

WATER

CURRENT

NEBRASKA WATER CENTER

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GLOBAL INSTITUTE AT THE
UNIVERSITY OF NEBRASKA

SPRING 2025

Core Research, Events, and News from the Nebraska Water Center



**Nebraska
Water Center**
Daugherty WaterforFood Global Institute

North Loup river south of Valentine, Nebraska

Inside

Director's Letter	p.2
Great Plains Water Conference	p.3
Research Updates	p.6
Master Irrigator Summits	p.8
Nitrogen Recommendations	p.11

And More!



From the Director

Chittaranjan Ray, Ph.D., P.E.
Director, Nebraska Water Center (NWC)

Dear Reader,

With spring's arrival, we reflect on the vital connection between water and agriculture and the shared responsibility of sustainable resource management. At the Nebraska Water Center, we are taking advantage of the spring season to continue field research and outreach opportunities. In this newsletter, we are glad to bring updates on staffing, research, and education and outreach opportunities.

This spring we welcomed two new staff members. Jennah Duncan has taken on the role of Laboratory Research Manager at the Water Sciences Laboratory and Anni Poetzel is the new statewide water quality Extension Educator. You can read more about Jennah and Anni on pages 4 and 5.

In research news, we would like to provide updates on an enhanced rock weathering project and a carbon injection project funded by the Nebraska Corn Board. Information on these projects is available on pages 6 and 7. We are also glad to share an update on UNL's nitrogen recommendations, found on page 11.

The team has been busy with outreach and education events through the winter and spring. You can learn more about the Master Irrigator

program on page 8 and the Testing Ag Performance Solutions program on page 10.

I am pleased to announce this year's annual conference will be held in Omaha on September 18 and 19. This conference will have a regional focus and be hosted in collaboration with Water Centers across the Great Plains. More information on the 2025 Great Plains Water Conference can be found on the following page, with registration and agenda details available on our website this summer.

I am glad to have seen many of you at our in-person Spring Seminar Series in the past few months. For those of you located across the state who have been unable to attend in-person, the video recordings are available online.

The Nebraska Water Center team looks forward to seeing many of you at field days and events throughout the summer, and we hope to see you at our conference in September. In the meantime, please enjoy the spring weather and the opportunities for research and recreation it provides.

Chittaranjan Ray

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Save the Date for the 2025 Great Plains Water Conference



2025 GREAT PLAINS WATER CONFERENCE

SECURING WATER RESOURCES FOR TOMORROW

University of Nebraska Omaha
Milo Bail Student Center
September 18 and 19



September 18 and 19, 2025

Milo Bail Student Center, University of Nebraska Omaha

Save the date for the 2025 Great Plains Water Conference! On September 18 and 19, we'll gather at the Milo Bail Student Center on the University of Nebraska Omaha campus to discuss Securing Water Resources for Tomorrow. This multi-state conference will provide updates from the Great Plains states on water supply and water quality. Topics include water smart communities and watersheds, water quality monitoring and treatment strategies, emerging contaminants, wellhead protection, and more. Join researchers, government, nonprofits, state agencies, students, and more to share how communities across the Great Plains are securing water resources for tomorrow.

The conference registration and agenda will be available on our website this summer. We will also be opening a call for proposals soon for those of you who are interested in presenting at the conference. More information will be posted at go.unl.edu/waterconference as it's available.

We hope to see you in Omaha in September!

Water Sciences Laboratory Welcomes New Manager

By Ann Briggs, Public Relations and Engagement Coordinator

This spring the Water Sciences Laboratory welcomed a familiar face to a new role. Jennah Duncan is taking on the position of Laboratory Research Manager after previous lab manager Victoria Dey moved on from the role. We sat down with Dan Snow, Water Sciences Laboratory Director, and Jennah Duncan to learn more about the staffing change.

Dan, can you tell us about the staffing changes in the Laboratory Research Manager position?

