

NDSU

AGRICULTURE

For the Land and Its People



Fall 2025

By advancing agricultural technology, integrating crops and livestock in new ways and equipping students to thrive in every stage of life, NDSU Agriculture is shaping the future of agriculture in North Dakota and beyond. This issue of For the Land and Its People highlights how the College of Agriculture, Food Systems, and Natural Resources (CAFSNR); North Dakota Agricultural Experiment Station (NDAES); and NDSU Extension are preparing students for careers in AgTech, conducting cutting-edge research in integrated systems and guiding students through the NDSU Next Chapter program. Enjoy.

Greg Lardy

Joe and Norma Peltier Vice President for Agriculture

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NDSU researchers determine livestock integration provides return on cover crop investment



Mixing crops and animals on the farm is anything but new.

Using crop residues for grazing and manure as fertilizer is a common practice, historically, but agriculture has shifted toward more specialized cropping and livestock systems. However, the two systems are finding their way back together again.

Research conducted at North Dakota State University's School of Natural Resource Sciences and the Department of Animal Sciences has discovered that bringing livestock to graze a cover crop does provide at least a return on the cover crop investment.

For crop farmers, planting cover crops has become increasingly popular, as it's becoming increasingly recognized as an effective and sustainable practice. But despite the benefits, there's no short-term financial return on investment, especially in a semiarid environment like North Dakota.

On the livestock side, winter feeding is a high cost, so anything that can be done to extend the grazing season is to ranchers' benefit.

Economic returns from cover crops are often not realized without livestock integration. There has been increased interest by farmers in integrating livestock, but only 24% of surveyed farmers reported grazing their cover crops.

Miranda Meehan, North Dakota State University associate professor and Extension livestock environmental stewardship specialist, says those farmers, hungry for information about grazing cover crops, prompted this research on integrating livestock on cover crops.

"I kept getting calls from producers asking, 'What is the impact if I fall graze my winter rye cover crop? What will happen to forage production? Will I be able to graze it in the spring? Will it impact cover?'"

"Getting the research means answering those questions, and it means Extension specialists guiding farmers to make informed management decisions," says Meehan.

The study began as an exploration of grazing management, crop

production, livestock production and their economics.

Katrina Kratzke, an NDSU graduate research assistant, is in her second year of her natural resource sciences masters program. She helped lead the final two years of the four-year study of livestock integration.

Kratzke became involved in this project because her family's home farm in Fertile, Minnesota, began integrating livestock.

"We didn't know if there'd be enough growth to make it worth it, and putting money into grazing without getting anything out of it was too big a risk for us," says Kratzke. She wanted to see for herself the effects of grazing after specific crop rotations.

Grazing also benefits soil health, and the study explored how the added nutrients from manure affected the crop.

"One of the soil health principles is biodiversity, and integrating livestock is a great way to increase biodiversity," says Kratzke.



The research team began planting in fall 2022 and included different plot treatments: dual-grazed cover crops, single-grazed cover crops, nongrazed cover crops and a control plot with no cover crops. Foxtail millet hay was planted first, then soybeans in 2023, corn for silage in 2024 and corn for grain in 2025.

Elements such as soil samples, forage samples and water infiltration rates were collected throughout the planting and grazing periods.

Results indicated that integrating livestock, even in a short grazing period, reduced the investment cost of the cover crop by half. A longer grazing period would mean a full return on the cover crop investment.

"That was a really exciting part, to see the differences in economics," says Meehan, "especially knowing that feed cost would be reduced as well, as the animals wouldn't need to be fed in a drylot."

FOR MORE INFORMATION:

Miranda Meehan, NDSU Extension livestock environmental stewardship specialist, 701-231-7683, miranda.meehan@ndsu.edu
"Livestock integration provides return on cover crop investment in crop production systems" in the 2025 North Dakota Livestock Research Report – ndsu.ag/ndlrr25

The study found no significant changes in soil health after three years of implementing cover crops, suggesting that a longer study period is necessary to observe impacts.

Kratzke says she was surprised at the significant weed suppression ability of winter rye, particularly against kochia, a glyphosate-resistant weed.

This research has prompted Kratzke to consider grazing back home:

"To be able to come here and do the research on it and bring back what I find to my farm is really exciting to me."

This soil health component of this research is expected to continue. It takes five years in a semiarid environment to see changes in soil health. Meehan is excited to get long-term data on these types of systems.

"Being able to have a long-term investment in this type of research is really important to see what those benefits look like over the long run," says Meehan, "especially with the weather variability we have here."

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North Dakota 4-H Youth Development initiative gears up to **EMPOWER YOUTH**

In January, North Dakota State University Extension 4-H Youth Development announced that the Next Chapter at NDSU initiative was selected to receive a \$250,000 grant from the CHS Foundation. Only one program per college was eligible to compete for the award.

The Next Chapter at NDSU initiative is a career readiness curriculum for youth as young as eighth grade. Through hands-on activities, participants explore their passions, develop critical life skills and map out pathways toward postgraduation goals.

