
Jo Daviess	Plant several cover crop mixes interseeded with cash crops. Measure surface water and run-off for nitrates, phosphorus, and ammonia. Carbon-nutrient cycling.	Field Day = 65
Piatt	Invite speakers from local SWCDs, Northwater Consulting, Lake Decatur Watershed Project and local agricultural educators. Field Day education on conservation and water quality.	Field Day = 35
Wayne	Create NLRS demonstration plot to demonstrate efficacy of nutrient enhancers, inhibitors, biologicals, inoculants to improve fertilizer efficiency for higher return.	Field Day = 45
Cook	Partner with MWRD and Margenot research group at University of Illinois to investigate use of struvite as slow release phosphorus fertilizer. Apply to specialty crops.	Field Day = 65
Knox	Comprehensive cover crop project across 20 townships with 20 acres in each township. Data has been collected and compiled into a booklet. Continue to edit booklet and host field day with soil pit demonstration.	Field Day = 60
LaSalle	Hosted elected official outreach event, including nutrient loss reduction topics and biologicals.	Field Day = 45
Clark, Douglas, Vermillion	Provide informational meetings on NLRS practices (cover crops, edge of field, etc.).	Field Day = 20
Lee	Partner with Northwestern University and share their environmental research. Bring researchers to Adam Henckle's farm to discuss conservation practices and research opportunities.	Field Day = 25
Whiteside	Host informational meeting for farmers and individuals in the agricultural industry focused on regenerative agriculture.	Field Day = 25

Partnering to Expand Conservation in Key Areas

Illinois recently secured $15 million in traditional USDA Natural Resources Conservation Service Environmental Quality Incentives Program, EQIP, funding, a direct result of the collaborative efforts between the Illinois Corn Growers Association and the Illinois Department of Agriculture, with crucial support from U.S. Sen. Dick Durbin. This additional funding, part of the 2025 EQIP sign-up, was split evenly: $7.5 million dedicated to priority nutrient loss reduction in key watersheds and $7.5 million aimed at preserving valuable topsoil in regions increasingly affected by dust storms. This achievement effectively doubles the typical row crop EQIP funding for Illinois, representing a significant win for the state's farmers and conservation goals.

Partnerships with Drinking Water Suppliers and Wastewater Treatment Plants

The Illinois Farm Bureau, IFB, continued to build and strengthen relationships with drinking water suppliers and wastewater treatment utilities across Illinois, as a part of ongoing efforts to build connections between point source and nonpoint source sectors to address key concerns about nutrient loss reduction.

In 2023 and 2024, IFB actively supported several drinking water supply projects across the state. This work included providing financial and in-kind support for several USDA Natural Resources Conservation Service Regional Conservation Partnership Program and Illinois Environmental Protection Agency Section 319 grant projects focused on several watershed and NLRS-related topics described in IFB NLRS Priority Watershed Workand Nutrient Stewardship Grant Program narratives. For many years, IFB has also partnered with the Metropolitan Water Reclamation District of Greater Chicago, MWRDGC, on shared interests in bridging gaps between point sources and nonpoint sources to address nutrient loss reduction.

Major projects and research in 2023 and 2024 included Biochar work with University of Illinois, MWRDGC, Cook and Fulton County Farm Bureaus, and IFB:

1. Designer Biochar for Ag and Wastewater capture of Nutrients (N & P) – Wei Zheng
2. Utilization of Designer Biochar in field bioreactors to capture Nutrients (N & P) – Wei Zheng
3. Recycle nutrient-captured Biochar as slow-release fertilizer in-field – Wei Zheng
4. Struvite collection and application as slow-release P-Fertilizer – Andrew Margenot
5. Bio-compost and Bio-solid promotion program

Research items 1-3 focused on the use of biochar to capture nitrogen and especially phosphorus in field runoff or wastewater. The use of this nutrient-dense biochar was then tested as a slow-release fertilizer and showed promising results in greenhouse trials. Additionally, struvite (magnesium ammonium phosphate) is a wastewater-derived form of phosphate that can be used as a slow-release fertilizer. The removal of the phosphate from wastewater and application of it on-farm reduces phosphorus losses for both point and non-point sources and could be a major development in phosphorus reduction strategies.

The bio-compost and bio-solid program showcased through Cook and Fulton County Farm Bureaus highlighted the efforts of MWRDGC to reduce nutrient losses through the Biosolids Beneficial Reuse program. Social media and print promotion were included (20,000+ reach). Also, the bio-compost and bio-solid program were showcased at the MWRDGC Sustainability Summit focused on sustainability and water resource protection. Multiple field days were also held to showcase research items 1-5.