Dan Snow: "Victoria Dey was first recruited as an undergraduate intern at the Water Sciences Laboratory (WSL) and progressed to laboratory technician after graduation from UNL in December 2017. She applied for and was hired as our research laboratory manager from September 2021 until December 2024. Victoria had an amazing attention to detail, very high standards for data quality, and at the same time was kind and extremely helpful to all students, faculty, and other WSL clients. Jennah Duncan also started as an undergraduate intern, progressed to laboratory technician and now has taken on the demanding job of our research laboratory manager. We are extremely fortunate to have another outstanding technical specialist who has high standards for data quality and is also kind and helpful to all who will use the Water Sciences Laboratory. While we will all miss Victoria, we are very thankful to have someone like Jennah who is ready to jump in and take over where Victoria left off."

Jennah graduated from UNL with a Bachelor of Science in Forensic Science in May 2023. She is currently working on a master's degree in cybercrime and digital investigation in addition to her role at the Water Sciences Laboratory. We talked with Jennah to learn more about her new position at the lab.

Jennah, tell us about your previous work at the Water Sciences Laboratory.

Jennah Duncan: "I started at the lab in November of 2022 as an undergraduate intern working on the Know Your Well project. I moved into the technician role in May of 2023 after finishing my bachelor's degree at UNL. I mostly worked in the wet chemistry lab as well as running samples on the ICP-OES and ICP-MS. I also trained interns to work in the wet chemistry lab."

Why did you want to take on the lab manager position, and what are you excited about for this new role?

Jennah Duncan: "Working at the Water Sciences Lab is the first job I had where I didn't dread coming to work. I enjoy being here and wanted to do more and be a bigger part. I'm excited to see how the lab grows. Lots of our current projects are coming to an end and I'm excited to see what we'll do next and how we'll continue to prosper and grow."

What do you like about working at the Water Sciences Laboratory?

Jennah Duncan: "I really enjoy the people and the work we do. I feel the work is very important. I really like puzzles and problem solving, which happens here every day. This job isn't your typical 9 to 5 and really challenges me in a great way. I enjoy figuring out sample and test questions, as well as fixing equipment and working with the interns and staff."

You worked closely with Victoria for the past few years. How do you feel about her departure and taking on her role?

Jennah Duncan: "Victoria was the best manager I've ever had. I was never afraid to go to her with problems because she is kind and understanding while being so knowledgeable. I'm grateful she was so organized in her work because it made the transition of taking on her role very easy. Victoria is great in every aspect."

The lab currently employs six full-time employees in addition to the lab Director. The full-time staff and interns run over 200 test types. The laboratory research manager position is crucial to keeping lab operations running smoothly and ensuring samples are run properly and in a timely manner. We welcome Jennah Duncan as she takes on this new role.



Jennah Duncan, Water Sciences Laboratory
Research Manager

Water and Cropping Systems Extension Educators

By connecting with Nebraska Extension's Water and Cropping Systems (WCS) team, Nebraska amplifies its strengths in agriculture, food production and natural resources stewardship in ways that are environmentally and economically sustainable—ensuring that all Nebraskans have access to safe and healthy food, abundant water, and the benefits of Nebraska's outdoor spaces.

WCS extension educators are located across Nebraska to best serve each community. The current statewide WCS team is shown in the map below.

In March, an important state-wide water quality extension educator role was filled. In this role, Anni Poetzl serves as a liaison between the University of Nebraska and the Nebraska Department of Environment and Energy (NDEE) to support increased communication and collaboration between these two entities, their partners, and the public in addressing nonpoint source pollution of surface and groundwater resources across the state.