The curriculum features 17 adaptable and updated lesson plans. Topics include goal setting, time management, resume writing and financial management. Delivered in the classroom, after school and in 4-H club settings, the program aims to prepare youth to succeed in their future careers — to be “Beyond ready,” a new initiative by the National 4-H Council to prepare youth to be healthy, productive and engaged.

“This recognition highlights our and the CHS Foundation’s unwavering commitment to empowering youth and cultivating the next generation of agricultural leaders,” says Leigh Ann Skurupey, assistant director of 4-H Youth Development.

The Next Chapter at NDSU initiative is a response to a national survey of high schoolers indicating that they do not feel prepared for a job after graduation and want an educational pathway that is shorter, more affordable and connected to a career. The program emphasizes both college and career readiness, ensuring youth are equipped to thrive in their future endeavors. It also helps connect youth and professionals to foster networking and mentorship.

Although the initiative is still in a pilot stage, the response has been enthusiastic.

“Teachers are excited about it,” says Margo Bowerman, NDSU Extension specialist for 4-H STEM. “We’re asking the schools currently teaching the curriculum to let us know how they are using it.”

Bowerman says the promotion at the North Dakota Department of Career and Technical Education Conference drew over 200 educators to their booth, and that the turnout for their presentation session confirmed that this will be an attractive addition to classrooms.

A feature of Next Chapter at NDSU is the Careers in a Box resource. Designed to expand program reach and enhance youth development, Careers in a Box introduces participants to career-focused activities that provide real-world experiences.

This interactive tool connects youth to career possibilities they may have never considered, aiming to foster self-discovery and help envision a future full of opportunity. Where the Next Chapter helps create skills, Careers in a Box creates awareness of careers.

Jenna Radtke, coordinator of Next Chapter at NDSU, has helped develop new Careers in a Box to highlight specific occupations.

“I’ve been building hands-on activities to go along with individual careers and roles,” says Radtke. “What does a metal fabricator do?” We have a lesson about welding. “What does an animal nutritionist do?” “What kinds of jobs are in agricultural co-ops?”

School has just started, so Radtke is looking forward to hearing back from the educators she’s been working with.

In addition to the CHS Foundation grant, there is an incentive program for individual counties to connect their youth with NDSU.

Radtke details the effort to incentivize NDSU Extension agents to teach or promote this curriculum:

“Thanks to Keith and Cathy Peltier’s generous support, the incentive program awards the three counties with the highest percentage of students enrolled in Next Chapter,” says Radtke. “The county with the highest percentage enrolled can earn monetary prizes which support 4-H programming at the local level. The prizes are based on the highest percentage of total youth enrolled in Next Chapter.”

An agent can even come in as a guest lecturer and teach a lesson.

The Next Chapter at NDSU initiative is meant to complement other career-readiness programming, whether in an FFA chapter or a family and consumer science course.

“We’re not here to compete with programming,” says Skurupey. “Next Chapter is an opportunity to collaborate and support alongside you.”

“The CHS Foundation is proud to support North Dakota 4-H and its Next Chapter at NDSU program,” says Megan Wolle, CHS Foundation president. “This work is both creative and grounded in research for youth development. We’re grateful for the strong program leadership that will help develop the next generation of agriculture leaders in North Dakota.”

Skurupey urges anyone interested in learning more to contact North Dakota 4-H to find out how Next Chapter at NDSU can be involved in their community.

FOR MORE INFORMATION:

Next Chapter at NDSU – www.ndsu.edu/admission/nextchapter
Margo Bowerman, NDSU Extension 4-H Youth Development STEM specialist, 701-231-5634, margo.bowerman@ndsu.edu
Jenna Radtke, 4-H Next Chapter at NDSU coordinator, 701-231-7251, jenna.radtke@ndsu.edu



Farming and Ranching are Stressful



NDSU | EXTENSION

Concerns about production, prices and policy can weigh heavily on us. It is okay not to be okay in times of high stress, whether during harvest time or when dealing with an uncertain farm economy.

If you feel isolated or overwhelmed, talk to someone — family, friends or a professional. Reaching out for help isn’t weakness; it’s a sign of wisdom and strength. Recognize that you’re not alone.

Take time to connect with resources that can support you and help you to be resilient in tough times. **Find stress management tools made for farmers and ranchers at ndsu.ag/managingstress.**

If you or someone you know is struggling or in crisis, help is available. **Call or text 988.**

NDSU research seeks to address AgTech workforce needs

What will the agriculture technology workforce look like in North Dakota in the next five years? Ten years? And will there be enough workers to meet those demands?

NDSU is researching ways to determine what those labor needs will be with the intent of developing and implementing a curriculum that will train students to be ready for those careers. NDSU is also seeking to attract more students to the AgTech field and prepare those individuals to be industry-ready upon graduation, thereby helping to meet the workforce needs.