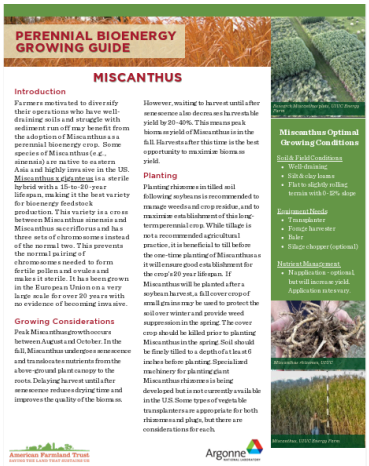
For more information, see www.ilfb.org/ruralurban.

Perennial Bioenergy Crop Diversification Project

The American Farmland Trust is collaborating with Argonne National Laboratory to support crop diversification and farm resiliency efforts in Illinois. In recent years, there has been a noticeable increase in the diversification and installation of alternative energy sources. This increase coincides with the emergence of the potential for a robust bioeconomy in the Midwest. This project explores opportunities to support the Illinois agricultural community through the adoption and utilization of perennial bioenergy crops. These opportunities aim to provide economic and environmental resiliency to farms.

This project seeks to repurpose marginal or low return-on-investment lands using perennial crops to provide additional economic opportunities while reducing non-point source pollution. The crops recommended for this transition include switchgrass, miscanthus, native prairie mixes, shrub willow, and poplar. These perennial bioenergy crops are harvested for their biomass feedstock to generate fuel for heating, electricity, and biochar. This feedstock offers farmers the opportunity to sell to biorefineries in the region or process the biomass on their farm with energy producing technologies. Additionally, Argonne National Lab has developed an analysis tool called SUPERBEEST to assess the ecosystem services and economics of these crops. This tool is available to support farmer decision-making around crop selection and suitability to address various marginal environmental characteristics like nitrate and pesticide leaching, run off, flooding, and others.

To date, AFT has developed three perennial crop growing guides, image below, held four listening sessions and four in-person workshops, performed stakeholder interviews, conducted webinars, and launched the Midwest Bioenergy Crop Coalition. AFT has also conducted outreach throughout Illinois, reaching over 1,500 people.


PERENNIAL BIOENERGY GROWING GUIDE

MISCANTHUS

Introduction

Farmers motivated to diversify their operations who have well-draining soils and struggle with sediment run off may benefit from the adoption of Miscanthus as a perennial bioenergy crop. Some species of Miscanthus (e.g., sinensis) are native to eastern Asia and highly invasive in the US. Miscanthus x giganteus is a sterile hybrid with a 15-to-20-year lifespan, making it the best variety for bioenergy feedstock production. This variety is a cross between Miscanthus sinensis and Miscanthus sacriflorus and has three sets of chromosomes instead of the normal two. This prevents the normal pairing of chromosomes needed to form fertile pollen and ovules and makes it sterile. It has been grown in the European Union on a very large scale for over 20 years with no evidence of becoming invasive.

Growing Considerations

Peak Miscanthus growth occurs between August and October. In the fall, Miscanthus undergoes senescence and translocates nutrients from the above-ground plant canopy to the roots. Delaying harvest until after senescence reduces drying time and improves the quality of the biomass.

However, waiting to harvest until after senescence also decreases harvestable yield by 20-40%. This means peak biomass yield of Miscanthus is in the fall. Harvests after this time is the best opportunity to maximize biomass yield.

Planting

Planting rhizomes in tilled soil following soybeans is recommended to manage weeds and crop residue, and to maximize establishment of this long-term perennial crop. While tillage is not a recommended agricultural practice, it is beneficial to till before the one-time planting of Miscanthus as it will ensure good establishment for the crop's 20 year lifespan. If Miscanthus will be planted after a soybean harvest, a fall cover crop of small grains may be used to protect the soil over winter and provide weed suppression in the spring. The cover crop should be killed prior to planting Miscanthus in the spring. Soil should be finely tilled to a depth of less than 6 inches before planting. Specialized machinery for planting giant Miscanthus rhizomes is being developed but is not currently available in the U.S. Some types of vegetable transplanters are appropriate for both rhizomes and plugs, but there are considerations for each.