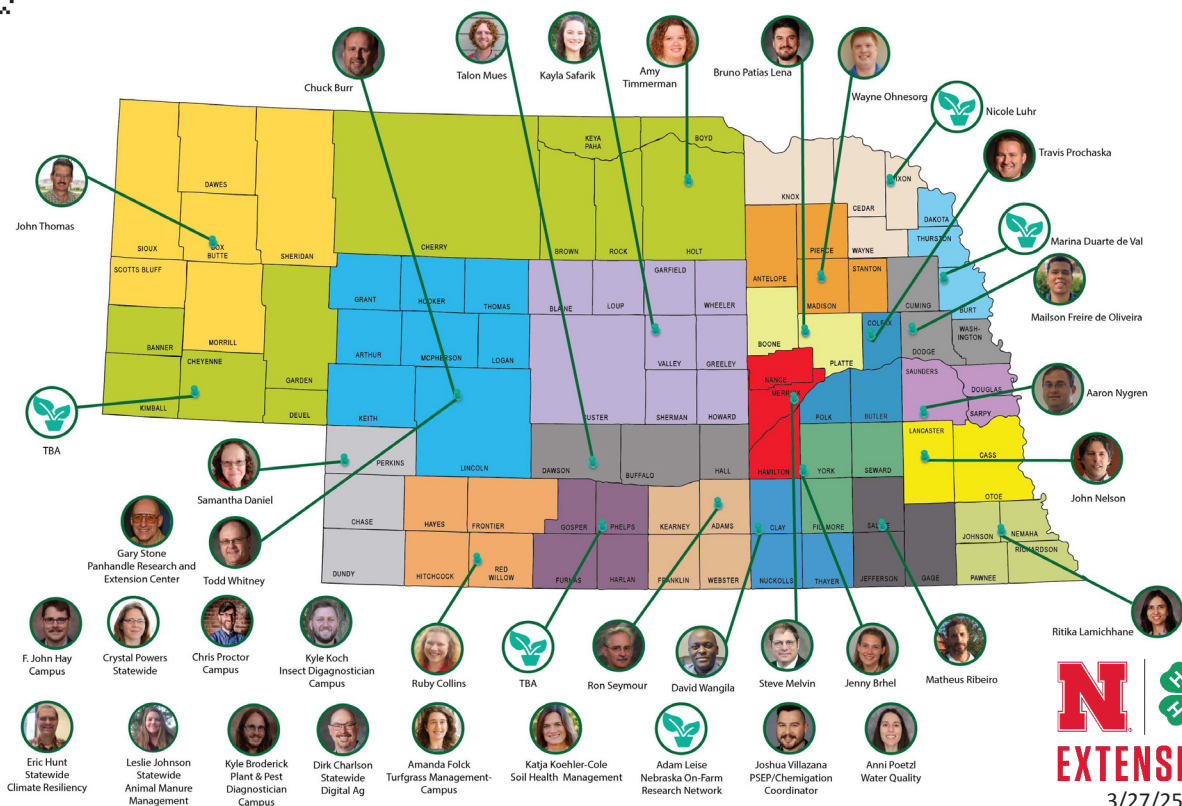
Prior to this role, Anni worked at NDEE, connecting the regulated public to staff and resources, and assisting them in their multi-media inquiries. She has a master's degree in Natural Resources from the University of Nebraska – Lincoln and has bachelor's degrees from Arizona State University in English Literature and Conservation Biology and Ecology.



Anni Poetzl, new Water and Cropping Systems Extension Educator



WATER AND CROPPING SYSTEMS ACCOUNTABILITY REGIONS



Researchers Test Carbon Dioxide Sequestration Method: Enhanced Rock Weathering Project

By Kalley Collins, Graduate Student

A Nebraska Water Center research team is testing a field application solution to sequester carbon dioxide from the atmosphere into agricultural fields in Nebraska. Kalley Collins, a graduate student in UNL's School of Natural Resources, is working with Arindam Malakar, Nebraska Water Center Research Scientist, and Trenton Franz, School of Natural Resources Hydrologist, to conduct field tests to investigate the efficiency of this method.

Enhanced rock weathering (ERW) is an emerging Negative Emissions Technology (NET) solution that sequesters carbon dioxide (CO₂) from the atmosphere. One advantage of ERW in the market is it has the supply and mechanisms already in place to be deployed at large scale; ERW is useful in that it can replace the already existing use of agriculture liming which would increase soil pH and would eliminate the dissolution of lime as a major source of agricultural CO₂ emissions.

