

# For the Land and Its People

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The North Dakota Agricultural Experiment Station (NDAES), College of Agriculture, Food Systems, and Natural Resources (CAFSNR) and NDSU Extension contribute greatly to the economic success of North Dakota through our teaching, research and Extension missions.

Despite the challenges of the past year, our efforts have resulted in innovative teaching methods, more collaborative research, more opportunities for learning and meaningful connections.

We hope the stories we're sharing with you about our work communicate our impact on the future success of North Dakota.

Enjoy.

**Greg Lardy**

Vice President for Agricultural Affairs

**NDSU** NORTH DAKOTA  
STATE UNIVERSITY

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





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# Bees a Key to Controlling Head Rot in Sunflowers

Research by scientists at NDSU's Langdon and Carrington Research Extension Centers is showing that bees are helping control Sclerotinia head rot in sunflowers.

NDSU teamed up with a Canadian company, Bee Vectoring Technologies International Inc. (BVT), to test BVT's biological fungicide called CR-7. Researchers use bumble and honey bees to distribute CR-7, a naturally occurring fungal organism that blocks fungi from causing disease.

"The system, which has been in development for more than a decade, has bees walk through a tray dispenser (placed along with the hive with entry and exit holes) of inoculating powder before they exit their hive," says Venkata Chapara, an assistant research scientist at the Langdon Research Extension Center.

The powder clings to the bees' fur, and spores of the bio agent are dropped on flowers as the bees forage. When absorbed by sunflowers, the bio agent germinates and waits for the fungal pathogen to infect the flower. Once the infection occurs, the waiting bio agent infects the pathogen, which blocks the disease.

Finding a novel way to control head rot is good news because it is the most widespread sunflower disease in North Dakota and Minnesota, according to Chapara. Head rot causes severe seed yield and quality losses.

"Vectorite with CR7 gives sunflower growers an opportunity to prevent a disease that has no effective treatment on the market today," says Ian Collinson, BVT's sales manager. "It's an all-natural method and allows growers to treat their field without having to get in a tractor or organize a plane to drop fungicide on their crops. Sclerotinia can decimate an entire sunflower field, and our technology can prevent that from happening. The research with NDSU has been instrumental in demonstrating field efficacy of the BVT system in sunflower."

NDSU's collaboration with BVT started in 2016.

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## NDSU Helping Control Sugarbeet Root Maggot

**T**he sugarbeet root maggot (SBRM) is the most economically significant insect pest in the Red River Valley growing area.

The SBRM only causes damage at the larva stage. As the name implies, larvae injure sugarbeet roots by scraping the root surfaces with paired oral hooks.

“While varying levels of yield loss are possible, this injury can kill young sugarbeets when plants are affected by another stressor such as drought or root disease,” says Mark Boetel, NDSU entomologist and professor in the School of Natural Resource Sciences, who is working to control the problem.

The SBRM is capable of causing up to 45% yield losses that can equate to revenue losses of up to \$500 per acre if not adequately controlled. Annually, more than 85,000 acres in the Red River Valley are at risk of economically damaging SBRM infestations. However, in 2020, about 140,000 acres were affected by moderate to high SBRM infestations.

Boetel expects infestations this year will be similar to the very high levels that have plagued producers in the past few years. He also is concerned about the spread of infestations into areas that had problems only rarely in the past.

Producers use modeling, monitoring and measuring tactics to determine the likelihood of SBRM and make decisions about using control tools such as insecticides to protect the crop. To help with that, Boetel developed a growing degree-day model for forecasting peak activity of the adult (fly) stage of the insect. The Root Maggot Model is available as an application on NDSU's North Dakota Agricultural Weather Network website and as a free mobile device app.

In response to rising SBRM populations in recent years, American Crystal Sugar Co. and MinnDak Farmers Cooperative staff have assisted NDSU with its SBRM population monitoring program. As a result, it has expanded from a few dozen to about 150 grower-managed fields each year.

Insecticides are the way producers control the insect. Most apply the insecticide at planting time. Those in high- to severe-risk areas also commonly make at least one postemergence insecticide application to protect the crop.

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# Drought Enhances Palmer Amaranth Threat

Palmer amaranth could pose a greater threat than ever to North Dakota because of the widespread drought, NDSU Extension specialists are warning producers.

Because of the extreme drought conditions across much of the state, ranchers are purchasing hay and other feed to supplement existing feed resources, which opens the door to unwanted weeds such as Palmer amaranth.

“Transported hay and feed are one of the primary methods of dispersal and introduction for noxious weeds,” says Miranda Meehan, NDSU Extension livestock stewardship specialist.

Grain screenings, a cattle feed, can be another source of Palmer amaranth, a very aggressive, difficult-to-control weed found in North Dakota for the first time in 2018. It has been confirmed in 13 counties, and Extension agents and specialists are working with producers to keep it from spreading.

“While Palmer amaranth looks like a pigweed, it is resistant to many of our commonly used herbicide modes of action, it is extremely prolific in its seed production and it can spread like wildfire,” says Brian Jenks, weed scientist at the NDSU’s North Central Research Extension Center. “The best way to control Palmer amaranth is not having it enter your farm.”