Miscanthus Optimal Growing Conditions

Soil & Field Conditions
- Well-draining
- Silt & clay loams
- Flat to slightly rolling; terrain with 0-5% slope

Equipment Needs
- Transplanter
- Forage harvester
- Baler
- Silage chopper (optional)

Nutrient Management
- Nitrogen fertilizer - optional, but will increase yield. Application intensive.

American Farmland Trust

Argonne

For more information, see farmland.org/illinois-perennial-bioenergy-crop-diversification-project.

Post Application Coverage Endorsement Crop Insurance Policy

The risk of not being able to apply nitrogen at the right time is one of the challenges farmers face when considering split-applications of nitrogen. The Illinois Corn Growers Association helped to research, develop, and receive approval for a new crop insurance product. Post Application Coverage Endorsement, PACE, is a private product that can be added on to a farmer's underlying base crop insurance plan. The coverage protects a farmer if a planned in-season application of nitrogen (V3-V10) cannot be made due to unfavorable conditions. This program has been expanded to all counties in the original 11 states served by the program. For more information, see PaceCropInsurance.com.

Precision Conservation Management

In response to the Illinois NLRS, Illinois Corn Growers Association developed Precision Conservation Management, PCM, is an agricultural service program that helps farmers identify best management practices suited to their individual farming operations, conservation interests, and business goals. PCM is jointly managed by the Illinois Corn Growers Association and the Illinois Soybean Association. The program helps farmers understand and manage risks associated with adopting new conservation practices, with the objective of helping farmers make sound financial decisions. PCM evaluates conservation practices based on both their impact to the environment and their impact to family farmer profitability.

Through collaborations with more than 30 partners and the development of a farmer-friendly data collection platform, PCM offers one-on-one technical support to 603 farmers in Illinois, and 138 farmers in Kentucky and Nebraska. As of 2024, PCM incentives reach more than 30 counties in Illinois, 10 in Kentucky, and 10 in Nebraska. Of these counties, 20 are eligible for USDA NRCS Regional Conservation Partnership Program cost-share funds, a pool of funds that represents approximately one-third of the PCM incentives available to farmers. The balance of cost-share funds is available through other PCM partnerships depending on region. In Illinois, PCM is also partnered with PepsiCo to provide incentive payments to farmers implementing in-field conservation practices, with 323 farmers enrolled in Illinois in 2024.

PCM develops confidential yearly reports of each farmer's environmental and financial strengths and weaknesses, offering data summaries demonstrating average financial and environmental metrics for different management systems represented in its database comprising more than 500,000 acres of cropland in Illinois, Nebraska, and Kentucky. In the 2023 and 2024 growing seasons, PCM farmers implemented or continued to implement reduced tillage, in-season nitrogen applications, and cover crop practices. PCM offers participating farmers opportunities to receive financial and technical assistance for adopting new conservation practices. To learn more about PCM and to see the program summary and seven-year data highlights, visit https://ilcorn.org/priority-issues/precision-conservation-management.

For more information, see www.precisionconservation.org.

Soybean Production Research, Outreach, and Education

Each year, the Illinois Soybean Board of Directors, consisting of farmers from around the state, approves a suite of projects funded with Illinois Soybean Association checkoff dollars in three focus areas: market development, soybean production, and government relations. The ISA Agronomy Team is responsible for cross-functional agronomic research and education that creates opportunities for Illinois soybean farmers to increase on-farm profitability and manage crop production risks. During ISA's 2025 fiscal year (Sept. 1, 2024 – Aug. 31, 2025), projects totaling over $1.1 million were approved to provided research, education and outreach on topics related to best management practices listed in the NLRS. Farmers can learn more about checkoff funded soybean production projects by visiting FieldAdvisor.org/current-projects.

Project titles and leaders are listed below.

- Evaluation of a Targeted Conservation Plan in the Lake Bloomington Watershed – Shalamar Armstrong, Purdue University
- Assessing the Impact of Cover Crops on SCN Populations in Field Conditions – Jason Bond, Southern Illinois University
- Quantifying Conservation Benefits for Illinois Soybean Farmers: Extrapolating On-Farm Trial Measurements to Commercial Farm Fields Through Validated Algorithms and Methods – Kaiyu Guan, University of Illinois
- Validating the MRTN Recommendations to Reduce Tile Nitrate Loss in Conventional and Cover Cropping Systems – Dan Schaefer, Illinois Fertilizer and Chemical Association
- Understanding the Importance of Cover Crop Planting Dates in Illinois Row Crop Production – Nathan Johanning, University of Illinois Extension
- Benchmarking and Integrating Soil Health, Water Quality, and Climate-Smart Footprints of Illinois Soybeans – Andrew Margenot, University of Illinois
- Residue Management and Nutrient Value for Soybean Production – Andrew Margenot, University of Illinois
- Integrated Management Strategies for Maximizing Soybean Production in Conservation Tillage Systems – Giovani Preza Fontes, University of Illinois
- Enhancing the Profitability of Wheat-Soybean Double Cropping – Jessica Rutkoski, University of Illinois
- Increasing Soil Health/Cover Crop Training and Demonstration Capacity in Illinois – John Pike, Pike Ag, LLC
- ISAP Soil Health Leadership Program 2024-25 – Illinois Sustainable Ag Partnership
- Scaling Cover Crop Adoption in Priority Watersheds for Nutrient Loss Reduction – Rachel Curry, University of Illinois Extension

