

For the Land and Its People

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NDSU Extension Promotes Safety on the Farm and Ranch

November–December 2020

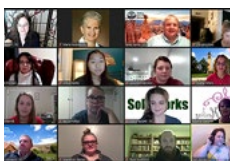
One of the reasons why patience is so important is that it takes the tiny seeds we plant some time to grow into the trees that bear fruit. Sometimes the research, Extension programming and teaching we do can take time to have true impact as well. But in spite of the time needed, we know that the mission and purpose of the College of Agriculture, Food Systems, and Natural Resources (CAFSNR); North Dakota Agricultural Experiment Station (NDAES); and NDSU Extension are meaningful and impactful. We hope the stories we've shared with you about the fruits of our labor this past year communicate our impact on the future success of North Dakota.

Enjoy.

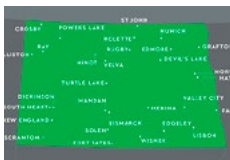
Greg Lardy

Vice President for Agricultural Affairs

NDSU Extension Helping
North Dakotans Work Remotely



NDSU Extension
Working to Prevent Opioid Misuse
in Rural Areas



NDSU Precision Agriculture
Research May Lead
to Significant Savings



Cattle, Crop Integration
Research Showing Promise



CAFSNR Offers Undergraduate
Scholarship Opportunities



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Farm and



A farm-related accident can happen in an instant. Often, that one decision will change the course of a life forever.



www.ag.ndsu.edu/extension/farmsafety

Ranch Safety

NDSU Extension Promotes Safety on the Farm and Ranch

Farming and ranching are among North Dakota's most dangerous occupations. Just ask Emmons County farmer/rancher Doug Bichler.

"A farm-related accident can happen in an instant," he says. "Often, that one decision will change the course of a life forever. This was the case for me. One simple, ill-thought choice led to the amputation of my right arm."

A team of Extension specialists and agents has developed numerous resources to encourage farmers and ranchers to think before they act. These resources include videos on anhydrous ammonia, proper pesticide storage and transportation, proper pesticide mixing and handling, handling farm chemicals, electrical safety on the farm, grain bin safety, all-terrain vehicle safety, and tractor and other equipment safety.

The team also has developed publications such as "Anhydrous Ammonia: Managing The Risks," "Caught in the Grain" and "Chain Saw Safety: No Tricks."

"Anhydrous ammonia has the potential to be one of the most dangerous chemicals used in agriculture today," says team member Rick Schmidt, Extension's agriculture and natural resources agent in Oliver County.

Getting caught in grain or conveyors is another major farm hazard. Several North Dakotans die from it each year.

"People who work with grain—loading it, unloading it and moving it from bin to bin—need to know about the hazards of flowing grain and how to prevent a grain entrapment situation," says Ken Hellevang, a team member and Extension agricultural engineer.

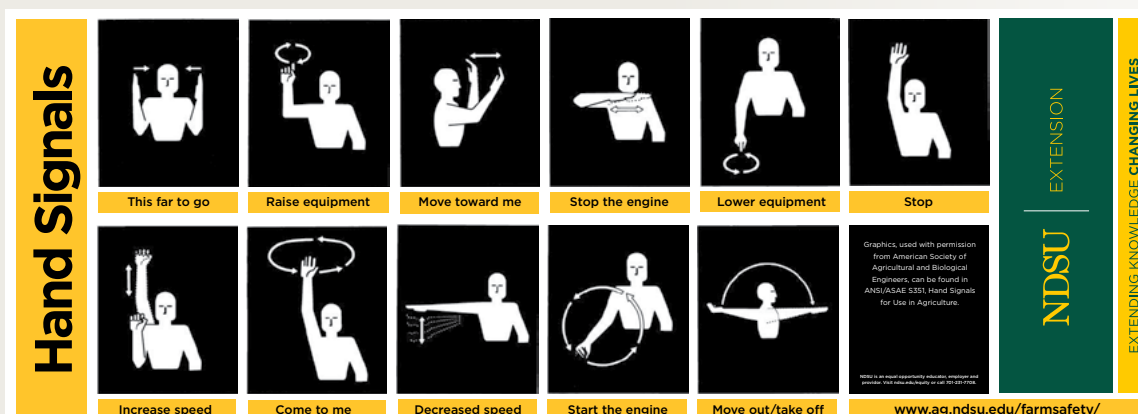
NDSU Extension farm safety resources also include information on dealing with COVID-19 such as:

- Cleaning and disinfecting high-touch surfaces in vehicles and farm equipment
- Physical distancing
- Which mask to use

The team has developed two window clings/stickers that farmers can post in their farm vehicles and equipment. One window cling contains the 11 hand signals used in agriculture. The other notes the items that should be cleaned and disinfected and the proper way to do that.

