

For the Land and Its People

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We live in a world where instant answers and solutions to challenges are expected. But when it comes to long-term results, solutions to complex matters, or getting to the heart of transformational change, faster is not always better. The stories in this issue of For the Land and Its People illustrate some of the ways that the College of Agriculture, Food Systems, and Natural Resources (CAFSNR); North Dakota Agricultural Experiment Station (NDAES); and NDSU Extension are continually working to make long-term impacts for the future of agriculture and for the good of North Dakota citizens.

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
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From 2013 through 2022, NDSU Extension Master Gardeners donated a total of 93,613 hours to horticultural-based community service. The value of this volunteer service to North Dakota is \$2,415,192.

NDSU Extension Master Gardener Program Invests in North Dakota Communities

In the mid-1970s, an Extension agent in Washington state named David Gibby and his colleague Bill Scheer were inundated with home gardening questions from rapidly urbanizing areas. The two community-minded agents came up with the concept for the Extension Master Gardener (EMG) Program.

They would recruit and train volunteers to answer gardening questions and serve the needs of their communities. Two hundred applicants were accepted into the program and completed a 40-hour horticulture training. Upon completion, Master Gardeners were expected to volunteer with the gardening public under the supervision of Extension.

The volunteer program was a success and has inspired programs in land-grant universities in 49 states, Canada and South Korea. The Extension Master Gardener Program is celebrating its 50th anniversary in 2023. The program has grown to more than 86,000 volunteers in 49 states.

The NDSU Extension Master Gardener Program was started in 1980 and currently has more than 400 volunteers.

Each year, NDSU Extension offers a 40-hour EMG Core Course to train new interns. The course covers a wide variety of topics such as botany, ornamental plants, trees, soils, plant pathology, entomology, wildlife management, lawns, fruits, vegetable production and plant diagnosis. In exchange for this valuable education, the interns agree to volunteer in cooperation with NDSU Extension in communities around the state.

“The NDSU Extension Master Gardener Program goes beyond ordinary and invests in creating leaders to serve the needs of their communities,” says Esther McGinnis, NDSU Extension horticulturist and Master Gardener program coordinator. “Master Gardeners become ambassadors to assist NDSU Extension in providing scientifically accurate and environmentally sustainable horticultural advice.”

Extension Master Gardeners answer gardening questions in county NDSU Extension offices, organize horticultural workshops, give talks and demonstrations, fight food insecurity, conduct citizen science and teach children the joys of gardening. They also beautify the state by designing and maintaining community, school and church gardens. Public institutions such as zoos, historical sites and museums also greatly benefit from the generosity of Extension Master Gardeners.

FOR MORE INFORMATION:

ndsu.ag/mastergardener

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Some of the 2022 NDSU Extension Master Gardener (EMG) Program highlights include:

- » EMGs grew or collected **33,080 pounds of produce** to benefit **42 food pantries** in **23 counties**. Since 2014, EMGs have donated 144,022 pounds of fresh produce to local food pantries. This is the equivalent of 576,088 servings of fruits and vegetables.
- » 36 EMGs conducted **211 vegetable variety trials** across **21 counties** to identify the best varieties for home gardeners.
- » 101 EMGs cared for **70 ornamental gardens** in **24 counties** across the state.
- » EMGs planted **four demonstration bee lawns** at the Dakota Zoo (Bismarck), Augustana Lutheran Church (Grand Forks), Ellendale Buzz Garden (Ellendale), and the Minot Pollinator Project (Minot).
- » EMGs maintained **38 public pollinator gardens** in **21 counties**.
- » In 2022, **209 EMG volunteers and interns** reported **12,510 volunteer hours** in **37 counties**.
- » From 2013 through 2022, NDSU Extension Master Gardeners donated a total of **93,613 hours to horticultural-based community service**. The value of this volunteer service to North Dakota is **\$2,415,192**.



Mind, Body and Spirit:

NDSU's Bison Strides Program Transforms Participants

Though riding a horse can be an intimidating experience, especially for a child who is frightened and struggling with physical challenges, a profound connection takes place when you partner horses and humans, says Erika Berg, NDSU Department of Animal Sciences associate professor and director of NDSU's Bison Strides program.

Bison Strides is an equine-assisted services program offered through the NDSU Department of Animal Sciences. The program teaches horsemanship skills to people with physical, cognitive, emotional, behavioral or mental health challenges through weekly adapted therapeutic riding lessons.

In addition, undergraduate students in the Equine Assisted Services minor at NDSU engage in high impact experiential teaching, learning and service opportunities through their involvement in the program.

