

Central Platte NRD Newsletter

215 Kaufman Ave Grand Island NE (308) 385-6282 cpnrd.org

Using Sensors and Imagery to Improve Nitrogen Management

For corn producers, one of the most important decisions each growing season is how much nitrogen to apply, and when, to meet the crop’s yield potential. For more than 50 years, University of Nebraska–Lincoln (UNL) research has focused on estimating nitrogen needs using expected yield, soil nitrate levels, organic matter and other nitrogen credits. These predictive tools have generally worked well, but they rely on preseason estimates and averages that cannot fully account for in-season weather conditions or crop response.

UNL research focuses on improving Nitrogen Use Efficiency (NUE) in corn through the 4R Nutrient Stewardship framework: Right Rate, Time, Source, Place. NUE is calculated by dividing pounds of nitrogen applied per acre by the bushels produced (lbs N/ac applied/bu). Early sensor-based nitrogen management research in the 1980s focused on canopy sensors mounted on high-clearance sprayers. As technology advanced, research expanded to include drone imagery and, more recently, satellite imagery capable of evaluating crop conditions across entire fields.

Sensor-based imagery allows producers to assess crop health and nitrogen demand during the growing season, rather than relying on preseason recommendations. By identifying variability within a field, imagery helps determine when and where in-season nitrogen applications are needed. This targeted approach allows producers to apply nitrogen more precisely, improving NUE while reducing unnecessary applications.

Building on this research, former UNL student Jackson Stansell founded Sentinel Ag, which uses satellite imagery to provide daily crop nitrogen and soil-moisture insights for producers. This service platform helps producers make in-season management decisions, maintain yield, and reduce excess nutrient applications.

What is Total NUE?
Total NUE is the most accurate measure of nitrogen use efficiency, accounting for both fertilizer applied and nitrogen available in the soil and water.

Figure 1. Grower vs. Sentinel Management: Nitrogen Application & Crop Yield

SECTOR	GROWER/ SENTINEL	NITROGEN APPLIED	YIELD	APPLIED NUE
1	Grower	193	230	.84
2	Sentinel	160	236	.68
3	Sentinel	100	233	.43
4	Grower	193	231	.83
5	Sentinel	160	231	.69
6	Grower	193	239	.81
7	Grower	193	236	.82
8	Sentinel	200	236	.85
Grower Average		193	234	.82
Sentinel Average		155	234	.66

In 2025, Sentinel Ag cooperated with CPNRD and UNL on an On-Farm Research site to evaluate this approach. One field compared grower-managed and Sentinel-managed nitrogen applications by sector.



Same Yield, Less Nitrogen
Figure 1 shows the Sentinel managed sectors achieved the same average yield (234 bu/ac) while using 38 fewer pounds of nitrogen per acre (155 lbs vs. 193 lbs/ac).

These results demonstrate imagery-based, in-season nitrogen management can maintain yields while reducing nitrogen use.

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Nitrate Contamination in Nebraska: Actions to Improve Health

This article is the third of a four-part series on nitrates from the University of Nebraska Medical Center.

In Nebraska, many residents rely on their healthcare providers or local community workers for information about water quality risks, including nitrate contamination in drinking water. Historically, medical education for physicians and nurses has not included environmental health education. Education on environmental health would equip healthcare workers to recognize and prevent exposure-related illnesses, counsel patients on risks (such as water quality), and advocate for preventative interventions that reduce disease burden.

NEBRASKA HEALTH CARE WORKERS & WATER QUALITY

A research study conducted by the University of Nebraska Medical Center's (UNMC) Water, Climate & Health Program, in partnership with the UNL Extension Office, recently explored attitudes and perspectives of Nebraska healthcare workers toward water quality topics. The goal of the study was to determine if additional water quality related resources are needed to support Nebraska healthcare providers (HCPs), particularly in rural areas.

A survey was administered to HCPs in Nebraska, with a total of 689 respondents representing a variety of specialties and regions. Respondents were asked to rate their overall knowledge on water quality topics (such as nitrate contamination) their awareness of the risk of environmental exposures for their patients, how they felt about discussing water quality with their patients, if they had access to resources and materials, and their preferences on receiving future water quality-related educational resources for their clinics.

The majority of respondents (94%) had not yet received formal training or education on health effects of nitrate contamination, and most reported being "somewhat" or "not at all knowledgeable" about these effects themselves (Figure 1).

Many respondents did not feel confident discussing the health effects of nitrate contamination in water with their patients, with most reporting they were "somewhat confident" or "not at all confident" (Figure 2).