Understanding the science behind ERW starts with knowing that when rocks weather on earth's surface naturally this process removes CO₂ from the atmosphere. ERW takes this principle and uses a rock that weathers naturally very fast. In this study we used olivine, which is high in magnesium and weathers quickly. The rock is first ground down into a fine powder which increases the reactive surface area of the ERW product which increases weathering to the point it can be measured on a yearly timescale. In the atmosphere CO₂ combines with raindrops. This reaction creates a weak carbonic acid that falls on and reacts with the crushed olivine in the soil. The carbonic acid and cations form inorganic carbon or bicarbonate (HCO₃⁻) which can be measured as alkalinity. The bicarbonate leaves the soil in the form of soil solution leachate and eventually drains into the ocean where it can form carbonate. Carbonate is stable on long-term timescales of up to 100,000 years making this a partial solution to removing excess carbon in the atmosphere through natural weathering reactions.

The research at UNL was to set up a large scale science-based case study to investigate the efficiency of ERW to quantify monitoring, reporting and verification (MRV) of the technology. A lack of field scale agricultural studies is a current limitation of ERW. Establishing and validating MRVs are critical to issuing credits for carbon sequestration and properly setting up rigorous technologies for creation of markets by companies and governments. Experiments from greenhouses indicate that directly measuring alkalinity is difficult for deployment in field settings. To accurately measure CO₂ sequestration, the UNL team used soil samples to measure differences between cations in the soil prior and post application. As olivine weathers certain cations leave the soil, while others remain which then can be used as a proxy for CO₂ sequestration. The field experiment is at the Eastern Nebraska Research Extension and Education Center (ENREEC) on a no-till rainfed corn-soybean rotation field. The researchers successfully applied olivine and agricultural lime at a rate of 3 tons per hectare in Fall of 2023. Harvest data from 2024 indicated no yield loss between the treatments. Additionally, soil samples indicate a consistent increase in soil pH in the olivine and agricultural lime plots compared to the control plot. Lastly, soil and water samples from lysimeter plots were collected to a depth of 30 cm to study changes in inorganic carbon, pH changes, and decreasing cations from weathering over time.



UNL graduate student Kalley Collins measuring dissolved oxygen (DO) in lysimeter water samples from field experiment where olivine was applied.



Application of enhanced rock weathering (ERW) product of olivine at ENREEC in fall 2023.

Wood carbon subsoil amendment for sustainable corn production on sandy irrigated soils

By Dan Snow, Water Sciences Laboratory Director

High groundwater nitrate is a serious problem affecting drinking water quality in many intensively agricultural areas across the United States, with growing annual treatment or avoidance costs to public water systems and private well owners. More than 2.5 million acres of irrigated cropland in Nebraska exceeds the 10 mg/L nitrate-N standard for safe drinking water. The incidence of high groundwater nitrate is greatest beneath intensively irrigated sandy, well-drained soils, vulnerable to nitrate leaching below the root zone.

Few cost-effective alternatives are available to producers to control nitrate losses in highly vulnerable, irrigated soils. A project supported by the Nebraska Corn Board is demonstrating the efficacy of using waste wood carbon injection for improving groundwater quality in areas vulnerable to nitrate leaching. Using modified farm equipment, a subsoil bioreactor layer was created under two irrigated corn test plots in northeast Nebraska in May 2024. Soil and porewater samples were collected bimonthly during the growing season for measuring nitrate, ammonia, carbon and other parameters designed to test the effectiveness of installing a subsoil bioreactor at the plot scale. Preliminary results of the nitrate-N concentrations between deeper soils receiving ground wood carbon show a systematic (~15-20%) reduction in nitrate-N concentrations. Deeper cores collected before and after the growing season are being analyzed for microbial indicators to support denitrification as the mechanism for nitrate reduction. On-farm injection of ground waste wood could also provide an economical method for increasing soil organic carbon and reducing greenhouse gas emission. Investigators for this project include Daniel Snow, Arindam Malakar, Aaron Daigh, Daniel Miller (USDA-ARS) and graduate student Xiaochen Dong.