Bison Strides is accredited by the Professional Association of Therapeutic Horsemanship International (PATH Intl.) and is currently the only PATH Intl. Premier Accredited Center in the state of North Dakota. Just 31% of the over 880 PATH Intl. centers worldwide have earned this status. In addition, NDSU is one of only 12 PATH Intl. Higher Education Members in the U.S.

Currently, Bison Strides offers four different program options throughout the year:

- Adapted Therapeutic Horsemanship – Designed to teach participants horsemanship skills, this program's documented benefits include improved social skills, balance and posture, as well as greater self-confidence and increased self-awareness.
- Equine Assisted Learning – Through equine assisted activities this program promotes self-awareness and problem-solving skills, in addition to providing equine interaction opportunities that teach honesty, respect, empathy and communication.
- Military and Veterans Horsemanship – Open to veterans and active-duty military personnel, this program is primarily ground-based and focuses on building a relationship with the horse. These interactions provide an opportunity for self-reflection, emotional awareness and stress tolerance. The program is supported by donors and grants so there is no fee to service members for this program.
- Physical and Occupational Therapy – In partnership with Bison Strides, Beyond Boundaries Therapy Services offers physical and occupational therapy using equine movement to engage the participant's sensory, neuromotor and cognitive systems to achieve functional outcomes.

"These programs enable our participants to experience improved balance and gait symmetry, practice patience and mutual respect, gain greater social functioning and language development, increase confidence and self-esteem, build relationship and communication skills, as well as find peace and calm in their body and mind," says Berg. "But we couldn't do it without our extraordinary therapy horses and their owners, and the dozens of community volunteers, who come each week to support our participants."

FOR MORE INFORMATION:

www.bisonstrides.org
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NDSU Extension Prepares Leaders in Soil Conservation

Twice a year, soil conservation district supervisors and staff from across North Dakota attend a Soil and Water Conservation Leadership Academy hosted by NDSU Extension. The academy prepares supervisors to become more effective leaders and community builders in the area of soil and water conservation. It incorporates both technical training and professional leadership development.

Supervisors are responsible for the management of the soil conservation district and the implementation of North Dakota Century Code rules and regulations. They run board meetings, manage the district budget, develop district policies and hire district support staff. Attending annual training on topics related to their work is a requirement of the Century Code.

“One of the most important responsibilities of soil conservation district supervisors is creating the district’s annual plan of work,” says Jodi Delozier, Extension specialist and program director of soil and water leadership development. “We help them write impactful goals, identify partners and expand community outreach.”

The academy also includes sessions on ethics, parliamentary procedure, open records and open meetings laws, human resources policy, conflict management, communication and relationship building.

Two grant-funded soil conservation district program coordinators help Delozier develop other types of training to support the districts throughout the year, including 10- to 15-minute “microlessons” for use at board meetings. They are also putting together webinars, a podcast, and a toolkit of resources, including an onboarding checklist for new district staff and templates to help districts create individual legislative updates.

“We want to help soil conservation districts deliver more outreach and promote the conservation work they are doing,” says Delozier. “The districts are doing great things. Each one is doing something that is unique and impactful.”

“NDSU Extension’s role is to help build soil conservation district capacity,” says Delozier. “We help them become more knowledgeable and do more with the resources they have.”

FOR MORE INFORMATION:

North Dakota State Soil Conservation
www.ndsu.edu/ndssc

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WREC Takes a Multi-pronged Approach to Managing Root Rot Diseases

Whether she's out scouting dry pea, chickpea or lentil fields, conducting soil pathogen tests, managing multiple WREC root rot nurseries, consulting with agronomists and farmers, or working to develop new risk-forecasting tools, root rot is on the mind of Audrey Kalil, Williston Research Extension Center plant pathologist.

According to the U.S. Department of Agriculture, production of pulse crops (dry edible pea, lentil, chickpea and dry bean) in the U.S. has grown exponentially over the past two decades, with more than 3.3 million acres planted to pulse crops in 2020. Most of this growth has taken place in the semiarid regions of the northern Great Plains, Montana and North Dakota, where, along with dry edible pea, lentil has replaced fallow in wheat-fallow production systems.

"The growing production of pulse crops is due in part to the increased demand for plant-based protein in human diets," explains Kalil. "These high-value crops require minimal nitrogen fertilization and are beneficial in crop rotations, but with the increased adoption of pulse crops in the MonDak region, higher levels of disease from soilborne pathogens causing root rot have occurred over time."

Kalil and a multi-disciplinary team of NDSU and Montana State University plant pathologists, pulse breeders, and Research Extension Center scientists, are taking a multi-pronged approach to understand and help farmers manage the most devastating of root rot pathogens: *Fusarium* species and *Aphanomyces euteiches*.

