

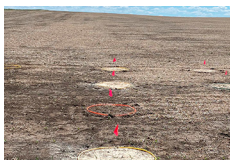
For the Land and Its People

NDSU College of Agriculture, Food Systems, and Natural Resources > North Dakota Agricultural Experiment Station > NDSU Extension



Peltier Complex: A Partnership for Agriculture's Future

Dickinson REC
Tackles Regional Soil Acidity



NDSU Extension IPM Program
Combats Crop Insect Pests and Diseases



NDSU Extension Offers
Design Your Succession Plan
Program



NDSU Extension Center for 4-H
Honors Volunteers
Who Strengthen Communities



November–December 2021

Partnering to advance agriculture's future. Creating opportunities for learning and discovery. Addressing citizens' needs. Developing volunteers to strengthen communities. These are the themes of the stories in this issue of For the Land and Its People. Throughout 2021, we have shared similar stories about the people and programs that make up the College of Agriculture, Food Systems, and Natural Resources (CAFSNR); North Dakota Agricultural Experiment Station (NDAES); and NDSU Extension. We hope that these stories convey our dedication to the land-grant mission and our commitment to bettering North Dakota. Keep reading to learn more about the work we've done in 2021 and our next steps in 2022.

Enjoy.

Greg Lardy

Vice President for Agricultural Affairs

NDSU NORTH DAKOTA
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College of Agriculture, Food Systems, and Natural Resources
North Dakota Agricultural Experiment Station
NDSU Extension



Rendering by Zerr Berg Architects, Inc.

The state-of-the-art NDSU Peltier Complex will bring together scientists, teachers, farmers, customers and students who will develop innovative solutions to complex problems.

Peltier Complex

A Partnership for Agriculture's Future

North Dakota State University's (NDSU) rich history of agricultural product research has elevated agriculture in North Dakota and the greater region to be the supplier of choice for high-quality commodities in both domestic and international markets.

In 2021, the North Dakota Legislature approved \$70 million for the completion of a new combined facility and authorized an additional \$15 million in fundraising to expand and enhance research and teaching capacity at NDSU. These funds will be used to build an Agricultural Products Development Center (APDC) co-located with the Northern Crops Institute (NCI).

This vision became reality when NDSU held the groundbreaking and naming ceremony of the Peltier Complex at the NDSU Wallman Wellness Center on Nov. 19. The Peltier Complex will bring together NDSU's food science, meat science and cereal science laboratories along with NCI, a four-state-focused agency committed to promoting, developing and marketing crops grown in North Dakota, Minnesota, South Dakota and Montana. Located in the southwest corner of NDSU's campus, the state-of-the-art facility will be uniquely positioned as a cornerstone of the university.

"The Peltier Complex will be a facility unlike anything else we have ever constructed at NDSU," said Greg Lardy, NDSU's vice president for agricultural affairs. "It will be the largest single academic building project in NDSU history."

"The Peltier family generously gave a naming rights gift to support the private fundraising portion of the project, which partnered with the North Dakota Legislature to complete the overall financing package," continued Lardy. "For generations, members of the Peltier family have been actively involved in North Dakota agriculture. In addition, they have a history of service with a variety of agricultural research programs, boards and councils. The family shows their support for NDSU Agriculture in many ways, and we are thrilled the family chose to honor their legacy in this manner."

In addition to the Peltier family, numerous gift commitments were made by several commodity groups, alumni, businesses and friends of NDSU and the NCI as part of NDSU's \$455 million *In Our Hands* fundraising campaign.

The complex will support a wide range of research involving food science, meat science, muscle biology, food safety, nutrition, consumer sensory traits and the development of new agricultural products. Designed to meet federal and state food processing and food handling regulations, the center's labs will expand research grant opportunities and partnerships with federal and state agencies.

"This will be a state-of-the-art learning facility that uniquely positions NDSU students for rapidly expanding career opportunities in the food industry," said David Buchanan, NDSU associate dean, College of Agriculture, Food Systems and Natural Resources. "Providing abundant food that is safe and healthful is among the most pressing issues of our time. It is of utmost importance to have learning space in food science labs with the most up-to-date technologies."

"The Peltier family has been an integral part of the history of NDSU and agriculture in the state," said NDSU President Dean L. Bresciani. "From farming, to the seed business, to grain elevators, to serving on commodities boards, the family is uniquely aware of the critical role NDSU's College of Agriculture, Food Systems, and Natural Resources plays in our state, the nation and the world."

The Peltier Complex will open opportunities, markets and address some of the most perplexing issues facing crop and livestock production, food systems and the development of new agricultural products. This state-of-the-art complex will bring together scientists, teachers, farmers, customers and students who will develop innovative solutions to complex problems.

Construction is estimated to begin in the late spring of 2022 and will take approximately 20 to 24 months to complete.