A team led by Adam Marx, NDSU associate professor of agricultural education, and Brooke Thiel, NDSU assistant professor of agricultural education, is working to collect data from college students to determine their interests in AgTech and the reasons behind their choice of major or career path.

“The number of kids growing up on farms and in rural communities is decreasing,” says Thiel. “We know that one of the predictors of career interest in agriculture is exposure to the industry, either through parents, family members or close friends. As youth become more removed from agriculture, we anticipate fewer young people will naturally develop an awareness of careers in agriculture. Thus, it is becoming more important to explore what young people know about agriculture across North Dakota and how that knowledge and awareness may influence their career decision-making.”

The research is part of the Food, Energy and Water Security initiative at NDSU, which is supported by USDA-ARS funding. The FEWS initiative addresses many key issues facing food, energy and water resources today, strongly emphasizing technology and research.

Marx stated that the team is conducting a systematic review of the literature related to young adults’ career decision-making.

“We will pilot a study with current college students in agricultural majors to better understand the things that impacted their decisions to choose their career paths,” says Marx. “This work will

additionally help inform how we help connect people to the diverse agricultural careers we have in North Dakota and beyond, in hopes of helping to fill the industry’s demand for an engaged workforce.”

The team explored the actual ag-sector employment demand in North Dakota with the help of Job Service North Dakota reports and prospectus. Analysis of the data showed the scope of agricultural careers reported was narrower than the actual scope of careers available within agriculture. For example, within the JSND, which is aligned with federal job classifications, many careers are mainly on-farm and farm labor positions.

“We decided to align a deeper review of agriculture-related careers with content areas we see in the College of Agriculture, Food Systems, and Natural Resources here at NDSU,” says Marx. “What that ultimately revealed is what we believe to be a more accurate picture of agricultural career demand in the coming decade, which accounts for blue- and white-collar fields extending from education to engineering and finance to field work.”

“The intent is to use the survey data to guide the development of experiences that would lead young adults to consider careers in agriculture,” says Thiel. Determining the future needs of North Dakota’s agricultural workforce involves conducting national agricultural literacy surveys among high school students. Agricultural literacy refers to the knowledge and understanding of food, its production and processing, and the vital role of agriculture in our daily lives and economy.

“To meet the agricultural workforce needs in North Dakota, we need to be recruiting and training employees from all walks of life. However, retaining the youth from North Dakota in the agricultural industry should be a top priority for our state. Hopefully, by encouraging young people to prepare for and enter careers in agriculture, the state and industry can flourish.”

FOR MORE INFORMATION:

Adam Marx, 701-231-7439, adam.marx@ndsu.edu
Brooke Thiel, 701-231-5839, brooke.thiel@ndsu.edu



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North Dakota State University
Dept 7520, PO Box 6050
Fargo, ND 58108-6050

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NDSU's Land-Grant Mission

The College of Agriculture, Food Systems, and Natural Resources has a tradition of excellence in educating students for real-world careers. Our students learn from and work with world-class scientists in state-of-the-art facilities. These interactions, along with a relatively low student-faculty ratio, provide opportunities for students to develop their critical thinking skills, to work in a team setting, and to capitalize on hands-on learning experiences that will allow them to be competitive in a global economy.

The North Dakota Agricultural Experiment Station consists of seven Research Extension Centers placed strategically throughout the state, the Agronomy Seed Farm in Casselton and the Main Station in Fargo. We work to develop techniques and technologies to enhance the production and use of food, feed, fiber and fuel from crop and livestock enterprises.

NDSU Extension empowers North Dakotans to improve their lives and communities through science-based education. We serve all people of the state through our 52 county and Fort Berthold offices, seven Research Extension Centers and the main campus in Fargo.

For more information on the programs in this publication, contact the faculty and staff listed. For more information about our other programs or have questions, comments or suggestions, please contact me.

Greg Lardy

Joe and Norma Peltier Vice President for Agriculture
NDSU Dept. 7520, 314 Morrill Hall, Box 6050
Fargo, ND 58108-6050
701-231-7660
gregory.lardy@ndsu.edu

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NDSU Giving Day – October 14-15

What is NDSU Giving Day?

NDSU Giving Day is an online fundraising event that brings together NDSU alumni, students and many other supporters of the University. It is an opportunity to make a lasting impact at NDSU by making an online donation at ndsugivingday.com. Funds raised during NDSU Giving Day will support student scholarships and a wide range of educational priorities across the university.

HAVE YOU HEARD? SPREAD THE WORD!
GIVING DAY 
OCT. 14-15, 2025

Why should I give to North Dakota State University?

Your generosity will support educational priorities that set NDSU students apart and help prepare them for real-world success. NDSU Giving Day donors also support scholarships, making an NDSU education possible for talented students who are limited only by their financial resources.

What areas of the university can I support?

The NDSU Giving Day website will offer many funding options among the University's colleges, departments and programs. Giving is easy and a great way for donors to support areas of the university that they are most passionate about, like the NDSU College of Agriculture, Food Systems, and Natural Resources.

To learn more, visit
NDSUGivingDay.com

