



ILLINOIS
NUTRIENT LOSS
REDUCTION STRATEGY

Biennial Report 2023

APPENDIX E: PARTNER UPDATES - AGRICULTURE



Illinois Extension
UNIVERSITY OF ILLINOIS URBANA-CHAMPAIGN

Appendix E: Partner Updates - Agriculture

4R Field Day

In coordination with the 4R Field Day Alliance, Illinois Fertilizer & Chemical Association hosts a 4R Field Day each fall. In 2021, the field day was at Precision Planting in Pontiac, Ill. The field day was held in 2022 at Eric Miller's farm in Hammond, Ill. Miller's farm hosts a multitude of research projects, many of which are funded through the Nutrient Research & Education Council and researched by varying University of Illinois personnel. The below photos depict the successful turnout of participants at the field day at Miller's farm. Topics covered included cover cropping, reduced tillage practices, nitrogen, and phosphorus management, among many others.





4R Metrics Survey

The 4R Metrics Survey update is located earlier in chapter 4.

5-Year Soil Health Transition

The Illinois Corn Growers Precision Conservation Management team has been working with participating farmers in the 5 Year Transition program to complete new enrollments and prepare current participants for adapting to soil health systems. Conservation Specialists work with individual farmers to walk through the new management practices with them and help them compare against their conventional practices. The eight current specialists are assisted by project lead Jim Isermann and receive support from the agronomy team at the Illinois Soybean Association, directed by Abigail Peterson. 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 conducting 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 as well to facilitate peer-to-peer learning opportunities and demonstrations to help farmers see visually what is occurring from focusing on soil health. This program currently has about 69 producers enrolled, and is seeking an additional 11 to reach full enrollment. 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.

Carbon and Ecosystem Market Resources and Programs

The Carbon and Data Guidebook was released in 2022 and provides farmers with information on the basics of emerging carbon and ecosystem programs, farm data needs associated with enrolling in one of these programs, and tips for farmers to best position themselves for success if they choose to enroll in a data-driven program or initiative. The Guidebook has received over 400 online views and is accessible on ILSoyAdvisor.com, along with additional information around the carbon and ecosystem market space, in a section called CarbonSense. For farmers and advisors looking for a deeper understanding of carbon markets, CarbonSense provides helpful graphics and descriptions, terminology, FAQs, and tips for transitioning to a soil health focused management system, including minimum tillage to no-tillage, cover crops, and nutrient management. Additionally, a four-episode podcast series under the CarbonSense name was released in 2022 covering topics like the science behind carbon, conservation best practices, carbon market opportunities, and crucial carbon market questions. The podcast series received 735 listens and counting.

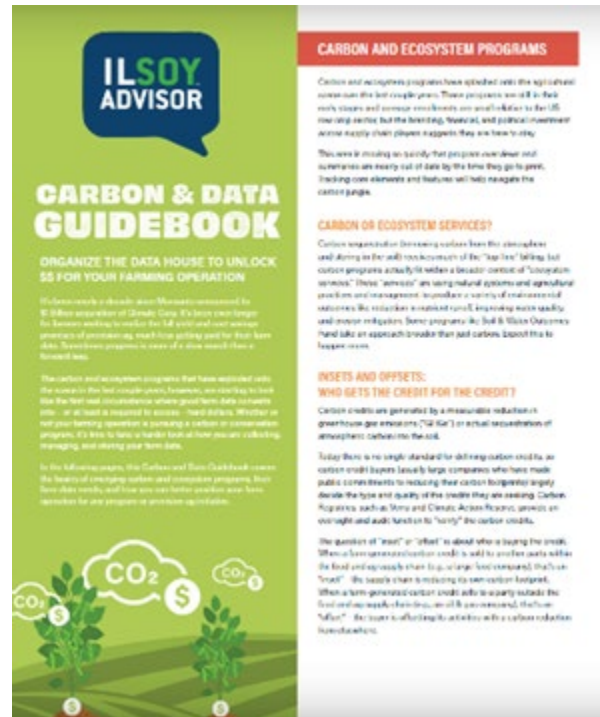


Figure 1. The Carbon and Data Guidebook, developed with funds from the ISA checkoff program.

For more information, see www.ilsoyadvisor.com/carbon-data-guidebook.

Crop Grower Satellite Imagery Analysis

Find an update on the Crop Grower Satellite Imagery Analysis earlier in chapter 4.

Edge-of-Field Partnership for Saturated Buffers

The Edge-of-Field Partnership for Saturated Buffer 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 Natural Resources Conservation Service. 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 five-year collaboration period, and beyond. The first saturated buffer was installed in the spring of 2019 in Moultrie County. Throughout 2022, partners worked to finalize plans for a saturated buffer which will be installed in summer 2023.

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

Edge-of-Field Partnership for Woodchip Bioreactors

The Edge-of-Field Partnership for Woodchip Bioreactors is a multi-year collaboration between Illinois Farm Bureau, Illinois Land Improvement Contractors Association Inc., University of Illinois, and Illinois 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 five-year collaboration period, and beyond. In previous years, the partnership has installed woodchip bioreactors in Bureau and Henry counties.

In 2021, the partners finalized the installation of the fourth woodchip bioreactor in McDonough County. Due to extended project delays throughout 2021, the partners pushed back their in-person field day to July 2022. In November 2022, the partners installed the fifth woodchip bioreactor in Sangamon County, with plans to host a field day in summer 2023.

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

Farm Gate: Environmental Education Program for Livestock Producers

Illinois' livestock industry works hard to address environmental protection through regulatory programs, industry-led educational initiatives, and publicly funded programmatic approaches. Illinois Farm Bureau, with the support of Illinois Beef Association, Illinois Milk Producers Association, and Illinois Pork Producers Association, wants to assist producers with regulatory questions and provide educational opportunities and resources to help meet industry regulations and protect the environment.

These organizations continue to share resource guides for swine, beef, and dairy operations. These guides are meant to provide members with information toward understanding whether and how environmental rules and regulations impact their operations. These resource guides have been distributed widely and help ensure compliance and increase confidence.

The Farm Gate program is built for livestock farms of all sizes, with a special focus on small and medium-sized operations. For more information, see www.ilfb.org/FarmGate.

IFB NLRS Priority Watershed Work

Throughout the course of 2021 and 2022, supporting watershed planning efforts in Illinois EPA priority watersheds was a significant area of focus for Illinois Farm Bureau and County Farm Bureaus. 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 working 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. In 2021 and 2022, 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 approximately 1,546,232 acres. The watershed has been identified as an NLRS priority watershed, but currently does not have a watershed plan in place, making this a prime location for IFB and local CFBs to be involved in watershed efforts. To help address issues within the watershed, IFB, along with Hancock, Henry, Knox, Warren-Henderson and Mercer CFBs, continued to raise support and interest surrounding

an IEPA Section 319 grant application to develop a watershed plan, which would include specific proposals for implementing conservation practices in one to two high-priority subwatersheds.

In 2021, with the help of many stakeholders, including local Soil and Water Conservation Districts (and Natural Resources Conservation Service, rescheduled planning meetings were held at each CFB, reaching nearly 50 landowners and farmers across the watershed. The feedback shared at these meetings was later shared with stakeholders through a report and will be incorporated into the future watershed plans.

While waiting for official word on the status of the IEPA grant proposal, Mercer and Knox CFBs partnered to host additional Mississippi North Central watershed planning meetings in February 2022. These planning meetings were a valuable opportunity to share information about the NLRs and watershed planning process with farmers and other stakeholders, discuss conservation needs and concerns, and help prioritize work for future watershed planning purposes. By late May, the IEPA 319 grant was officially awarded to Mercer SWCD and its partners, marking the beginning of watershed inventory characterization and analysis work, which included incorporating initial stakeholder feedback. Looking forward, all CFBs and stakeholders across the watershed will begin implementing an IEPA-approved education strategy and continue supporting data modeling and sub-watershed prioritization.