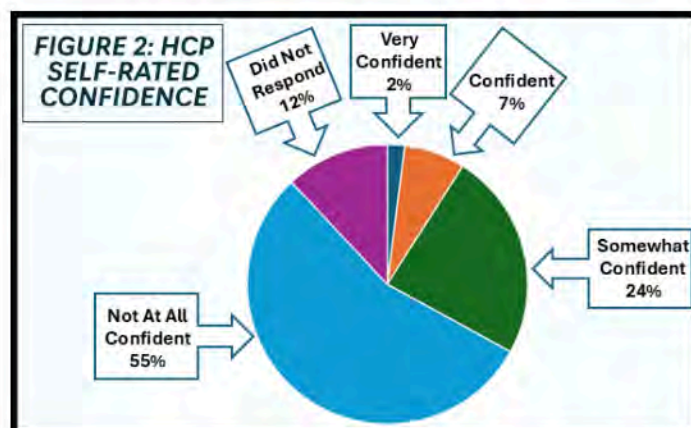
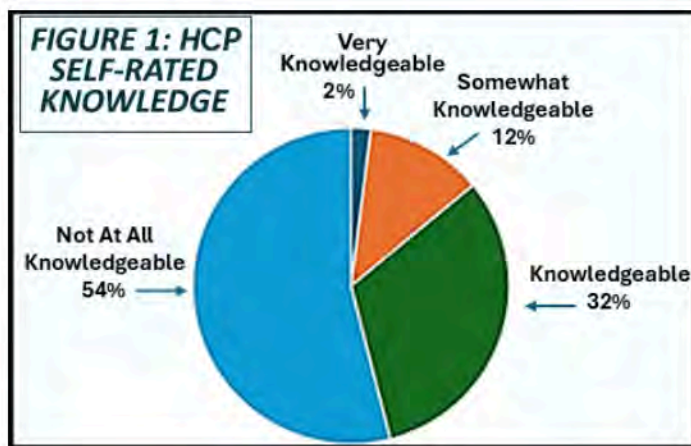
Although healthcare workers reported a lack of knowledge or confidence on the subject, many acknowledged this was a significant health concern, and approximately 88% wanted to share educational information with their patients if such resources were made available.

Finally, of the healthcare workers participating in this important research study, approximately 98% reported that they did not currently provide patients with information about nitrate contamination in drinking water. However, they did share the types of resources and educational materials they would like to have to better meet their patients' needs.

Healthcare workers requested a resource website where they could find materials on environmental exposures to share with their patients, educational videos to deepen their understanding of water quality topics, and virtual training to learn more about the health impacts of nitrate contamination.

The UNMC and UNL Extension are working closely with Nebraska public health departments and community partners to develop educational trainings and resources requested by the healthcare workers who participated in this study.

If you have a private domestic well, you can order a testing kit from Nebraska Public Health Environmental Laboratory at: nebraska.gov/dhhs/water-test-kits/private.html. To learn more about water quality and your health in Nebraska, visit the UNL Extension webpage: water.unl.edu/category/water-and-health



Experience Spring Crane Migration in the Central Platte NRD

Central Platte NRD invites families and wildlife enthusiasts of all ages to experience one of nature's most spectacular events from CPNRD's two crane viewing decks in Alda and Gibbon. Both sites offer free public access and parking.

Each spring, nearly one million Sandhill cranes return to the Platte River in central Nebraska. In addition to the cranes, millions of ducks and geese use the Platte River corridor, creating exceptional opportunities for wildlife viewing and photography. Sandhill cranes are expected to remain in the area through mid-April, gradually moving west along the Central Nebraska Flyway offering excellent viewing opportunities throughout the District.

The 2025 spring migration was record-setting, with 736,000 Sandhill cranes counted from Overton to Chapman. The migration also included 25 groups of Whooping cranes, totaling 105 individuals, observed in the Central Platte Valley.

In-Person Viewing Resources

* CPNRD's Viewing Decks & Maps: cpnrd.org/wildlife/crane-viewing

* Interactive Crane Watch Guide & Lodging: visitkearney.org/sandhill-cranes & visitgrandisland.com

* Plan Your Trip: nebraskaflyway.com

* **Watch From Home!** Rowe Sanctuary free online Crane Cam: rowe.audubon.org/crane-cam



CPNRD
CENTRAL PLATTE
NATURAL RESOURCES DISTRICT

**Enjoy Crane Viewing on the Platte River
Free and Family-Friendly!**

Crane Viewing Decks

- Gibbon-Richard Plautz: 1.5 miles south of 1-80/Exit 285
- Alda: 2 miles south of 1-80/Exit 305

Both sites have been recently updated with new viewing decks and concrete trails. Year-round accessibility with free parking. Witness the breathtaking spectacle of migrating cranes at no cost!