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www.ag.ndsu.edu/extension/farmsafety





**REMOTE
ONLINE
INITIATIVE™**

NDSU Extension Helping North Dakotans Work Remotely

After the COVID-19 pandemic hit, millions of Americans suddenly were out of work or having to work remotely.

That led North Dakota State University Extension to partner with Utah State University Extension to offer Utah State Extension's remote work certification course in North Dakota. The program is designed to equip workers with the tools and skills they need to work from home as a remote worker, freelancer or entrepreneur.

"We saw this as not only an opportunity to help the North Dakota workforce be more efficient remote workers but to also help the rural economy by providing professional opportunities to rural citizens," says Jodi Bruns, NDSU Extension leadership and civic engagement specialist.

The Master Remote Work Professional Certificate program is a one-month specialized training that combines self-directed learning and virtual workshops. Course topics include the work day, communication, workflow, productivity and time management, teamwork, critical thinking and remote job development.

"I learned so much more than I expected," says Julie Lamborn of Bowman, who took the course in September. "I honestly felt like I was in a college class."

Sue Milender, an NDSU Extension family and community wellness agent in Barnes County also completed the course in September.

"I would highly encourage everybody, regardless of their age, regardless of their position, if they are an employer or an employee, to look into taking this course," she says.

Approximately 500 people from throughout the U.S., including about 50 from North Dakota, participated in sessions of the course that NDSU Extension held in the fall.

Following the one-month course, NDSU Extension offered a career planning meeting.

"This isn't required, as many students are already employed, but for those looking for work, we work with them to connect with remote work job opportunities," Bruns says.

NDSU Extension is holding the program monthly except for July and December.

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<https://www.ag.ndsu.edu/lead/remotework> to register

NDSU Extension Working to Prevent Opioid Misuse in Rural Areas

Farming and ranching often involve the entire family, so when the farm or ranch faces challenges, the stress affects everyone in the family. These stressors are risk factors for prescription opioid misuse.

NDSU Extension and South Dakota State University Extension have partnered to provide services that prevent opioid misuse in rural areas through a program called Strengthening the Heartland (STH). They received nearly \$884,000 in federal grants to carry out that work.

“With opioid misuse a rising problem in North Dakota, this grant allows us to provide the resources and tools to individuals in rural communities who may not have access to health care and resources,” says Meagan Scott Hoffman, NDSU 4-H youth development specialist and one of STH’s leaders.

STH offers resources such as printed material, a website, webinars and two programs. One program, the Opioid Public Health Crisis, is for adults. It addresses opioid misuse, risk factors and suggested prevention methods.

The program for youth is This is (Not) About Drugs. It is targeted toward youth in grades six to 12. It helps raise awareness of the risks of misusing prescription opioids and encourages youth to seek alternatives to substances when dealing with stress.

In two years, the youth program has reached 2,086 youth in 30 North Dakota schools. The 1,424 North Dakota youth who completed a survey assessing their knowledge before and after the program reported a 15.2% increase in their knowledge of prescription opioid misuse.

“I really enjoyed this particular presentation because it was not like others where the message to students is to stay away from drugs; rather it took a more informative approach: what are drugs, the types of drugs people use and why people use drugs,” says Lupita España, school counselor for Ray (N.D.) Public Schools.

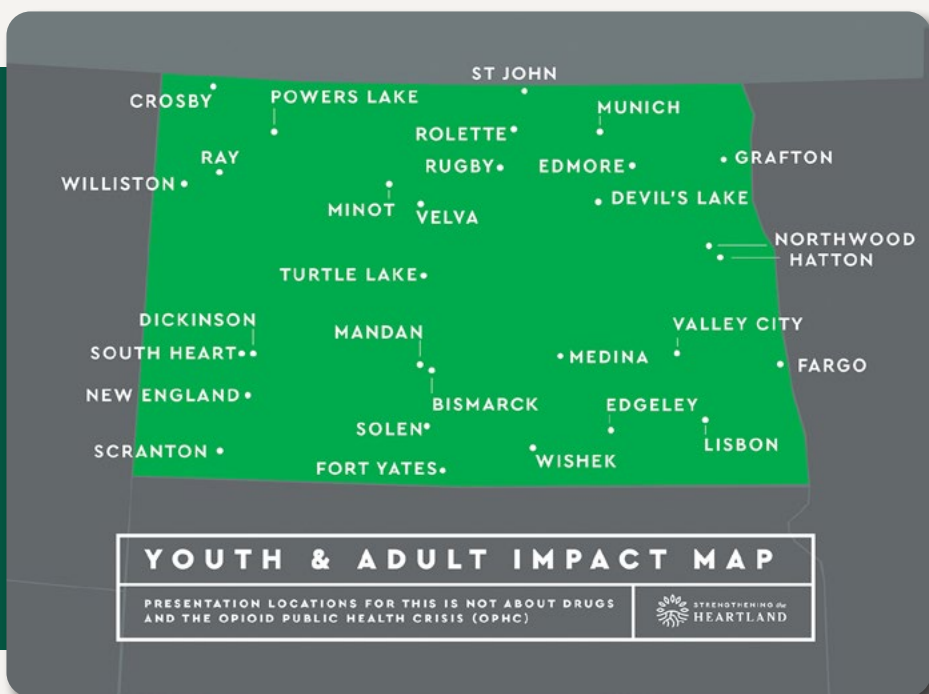
The adult program has reached 287 people in seven locations across North Dakota.