The ISA Agronomy Team, through the ISA On-Farm Trial Network, hosts research trials with farmers around the state related to soil health, cover cropping, nutrient management and more. The network began in 2024 so farmers can expect to see results following the 2025 growing season. Educational opportunities are also hosted by the team at permanent demonstration plots at the Farm Progress Show grounds in Decatur. Demonstrations have included growing several varieties of cover crops so farmers can ask questions before trying the cover crop on their fields.

Sustaining our Future: A Farm Family Story

Farmers throughout Illinois go to great lengths to preserve our soil and protect water quality. Illinois Farm Bureau staff wanted to go to those same great lengths to produce a documentary that showcases these efforts, the farmer spirit, and the collaboration required to achieve the goals of the Illinois Nutrient Loss Reduction Strategy. To showcase these voluntary efforts, IFB video and environmental teams partnered with farmers, County Farm Bureaus, researchers and other key stakeholders throughout 2022-23 to create an original documentary, "*Sustaining Our Future: A Farm Family Story.*"

Centered around the Ganschow family farm in Bureau County, the documentary illustrates how three generations of farmers have approached sustainability. It also highlights the role of scientific research in the process and even includes perspectives from Louisiana Farm Bureau on the hypoxic zone in the Gulf. The efforts depicted in the documentary are representative of the farmer spirit and collaboration required to achieve the goals of the NLRS. These efforts involve the work of countless IFB members voluntarily implementing solutions on their farms.

Stakeholders are encouraged to watch and share the documentary and amplify its message: Continue to remain passionately dedicated to improving agriculture's impact on the environment.

For more information, see ilfb.org/documentary.

Tree Buffer Program

The Illinois Pork Producers Association offers pig farmers the opportunity to take part in a tree buffer grant program. Tree buffers are just one of the current best management practices that Illinois swine farmers are embracing to benefit the environment. A tree buffer is an area of trees that are strategically placed to provide a wind break, recycle clean air, and provide fresh landscaping and curb appeal to a farm and landscape.

To date, the program has assisted farmers in planting over 4,800 trees. This grant program is available each year and is offered on a first-come-first-serve basis. Funding aids the purchase of trees and shrubs, as well as design and tree placement.

For more information, see ilpork.com/tree-buffer-grant-application.

Unmanned Aircraft Systems Ag Study

The Greater Egypt Regional Planning and Development Commission serves as southern Illinois' Areawide Water Quality Management Planning Agency. This title was delegated by the Illinois Environmental Protection Agency under the Illinois Water Quality Management Plan. Through the plan, the Environmental Planning Department with Greater Egypt conducts various water quality planning initiatives and community education and outreach regarding water quality.

Generally, planning is completed on a larger scale. Watershed-based planning is conducted at a HUC12 level. These plans assist communities and landowners with developing strategies to combat agricultural and urban runoff. Urban stormwater planning generally happens at the municipal level and can involve various aspects of city and water quality planning.

While urban areas do contribute runoff in the watershed, most nutrient losses derive from agricultural sources in southern Illinois watersheds. To examine the effectiveness of management measures in an agricultural setting, the Environmental Planning Department proposed a strategy that would combine water sampling and aerial photography utilizing Illinois EPA 604b funding.

