

For the Land and Its People



Summer 2026

In this summer edition of *For the Land and Its People*, we highlight storied programs and developing projects. You'll read about the legacy of the NDSU breeding programs, the university's collaboration with an international institute housed right on campus and how an Extension program continues to strengthen our North Dakota communities. These stories show how NDSU Agriculture continues to grow and adapt to serve our state, our country and our world.

Enjoy.

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NDSU NORTH DAKOTA
STATE UNIVERSITY

College of Agriculture, Food Systems, and Natural Resources
North Dakota Agricultural Experiment Station
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A century of innovation:

NDSU crop breeding continues to influence regional agriculture

The year 2026 marks the 100th anniversary of the Ceres spring wheat variety, which was the first spring wheat bred and released at the North Dakota Agricultural Experiment Station.

Developed by L.R. Waldron, Ceres was a landmark variety that improved rust resistance and bridged the gap between early-susceptible wheats and modern disease-resistant varieties. Ceres was known for its high yields and stability in addition to its rust resistance. By 1935, Ceres had been grown on 50% of North Dakota's spring wheat acreage.

Spring wheat is one of several crops in which NDSU's crop breeding programs have made a mark on agriculture. There are 12 active breeding programs at NDSU, which have bred and released 353 crop varieties.

"Public investment in agricultural research is one of the highest-return investments the state can make," says Frank Casey, associate director of the North Dakota Agricultural Experiment Station. "Studies show every dollar returns about \$40 in direct economic impact over the life of that investment — an internal rate of return of 28.4%."

"Public plant breeding is among agriculture's highest-return on investments, delivering higher yields, disease resistance and quality to farmers," says Rich Horsley, head of NDSU's Department of Plant Sciences, who also oversees the barley breeding program at the university. "When L.R. Waldron released Ceres wheat in 1926, its yield and rust resistance made it a dominant spring wheat and established a genetic foundation that still shapes wheat breeding today."

The most recent spring wheat variety released by NDSU was ND Blockade in 2025, says Andrew Green, Richard Frohberg Endowed Associate Professor of wheat breeding. ND Stampede, now in its second year, has high yield, high protein and good end-use quality and was sold by 75 seed associates this spring.

"My goal is to continue to push yield and end-use quality simultaneously, while working to solve emerging disease and agronomic issues to make wheat profitable for farmers," says Green. "We are also working on several unique traits that may present a direct value-added option for wheat growers. Our economic and national security interests rely on successful domestic crop production, and North Dakota is a big part of that as one of the top two states annually in wheat production."

Elias M. Elias, University Distinguished Professor, is the durum wheat breeder at NDSU.

Since the durum wheat breeding program began in 1929, 63 varieties have been released.

"Varieties developed by this program continue to be the leading cultivars grown in North Dakota, with several also widely grown in Montana," says Elias.

NDSU's program is the largest public durum breeding program in the nation, with varieties widely grown in North Dakota and Montana.

"During the past five years, NDSU-developed cultivars were grown on more than 91% of the durum acreage in North Dakota," says Elias. "Over the same period, North Dakota accounted for 56.2% of U.S. durum wheat production, generating approximately \$1.6 billion in direct economic value for North Dakota producers."

Henry L. Bolley bred the first wilt-resistant flax variety in 1908, one of 34 flax varieties bred at NDSU. The new Bolley Agricultural Laboratory, which will house NDSU's plant breeding programs, will open in summer 2026.

Md. Mukhlesur Rahman, NDSU plant science professor, has served as NDSU's current flax breeder since 2017. The crop is important to North Dakota, which leads the nation in flaxseed production.

NDSU is releasing two new flax varieties that have demonstrated higher yield potential in trials. Flaxseed is high in omega-3 fatty acids, an essential nutrient for humans.

"Awareness of the health benefits of flaxseed consumption is increasing, and we are optimistic that flax acreage in North Dakota will continue to expand in the coming years," says Rahman.

North Dakota is one of the leading barley-producing states in the nation. In 2024, barley generated more than \$122 million in farm-gate value across 370,000 acres. NDSU's breeding program has helped drive that success, as ND Genesis barley, released in 2015, accounted for 14.1% of the state's acreage.