Call: (308) 385-6282 or visit: cpnrd.org

Using Sensors & Imagery to Improve Nitrogen Management *(continued)*

Figure 2 shows a full center pivot of corn planted into haled beans with a cover crop, managed using Sentinel Ag imagery to guide nitrogen decisions. At this site, residual nitrogen was estimated at 232 lbs/ac, with a 35-lb/ac base rate applied. Canary plots were used to check crop response. Yellow plots received 95 lbs/ac of nitrogen and red plots received 0 lbs/ac. Using imagery and crop response, total nitrogen applied averaged 66 lbs/ac, while the field achieved an average yield of 251 bu/ac with a nitrogen use efficiency (NUE) of 0.26. These field results are consistent with what has been observed over multiple seasons.

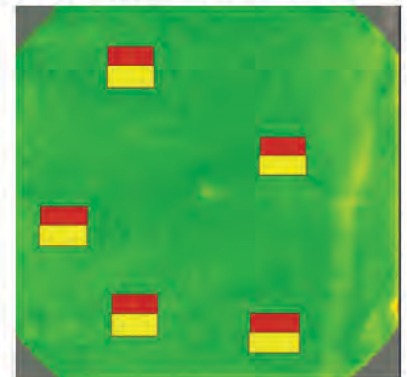
A 2022–2025 summary provided by Sentinel Ag shows similar results:

- Average crop yields ranged from 235-246 bu/ac
- Nitrogen use efficiency improved by 19%–26%
- Applied nitrogen was reduced by 42 to 51 lbs/ac
- Estimated nitrogen cost savings ranged from \$27/ac to \$40/ac

What the On-Farm Field Results Tell Us

These results demonstrate that imagery-based nitrogen management can help producers apply fewer pounds, maintain crop yield and improve nitrogen use efficiency to support both on-farm profitability and long-term groundwater

Figure 2. Imagery-Guided N: Corn on Haled Beans with



In This Edition

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Recognizing Dedicated Service

The following individuals were recently recognized for their years of dedicated service and commitment to conserving the District's natural resources.

- 45 Years** Dean Krull, UNL/CPNRD Demonstration Projects Coordinator
- 25 Years** Shelly Lippincott, Office Assistant, NRCS Kearney Field Office
- 20 Years** Jay Richeson, Dwayne Margritz, Marvion Reichert, Directors
- 15 Years** Jerry Milner, Director
- 10 Years** Deb VanMatre, Director/Chairman of the Board

Andy Bishop Receives NACD Friend of Conservation Award

Andy Bishop, Coordinator of the Rainwater Basin Joint Venture (RWBJV), was selected to receive the Friend of Conservation Award last month from the National Association of Conservation Districts (NACD). The award recognizes individuals who have made outstanding contributions to the conservation of our nation's natural resources.

Andy oversees eight innovative RWBJV programs that protect wetlands while maintaining agricultural productivity. His work emphasizes practical, on-the-ground solutions, such as modifying pivot crossings and managing grazing on wetlands, that balance ecological integrity with economic viability.

He also provides strong financial leadership managing a \$6 million annual budget with about 90% secured through competitive grants. With effective leveraging of public and private resources, 87% of the budget is directed toward on-the-ground conservation efforts and maximizing impacts while minimizing administrative costs.

RWBJV's success is built on strong collaboration. Partner organizations include the Central Platte, Tri-Basin and Upper Big Blue NRDs; NRCS, Nebraska Game & Parks Commission, Pheasants Forever, U.S. Fish & Wildlife Service, University of Nebraska, The Nature Conservancy, and many others.

Central Platte NRD congratulates Andy Bishop on this well-deserved recognition and thanks him for his continued leadership and dedication to conservation in Nebraska.



Andy Bishop, Rain Water Basin Joint Venture

Precision Conservation Management Report



Darren Cudaback, Precision Conservation Specialist, presented the 2025 Precision Conservation Management (PCM) report in January. The PCM program includes 83 Frito Lay cooperators managing 141,907 acres in the Gothenburg area. With a 100% participant retention rate, Cudaback noted that participants remain focused on advancing conservation practices that benefit both the environment and farm profitability.

The producers are enrolled in no-till or strip-till practices to improve soil health, reduce fuel use, and enhance moisture retention. Two producers are participating in the new 10% Nitrogen Reduction Program, aimed at optimizing fertilizer use while reducing nutrient losses. Total producer incentives reached \$1,267,336 averaging \$15,269 per producer, reflecting significant investment in conservation practice adoption.