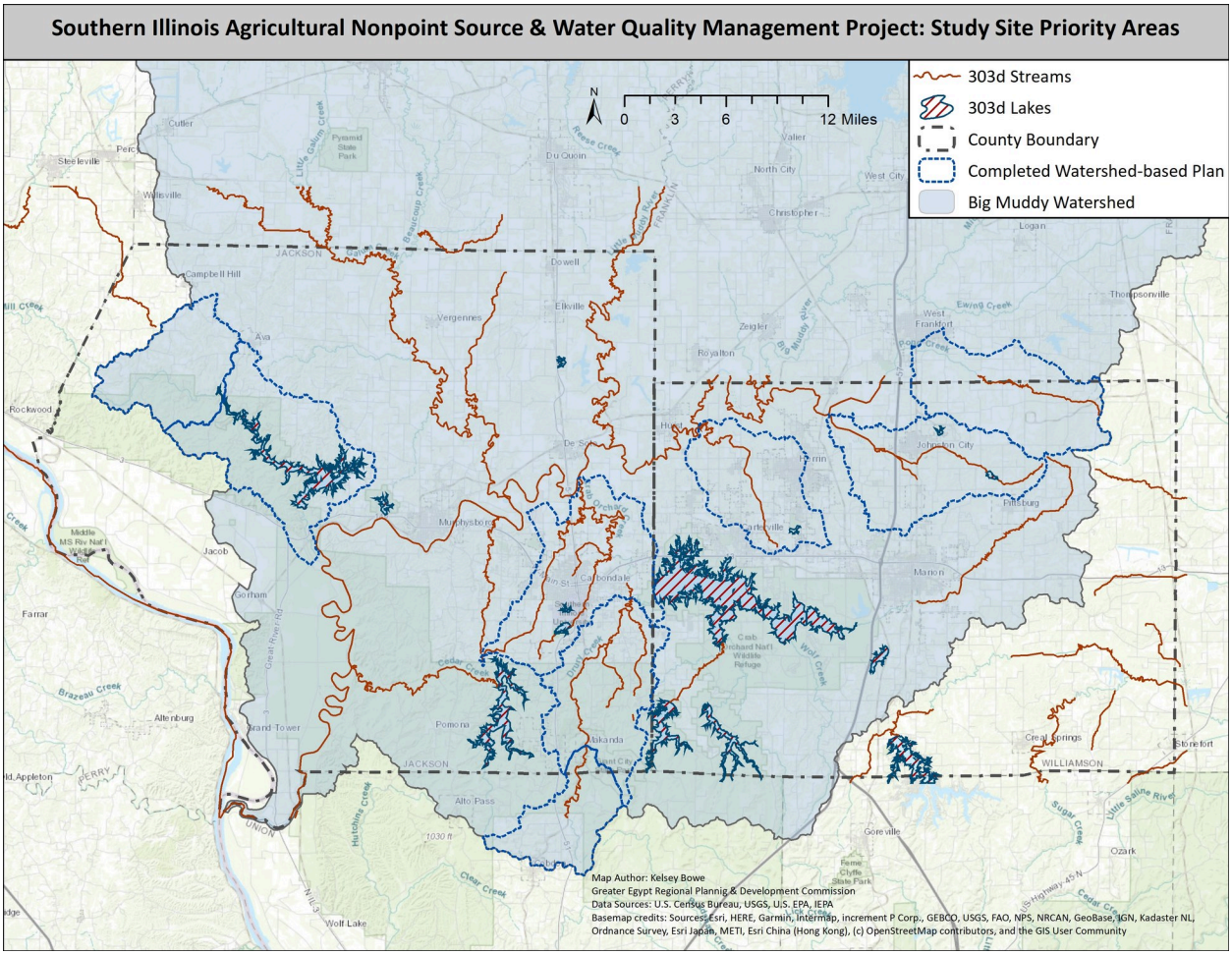
Agricultural UAS Pilot Program

Greater Egypt developed a pilot program for local farmers in Jackson and Williamson counties to monitor agricultural runoff. This project utilized unmanned aircraft systems, UAS, technology by equipping the drone with a multispectral camera, allowing the creation of multispectral indices for vegetation cover. These data will be used to compare agricultural land that utilizes best management practices with land that does not employ similar practices.

This program gathered input and local knowledge from potential planning partners. Planning partners included local agricultural professionals and groups in Jackson and Williamson counties, such as County Farm Bureaus, USDA NRCS, Soil and Water Conservation Districts, and local farmers.

The UAS was utilized to create a normalized difference vegetation index, NDVI, and normalized difference red edge, NDRE, crop index for each sample site. These data were used to analyze water flow, crop yields, nutrient applications, and effects from both increased runoff and lack of precipitation events when available. UAS data also assisted in locating areas with increased erosion and increased sediment deposits.

Project priority sites for UAS analysis were given to agricultural areas with an existing or current working watershed-based plan. Higher priority was given to watersheds with phosphorus and other impairments as listed in the 2020 Illinois Integrated Water Quality Report and Section 303(d) List.