The Embarras River watershed, located in southeastern Illinois, covers approximately 1,558,063 acres across 12 counties. In spring 2021, IEPA announced that stakeholders were successful in securing funding to update the Embarras River Watershed Management Plan, which was otherwise set to expire in 2021, as well as to create watershed plans for two sub-watersheds, the Slough and Polecat Creek. 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 2021, IFB and their partners worked together to provide watershed planning updates and gather feedback for the watershed plan updates. To educate farmers and landowners about the process and provide information about how they can get involved, CFBs located in the sub-watersheds (Richland and Lawrence; Coles) partnered to host two field days. These field days provided stakeholders with in-person opportunities to share updates on the planning process and for attendees to learn about various conservation practices and programs they can access to help reach watershed goals.

In addition to the work needed to update the Embarras River Watershed Management Plan, stakeholders worked to provide updated information to local landowners and farmers throughout 2022. Update meetings were held in both sub-watersheds to support continued farmer and landowner engagement, and provide updates about the character of the subwatersheds. 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 IEPA 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.

IFCA-supported NREC Projects

New in 2021-22, the Illinois Fertilizer & Chemical Association supports research on practices listed in the Illinois NLRS at permanent sites in Douglas County and Piatt County. This work is funded by the Illinois Nutrient Research & Education Council. IFCA staff helps to manage all practices at these sites, including implementing and managing nutrient applications, crop protection applications, tillage practices and cover crop seeding. Tile monitoring structures are used at both sites, enabling further insight into nitrogen and phosphorus losses from differing agricultural practices researched.

Illinois Ag Retailer Survey

The new “Illinois Ag Retail Survey” was formed to measure and demonstrate environmental progress of Illinois agriculture. The survey is supported by Illinois Fertilizer & Chemical Association, Illinois Farm Bureau, Illinois Corn Growers Association, Illinois Soybean Association, Illinois Pork Producers, Illinois Beef Association, the Illinois Council on Best Management Practices, and the Illinois Certified Crop Adviser Program.

Regional liaisons travel the state and visit randomly selected agriculture retail locations. The liaisons arrive at a location and perform a random sampling protocol for customer selection purposes. A list of questions focusing on agricultural practices listed in the Illinois NLRS are then asked. All data is entirely anonymous. Upon completion of each survey year, the anonymous data will then be aggregated and allow for statewide regions to be represented. We are no longer continuing the 4R Metric Survey now that the agriculture retailer survey is underway.

Illinois Buffer Partnership

This program is a collaborative partnership of Trees Forever and its members, GROWMARK, state and federal government agencies, and participating landowners. The Illinois Buffer Partnership is a statewide Trees Forever program that promotes and showcases the voluntary efforts of farmers, landowners, and communities in the planting, maintenance, and enhancement of conservation buffers to reduce soil erosion, improve water and soil quality, and provide wildlife and pollinator habitat.

Illinois Buffer Partnership participants are eligible to receive: cost-share assistance, on-site technical assistance from Trees Forever, project signs, and the opportunity to host a field day to highlight their project. Eligible conservation projects include riparian buffers, livestock buffers, streambank stabilization projects, wetland development, pollinator habitat, rain gardens, and agroforestry.

In 2021 and 2022, Trees Forever provided \$14,000 and technical assistance to seven projects across Illinois to plant native trees, shrubs, forbs, and grasses to improve water quality, reduce erosion, and provide wildlife and pollinator habitat. These projects covered 25.3 acres and protected 0.7 miles of streambank. Trees Forever provides outreach and education covering a wide range of topics, including: soil health, riparian buffers, native plants, pollinators, agroforestry, forest and pest management, tree care, improved water and air quality, species diversity, invasive species management, erosion reduction, establishing and maintaining best management practices, energy efficiency, and plant identification.

For more information, see treesforever.org/illinois_buffer_partnership.

Illinois Cover Crop Initiative

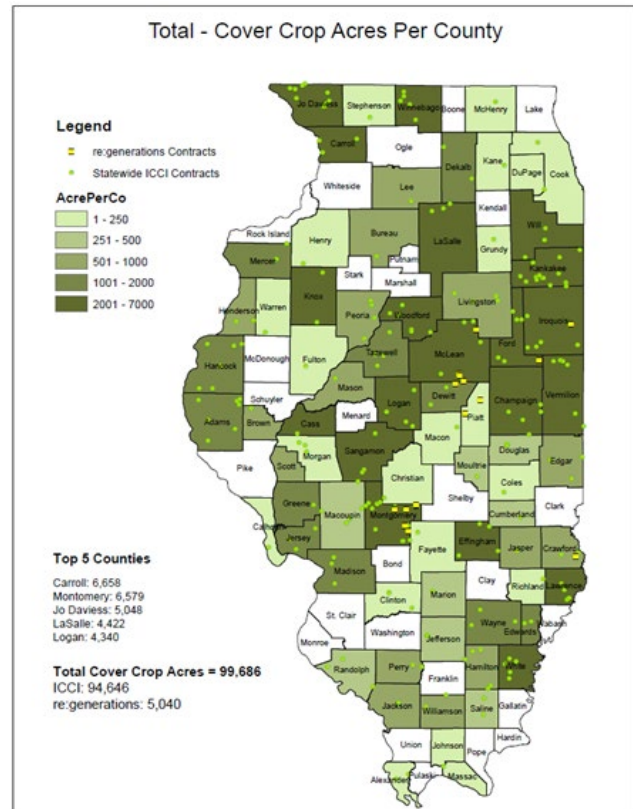
American Farmland Trust launched the Illinois Cover Crop Initiative in June 2022, a partnership with National Fish and Wildlife Foundation, Natural Resources Conservation Service, and ADM. ICCI provided a \$10 per acre financial incentive to Illinois farmers planting cover crops. Additional incentives were available for ADM customers to implement no-till and / or provide data for emissions scoring.

In the first year of the program, AFT enrolled just over 100,000 acres, reaching farmers across the state. Counties with the greatest acres enrolled include Carroll, Montgomery, and Jo Daviess. The figure to the right summarizes acres enrolled by county.

AFT utilized NIRS data to estimate load reductions achieved through the ICCI. Cover crops planted through the program reduced nitrogen loads by 300,000 pounds, and reduced phosphorus loads by over 24,000 pounds. These values are based on county average baseline loads x cover crop acres planted x reduction coefficient for cover crops.

AFT and partners are expanding the program for 2023.

For more information, see farmland.org/icci.



	Load Reductions
Phosphorus	24,128 lbs
Nitrogen	303,066 lbs

Table summarizes nutrient reductions achieved by cover crops enrolled in the ICCI program.

Illinois Cover Crop Programs

Illinois Corn Growers Association is an ardent supporter of cover crops, developing and leading programs for ICGA members and Illinois farmers. The programs facilitate cover crop adoption among farmers who are interested in this practice, and appeal to growers with experience ranging from novice to experienced.

- Cover Crop Coupon—Through a partnership among several Illinois cover crop retailers, this coupon provides ICGA members a discount up to \$200 on the purchase of cover crop seed.
- A new cover crop incentive program was offered statewide in 2022. This program touched nearly 26,000 acres, of which over a third were first-time cover crop acres offering a cover crop cost-share payment.

Combined, those two programs touched 50,000 acres in 2022.

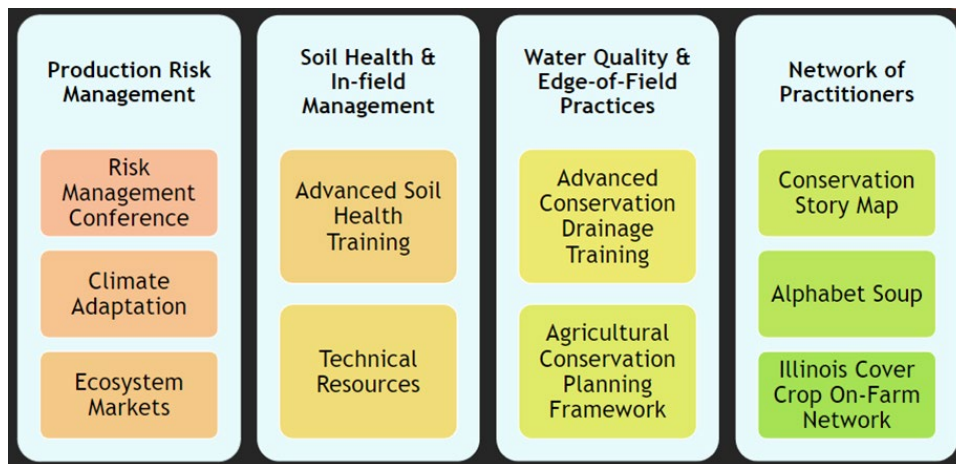
For more information, see ilcorn.org/pcm.