Operation of the farm auger hopper containing ground wood chips on a farm cooperators' field near the city of Creighton, Nebraska in May 2024.

Nebraska Water Center and USDA-ARS Host Crop Modeling Workshop

By Ann Briggs, Public Relations and Engagement Coordinator

USDA-ARS Adaptive Cropping Systems Laboratory (ACSL), in association with the Nebraska Water Center, conducted a half-day workshop and demo on 'Crop Simulation Models for Agricultural Systems Applications - Introducing the CLASSIM Interface'. This workshop was part of the 2025 Water for Food Global Conference.

The workshop hosted 25 attendees from natural resource districts, state agencies, environmental engineering firms, and universities. Researchers and staff from the ACSL lab in Beltsville, Maryland taught participants how to use the crop models and modeling software their lab created in cooperation with the Nebraska Water Center.

ACSL is at the forefront of developing and improving mechanistic, process-based crop and soil models. These models simulate crop growth and development, yield, root growth, soil water, nutrient, heat and gas dynamics, soil carbon and nitrogen transformations, and gas emissions, and account for environmental, cultivar, and management interactions. The crop models were recently updated with more accurate components for predicting photosynthesis and transpiration, including improved functions for high-temperature responses, and are integrated with a two-dimensional finite element-based soil process simulator.

USDA-ARS ACSL developed the Crop Land And Soil SIMulation (CLASSIM) graphical user interface to provide standardized access to these crop models. CLASSIM is designed to function as a standalone Windows-based application and simplifies the use of USDA crop models for corn, cotton, potato, soybean and cereal rye.

Workshop attendees received hands-on training in using the CLASSIM interface and understanding how crop models can be applied to research and management decisions.



Sahila Beegum, Nebraska Water Center Research Assistant Professor, showcases the CLASSIM model at the workshop.

Nebraska Master Irrigator Program to Equip Growers to Lead Irrigation Innovation

By Karlie Gerlach, West Central Research, Extension, and Education Center Communications Specialist

The University of Nebraska–Lincoln is launching a new Master Irrigator program, providing Nebraska growers with a platform to connect with the latest agricultural innovations and conservation practices. The program began in February with design summits offering an introduction to the initiative and allowing Nebraska growers to shape its future direction.

The goal of the Nebraska Master Irrigator program is to provide farmers with locally relevant insights into innovations from industry, policy, and research. Each session highlighted resources from UNL's Testing Ag Performance Solutions (TAPS) program, the USDA Natural Resources Conservation Service, Nebraska's Natural Resources Districts, and other industry leaders. These highlights were followed by discussions among growers to refine program development, said Crystal Powers, UNL extension educator and program coordinator.

"We want growers to drive the creation of Nebraska Master Irrigator so it meets their needs," Powers said.

Nebraska is the epicenter of modern irrigated crop production, with deep roots in the practice's history and development. Today, Nebraska has more irrigated cropland acres than any other state. UNL has long been a leader in research, teaching, and extension programs focused on irrigation cropping systems. Combined with USDA NRCS and Nebraska Natural Resources Districts programs, Nebraska growers are already some of the most skilled in the world.

The goal of the program is to meet the needs of the state's top irrigators, said Derek McLean, dean and director of UNL's Agricultural Research Division. Nebraska's Master Irrigator program will cater to those seeking to elevate their fields to the next level. Topics will include leveraging new technologies, implementing conservation and regenerative practices, navigating current events, and managing the complexities of modern farming.



Crystal Powers presents at the Master Irrigator Design Summit in Beatrice, Nebraska.

"Nebraska producers are extremely knowledgeable about irrigation and nutrient management," McLean said. "What we're hearing is a desire for more opportunities to interact with peers and industry leaders on the latest advances in water management and irrigation technology. In a state like Nebraska, the futures of irrigation management and precision agriculture are inextricably linked, and we have a role to play in shaping what that looks like."