The Illinois EPA Marion Field Office staff trained Greater Egypt staff on water sampling techniques. Staff collected water samples which were taken near the chosen sites. These samples were analyzed by Illinois EPA labs.

Greater Egypt purchased a multispectral camera to attach to the UAS. The camera captured the data required of the NDVI and NDRE datasets. NDVI measures chlorophyll, which is a common indicator of plant health. The measurement of chlorophyll is limited to the topmost layer of canopy with the NDVI sensor. With a denser canopy, such as in grasses or later growth stages of corn and soybeans, NDRE picks up data that is lacking with the NDVI. NDRE can reach the surface with the red edge band and provide a more complete analysis of crop health and water resource distribution. The camera allows for simultaneous data collection of both NDVI and NDRE.

All UAS flights were in accordance with Federal Aviation Administration, FAA, regulations regarding remote pilots through Part 107 rules for small, unmanned aircraft. Both pilots involved in the program are certified under FAA Part 107 guidelines.

Project Objectives:

1. UAS Analysis
    a. Define project location sites
    b. Conduct UAS flights
    c. Analyze multispectral data
2. Water Quality Analysis
    a. Define sampling and monitoring locations
    b. Analyze Illinois EPA Lab results

Project challenges were identified during the planning process. These included a major change in scope, difficulty engaging the traditional farming community, and general UAS operational limitations.

Volunteer Farmer Outreach



Since the program relied on farmers in Jackson and Williamson counties, a search for volunteers was conducted using direct mailings, social media posting, advertisements in printed media, flyers, and online surveys.

Regional Agricultural Context

Land use in southern Illinois is predominantly a mix of forest, cropland, and various impervious centers, like towns and highways. Cropland primarily consists of corn and soybean row crops. The region is also known for smaller farming operations, such as pasture, orchards and vineyards.

Data and Study Limitations

There was a lack of traditional row crop study sites. Not having traditional row crops in the study altered the results of the NDRE and NDVI indices. While some areas were detectable in the multispectral layers, the data were insufficient to draw conclusions about the effectiveness of management measures.

Water Quality Findings

The farms in this program included small, natural operations with selected crops and that did not use the entire space for agriculture. The study area needs to be at a size where most or all the area is utilized for crops. This could include a farm using pesticides or herbicides with row crops like corn and soy where water flow is more impactful. The area would likely need to be 50 or more acres.

These farms would also need to use larger scale management measures to notice results from the water quality samples. These could include grassed waterways or reduction of chemicals.

The nutrient levels in the sampled data are consistent with surrounding waterbodies not experiencing a rise in nitrogen, phosphorus, or other indicator of increased nutrient loading. Rises generally happen during heavy rainfall or rise in extreme temperatures.

While the tributary at Glaciers End (NGAC-01) did contain one sample with a Metolachlor reading, this was a single incident throughout the planning period. This tributary and the surrounding waterbodies would need to be studied to examine spray drift effects.

Conclusions

Based on the *Measurable Objectives* outlined in the Program Background and Planning section, the minimal goals were obtained. UAS flights were conducted. Multispectral data was collected and water samples were collected and analyzed.

Although the farms in the pilot program were small and represented minimal runoff, they were still encouraged to apply best management practices. Funding for management measures is generally available through grants and loans through the state and federal agencies.

For more information, see greateregypt.org/nonpoint-source-pollution-planning.

Vermilion Headwaters Watershed Partnership

The Vermilion Headwaters watershed is a 305,426-acre rural watershed of the Vermilion River encompassing parts of Livingston, Ford, Iroquois, and McLean counties. This watershed has been identified as one of the top five non-point source nitrogen loading watersheds in Illinois and is a major contributor to nitrogen loading in the Mississippi River.

The Vermilion Headwaters Watershed Partnership is a group of stakeholders including farmers, community leaders, government agencies, research institutions, and nonprofit organizations working to reduce the loss of nitrogen from farmland in the watershed. The Partnership completed a watershed-based plan with support from Illinois EPA's 604b program, and implemented reduced tillage, cover crops, nutrient management, and tile water treatment practices by leveraging more than $500,000 from USDA Natural Resources Conservation Service Mississippi River Basin Initiative.

For more information, see farmland.org/vermilion-headwaters-watershed-partnership.

The Vermilion Headwaters Partnership is currently reorganizing as a farmer-led council under American Farmland Trust's Farmer-Led Advances in Soil Health Program.