FOR MORE INFORMATION:

<https://ndsufoundation.com/news/2021/09/peltier-complex>
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Dickinson REC Tackles Regional Soil Acidity

The opposite of soil alkalinity is acidity. While a large portion of the state worries about soil pH being alkaline, crop producers in the Dickinson area and parts of western North Dakota are battling a different beast, acidic soils.

Traditionally found in the southeastern U.S. and the southern Great Plains, acidic soils are now being discovered from western North Dakota through central Montana.

"Soil pH is a measure of soil acidity or alkalinity, and anything below 7 is considered acidic," says Chris Augustin, NDSU Dickinson Research Extension Center (DREC) director. "Some of the areas we've tested have a pH below 5.5. When the pH drops below these levels it impacts nutrient availability, activity of bacteria in the soil and reduces yield from Aluminum toxicity."

"The best management practice for these situations in no-till operations is a surface application of lime," explains Ryan Buetow, NDSU Extension cropping systems specialist at the DREC. "However, it takes a large amount of product to change soil chemistry to adequate levels, and a surface application can take time to adjust pH levels. Producers are searching for less costly short-term options, especially for rented land."

Starting in 2018 and continuing to 2021, research has been conducted at the DREC to better understand the soil acidity issues in the area.

2018's research included planting multiple wheat varieties to study how they performed in low pH soils. Significant differences were found in yield and test weight among the crop varieties studied.

A comparison of lime and phosphorous treatments applied with the seed in acidic soil was conducted to observe impact on growth and yield on soybeans in 2020. Calcium treatments such as lime applied with the seed at 75 pounds per acre showed a yield increase for soybeans. For soybeans, phosphorus treatments decreased stand and yield as shown in previous NDSU research.

In 2021, a trial was conducted observing different seed treatments applied on tolerant and susceptible varieties of hard red spring wheat on acid soils. Buetow found that adding phosphorus in furrow to a susceptible variety, a variety that is impacted by acid soils, showed a positive yield response, however the phosphorus was not necessary for tolerant varieties.

Buetow added that it is important to keep in mind that acidity and alkalinity have nothing to do with salts, even though saline soils are often referred to as "alkaline."

Buetow concludes, "The issue we are discussing has to do with pH, which can vary widely across a field. Site-specific zone soil testing is vital because you can have alkaline and acid soils within the same field."

FOR MORE INFORMATION:

<https://www.ndsu.edu/agriculture/ag-hub/research-extension-centers-recs/dickinson-rec/research/agronomy>

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NDSU Extension IPM Program Combats Crop Insect Pests and Diseases

Each year, NDSU-trained crop scouts survey fields for insect pests and diseases that threaten North Dakota's crops.

The IPM scouts' work is the heart of NDSU's Integrated Pest Management (IPM) crop survey program, says Patrick Beuzay, NDSU research specialist and IPM coordinator.

The scouts collect information to give Extension agents and those in agriculture a weekly snapshot of the presence and prevalence of insect pests and diseases, and potential economic damage they might cause. Once producers know a disease or insect pest is in their area, they can monitor their fields and take steps to manage it, says Andrew Friskop, NDSU Extension plant pathologist.

Janet Knodel, lead principal investigator of the IPM Program of North Dakota and NDSU Extension entomologist, says the survey data has other long-term benefits, including:

- Providing seasonal and long-term information on pest presence, distribution and severity
- Detecting the early development of pesticide resistance
- Surveying for new invasive insect pests or diseases
- Improving exports of North Dakota crops through negative data for invasive insect pests and diseases
- Spotting relationships between pest populations and environmental factors for improved risk forecasting models
- Demonstrating the impact of IPM practices on the occurrence of pests
- Identifying areas for additional crop research
- Pinpointing the need for educational programs on improved strategies for insect and disease pest management

NDSU's IPM survey began in 1988 with one IPM scout to identify diseases in wheat and barley in eastern North Dakota. In 2021, eight IPM scouts surveyed a total of 678 wheat fields (winter wheat, hard red spring wheat, durum wheat) and 119 barley fields for 18 diseases and six insect pests throughout North Dakota.



IPM scouts also surveyed a total of 539 soybean fields and 299 sunflower fields during the 2021 growing season. Pheromone traps are used by the IPM scouts to monitor for key insect pests as well as invasive insect pests in North Dakota crops, such as banded sunflower moth, wheat midge, common armyworm and the invasive old-world bollworm.

"We use the scouting data to create survey maps showing where insects and diseases are detected and the severity of the infestations, plus charts and tables to indicate trends and estimate potential yield losses," says Samuel Markell, Extension plant pathologist.

Throughout the growing season, real time data is disseminated through NDSU's IPM website, the NDSU Extension Crop and Pest Report, county Extension Ag Alert newsletters, NDSU's Ag Hub website and at meetings and field days.