The need for a high-level program like Master Irrigator was underscored by farmers across the state. The program will also highlight the work of Nebraska's most innovative producers.

"We are armed with so much intelligence, science, and research that building a trust model is what comes next, and I think that's where Master Irrigator will reside," said Roric Paulman, a grower from western Nebraska.

The program will align with UNL's TAPS program, based at the West Central Research, Extension, and Education Center in North Platte. TAPS allows farmers to experiment with new technologies and crop-growing approaches in a fun, risk-free environment.

Nebraska Master Irrigator also supports Gov. Jim Pillen's initiative to expand the state's bioeconomy, encouraging producers to be efficient stewards of natural resources while maintaining Nebraska's leadership in livestock, crops, and biofuels production.

"The goal is to prepare producers for success in all areas of their operations," Powers said. "From precision agriculture tools to regenerative management practices, all with an eye on return on investment. Long-term, Master Irrigator aims to position Nebraska as a global leader in water and irrigation management while fostering the state's agricultural and natural resource future."

Three design summits crossed the state this spring to share previews of different topics and gain insights from different regions about key issues affecting Nebraska's irrigated cropping systems. 98 participants joined in the discussion, providing hundreds of suggestions. Nearly 9 out of 10 participants said they will take action on what they learned through the Summit.

Special thanks to the industry panelists for their insights and providing lunch: Arable, Bish, CropX, Delta Plastics, Komet, Lindsay, Nelson, Prairie Fire Ag Solutions, Reinke, Senninger, Sentinel, Valley, T-L, BioAg Solutions, and Yield Plus Agronomics.

Policy Panelists included: USDA-NRCS, four Nebraska Natural Resources Districts, Nebraska Department of Environment and Energy, Nebraska Department of Natural Resources, the Nature Conservancy Nebraska, and the Nebraska Corn Board.

The next steps for Master Irrigator will be to form an Advisory Team that will work in partnership with the existing team to create the full curriculum for 2026. The team plans to preview and host hands-on sessions in the Northeast and Panhandle this summer.

Irrigation Innovation: Educating the Next Generation of Conservation Advocates

By Kristen Herrick, NWC Communications Intern

Two University of Nebraska—Lincoln professors, Wei-zhen Liang and Xin Qiao, are using their education and research expertise to lead a grant-funded project aimed at aligning urban and rural water conservation efforts. Funded by the Nebraska Water Center through the U.S. Geological Survey's 104b program, the team is developing a device to help homeowners better manage lawn irrigation, promoting more sustainable water use in urban settings. The broader project also emphasizes sustainable irrigation practices in agricultural communities and creates valuable opportunities for students to engage in hands-on, real-world research. For this project, team members were hired from Western Nebraska Community College (WNCC) bringing together diverse perspectives and providing training opportunities.

At the heart of the research is a commercially available soil moisture sensor, typically used by research and commercial farms, now being tested for its potential to help homeowners monitor soil moisture more effectively. The device offers real-time monitoring capabilities and raises awareness about water use. Designed with accessibility in mind, it features a weatherproof design, solar power, Wi-Fi connectivity, and measures soil moisture every 30 minutes. Users can view moisture levels, battery life, signal strength, and a wet/dry gauge through a connected mobile app (https://phrec-irrigation.com/#/app_intro). Currently, prototypes are being tested in the homes of team members.

In a state like Nebraska—where crop production is high and irrigation is widespread—conserving water becomes an ever-growing challenge. While it may seem simple to some, improving irrigation practices can be complex. With the help of innovative technology and community education, more people can become aware of their water usage and adopt conservation-minded habits.

Often, irrigation is only associated with agriculture. However, Qiao and Liang are working to shift that perception by adapting agricultural irrigation models for urban environments—specifically for homeowners and lawn care. Aligning mindsets between urban and rural residents creates a shared understanding of responsible water use. The ultimate goal is to encourage smarter irrigation habits across all communities.