Here are ways producers can reduce the spread of the weed:

- Plant clean seed.
- Test screenings for Palmer amaranth prior to feeding them to livestock.
- Grind screenings finely.
- Compost manure to reduce seed viability.

However, if the manure isn’t composted properly and it’s spread on a field, seeds could turn into plants, and one Palmer amaranth plant can produce up to a million seeds in a year.

“So be aware of the noxious weeds that may be present when purchasing hay and feed, and if necessary, purchase hay and feed from another location,” advises Joe Ikley, NDSU Extension weed specialist.

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## Extension Helping Families Access Nutritious Local Food

Low-income families are getting more access to nutritious locally produced food with assistance from NDSU Extension.

Through a grant, Jan Stankiewicz, Extension community health and nutrition specialist, is helping seven farmers markets become authorized to accept Supplemental Nutrition Assistance Program (SNAP) benefits and implement a Double Up Dakota nutrition incentive program.

SNAP is a federal program that provides nutrition benefits to supplement needy families' food budgets so they can purchase healthful food. The Double Up program doubles the value of SNAP benefits spent at participating markets, which allows families to purchase additional fruits and vegetables.

"The process for farmers markets to become authorized can be cumbersome and confusing, and there can be quite a bit of associated costs," Stankiewicz says. "The project allows the markets to walk through the process together, as a cohort of sorts, while receiving technical assistance and training, as well as capacity-building funding so the program is sustainable."

"It has been frustrating every step of the way as far as the application goes, but Jan with NDSU has been very helpful," says Heidi Ziegenmeyer, who is with the Spirit Lake Mobile Farmers Market at Cankdeska Cikana Community College in Fort Totten, N.D.

"I would have been clueless on where to start, apart from knowing I had to submit an application," she says. "Jan provided training detailing the ins and outs of the application process, different considerations for choices we need to make to set up to accept SNAP, and details on how the Double Up Dakota program works. She has broken the topics into multiple shorter trainings over time, which has been really helpful and not overwhelming."

"This has been a great program," Ziegenmeyer adds. "It kept me on track with my preparations and I wouldn't be half as ready for the market if it weren't for Jan, NDSU and the training I received."

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## 4-H Camp Offers Fun Learning Opportunities

**M**ost years, about 600 youth travel to the North Dakota 4-H Camp west of Washburn to have fun and experience adventures while gaining skills.

The camp is on 80 acres of wooded riverfront property along the Missouri River. Youth age 8 and older spend four or five days at camps such as the Just Starting to Ride: Wish I Had a Horse, Livestock, 4-H Adventure, Survivor and STEM Explorer camps. Youth 5 to 9 years old can enjoy Clover Camp.

This year, campers have a new adventure awaiting them: the 4-H Energy Camp. David Ripplinger, NDSU Extension bioproducts/bioenergy economist, will lead campers on field trips in western North Dakota so they can learn about the state's production of oil, natural gas, coal, renewable energy and ethanol. Youth will spend a week learning about energy science and job opportunities and interacting with North Dakota energy leaders.

Youth do not need to be a 4-H member to attend any of the camps.

The camps will look a little different this year because of the COVID-19 pandemic. For example, organizers scheduled camps with smaller capacities, such as Wish I Had a Horse, Livestock Camp, and Clover Camps I and II, for early in the season.

"We have prepared a COVID plan for camp, which will add extra cleaning, sanitizing and social distancing requirements for campers and staff," says Lindsey Leker, Extension 4-H youth development science specialist.

Youth see the value of camp and are excited about getting back to it this year after the 2020 season was canceled because of the pandemic.

"Camp was fun," says Stran Ressler, a Morton County 4-H'er. "I was able to learn how to clip my steer and improved my showmanship skills. It helped me to understand how to work with my steer."

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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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## Horticulture Program Leads to Rewarding Careers

Elizabeth Knutson hopes a degree in horticulture will lead to a career in research, most likely in plant breeding.

Knutson, who will be a junior this fall, is one of about 40 students majoring in horticulture at NDSU. The Horticulture program also can lead to a number of other careers, including arborist, landscape designer, landscape manager, sports turf manager, golf course superintendent and crop producer.

"The best part about the program is all the hands-on experience we can get here on campus," Knutson says. "I spend a lot of time in the teaching greenhouse, and I think it's great that we can have classes right next door to our ongoing experiments. I've also taken a woody plant identification class, and nearly all of the trees and shrubs we learned about were right here on campus for us to see. I feel very lucky to be studying here at a college that values hands-on experience so much."

Senior Benjamin Inman agrees the best part of the program is the hands-on experience.

"I physically get to work with plants, insects and plant diseases and it is quite fascinating and engaging," he says.

The Plant Sciences Department is in the process of changing the program's name to Horticulture and Urban Agriculture. Todd West, program coordinator, hopes this will help double the number of students in the program.

"The term 'horticulture' has always been difficult because most people, especially younger people, do not have a clue what it is," he says. "By adding urban agriculture, we are hoping to attract a wider audience of students and increase exposure of what we do."

"Horticulture and urban agriculture encompasses conventional and sustainable practices for the development, production, distribution and utilization of vegetables, fruits, turfgrass, woody landscape and greenhouse plants," he adds. "Horticulture becomes more important as an area becomes more urban."

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