NDSU and SDSU Extension recently were awarded grants totaling \$1,473,815 to continue their work for another two years.

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<https://www.sdstate.edu/strengthening-heartland>



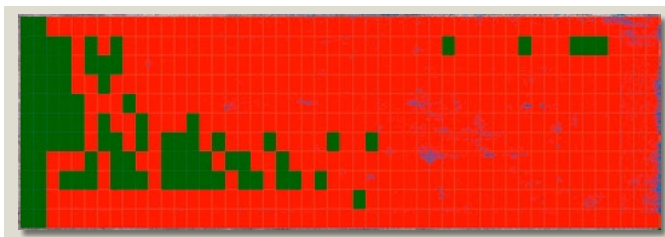
This grant allows us to provide the resources and tools to individuals in rural communities who may not have access to health care and resources.

NDSU Precision Agriculture Research May Lead to Significant Savings

A common agronomic practice for weed management in corn is to make two herbicide applications during the growing season. The first one commonly is done at pre-planting or immediately after planting, while the second usually takes place around the V4 to V6 growth stages. The cost of the second herbicide application is usually around \$15 to \$20/acre.

A group of NDSU researchers on the main campus and at the Carrington Research Extension Center (CREC) is working to make that cost a lot less.

“Using unmanned aerial systems (UAS, commonly known as drones) imagery, one can create weed control prescription maps, which can be loaded into sprayers to implement site-specific weed management,” says Paulo Flores, NDSU Department of Agricultural and Biosystems Engineering assistant professor. “Site-specific weed management is a method to limit the application of herbicides only to areas with weeds.”



In 2018, a 40-acre corn field at the CREC was sprayed with herbicide after a prescription control weed map was created. Researchers created a 20-foot-long by 30-foot-wide grid cell map of the field that they intersected with UAS imagery showing where weeds were located between the corn rows. By manually turning their sprayer on only in the cells containing

weeds, the researchers were able to decrease the area that needed to be sprayed by 16%.

Using the same weed data layer and by decreasing the grid cell size to 10 by 10 feet or to 3.28 by 3.28 feet, the area not sprayed would go up to 40% and 70%, respectively.

“Based on the research results, the use of UAS imagery for site-specific weed control on corn has the potential to generate savings for corn growers by decreasing the area that needs to be sprayed,” says Mike Ostlie, CREC research agronomist. “In addition, there is a potential to decrease the environmental impact of corn production as well since the approach reported here would lead to less chemicals being applied to corn fields.”

“This approach could save corn growers in North Dakota as much as \$5 million to \$7 million annually, with as little as a 10% reduction in applied acres,” says Flores.

Despite the technical difficulties faced during the last two growing seasons, the group intends to continue the research in 2021.

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<https://www.ag.ndsu.edu/carringtonrec/documents/annual-reports/2018-annual-report>





Cattle, Crop Integration Research Showing Promise

For the past 10 years, a multidisciplinary team of NDSU scientists and specialists have studied the impacts of integrating cattle and crop production and have seen significant results.

As part of the study, yearling steers grazed on native grasses, then grazed on a sequence of field peas and barley, corn, cover crop and baled cover crop hay before going to the feedlot. The crop rotation also included spring wheat and sunflowers, which were harvested as cash crops.

The team found that:

- Keeping the steers grazing well beyond the normal grazing season, thus delaying their entry into the feedlot, saved feedlot costs and produced yearlings that weighed considerably more than if they had gone through the traditional growing/finishing process.
- The steers improved soil health by providing manure and urine, which contributed to increased organic matter diversity.
- Soil nutrients, especially nitrogen, increased, eliminating the need to apply nitrogen to the crops.
- Grazing reduced carbon dioxide and tended to reduce nitrous oxide greenhouse gases.
- Spring wheat yield and net return increased.