Illinois Sustainable Ag Partnership

The Illinois Sustainable Ag Partnership 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. By developing comprehensive programming, building a strong network of sustainable agriculture advocates, and sharing relevant research and resources, ISAP is committed to working together to support healthy soil, clean water, and profitable farms in Illinois. ISAP invites conservation leaders to share their own conservation story by adding their pin to ISAP's new Conservation Story Map at ilsustainableag.org/conservation-story-map.



ISAP's members include: The Nature Conservancy, American Farmland Trust, Precision Conservation Management, Illinois Corn, Illinois Central College, The Wetlands Initiative, The Zea Mays Foundation, Illinois Land Improvement Contractors Association, Association of Illinois Soil and Water Conservation Districts, Illinois Pheasants Forever and Quail Forever, University of Illinois Extension, Agriculture Drainage Management Coalition, Illinois Soybean Association, Illinois Certified Crop Advisers, and Midwest Dairy. For more information, visit www.ilsustainableag.org.



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. The conference aims to increase the knowledge of farmers, landowners, and advisers, bringing the agriculture industry together to highlight how conservation practices build resiliency for Illinois farms. In June 2022, ISAP brought together experts on

cover crops, tile drainage, and economics to tackle common myths in conservation cropping systems. The series was well attended with over 120 individual attendees representing 17 states/provinces across North America. Farmers, ag advisers, Illinois Extension staff, and non-profit conservation advocates had the opportunity to learn how, in a well-managed system, cover crops and tile drainage can be incorporated into successful, sustainable, and profitable farms.



ISAP's risk management conference addressed common conservation myths

ISAP's **Ecosystem Markets** work provides farmers with transparent and practical information that will increase their confidence to evaluate ecosystem market opportunities. In 2021, ISAP hosted five webinars covering ecosystem markets, connecting farmers with data platforms, input providers, and other members of the food and ag supply chain. The webinars reached an initial audience of over 2,000 attendees, and the recordings have been viewed over 1,500 times on YouTube. Between 2021 and 2022, ISAP shared resources and tools to communicate and evaluate ecosystem market opportunities during 16 workshops, reaching over 3,300 individuals. These workshops provided a comprehensive overview of concepts farmers should know and consider when navigating the rapidly evolving space of carbon and ecosystem markets.



Soil Health and In-Field Management

ISAP developed the **Advanced Soil Health Training** to support Illinois farmers, retailers, crop advisors,

and conservation professionals as they improve their understanding of soil health science and the production management changes needed to maximize on-farm benefits of soil health systems. The intensive classroom and in-field training model spans 18 months. Graduates are encouraged to share what they learn through presentations and field days to farmers in their network.

In June 2021, the third Advanced Soil Health Training was launched for a Bi-State Cohort of 25 individuals from Iowa and Illinois. In August 2022, the third cohort of trainees graduated from the Advanced Soil Health Training program, further increasing the number of soil health specialists prepared to support Illinois farmers. The fourth Advanced Soil Health Training cohort, made up of 17 retailers and ag education professionals based in Central Illinois, kicked off their program in August 2022. The classroom and in-field sessions have focused on soil health, soil biology, and nutrient management. This class will graduate in winter of 2023.

ISAP published Illinois’s first **Cover Crop Incentive Directory** that provides an overview of 15 unique cover crop incentive payment opportunities for farmers in Illinois. The directory includes both publicly and privately funded programs as well as a “Stacking Matrix” so farmers can easily determine if they may be eligible to stack payments from multiple programs. The directory is available at ilsustainableag.org/resource/isaps-cover-crop-incentives-directory.

Illinois Sustainable Ag Partnership's Cover Crop Incentive Stacking Matrix

ISAP's Cover Crop Incentive "Stacking Matrix" is designed to demonstrate opportunities for farmers to stack payments from multiple incentive programs. Programs that are claiming a farmer's carbon asset will be marked with an asterisk (*).

These programs and the relationships shown on this matrix are acre-specific, meaning the same acres enrolled in EQIP on your farm are in-eligible to receive payments from other federally funded programs. However, you can enroll separate tracts on your farm in different federally funded programs and receive payments that way. For federal programs, acreage is only eligible for financial assistance if there is an unaddressed resource concern that may be mitigated by using cover crops.

	EQIP	CCP	RCPP	PEC	FCSS	PCDP	Champaign County Cover Crop Incentive	STAR PIP	*ICCI	*PapaCo Cover Crop Incentive Program	*PCM Soil Health Initiative	*SWOF
EQIP	X											
CCP	X	X										
RCPP	X	X	X									
PEC	X	X	X	X								
FCSS	X	X	X	X	X							
PCDP	X			X		X						
Champaign County Cover Crop Incentive	X	X	X	X	X		X					
STAR PIP	X	X	X	X	X	X	X	X				
*ICCI	X	X	X	X	X	X	X	X	X			
*PapaCo Cover Crop Incentive Program	X	X	X	X	X	X	X	X	X	X		
*PCM Soil Health Initiative	X	X	X	X	X	X	X	X	X	X	X	
*SWOF	X	X	X	X	X	X	X	X	X	X	X	X

Water Quality and Edge-of-Field Practices

ISAP’s **Advanced Conservation Drainage 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 and improve water quality. The program provides relevant research on the effectiveness of conservation drainage and sharing comprehensive planning tools to enable practice prioritization at the watershed scale. In 2022, ISAP tailored training information for specific key audiences and integrated conservation drainage content and messaging into existing meetings and events, including a presentation at the 2022 Certified Crop Advisors conference (photo below).

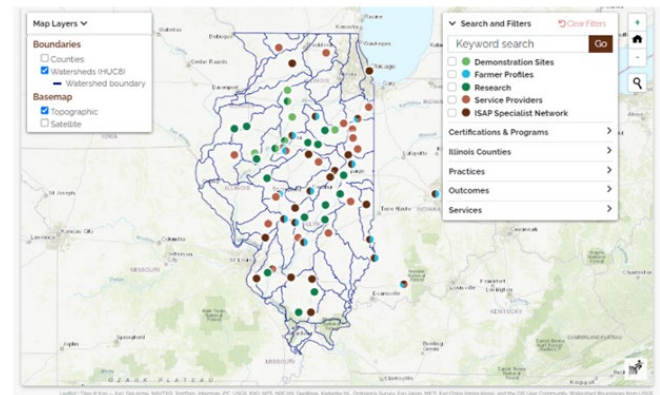


Network of Practitioners

ISAP leads the **Illinois Cover Crop On-Farm Network**, a group of farmers and cover crop practitioners from across Illinois and the broader Midwest who join monthly discussions to explore new research,

troubleshoot field conditions, and provide updates on policies and programs related to cover crops. In 2021-22, ICCON calls were attended by 186 cover crop enthusiasts who learned about cover crop resources, producer-led watershed programs, commercial cover crop projects, carbon sequestration, grazing considerations, and robotic planting technology. With support from the Illinois Nutrient Research & Education Council, ICCON hosted a winter series on New and Emerging Cover Crops, exploring the cover crop potential of Balansa clover, Camelina, CoverCress, and Berseem clover.

In 2022, ISAP launched an interactive **Conservation Story Map** to showcase sustainable agriculture efforts in Illinois and facilitate connections among leaders in soil health and nutrient loss reduction. ISAP's Conservation Story Map features farmers, service providers, conservation specialists, research, and demonstration sites across the state of Illinois that are successfully adopting, exploring, or promoting conservation cropping systems and conservation drainage management. The Conservation Story Map communicates the system-wide approach that is necessary to achieve the state's nutrient loss reduction goals, acknowledging that every farmer's soil health and water quality journey may look a little different. ISAP invites farmers, service providers, researchers, and other conservation professionals to put their pin on the map by visiting www.ilsustainableag.org/conservation-story-map.