The IPM Crop Survey Program is made possible through a grant from the USDA National Institute of Food and Agriculture, Crop Protection and Pest Management Program – Extension Implementation Program (award number 2021-70006-35330) and the Cooperative Agricultural Pest Survey Program of the North Dakota Department of Agriculture.

FOR MORE INFORMATION:

<https://www.ag.ndsu.edu/ndipm>

<https://www.ndsu.edu/agriculture/ag-hub/ag-topics/crop-production/crop-pest-report/entomology>

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DESIGN YOUR SUCCESSION PLAN

Participants attended the Design Your Succession Plan for Small Business program held in Hettinger in Adams County for one evening a week for three weeks. The meetings were hosted by NDSU Extension and the Adams County Development Corporation at The Rural Collective.

NDSU Extension Offers Design Your Succession Plan Program

Recognizing the needs of small businesses and farm and ranch families, NDSU Extension offers two different Design Your Succession Plan (DYSP) programs: one for small business and one for farm and ranch families. The program assists in beginning the process of creating a succession plan; defines the process, tools and terms used in succession; transition; estate and retirement planning.

“Preparing the next generation to weather uncertain environments is an important part of these potential retirements and local legacies,” said Carrie Johnson, NDSU Extension personal and family finance specialist.

“Those who begin the succession planning process during the DYSP workshops and continue it at home can cut costs because they are well-prepared to meet and work efficiently and effectively with legal and financial professionals,” said Johnson. “Attendees think about what they want, explore options and consider consequences before making decisions.”

“The program provides owners and the identified successor generation an opportunity to begin shaping future ownership,” said Andrea Bowman, NDSU Extension program coordinator, leadership and civic engagement. “Good communication is key to a successful succession plan.”

Discussions about the future can be difficult conversations. DYSP workshop participants learn how to start and sustain those discussions and begin developing a succession plan. They also learn about choosing and preparing to work with legal and financial professionals who will help make sure the plan is workable.

“The businesses who participated in the program noted that the ability to communicate with other business owners who are also struggling with succession planning was a huge relief and resource to them,” said Jasmin Fosheim, Adams County Development Corporation/Hettinger Chamber of Commerce executive director. “One of the most important takeaways of the sessions was the realization that businesses don’t need a special course to be doing succession planning: it can begin today.”

FOR MORE INFORMATION:

<https://www.ndsu.edu/agriculture/extension/programs/design-your-succession-plan>

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NDSU Extension Center for 4-H Honors Volunteers Who Strengthen Communities

The NDSU Extension Center for 4-H Youth Development honored two Devils Lake residents, presenting Doug Darling with the Salute to Excellence North Dakota 4-H Outstanding Lifetime Volunteer award and Candace Berg with the Salute to Excellence North Dakota 4-H Volunteer of the Year award for 2021.

“Our North Dakota communities are stronger because of NDSU Extension 4-H Youth Development volunteers,” said Rachelle Vetter, NDSU Extension leadership and volunteer development specialist. “Our 4-H volunteers connect communities by building relationships, improving community health and increasing overall civic involvement.”

As a volunteer for the Ramsey County 4-H program, Darling has dedicated 16 years to the 4-H shooting sports program. He coached youth since the beginning of the county program in 2004, qualified seven teams for national competitions and one shotgunner achieved national grand champion trap honors. Darling empowers people to be the best they can be and encourages everyone he coaches that “Every clay counts. Never give up.”

Candace Berg has been a parent volunteer with Ramsey County 4-H for 15 years. She has led her club in annual community service projects including painting fire hydrants, baking goodies for the local nursing home and raising funds for foster care emergency kits. She is dedicated to continually making a positive impact on 4-H members by helping others and lifting spirits with her endless smile.

According to the North Central Region (NCR) 4-H Volunteer Impact Study conducted by the NCR Volunteer Extension Specialists in 2019, on average, each N.D. 4-H volunteer gives seven hours per month to help youth learn, lead and make a difference, and over 90% said they help youth serve their communities and make communities stronger.

“North Dakota volunteers come into the 4-H program hoping to support youth and make a difference, but they also gain skills in teaching, leadership and communication,” said Vetter. “These skills transfer to other environments in which volunteers work and live.”

For more information about volunteering with the North Dakota 4-H Youth Development program, contact the NDSU Extension Center for 4-H Youth Development.

FOR MORE INFORMATION:

<https://www.ndsu.edu/agriculture/extension/extension-topics/4-h-youth-development/join-4-h/become-volunteer>
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Doug Darling with 4-H shotgun participant representing North Dakota at the national competition. The team placed fifth overall in shotgun, and Dylan received sixth place individual in the sporting clays division.



Candace Berg, at left, learned how to build a ladybug home for them to overwinter during the 4-H Volunteer Project Training in Jamestown.



98%

help youth serve
their communities



96%

help make youth ready
for future careers



97%

help youth build
leadership skills



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www.ndsu.edu/vpag

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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Peltier Complex

A Partnership for Agriculture's Future

Construction starting in 2022.