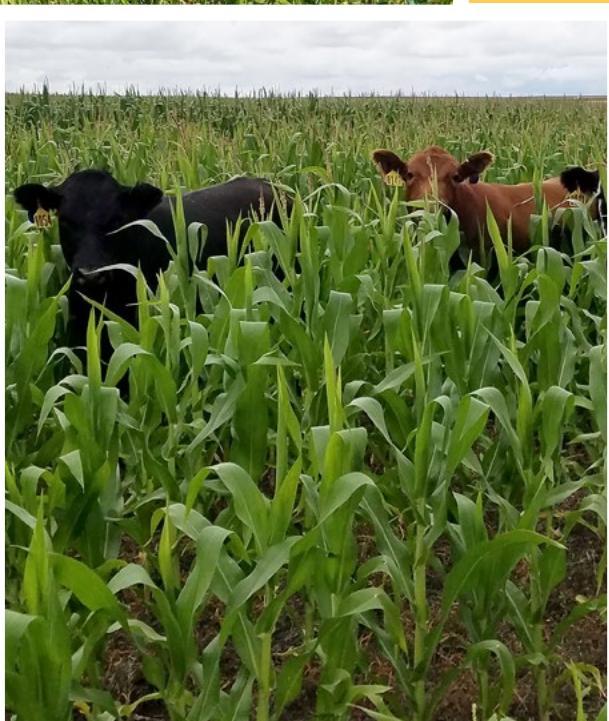
“The longer you allow cattle to graze, the more opportunities you have to make money,” says Doug Landblom, animal scientist the NDSU’s Dickinson Research Extension Center and research team leader. Others involved in the research, funded by two Sustainable Agriculture Research and Education grants, includes Songul Senturklu, a visiting scholar from Turkey; Larry Cihacek, Soil Science professor; Rob Maddock, Animal Sciences associate professor; Tim Petry, Extension livestock economist; Cheryl Wachenheim, Agribusiness and Applied Economics professor; and Steve Paisley, director, Sustainable Agricultural Research and Extension Center, University of Wyoming.

Richardton, N.D., producer Lucas Hoff, who has worked with the team and incorporated integrated systems on his operation, has increased the number of cows on a pasture and been able to reduce his harvesting costs because his grazing cattle are harvesting for him.

“I feel very confident in saying it’s been successful,” he says.

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www.ag.ndsu.edu/DickinsonREC/integrated-crop-and-livestock-systems



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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.

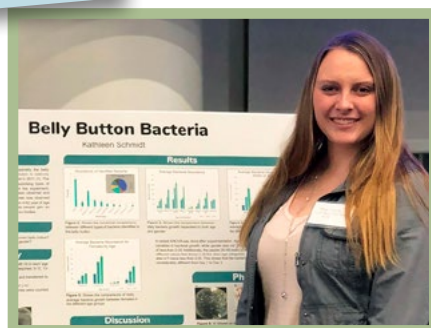
If you would like more information on the programs in this publication, contact the faculty and staff listed. If you would like more information about our other programs or have questions, comments or suggestions, please contact me.

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Katie Schmidt showcases her research at the 2018 Intel International Science and Engineering Fair.

CAFSNR Offers Undergraduate Scholarship Opportunities

Exploring career directions, building transferable skills, getting experience before graduate school and contributing to knowledge are a few reasons for taking on a research project while an undergraduate student at NDSU.

While some think of research as something only graduate students pursue, for some undergraduates, the opportunity to collaborate on research projects has opened doors to scholarships, new ideas and new career possibilities.

"I love all things bacteria," Katie Schmidt, an NDSU Microbiological Sciences undergraduate from Ashley, N.D., says. "Ever since I was little, I've always wanted to know why things happen."

Schmidt is one of NDSU's Goldwater Scholar nominees. The Goldwater Scholarship program is the most prestigious undergraduate research scholarship in the natural sciences, mathematics and engineering in the U.S.

Guided by Peter Bergholz, a former faculty member in the NDSU Department of Microbiological Sciences, and Danielle Condry, an assistant professor in the same department, Schmidt has focused her research on bacteria that cause foodborne disease, specifically E-coli strains found in soil samples from the Red River Valley.

Schmidt also has a specific interest in the human microbiome and its ability to fight off infection. She plans to obtain a Ph.D. and become a medical doctor.

For NDSU Duncan Scholar McKayla Neubauer of Kenmare, N.D., the opportunity to conduct research as an undergraduate has led to a passion for crop improvement.

An NDSU Crop and Weed Sciences senior, Neubauer's undergraduate research focused on discovering the differences in biotypes of the forage crop camelina. She hopes to contribute to plant breeding knowledge and molecular plant research by obtaining her master's degree from NDSU.

"It is such a joy to see a student grow from being a first-year student washing test tubes in a laboratory to presenting research at a scientific meeting before they graduate," says David Buchanan, CAFSNR associate dean for academic programs. "Involvement in research is a transformational experience that will pay enormous dividends in the student's life."

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