ILSoyAdvisor

ILSoyAdvisor is the go-to source for expert agronomic and management advice for Illinois soybean production. Funded by the Illinois Soybean Association checkoff program, ILSoyAdvisor provides the latest education, resources, webinars, success stories, and more to help Illinois soybean growers maximize their operation. In 2022, the ILSoyAdvisor website underwent reconstruction to better provide farmers and advisors with information. Additionally, the ISA Agronomy team placed emphasis on demonstrating soybean system agronomics focused on soil and water quality, agricultural resource resiliency, and land stewardship to farmers, landowners, and advisors. They utilized ILSoyAdvisor to conduct outreach through blogs, videos, social media posts, and the sharing of resources and tools.

In 2022, through ILSoyAdvisor blog outreach, 628 people viewed information related to conservation practices, economics, water quality, soil health, and carbon markets. Webinars hosted by ILSoyAdvisor focus on cover crops and spring management, carbon markets, farm incomes and environmental outcomes, and weather and climate trends reached 184 people live, with recordings available for later viewing. The team hosted or co-sponsored meetings and field days that contained a conservation education component for over 600 people. An additional 135 people heard from an ISA team member on topics related to conservation, soil health, cover crops, water quality, and more at events at which team members spoke. Technical assistance was provided to 54 farmers and landowners, mainly about implementation of cover crops and reduced tillage, strip tillage, or no-tillage on their operation.

For more information, see www.ilsoyadvisor.com.

Keep it 4R Crop

The Illinois Fertilizer & Chemical Association's Keep it 4R Crop program is based on principles of 4R nutrient stewardship. IFCA works closely with its members, including fertilizer manufacturers, distributors, and agricultural retailers, to promote the 4Rs and uphold the IFCA 4R Code of Practice, which promotes education and adoption of specific fertilizer management practices designed to reduce nutrient losses and assure nutrient use by the crop.

Mackinaw River Program

The Nature Conservancy in Illinois has been engaged in 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 throughout Illinois and the larger Mississippi River Basin. Key partners for the TNC's research in the Mackinaw River watershed include the McLean County Soil and Water Conservation District, McLean County Natural Resources Conservation Service, University of Illinois Urbana-Champaign, and Illinois State University. Our narrative describes ongoing projects at the Franklin Research and Demonstration Farm in Lexington, Ill., and the Paired Watershed Study in the headwaters of the Mackinaw River. For more information, visit www.nature.org/en-us/get-involved/how-to-help/places-we-protect/the-mackinaw-river-watershed.

The Mackinaw River is a major tributary to the Illinois River that drains into the Mississippi River. This 3,000-square-kilometer watershed contains some of the most productive agricultural lands in the nation and plays a key role in the livelihood of farmers and the Illinois economy. The Mackinaw River was selected as a priority site by The Nature Conservancy more than 25 years ago because of its status as a high-quality river that sustains some of the highest quality stream segments in Illinois and provides habitat for 60-70 native fish and 25-30 mussel species. Yet, urban development and intensive tile-drained row crop agriculture have stressed freshwater resources, leading to habitat loss and reduced water quality.

Subsurface agricultural tile drainage systems within the Midwestern region of the U.S. have been identified as major contributors of nutrients to the Mississippi River. Illinois is recognized as one of the highest contributors in the nation of total nitrogen and phosphorus flux to the Gulf of Mexico, much of which is exported through one of the most extensive subsurface agricultural tile drainage systems that exist within the Upper Mississippi River Basin. The Nature Conservancy's work in the Mackinaw River watershed includes research and monitoring at multiple scales to address and manage these nutrient losses.

At the **field and farm** scales, TNC studies the effectiveness of conservation practices in the context of a working farm. Established in 2003, the Franklin Research and Demonstration Farm in Lexington, Ill., is a collaborative effort between the TNC, University of Illinois Champaign-Urbana, McLean County Soil and Water Conservation District, McLean County Natural Resources Conservation Service, and the Franklin family. It serves as a model for sustainable agriculture, innovative research, and successful partnerships.

To better understand the scale of conservation practice adoption and implementation needed to provide measurable improvements in water quality, scientists from the TNC and Illinois State University

designed a **paired watershed study** in the headwaters of the Mackinaw River. Since 2000, TNC researchers have led water quality and flow monitoring efforts in two small (approximately 10,000 acre) watersheds and have worked with local partners to facilitate outreach and conservation practice implementation in the project's treatment watershed.

Multiple phases of research have occurred at the Franklin Farm and in the paired watershed study.

- **Phase 1:** Research revealed that conservation practices that reduced erosion and surface water runoff were not enough to solve water quality problems as nitrate and dissolved phosphorus runoff generally bypass these practices and enter river systems through tile-drainage systems.
- **Phase 2:** Research has focused on the **effectiveness of constructed wetlands** to treat excess nutrient runoff from tile drainage. The TNC's research in the paired watershed study is designed to measure if wetlands can improve water quality at various watershed scales. Parallel research at the Franklin Farm with the University of Illinois has shown these wetlands are very effective at reducing both nitrate-nitrogen and dissolved phosphorus from agricultural drainage tiles at the field scale.
- **Phase 3:** Research focuses on **stacked practices** at the field and watershed scales. Cover crops have been established at the Franklin Farm annually since 2010. In 2022, the tenant farmer agreed to transition from fall to spring nitrogen application for one of the experimental fields. In the paired watershed project, cover crops have been established annually in priority areas of the treatment watershed since 2019.

Key Research Findings – Franklin Research and Demonstration Farm

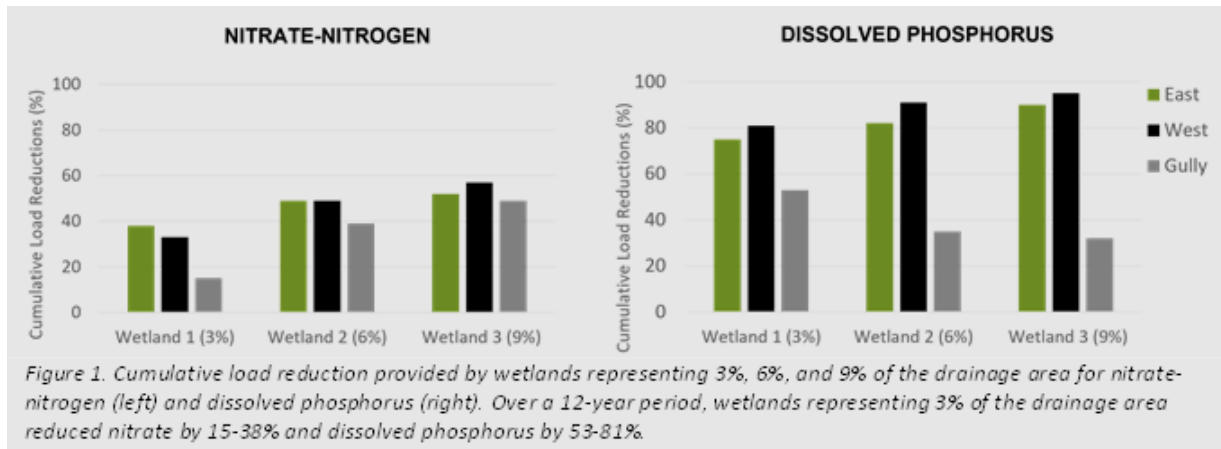
In 2022, analyses of data collected over 12 years was published in the peer-reviewed Journal of Environmental Quality, available at doi.org/10.1002/jeq2.20316. The long-term data show that these treatment wetlands are very effective at removing both nitrate-nitrogen and dissolved phosphorus from subsurface tile drainage systems. This research showed that even the smallest wetlands representing 3% of the tile-drained farmland are very effective at reducing nitrate losses by 15%-38% and capturing 53%-81% of the dissolved phosphorus.

The Franklin Farm wetlands have remained very effective over many years, emphasizing how incorporating constructed wetlands into state and watershed-level conservation planning can significantly contribute towards reducing excess nitrogen and phosphorus export to river systems, and ultimately to the Gulf of Mexico.