This approach includes conducting planting date and crop rotation trials, evaluation of fungicide seed treatments, screening breeding lines to identify those with greater tolerance and working with a non-profit lab to generate a soil testing tool to detect these pathogens in soil and plants using their DNA. The team also produces multiple pulse crop disease management guides, consults with growers at field days and regional educational events, and provides information on the Growing Pulse Crops Podcast.

One of the newest projects the team is working on is a root rot risk forecasting tool. The tool could potentially combine field history submitted by a grower, with soil testing for pathogen DNA and other soil characteristics to determine the level of root rot risk in a field.

"Our hope is that by understanding root rot risk a grower can have more confidence planting peas and lentils, and it helps them stay in the pulse production business," says Kalil. "These crops have been extremely important economically and we need to find ways to maintain this critical industry for the state."

FOR MORE INFORMATION:

WREC Plant Pathology Research and Outreach – ndsu.ag/wrecplantpath
Dry Pea and Lentil Root Rot Management Guide – ndsu.ag/root-rot-guide
Pulse Crop Production Field Guide for North Dakota – ndsu.ag/pulse-guide
Growing Pulse Crops Podcast - www.growingpulsecrops.com
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Big Data Initiative at NDSU Adds Value For North Dakota Stakeholders

Agriculture research data scientists, software developers and climate experts at NDSU are transforming the way researchers design experiments and analyze agriculture and weather data by delivering analytic and software solutions that are available at the tips of their fingers.

As technology plays an ever-greater role in agriculture, researchers are accumulating massive amounts of data, referred to as “big data.” All that data needs to be securely stored, managed and easily analyzed for it to become a meaningful tool for researchers and end users, such as farmers and ranchers.

Funding from the North Dakota Legislature and various federal grants has allowed NDSU Agriculture to begin building the human and technology infrastructure to support its big data initiatives.

The NDSU Big Data Pipeline Unit, led by director Ana Heilman-Morales, is leading projects in data analytics, database architecture and software development. The team is developing several applications that automate analyses and reporting to allow users to make data-driven decisions. Currently, one of their applications, FieldHub, has 11,000 users around the globe and is being recognized as a leading tool in both teaching and research.

The North Dakota Agricultural Weather Network (NDAWN) is also making strides in its management and use of big data.

NDAWN has 192 weather stations across the region that generate over a million readings per day, according to Daryl Ritchison, director of NDAWN. All that data goes into databases, where it is analyzed into information that supports decision-makers in agriculture and beyond.

With additional funding received from this year’s North Dakota Legislative Session, NDAWN will add programmers who can support the existing infrastructure, update existing tools into more modern versions, and begin creating new tools to meet the needs of stakeholders.

FOR MORE INFORMATION:

Big Data Pipeline Unit

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Visit www.ndsu.edu/vpag/newsletter to subscribe to For the Land and Its People e-newsletter.

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.

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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Urban Family Finds a Home in 4-H

Laura Devick, a 4-H leader and parent in Cass County, was not involved in 4-H as a youth. Now she leads an urban 4-H club in Fargo, where her six children have all been members.

When her children were younger, Devick received an invitation from another family to attend a 4-H meeting. After experiencing a meeting and learning about the variety of project areas, the Devicks determined that 4-H was the perfect fit for their family. It provided a way for the entire family to be involved in one activity, while still allowing all family members to pursue their own interests.

For example, one of Devick's children is passionate about music and has been able to do music-based projects. He has found ways to use music in meetings and demonstrations for the club, and he has developed the skills to talk about what he is doing and explain it to others. Others have pursued opportunities in communication, agriculture and natural resources, and citizenship and diplomacy.

"It's not about following a 4-H model," says Devick. "It's about letting 4-H take what you're doing to the next level."

Devick credits 4-H with fostering creativity and providing an outlet for her children's interests. As a leader, she tries to make her club's meetings action oriented to engage members. She wants families to see that 4-H is about developing leaders and helping youth develop their own unique leadership style.

"All leaders look different – some are out front, and some are service leaders behind the scenes," says Devick. "4-H has helped me see and appreciate the gifts of my kids."

Devick also values the support of North Dakota 4-H and NDSU Extension.

"Through 4-H, we have a network of people who want our kids to succeed, and they look out for leadership opportunities that fit each one," she says.

FOR MORE INFORMATION:

Join 4-H! | NDSU Agriculture

www.ndsu.edu/agriculture/extension/extension-topics/4-h-youth-development/join-4-h