Darren Cudaback, Precision Conservation Management

Participation by Program

- | | |
|--|--|
| Irrigation Incentive Program: 37 customers 11,535 acres | Flood-to-Pivot (new program): 6 customers 559 acres |
| Sprinkler Packages/Renozzling: 15 customers 4,351 acres | Computer Scheduling Tool: 4 customers 1,168 acres |
| Pivot Telemetry: 11 customers 3,196 acres | Variable Frequency Drives: 2 customers 646 acres |
| Autonomous Pivots: 3 customers 1,115 acres | Moisture Probes: 3 customers 500 acres |

PCM specialists work one-on-one with farmers to compile detailed field records, produce individualized profitability and sustainability reports, and connect producers with cost-share and incentive opportunities tailored to their operations.

Learn More About PCM:
precisionconservation.org

Your CPNRD Contact: Darren Cudaback | 308-216-1153 | dcudaback@precisionconservation.org

Board Takes Action on Flood Reduction Plans

In 2020, CPNRD received three Watershed Protection and Flood Prevention Operations (WFPO) grants from the USDA NRCS to evaluate flood risks and identify potential solutions within Elm/Turkey creeks, Spring/Buffalo creeks and Lower Wood River watersheds. The multi-year grants covered 100% of costs to complete environmental assessments and develop watershed plans.

Elm-Turkey Creeks Watershed

In February, the CPNRD Board approved moving forward with the design phase of the Elm–Turkey Creeks Watershed Flood Risk Reduction Plan. Advancing to the design phase allows the District to pursue future funding opportunities, but it does not commit the NRD to construction or additional project phases. Any progress beyond design will depend on available funding, partnerships, and the timing of federal resources.

The Elm-Turkey Creeks watershed spans 106,000 acres in Dawson and Buffalo counties, including the southern edge of Kearney. Flooding risks are influenced by the area’s flat topography and multiple flow constraints, including locations near I-80.

The approved design plan includes two diversion channels along the southern portion of the Turkey Creek watershed to convey floodwaters south during a 100-year storm event, helping to prevent an estimated \$90 million in flood damages in the Kearney area. The design phase will be fully funded by NRCS if federal funding becomes available.

Project StoryMap link: cpnrd.org/flood-reduction/in-the-works

Spring Creek Watershed

In February, the Board also approved the Spring Creek Watershed Plan but voted not to proceed with the design phase due to a low benefit–cost ratio and a lack of public support. Approval of the plan allows partner agencies to revisit and use elements of the plan in the future. The study area covers 266,870 acres including the City of Lexington. In 2023, proposed revisions to the plan’s alternatives and economic analyses were reviewed with NRCS and the U.S. Army Corps of Engineers, resulting in the removal of Buffalo Creek from the alternative.

Lower Wood River Watershed

In 2024, the Board voted to terminate the Wood River Watershed WFPO. The decision was based on the cost-benefit analysis, which showed that the level of flood risk reduction was not justified by the cost to address a 25-year flooding event. The plan evaluated flood risk reduction alternatives for areas near Gibbon, Shelton, Wood River and Alda. The proposed design included a 400-foot-wide diversion channel west of the City of Gibbon.



Renderings of conditions looking SW at Younes Conference Center in Kearney
Top: Existing 100-year conditions
Bottom: Proposed 100-year conditions

Cost Share Funds Available

Funds are available through the following cost-share programs:

- 100% WILD Nebraska
- 75% Phragmites Control
- 60% Well Abandonment
- 50% Streambank Stabilization, Windbreaks, Weed Barrier, Urban Forestry, Prescribed Burn, Flow Meters, Cover Crops, Burn Prep
- \$2,000 Soil Moisture Sensors (High Intensity Only)
- \$7,500 Center Pivot Incentive (\$5.77/foot)
- \$30/Acre Grazing Deferment (max \$30,000)
- \$13.50/Acre Sensor-Based Nutrient Management

To learn more visit: <https://www.cpnrd.org/cost-share>

Your CPNRD Contact: Kelly Cole
308-395-7134 | cole@cpnrd.org

Order Trees by April 1

It's planting season! Order your trees & shrubs by April 1st

- ✦ \$31.25 for 25 trees
- ✦ Sold in bundles of 25
- ✦ 33 species of deciduous, conifers & shrubs

(308) 385-6282 | [CPNRD.ORG](https://cpnrd.org)

Sensor-Based Nutrient Management

- Rate increase to \$13.50/acre
- Two-year commitment
- Receive 1/3 of payment after first year, remaining 2/3 after year two.
- Enroll up to two fields (max. 320 acres)