"Public barley breeding at NDSU has a direct economic impact on the state," says Horsley, who oversees NDSU's barley breeding program.

NDSU's breeding programs have set a standard that directly impacts the state's farm economy.

"NDSU's crop breeding programs are unmatched in scale, impact and legacy," says Horsley. "Our 10 active programs — the most at any single university site in the nation — develop varieties that improve yield, resilience and quality for North Dakota farmers, strengthening farm profitability, rural communities and the state's agricultural economy. Advances in genomics, AI and predictive breeding will further accelerate our efforts to develop new varieties."

FOR MORE INFORMATION:

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100 years after developing Ceres spring wheat, NDSU's crop breeding programs remain "unmatched in scale, impact and legacy."



GRACE OLIN

How an internship connects NCI to NDSU – and one student to a career

Housed in the Peltier Complex on North Dakota State University's campus, a small team of 18 works to facilitate global agricultural discussion, education and technical services — just minutes away from the fields in which the food is grown.

The Northern Crops Institute focuses on educational programs surrounding various forms of agriculture, bringing together customers, commodity traders, technical experts and processors.

NCI is a collaboration between North Dakota, Montana, South Dakota and Minnesota. As a part of North Dakota Century Code, NCI is administered by NDSU, with a separate budget and reporting lines.

Grace Olin, a soon-to-be junior at NDSU, is an NCI program intern. There, she lends a hand wherever needed — organizing people, driving guests around and helping promote NCI programming on campus.

She studies agricultural education, which combines the two things she loves the most: people and ag.

"When the 'light' comes on, when you can see it in their eyes — that's what I love so much about it," says Olin.

Instead of teaching youth in a classroom, Olin aspires to teach adults in a nonformal setting, similar to Extension adult education. Olin says this internship is helping guide her toward what she wants in a career and the types of learners she wants to work with.

This year, she's honing her skills by communicating with kids, parents, sponsors and her team to deliver agricultural programming.

That internship is a way NCI is connected with NDSU. "She's really taking care of a lot of the details we need," says Casey Peterson, program development manager at NCI. "She's played a critical role in putting our Summer Ag Academy together and making sure it runs smoothly."

The NCI Summer Ag Academy is a free, hands-on career exploration experience for high school students interested in food science, animal science, international trade and ag technology.

Olin credits her interest in ag education to growing up on the farm with her three siblings, bonding with her brother while learning to care for cattle.

She even did a bit of fundraising for the Ag Academy, giving her some solid real-world practice in this area.

NCI works with large national cooperators, such as U.S. Wheat Associates, U.S. Grains & BioProducts Council, and U.S. Soybean Export Council, to determine the agricultural and food systems knowledge participants are hungry for.

Peterson says he enjoys meeting collaborators from everywhere — from North Dakota farmers to CEOs of international food and feed companies.

"I love the interaction across the system," says Peterson. "Seeing how it works and helping connect the pieces is enjoyable and feels important."

For example, NCI hosted 36 international guests — soybean and soybean meal buyers — from 16 countries for a week-long risk management program in May. The next groups come in to learn about baking and food products using barley and sorghum. Every spring, there's a pasta manufacturing course. On-demand training and webinars are also available.

Of the course attendees, 61% end up purchasing more product from the U.S.

"It's really seeing how everything is developing, the technology that's coming into play, nutrient needs and wants globally — there's not a boring day here," says Peterson.

FOR MORE INFORMATION:

Northern Crops Institute, 701-231-7736,
<https://www.northern-crops.com/>

Woody Plant Improvement Project helps nursery trade and increases Great Plains diversity

The mission of North Dakota State University's Woody Plant Improvement Project is to introduce new trees and shrubs for the nursery trade. Since introducing its first plant variety in 1986, WPIP has introduced 63 plants with 45 U.S. Patent and Trademark Office trademarks.

"The NDSU WPIP has become a national leader in cold-climate horticulture," says Todd West, NDSU professor and WPIP program director.

"The program delivers an exceptional return on investment by expanding the palette of hardy, disease- and insect-resistant woody plants available to the nursery industry and by strengthening the resilience, biodiversity and long-term sustainability of landscapes throughout the broader northern region."

The NDSU WPIP began researching, developing and patenting new plant

varieties in 1954; the project started introducing plants in 1986.