Student involvement has been a key element of the project. Students from WNCC help with the design and gained useful experience with coding and hardware. The experience is intended to inspire the next generation of agtech professionals.

Community engagement is also central to the initiative. Educational workshops will be hosted to introduce homeowners to the sensors and promote sustainable irrigation strategies. A survey will be available to help gather feedback and measure impact. Funding from the Nebraska Water Center has played a pivotal role in making this research possible. Their support for prototyping, testing, and public outreach has been instrumental in the project's success.

Looking ahead, the team envisions expanding their work to reduce unnecessary irrigation and encourage practical water use among homeowners. With additional support from organizations like the Nebraska Environmental Trust and the National Science Foundation's Excellence program, there may be opportunities to scale the technology and bring affordable systems to more communities—while continuing to offer meaningful experiences for students.

With a focus on conservation, education, and innovation, the project is already making a difference. As Xin Qiao shares:

"People care about their lawns—you drive past the neighborhood and compare, like, 'Oh, this guy has a really good lawn.' That peer learning part is really interesting. Also, adoption is critical, and you have to get the technology to people's hands to let them experience and try. It's the same mindset with commercial farms. We had a grower who didn't use soil moisture sensors before, but after working with him for two or three years, he installed 20 sensors across all his fields. That's the kind of shift we're excited to see."

Liang and Qiao's work is one of many research efforts supported by grants that are driving forward sustainable water practices across Nebraska and beyond.



The app conveniently showcases soil moisture and other water management data.



The solar powered and Wi-Fi connected moisture sensor is now being tested at homes in Nebraska.

Testing Ag Performance Solutions (TAPS) Expands Reach

By Ann Briggs, Public Relations and Engagement Coordinator



The University of Nebraska Testing Ag Performance Solutions (UNL-TAPS) program was developed by the University of Nebraska-Lincoln's research and extension specialists and educators. It advances agricultural management skills and knowledge through competition. UNL-TAPS serves as both a growing-season-long farming contest and a research framework, designed to uncover how producers' management decisions drive profitability and input-use efficiency.

This interactive program is centered around real-world farm management competitions where innovation takes the spotlight. Participants are primarily farmers, but also include UNL scientists and extension, industry leaders, agriculture students, and government officials, all compete to showcase their skills. The competition awards those who achieve the "most profitable," "most input-use efficient," and "highest grain yield" outcomes.

In a low-risk environment, competitors can experiment with a wide array of cutting-edge technology to enhance their decision-making and management skills. This includes satellite and drone imagery, soil moisture and plant sensors, as well as data from local weather stations. These tools provide valuable insights, allowing participants to make informed choices and improve their agricultural practices. At the end of the season, participants gain access to a comprehensive dataset, offering valuable insights to refine their practices.

Supported by the University of Nebraska Extension, Natural Resources Conservation Service (NRCS), state and national commodity boards, Natural Resources Districts (NRD's), non-profit organizations,

industry leaders, and financial institutions, UNL-TAPS is more than a competition—it's a dynamic platform for advancing agricultural innovation and excellence.

TAPS increases impact through state-specific programming

In the past several years, TAPS has expanded beyond Nebraska. In 2024, seven competitions were held in three states. Oklahoma State University, Colorado State University, and Kansas State University have started their own TAPS programs to extend agricultural management skills and knowledge throughout the region, with each state creating unique competitions and curriculum to reflect management decisions that are relevant to their agricultural landscape.

UNL-TAPS awards banquet celebrates the culmination of 2024 competitions

On January 25, 2025, the UNL-TAPS program celebrated its eighth successful year with an awards banquet that recognized the top achievers in farm management competitions across the state.

The event was a night of interaction and celebration of the 2024 competitions, which included four competitions across the state:

- Sprinkler and Continuous Corn at the West Central Research, Extension, and Education Center in North Platte, Nebraska.
- Sorghum at the Henry J. Stumpf International Wheat Center near Grant, Nebraska.
- Soybean competition at the Eastern Nebraska Research, Extension, and Education Center near Mead, Nebraska.