Results Summary

- Wetlands representing 3% of tile-drained farmland (Wetland 1) reduced 15%-38% of NO₃-N export, with cumulative reductions of 39%-49% and 49%-57% as tile water flowed from the first wetland to wetlands representing 6% (Wetland 2) and 9% (Wetland 3), respectively. (Figure 1, below)
- Mass NO₃-N retentions ranged from 28%-52% across the 12 years.
- 12-year total dissolved phosphorus load reductions for Wetland 1 ranged from 53%-81%, with cumulative reductions of 35%-91% and 32%-95% for Wetlands 2 and 3, respectively. (Figure 1, below)
- Mass dissolved phosphorus retentions ranged from 71%-85%.

- Nitrate export was significantly higher for corn than soybean production years, during which 80%-84% of annual NO₃-N export occurred between March and June compared to 39%-56% during soybean years.



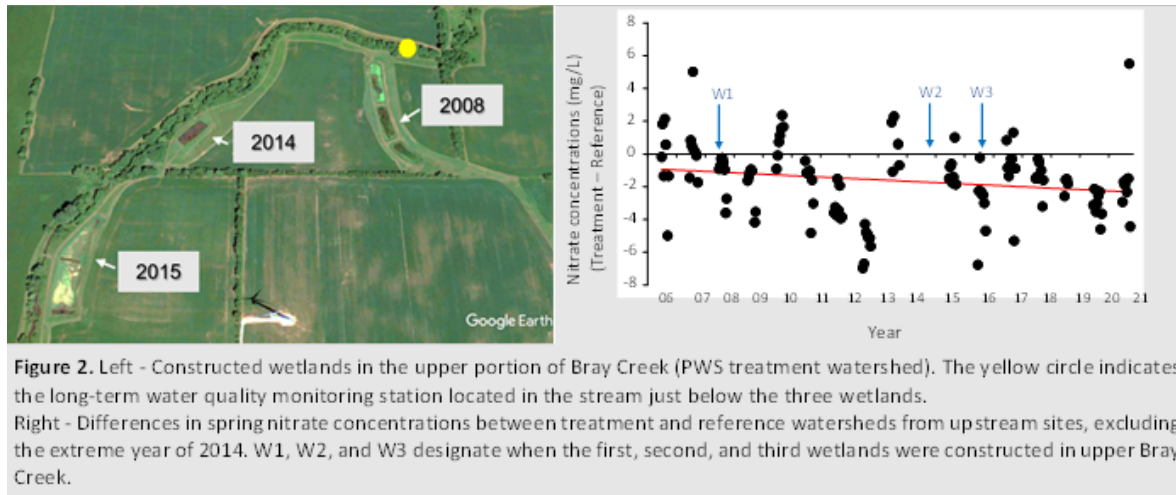
Cover crops: Cover crop success at the Franklin Farm has been highly variable over time. One important factor that has influenced cover crop success during this study is the timing between seeding and subsequent rainfall. In addition, researchers have observed that cover crop coverage is generally reduced in corn production years as a portion the cover crop established in the fall is disturbed with the application of fall anhydrous ammonia fertilizer. Additional data from several more years of successful cover crops during corn production years at the Franklin Farm are needed to quantify how much additional water quality benefit they are providing, in addition to their agronomic benefits.

Key Research Findings – Paired Watershed Study

The paired watershed study includes two approximately 10,000-acre watersheds. Bray Creek is the treatment watershed where the TNC and other project partners have provided extensive outreach and financial assistance to facilitate high levels of adoption of constructed wetlands and other conservation practices. In Frog Alley, the adjacent reference watershed, outreach related to conservation practices has been limited.

Results

- Water samples collected since 2010 from the first constructed wetland show that this wetland is reducing nitrate concentrations from tile drainage by 24% to 38% annually, thus, reducing the amount of nitrate-nitrogen that reaches Bray Creek from agricultural runoff. The results indicate that these wetlands are functioning as designed to remove excess nitrate export from tiles.
- Preliminary analyses of spring (March to June) data from 2006-21 showed that under normal weather conditions, constructed wetlands that were established in 2008, 2014, and 2015 (Figure 2, left) are providing significant nitrate-nitrogen reductions in the treatment watershed compared to the reference watershed, which has no constructed wetlands ($p=0.03$, Figure 2, right). This analysis did omit data from 2014 due to exceptionally high rainfall, and monitoring is continuing to determine if the observed changes in water quality are consistent over time.



Cover Crops: Monitoring data from the paired watersheds show that approximately 70% of the dates in which nitrate concentrations were similar or higher in the treatment than reference watershed occurred when winter cover crops should function to retain excess nitrogen in the field (between October and early May). TNC researchers hypothesized that stacking winter cover crops with wetlands in the headwaters of the treatment watershed could further reduce nitrate export during this critical time. In 2019, the TNC partnered with the McLean County Soil and Water Conservation District to pilot a cover crop project that enrolled 500 acres of cropland into winter cover crops in the treatment watershed. An extremely rainy fall hindered harvest and cover crop seed application – even so, a total of 311 acres were successfully seeded with fall cover crops. Cover crop acres planted in Bray Creek increased to 855 acres by 2021, but adoption in 2022 was again hindered by poor field conditions. Results from the paired watershed stacked practices study are forthcoming.

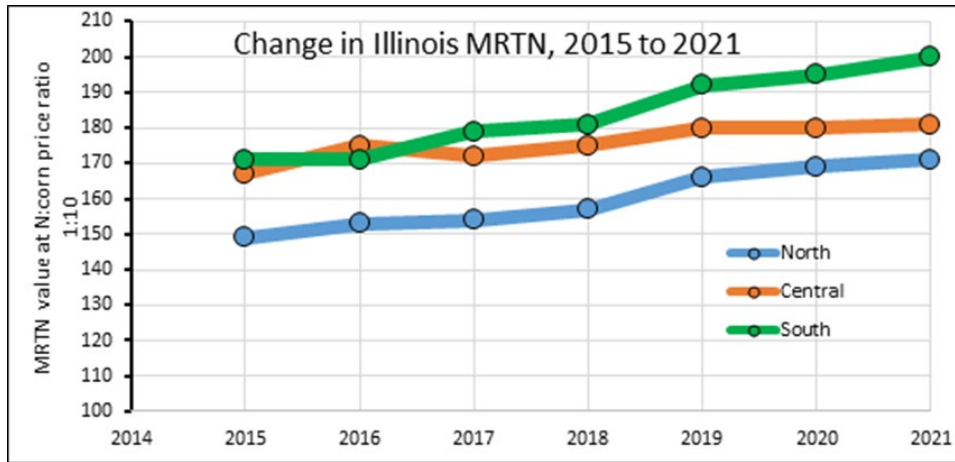
Nitrogen Rate Trials

The Nitrogen Rate Trials program has been coordinated and managed by Illinois Fertilizer & Chemical Association in partnership with University of Illinois Urbana-Champaign and Illinois Nutrient Research & Education Council. Since 2014, partner producers have implemented nitrogen rate trials in their fields and adhered to University of Illinois trial protocols. Between 2014-22, 470 nitrogen rate trials were performed throughout Illinois. Data provided by the nitrogen rate trials was used to help update the nitrogen rate calculator, or Maximum Return To Nitrogen calculator, at cnrc.agron.iastate.edu, by using a regional approach developed by university soil fertility specialists for the corn belt states for developing corn nitrogen rate guidelines.

Moving forward, a new program is being initiated to help improve N rate trial involvement and build confidence in the Maximum Return To Nitrogen, or MRTN. The new protocol calls for the use of small nitrogen trials performed by producers with little expense. Only two N rates are used; one rate that is the normal rate for the field plus one rate significantly lower or higher. Plots are only ½ to 1 acre in size and allow for the use of normal equipment. The goal is to use weather and soil information, along with yield monitor data to “train” a nitrogen prediction model that may improve on the MRTN approach. This

program involves the Precision Conservation Management program, member retailers, and growers throughout the state.

For more information see ifca.com/4R/Trials.



Graph showing the changes in the MRTN rate based on the nitrogen responses from the previous year.



Photo of a 2022 nitrogen rate trial plot being harvested.

Nutrient Research & Education Council

Since 2012, the Illinois Nutrient Research & Education Council has been Illinois agriculture's primary investment into nutrient research. Created by state statute, NREC works closely with the Illinois Department of Agriculture to collect an assessment of \$1/ton of bulk fertilizers. Seventy-five percent of this assessment serves as the funding source for nutrient research and outreach projects. In its first 10 years, NREC has invested more than \$30 million into this important work.