**CENTRAL PLATTE NRD
BOARD OF DIRECTORS**

Director	Subdistrict
Keith Ostermeier, Grand Island	At-Large
Jay Richeson, Gothenburg	1
Brian Keiser, Gothenburg	1
Dwayne Margritz, Lexington	2
Tom Downey, Lexington	2
Marvion Reichert, Elm Creek	3
Luke Ourada, Elm Creek	3
Lon Bohn, Gibbon	4
Ryan Kegley, Kearney	4
Deb VanMatre, Gibbon	5
Mike Wilkens, Gibbon	5
Jerry Milner, Grand Island	6
Mick Reynolds, Wood River	6
John Stoltenberg, Cairo	7
Ed Stoltenberg, Cairo	7
Todd Arends, Grand Island	8
Kevin Werner, Grand Island	8
Amy Kyes, Central City	9
Doug Reeves, Archer	9
Chuck Maser, Grand Island	10
Barry Obermiller, Grand Island	10

Board Officers

Chairman	Deb VanMatre
Vice Chairman	Tom Downey
Secretary	Keith Ostermeier
Treasurer	Marvion Reichert

Staff Member

Staff Member	Position
Lyndon Vogt	General Manager
Jesse Mintken	Assistant Manager
Tom Backer	Projects Assistant
David Carr	Range Management
Zachary Charity	RWBJV Easement Specialist
Kelly Cole	Administrative Assistant
Darren Cudaback	Precision Conservation
Tricia Dudley	Water Quality Specialist
Brandi Flyr	Hydrologist
Korey Gerken	Cozad Ditch Rider
Jim Harris	TMID Manager
Bill Hiatt	Resources Conservationist
Devin Hingst	Resources Conservationist
Dean Krull	UNL/CPNRD Project Coord.
Marcia Lee	Information/Education
Shane Max	Resources Conservationist
Courtney Olson	Office Assistant
Marci Ostergard	TMID Office Assistant
Mike Ostergard	TMID Technician
Collin Quandt	Agronomist
Michael Schmeeckle	Cozad Ditch Manager
Brody Vorderstrasse	Communications Assistant
Angela Warner	GIS Coordinator
Courtney Widup	Water Resources Technician
Vacant	Prescribed Fire Specialist
Luke Zakrzewski	GIS Image Analyst

NRD/NRCS Secretary

NRD/NRCS Secretary	County
Lexie Zubia	Hall
Kyla Friedrichsen	Merrick
Lisa Kennicutt	Dawson
Shelly Lippincott	Buffalo

Receive the *In Perspective Newsletter* by email:
send your email address to lee@cpnrd.org

Board of Directors Updates

2026 General Election

Central Platte NRD has a 21-member Board of Directors serving four-year terms. The Board includes two directors from each of the NRD's 10 sub-districts and one at-large director. Directors from the same sub-district are elected in alternating election years. The following incumbents have filed for the upcoming election cycle. Voting maps of each sub-district are available at: www.cpnrd.org/about/directors

Subdistrict/Director	Sub-District Locations
1 Brian Keiser	Custer, Dawson, Frontier
2 Tom Downey	Buffalo, Dawson
3 Luke Ourada	Buffalo, Dawson
4 Lon Bohn	Buffalo, Hall
5 Deb VanMatre	Buffalo
6 Jerry Milner	Hall
7 Ed Stoltenberg	Hall, Howard
8 Kevin Werner	Hall
9 Amy Kyes	Hall, Merrick, Nance, Platte, Polk, Hamilton
10 Charles Maser	Hall

At-Large Keith Ostermeier District-Wide

Board Officers

Board officers are recommended by the Board Officer Nominating Committee and may serve up to two consecutive two-year terms. The chairman and vice chairman are elected in the same year, while the secretary and treasurer are elected in alternating years.

In February, the Board elected Keith Ostermeier of Grand Island as secretary and Marvion Reichert of Elm Creek as treasurer; both are eligible for a second term through 2028.



Important Dates

March 26

Board of Directors Meeting 2:00 p.m.

March 31

Crop reports, soil and water samples due

April 23

Board of Directors Meeting 2:00 p.m.

May 12

Nebraska Children's Groundwater Festival
CCC/College Park - Grand Island

* **Volunteers Needed: Call 308-385-6282***

May 25

Memorial Day observed

May 28

Board of Directors Meeting 2:00 p.m.

June 1

Chemigation renewal permits due

June 15

College Scholarship applications due

June 25

Board of Directors Meeting 2:00 p.m.