Participants made individual input decisions for their plots, which were located alongside those of their competitors in the same field. These decisions differed for each competition, such as crop insurance, hybrid/variety and seeding rate, nitrogen timing and amount, irrigation timing and amount, insecticide, fungicide, cover crop termination, herbicide and micronutrient applications and, lastly, marketing of their crop.

2018

Two Competitions in NE

Over 60 Participants from 2 states

2020-2022

Six Competitions in NE & OK

Four States represented by over 160 participants

2024

Seven Competitions in NE, CO & KS

Kansas State University started KSU-TAPS

Eight states and 2 countries among over 300 participants

2017

TAPS Created

One Competition in NE

Over 20 Participants from Nebraska

2019

Four Competitions in NE & OK

Oklahoma State started OSU-TAPS

Over 140 Participants representing 5 states

2023

Eight Competitions in NE, OK & CO

Colorado State University started CSU-TAPS

Six states and 2 countries among over 200 participants

Each competition featured unique award categories, including Highest Input Use Efficiency, Most Profitable, and Greatest Grain Yield for corn and sorghum. The soybean competition recognized the Lowest Cost of Production, Most Profitable, and Greatest Grain Yield. Each award came with a cash prize of up to \$2,000, plus a plaque, an oversized check, and personalized TAPS apparel. The winners for each competition can be found at go.unl.edu/TAPS24.

The full 2024 TAPS competition report can be found online.

TAPS would like to express its gratitude to the generous sponsors, dedicated supporters, and passionate participants whose contributions have been instrumental in driving the continued success and growth of the program.



Nearly 140 people attended the 2024 UNL-TAPS awards banquet.

New NebGuide: In-Season Nitrogen Management for Irrigated Corn

With developments in sensor technologies and fertilizer application systems over the past 20 years, the University of Nebraska-Lincoln recommends that irrigated corn growers adopt sensor-based in-season nitrogen (N) management. This approach offers clear advantages in profitability and N use efficiency compared to traditional N management approaches.

A new NebGuide from Nebraska Extension, 'In-Season Nitrogen Management for Irrigated Corn' (G2365), briefly reviews the history of N management research and fertilizer recommendations for corn in Nebraska, and the need for improved approaches for N management to increase profitability and reduce environmental impacts of fertilizer use. Based on research in Nebraska, it describes approaches for using crop canopy sensor information to manage N during the growing season, rather than pre-season application, for irrigated corn production.

In the February episode of the Water for Food Podcast, Water Extension Educator Crystal Powers talked to Richard Ferguson, a University of Nebraska–Lincoln professor of agronomy who has been involved in UNL's nitrogen recommendations since the 1980's.

"The University of Nebraska nitrogen recommendations have gradually evolved as our science has advanced and our understanding has grown of how nitrogen works and how dynamic it is in the soil," stated Richard Ferguson. "Our recommendation processes on how farmers use nitrogen fertilizer are much more accurate and scientifically based than they would've been 60 years ago."

"Nebraska has had a prediction equation for 40 or 50 years now, and we still have that option for growers that would like to continue using that, we certainly encourage them to," said Richard Ferguson. "Based on research over the last four or five years, much of that conducted through the Nebraska On-Farm Research Network with growers, we felt like we had a sufficient database to formalize those findings in the recommendations for growers. A new NebGuide was published in December on providing guidance for in-season management for growers, especially for irrigated corn."

NebGuide G2365 is free and available online in PDF format by visiting extensionpubs.unl.edu.



A fertigation system with programmable injection pump, used for in-season nitrogen management.

Join us at our upcoming events

2025 Great Plains Water Conference

Securing Water Resources for Tomorrow
September 18 and 19, 2025

Milo Bail Student Center, University of Nebraska Omaha

2025 Water and Natural Resources Tour

Water Management in the American Southwest
November 2-7, 2025
Phoenix and Yuma, Arizona

For more details and to register to attend, go to **watercenter.unl.edu**