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 IDOA. Advisory members

are also appointed by the Director of IDOA and represent the Director of the Illinois EPA (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 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-NASS survey on NLRS practice awareness and adoption, and in serving 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. In addition, much of the research used to add water and sediment control basins to the strategy was funded by NREC.

Each year, the Council issues a 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:

1. Applying and understanding the 4Rs — identifying conservation practices and expanding the understanding of these practices related to more efficient fertilizer applications and using those nutrients for crop production.
2. Capturing excess nutrients in the field, primarily using cover crops, with a focus on finding the most economical strategies for adopting these methods on a wide scale.
3. 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.
4. 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 2020 and 2021, Illinois NREC invested \$4 million and \$3.9 million respectively into nutrient research projects. Each of those years also included an additional \$60,000 for outreach and education activities. Research partners for 2020 and 2021 included University of Illinois Urbana-Champaign, Southern Illinois University, Western Illinois University, Purdue University, and the Illinois Fertilizer & Chemical Association. Findings from this funded research are regularly highlighted in professional journals, webinars, farmer meetings, and other Illinois Extension activities. Each year, NREC publishes an annual report of the research findings. The reports are available at www.illinoisNREC.org.

NREC also invests in education-based projects that incorporate research findings and effectively promote 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, NREC posts project videos on its YouTube channel and utilizes other social media platforms to widely distribute research data.

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

For more information, visit illinoisnrec.org.

Nutrient Stewardship Grant Program

The Illinois Farm Bureau Nutrient Stewardship Grant Program was established in 2015 with the guidance and support of the Illinois Agricultural Association Board of Directors. The program was developed with the goals of Illinois Nutrient Loss Reduction Strategy in mind, providing County Farm Bureaus 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 million to the program, with \$150,000 being committed to the 2021 and 2022 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 138 projects across 74 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 may be used to initiate multi-year data collection and analysis projects. Project partners often prioritize practices featured in 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 the program, as well as other efforts, IFB is also able to support several research initiatives across the state. For example, connecting farmers with researchers to develop on-farm research trials, providing researchers with opportunities for outreach to farmer audiences, creating research publications, and more. Topics of this research have ranged from monitoring several woodchip bioreactors and saturated buffers, implementing cover crop test plots, conducting several types of water and soil testing, and other areas of water quality and soil health.

In 2021, \$150,000 was awarded to 28 CFBs working together on 21 projects across the state. Project partners included private consultants, community colleges, university staff, wastewater treatment facility staff, drinking water supply staff, and many others. These projects ranged from hosting "hybrid" 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 included in Table 1.

2022 marked the seventh year of the program, with \$150,000 being awarded to 25 CFBs working together on 21 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 2022 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. An overview of all projects is included in Table 2.

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

Table 1. 2021 Nutrient Stewardship Grant Projects Overview

CFB(s):	Project overview:	Project reach, impact, or deliverables, where applicable:
Bureau	Collected water samples and other data points. Analyzed results and developed a model based on past data.	N/A
Clinton	Supported a multi-year livestock nutrient management and cover crop project, including multiple education and outreach opportunities, soil health and forage quality testing, and supporting research.	<ul style="list-style-type: none"> • Spring virtual field day reach = 275 • Summer field day reach = 145 • Data booklet shared with 1,200 producers • Livestock nutrient management information shared with 1,200 producers
Coles, Richland, and Lawrence	Hosted two field days in subwatersheds in the Embarras River Watershed (i.e. the Slough, and Polecat Creek). Field days focused on watershed planning topics.	<ul style="list-style-type: none"> • Spring field day reach (Slough) = 250 • Summer field day reach (Polecat Creek) = 100
Cook	Brought producers to the Metropolitan Water Reclamation District of Greater Chicago (MWRD) for a meeting focused on areas where the groups could partner.	N/A
Fulton	Hosted a field day in collaboration with MWRD and other partners.	<ul style="list-style-type: none"> • Field day reach = 80
Hancock, Mercer, Warren-Henderson, Henry, and Knox	Hosted five watershed planning meetings in the Mississippi North Central watershed.	<ul style="list-style-type: none"> • Watershed meetings reach = 60
Henry and Rock Island	Hosted outreach event focused on several ag-conservation practices.	<ul style="list-style-type: none"> • Event reach = 35
Jefferson and Franklin	Hosted a cover crop field day in partnership with Illinois Department of Natural Resources (IDNR).	<ul style="list-style-type: none"> • Field day reach = 580
Jo Daviess	Hosted outreach events focused on cover crop, nitrogen management, and surface water runoff research taking place.	<ul style="list-style-type: none"> • Field day reach = 400

Knox	Offered cover crop program, with 20-acre cover crop plots across 20 townships.	N/A
LaSalle	Hosted elected official outreach event, including nutrient loss reduction topics.	<ul style="list-style-type: none"> Event reach = 45
Macon	Hosted Lake Decatur watershed field day focused on water quality and conservation.	<ul style="list-style-type: none"> Field day reach = 165
Marshall-Putnam	Hosted cover crop field day and shared cover crop analysis tools with producers.	<ul style="list-style-type: none"> Field day reach = 100
Mason, Cass-Morgan, and Tazewell	Collected water quality data and continued a multifaceted monitoring project.	N/A
McHenry	Hosted a woodchip bioreactor field day and continued collecting water samples.	<ul style="list-style-type: none"> Field day reach = 160
Sangamon	Hosted a cover crop field day and shared information about Lake Springfield watershed planning efforts and programs.	<ul style="list-style-type: none"> Field day reach = 300
Stephenson and Carroll	Hosted educational meeting, covering many ag conservation practices.	<ul style="list-style-type: none"> Event reach = 30
Warren-Henderson	Hosted nitrogen management field day.	<ul style="list-style-type: none"> Field day reach = 80
Washington	Developed cover crop plots and started collecting data.	N/A
Wayne	Hosted nitrogen management field day.	<ul style="list-style-type: none"> Field day reach = 55 Data booklet shared with 100 producers

*Note: 2021 field day reach included in-person and virtual participation.

Table 2. 2022 Nutrient Stewardship Grant Projects Overview

CFB(s):	Project Overview:	Project reach/impact, where applicable:
Bureau	Collected water samples and other data points. Distributed fact sheet.	N/A
Clinton	Supported a multi-year livestock nutrient management and cover crop project, including multiple outreach opportunities, soil health and forage quality testing, and supporting research.	<ul style="list-style-type: none"> Field day reach = 50 Livestock nutrient management information shared with 1,200 producers

Cook	Brought producers to MWRD and initiated a struvite study in the county.	N/A
Fulton	Hosted a field day in collaboration with MWRD and other partners.	<ul style="list-style-type: none"> Field day reach = 65
Greene and Calhoun	Initiated a cover crop demonstration project.	N/A
Jo Daviess	Hosted outreach events focused on cover crop, nitrogen management, and surface water runoff research taking place.	<ul style="list-style-type: none"> Field day reach = 45
Knox	Offered cover crop program, with 20-acre cover crop plots across 20 townships and hosted a field day.	<ul style="list-style-type: none"> Field day reach = 60
Lake	Initiated a lake improvement project and hosted a field day.	<ul style="list-style-type: none"> Field day reach = 40
LaSalle	Hosted elected official outreach event, including nutrient loss reduction topics.	<ul style="list-style-type: none"> Event reach = 20
Marshall-Putnam	Hosted cover crop field day and shared soil health information with producers.	<ul style="list-style-type: none"> Field day reach = 50
McDonough	Hosted a woodchip bioreactor field day.	<ul style="list-style-type: none"> Field day reach = 30
McHenry	Continued water sampling at woodchip bioreactor and developed fact sheet.	N/A
McLean	Hosted a field day focused on practices that can meet Lake Bloomington watershed goals.	<ul style="list-style-type: none"> Field day reach = 65
Mercer and Knox	Hosted watershed planning meetings.	<ul style="list-style-type: none"> Event reach = 35
Piatt and Macon	Hosted a Lake Decatur watershed field day.	<ul style="list-style-type: none"> Field day reach = 30
Shelby	Hosted a drainage water management field day.	<ul style="list-style-type: none"> Field day reach = 45
Tazewell, Cass-Morgan, and Mason	Collected water quality data and continued a multifaceted monitoring project.	N/A
Warren-Henderson	Continued to host nitrogen strip trial.	N/A
Washington	Hosted a cover crop field day.	<ul style="list-style-type: none"> Field day reach = 35
Wayne	Hosted nitrogen management field day.	<ul style="list-style-type: none"> Field day reach = 60 Data booklet shared with 100 producers

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. 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 to cover the event of an in-season (V3-V10) nitrogen application. The product was rolled in a limited launch pilot in select counties in 11 states.