The WPIP has three primary aims:

- evaluating unreleased and released cultivars from the nursery trade to determine usability in the region
- selecting and breeding and eventually introducing new cultivars for the region
- increasing diversity in woody plant availability

The WPIP process for developing a new woody plant is "long, methodical and heavily driven by field performance," says West. He adds that woody plants have long juvenile periods, and traits like hardness require multiple winters to test and verify.

With a climate like North Dakota's, developing a breed can take 15 to 30 years: the first five are for crossing and seedling establishment, the next decade is for harsh field testing and

heavy selection, the next decade is for propagation and nursery trials, and the final decade is for release and industry adoption.

"The WPIP functions less like a quick breeding pipeline and more like a long-term survival trial system," says West. "By the time a plant reaches the nursery trade, it has essentially 'proven' that it can handle the toughest conditions that the northern Great Plains can deliver, which is exactly why these cultivars are so valuable and respected throughout the region."

"NDSU's WPIP helps North Dakotans by creating tough, reliable plants for a tough climate, while boosting the economy, improving landscapes and supporting environmental resilience across the state," says West.

FOR MORE INFORMATION:

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Learning kitchens

help educators cook up interest in culinary basics

The Expanded Food and Nutrition Education Program, a federally funded program provided in North Dakota through North Dakota State University Extension, has just added a new tool to help community education.

Two mobile kitchens — one in Cass County and another in Rolette County — have been purchased by NDSU Extension to be used by program educators.

Teaching cooking skills is a big part of EFNEP programming, according to Christina Masich, NDSU Extension program coordinator.

“Building cooking skills can be challenging in certain locations where there is no access to kitchens or other food preparation facilities,” says Masich. “Providing recipe demonstrations and cooking activities can teach and empower our program participants to cook healthfully and affordably.”

The kitchens come with a sink, a fridge and an electric stovetop with two burners. They were built by Stephenson Custom Case Company.

These kitchens-on-wheels are only around a couple hundred pounds, and it isn't too difficult to travel and maneuver around. They can be hitched as a trailer or loaded in a truck bed for a longer trek.

EFNEP's goal is to help lower-resource families experience improvement in four core areas: diet quality and physical activity, food resource management, food safety, and food security.

Masich says using mobile kitchens in the community can help promote EFNEP and show its positive impact on North Dakota communities.

Arlan Littlewolf, an EFNEP nutrition education assistant in Cass County, led a cooking demonstration in the Cass County Annex in Fargo, North Dakota. He showed how to make a chicken and wild rice dish after presenting about the traditional significance of wild rice, specifically its place in Anishinaabe culture.

“Considering it was my first time using the station, it went very well,” says Littlewolf. “It was convenient for the audience, and it felt well-made.”

He says the kitchen allowed him to move around and utilize the space more efficiently.

“I am looking forward to doing more demos with this kitchen,” says Littlewolf. “It allowed me the flexibility to set up wherever and confidently cook just like I could in a real kitchen.”

Any EFNEP educator may use the mobile kitchens.

FOR MORE INFORMATION:

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Providing recipe demonstrations and cooking activities can teach and empower our program participants to cook healthfully and affordably.

NDSU

AGRICULTURE

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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.

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8 www.ndsu.edu/agriculture



2026 North Dakota State Fair 4-H Leader Showmanship Event

The 6th annual North Dakota State Fair 4-H Leader Showmanship Event may just be the most star-studded yet.

On Friday, July 24, North Dakota 4-H will bring together 24 youth showmen and 24 adult leaders to battle it out in this unique event.

Following a reception, youth will have just 60 minutes to give leaders a crash course on the ins and outs of livestock showing before they are put to the test to see which leader can claim the title of grand champion. The event is sure to be exciting for youth and leaders, with notable participants including U.S. Secretary of the Interior Doug Burgum, North Dakota Gov. Kelly Armstrong, former NDSU Presidents Dean L. Bresciani and David Cook, and Agriculture Commissioner Doug Goehring.



WHEN: July 24, 6 p.m.

WHERE: North Dakota State Fair All Seasons Arena

FOR MORE INFORMATION:

North Dakota 4-H state office, 701-231-7251, ndsu.4-H@ndsu.edu