For more information, see [PaceCropInsurance.com](https://pacecropinsurance.com).

Partnerships with Drinking Water Suppliers and Wastewater Treatment Plants

Illinois Farm Bureau 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 2021 and 2022, IFB actively supported several drinking water supply projects across the state. This work included providing financial and in-kind support for several Regional Conservation Partnership Program and Illinois Environmental Protection Agency Section 319 grant projects. As a part of their ongoing support of Springfield City Water, Light, and Power's work in the Lake Springfield watershed, IFB and Sangamon hosted a cover crop field day in 2021, as well as shared relevant updates with local stakeholders. In addition to supporting City of Decatur watershed planning efforts, including RCPP and 319 applications, IFB and CFBs across the Lake Decatur watershed hosted field days in 2021 and 2022, focused on several watershed and NLRs-related topics. For many years, IFB has also partnered with the Metropolitan Water Reclamation District of Greater Chicago on shared interests in bridging gaps between point sources and nonpoint sources in addressing nutrient loss reduction.

In 2021 and 2022, this work included collaboration on several education and outreach opportunities, including field days at the Fulton County research site, and farmer tours of MWRD facilities to see how point source groups like MWRD address nutrient reduction goals.

In 2021, IFB began a series of concerted efforts to develop partnerships with the Illinois Association of Wastewater Agencies. This work has included several presentations and opportunities to explore areas for future collaboration. In addition to work with IAWA, IFB was also able to build additional relationships with wastewater treatment plants at a national level throughout 2022. Through numerous virtual and in-person meetings, IFB helped develop a framework to partner with the National Association of Clean Water Agencies. This work has included identifying common views of agriculture and wastewater contributions to meeting nutrient reduction goals, as well as presenting on IFB's work at NACWA's annual meeting.

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

Perennial Bioenergy Crop Diversification Project

American Farmland Trust is collaborating with Argonne National Laboratory to broaden 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 also coincides with the emergence of the potential for a robust bioeconomy in the Midwest. This project will explore 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 lands using perennial crops to provide additional economic opportunities while boosting farm resiliency. 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 is developing an analysis tool called SUPERBEEST to assess the ecosystem services and economics of these crops.

To date, AFT has held four listening sessions, performed stakeholder interviews, and launched the Midwest Bioenergy Crop Coalition. AFT has also conducted outreach throughout Illinois, reaching over 1,000 people.

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

Precision Conservation Management

In response to the Illinois NLRs, Illinois Corn Growers Association developed Precision Conservation management, and Illinois Soybean Association joined as a full partner in 2020, making PCM the premiere nutrient loss reduction program working directly with farmers in Illinois. PCM is a service program to help farmers understand and manage risks associated with adopting new conservation practices, with the objective of helping farmers make sound financial decisions. The program evaluates conservation practices 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 375 farmers in Illinois, and 100 farmers in Kentucky and Nebraska. As of 2022, PCM incentives reach more than 30 counties in Illinois, 10 in Kentucky, and five in Nebraska. Of these counties, 20 are eligible for USDA NRCS RCPP 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.

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 22,000 agricultural fields of Illinois cropland spanning seven years. In the 2021 and 2022 growing seasons, PCM farmers implemented or continued to implement reduced tillage, in-season nitrogen applications, and cover crop practices. These practice acreages and associated nutrient and sediment loss reductions are shown in Table 1. 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 ilcorn.org/pcm.

For more information, see www.precisionconservation.org.

Table 1. PCM outcomes for 2021 and 2022

	2021	2022	Total 2021-22
Nitrate-N Loss Reductions (lbs NO₃-N)	578,550	1,079,539	1,658,088
Phosphorus loss reductions (lbs P)	84,040	165,163	249,203
Sediment Loss Reductions (tons sediment)	124,875	241,857	366,732
Reduced Tillage Acres	118,418	235,212	353,630
Nitrogen Management Acres	125,080	223,692	348,772
Cover Crops Acres	36,080	74,862	110,942

Soil and Water Outcomes

The Soil and Water Outcomes Fund offers farmers financial incentives for transitioning to conservation practices that provide positive outcomes for carbon sequestration and water quality. The SWOF program originated in Iowa but opened enrollment in Illinois in 2021 in 11 counties, including McHenry, Lake, Lee, DeKalb, Kane, DuPage, Bureau, LaSalle, Kendall, Grundy, and Will counties. For 2021, 117 fields were enrolled totaling 14,684 acres, with 11,160 of those acres utilizing cover crops, 4,405 acres utilizing reduced tillage, and 4,405 acres utilizing no-tillage. Conservation practice adoption resulted in 7,937 metric tons of carbon dioxide sequestered, equivalent to 1,726 cars removed from the road for one year. Regarding water quality, conservation practice adoption resulted in 214,605 pounds of nitrogen and 8,342 pounds of phosphorus prevented from entering waterways.



Figure 2. The 11 county SWOF program target enrollment geography in Illinois in 2021.

In 2022, SWOF expanded its territory in Illinois to a total of 17 counties after receiving an RCPP grant through the USDA-NRCS. The Illinois Soybean Association is a partner on the RCPP grant and assisted with promotion of SWOF’s enrollment period to farmers in the target geography of the original 11 counties from 2021, plus Winnebago, Boone, Ogle, Cook, Kankakee, and Iroquois counties. At the conclusion of the 2022 enrollment period, 17,572 acres were enrolled in SWOF in Illinois, including 6,522 acres using cover crops, 12,456 acres



Figure 3. The SWOF program target enrollment geography expanded to 17 counties in 2022.

using reduced tillage, and 5,041 acres using no-tillage. The adoption of these conservation practices resulted in 153,921 pounds of nitrogen and 7,142 pounds of phosphorus prevented from entering waterways.

STAR Conservation Evaluation Tool

Saving Tomorrow's Agriculture Resources is a free nationwide tool to assist farm operators and landowners in evaluating their nutrient and soil loss management practices on individual fields. The goal of STAR is to encourage the continued adoption of conservation practices and recognize farmers for their commitment to improved water quality and soil health.



In summer 2022, STAR released the Crop Year 2021 STAR Annual Report. The report features a summary of conservation efforts, environmental impacts, and growth of the STAR initiative. Read the full report on the STAR website at starfreetool.com/news-1. The Crop Year 2022 STAR Annual Report will be released in May/June 2023. Past reports are also available on the website.

In preparation for Crop Year 2022, several updates were made to the STAR Web App to improve the user experience. For the farmer app, a 'split fields' function was created to allow farmers and landowners to adjust field boundaries with a few clicks. Additionally, adjustments to the Improvement Plan function were made for more accurate scoring predictions. For the admin/licensee app, the dashboard now displays total acres, fields, and participants enrolled in STAR as a live counter throughout the crop year. Verification and Outcomes summaries will be available by the end of the crop year for each county Soil and Water Conservation District to easily access STAR-estimated outcomes and promote their efforts. The STAR Web App offers farmers and landowners an efficient way to evaluate multiple fields seamlessly on their phones, desktops, or tablets. It allows users to create customized field improvement plans, connect with local resources and technical assistance, and share their STAR Ratings with their online communities with a few simple clicks.

STAR continues to work with partners on projects and find funding opportunities. In spring 2022, USDA opened the Partnerships for Climate Smart Commodities funding opportunity. Although Champaign County SWCD's STAR-focused application was not accepted, STAR affiliate Colorado Department of Agriculture's application was accepted. Their proposal includes a generous subaward for the CCSWCD to continue building a National STAR support system for STAR Affiliates and partners in and beyond Illinois. Additionally, the University of Missouri Center for Regenerative Agriculture proposal included funding for the Missouri Association of SWCDs to lift Missouri STAR. STAR looks forward to working with partners to continue expanding STAR's impact.

Additionally, STAR is piloting a Pay-for-Performance model with a supply chain partner in Macon and Douglas counties (growing to Piatt and Moultrie counties in 2023!) that pays farmers for improved STAR Ratings, or consistent 5-STAR Ratings. We hope that such incentives will grow and be available for more geographic areas in the future as we develop additional partnerships. We hope all farmers participate in STAR now to establish a baseline for potential incentives in the future.

STAR Partners: American Farmland Trust, Archer Daniels Midland, Association of IL SWCD, Champaign County SWCD, Centrec Consulting Group, Champaign County Farmer, CHS, Inc., Coles County SWCD, Colorado Department of Agriculture, Conservation Districts of Iowa, DC Analysis, LLC, DIGS Associates, Illinois Corn Growers Association, Illinois Department of Agriculture, Illinois Fertilizer & Chemical Association, Illinois Nutrient Research & Education Council, Illinois Soybean Association, Kankakee County SWCD, McHenry County SWCD, NRCS Illinois, Piatt County Farmer & SWCD, Precision Conservation Management, Terra Economics, LLC, The Nature Conservancy, University of Illinois, University of Illinois Extension, USDA NRCS, Wabash Valley FS.

Keep up with the latest STAR info here:

Facebook: @STARfreetool

Twitter: @STARfreetool

Contact info@STARfreetool.com for questions or inquiries

For more information, see www.starfreetool.com.

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 video 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 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 of Mexico. 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 www.ilfb.org/documentary.



Tree Buffer Program

Tree buffers are just one of the current best management practices that Illinois pig farmers are embracing to benefit the environment. A buffer is an area of trees that are strategically placed to provide a wind break, recycle clean air, and provide curb appeal to a landscape.

Pig farmers in Illinois have the opportunity to take part in a tree buffer grant program. The Illinois Pork Producers Association is offering this incentive for farmers to implement fresh landscaping around their pig farms. Pig farmers from across the state have already utilized this program in the past years. To date, the program assisted farmers in planting 4,754 trees. This grant program opened again in March 2023 and is offered to Illinois pig farmers on a first-come-first-served basis. Funding aids with the purchase of trees and shrubs, as well as design and tree placement.

For more information, see ilpork.com/farmers-care/funding-opportunities/tree-buffer-grant-program.

Upper Macoupin Creek Watershed Partnership

In 2021 and 2022, American Farmland Trust provided technical assistance and outreach in the Upper Macoupin Creek watershed, increasing the implementation of practices that improve soil health, reduce nutrient loads, and provide economic benefits to local farms. Outreach conducted in 2021 reached 141 people, including a successful workshop focused on nutrient management, and field days featuring soil health practices.

Since 2015, the partnership has invested more than \$2.8 million in conservation practices through RCPP and MRBI funding. This amount was spread out over 100 contracts and improved management on 31,000 acres.

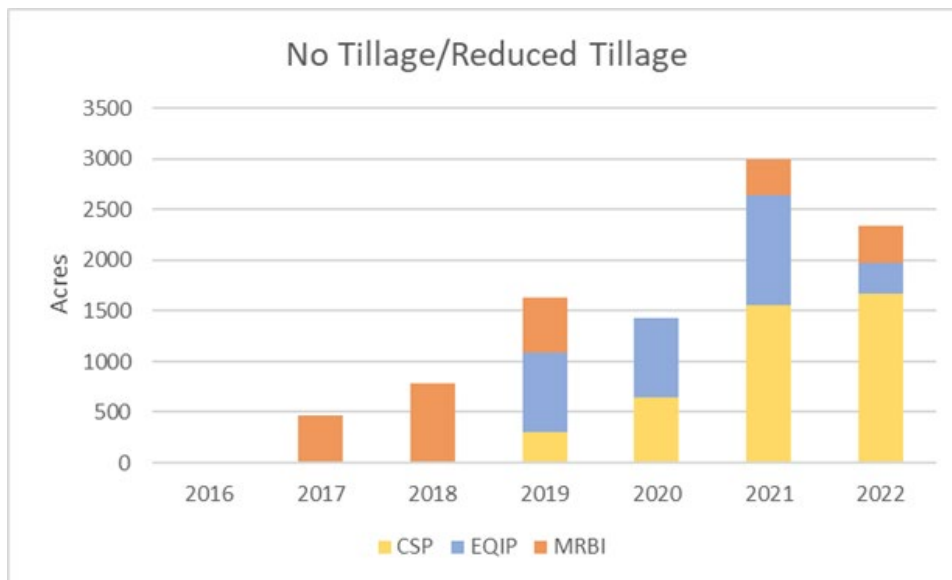


Figure shows improved tillage practice adoption from 2016-22, including both reduced tillage and no tillage practices. An additional 3,500 acres are contracted for 2023-25, bringing total improved tillage acres to just under 14,000.

	Load Reductions
Phosphorus	6,704 lbs./year
Nitrogen	45,286 lbs./year
Sediment	9,217 tons/year

Table summarizes nutrient and sediment reductions achieved through conservation practices implemented between 2016-22.

Based on water quality analysis conducted by the U.S. Geological Survey over the project period, the study area portion of the Upper Macoupin Creek watershed attenuated nitrate and total phosphorus yields by 54% and 21%, respectively; however, the yield of suspended sediment increased by 15% from inputs within the study area.

For more information, see farmland.org/project/umc.

Vermilion Headwaters Watershed Partnership

The Vermilion Headwaters watershed is a 305,426-acre rural watershed encompassing parts of Livingston, Ford, Iroquois, and McLean counties in Illinois. This watershed has been identified as one of the top five, nonpoint 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 adoption of conservation cropping systems, such as reduced tillage, cover crops, nutrient management, and tile water treatment, can help protect water quality and improve a farmer’s bottom line.

Funding for priority practices, like cover crops, nutrient management, and reduced tillage is available through the Mississippi River Basin Initiative. In Fiscal Year 2021, one contract was awarded a total of \$250,000, supporting reduced tillage, cover crops, and soil stabilization practices on nearly 300 acres. In Fiscal Year 2022, eight contracts were awarded a total of \$341,066, spanning 1,270 acres.

Efforts are underway to complete a watershed-based plan for the Vermilion Headwaters watershed, and AFT convened the Steering Committee on a quarterly basis to discuss plan updates. AFT hosted one field day in 2021 focused on strip tillage, cover crops, and constructed wetlands; and two field days in 2022 focused on cover crops and weed control. Collectively these events reached over 200 people.

For more information, see farmland.org/vhw.

Water Supply & Industry Partnerships

The Illinois Fertilizer & Chemical Association continues to work with water supply officials located within priority watersheds throughout Illinois. Monthly operational reports are shared with IFCA by the treatment facilities, assessing nitrate and phosphorus levels. IFCA continues to work with the Sangamon Soil and Water Conservation District and Springfield city Water, Light, and Power to promote best management practices among local growers and ag retail members in the watershed as well as help host a “Best Management Practices” meeting each year. IFCA also participates in both 319 and Regional Conservation Partnership Program grants in the Lake Springfield and Lake Decatur watersheds, focusing

on practices that help reduce the loss of nitrogen and phosphorus. Information received on lake nutrient levels and programs throughout varying watersheds are shared with our members via newsletters and direct messages, where the 4Rs and adoption of specific fertilizer management practices are promoted.

Water Testing Initiative

After providing and supporting water testing equipment and supplies to various County Farm Bureaus and Soil and Water Conservation District offices for many years through the Free, Confidential Water Testing Program, the Illinois Corn Growers Association shifted gears to partner with Illinois Soybean Association to offer a contest for Future Farmers of America chapters across the state.

FFA chapters develop and test hypotheses about nitrogen movement and potential loss from various production agricultural field settings. Participants identify locations with differing water sources and management styles at each site. They then develop a report discussing process, findings, and best management practices to address nutrient loss. Cash prizes are awarded to the winning 10 chapters.