

For the Land and Its People

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NDSU Develops Potato Variety Now Approved for McDonald's World-famous Fries



July–August 2022

Timely rain and warm days have brought fresh new growth to grass and crops this summer, a welcome change from last summer's drought. The thing about growth is that it requires continual input and effort. The stories in this issue of the For the Land and Its People highlight the ways the College of Agriculture, Food Systems, and Natural Resources (CAFSNR); North Dakota Agricultural Experiment Station (NDAES); and NDSU Extension are continually seeking opportunities to grow and expand student learning, conduct impactful research and extend education to the state's citizens.

Enjoy.

Greg Lardy

Vice President for Agricultural Affairs

NDSU-led Coalition Advances Fight Against Soybean Cyst Nematode



48,000 Measurements: Long-term WREC Dryland Research Studies Soil Water Content



New Pond Adds Value to North Dakota 4-H Camp



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Precision Agriculture Team Develops Multifunctional Robotic Platform



NDSU NORTH DAKOTA STATE UNIVERSITY

College of Agriculture, Food Systems, and Natural Resources
North Dakota Agricultural Experiment Station
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Asunta Thompson, NDSU associate professor of plant science, has developed a potato variety that recently was selected for McDonald's French fries.

NDSU Develops Potato Variety Now Approved for McDonald's World-famous Fries

The most recent potato variety to join the list of approved McDonald's potato varieties is the Dakota Russet, developed at North Dakota State University by Asunta Thompson, associate professor of plant science and potato breeder.

The Dakota Russet produces low sugars, which results in consistent French fry color and less undesired defects like dark ends.

"This is a dream come true," Thompson says. "Having our russet accepted by McDonald's for their French fries is the gold standard we all strive for. Cultivar development takes a team, and this difficult achievement would not have been possible without support from the NDSU potato improvement team, potato farmers and agriculture partners."

"My goal since returning to NDSU in 2001 was to identify superior cultivars across market types," Thompson says. "I focused on earlier maturity which would allow greater opportunity for economic and environmental sustainability for our farmers, while helping address the global challenge of feeding the world."

The cross (traditional hybridization) was made in 1999, and Thompson selected the seedling in the single-hill nursery in fall 2001. The variety was officially named and released in 2012. The approval process for the Dakota Russet to be accepted by McDonald's was completed in March 2022. The Dakota Russet is one of eight varieties accepted in North America. The most recent additions to the McDonald's North American varieties were in 2016.

The Dakota Russet was developed with the needs of Midwest farmers in mind, producing consistently high yields and fitting the shorter growing season with its medium maturity.

"The development of the Dakota Russet, and its acceptance from McDonald's as a potato variety speaks to the innovative research happening here at NDSU as part of the North Dakota Agricultural Experiment Station," NDSU President David Cook says. "Our talented researchers work hard to contribute to the success of our state and the world."

FOR MORE INFORMATION:

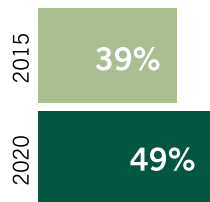
<https://www.ndsu.edu/news/view/detail/68927>

Asunta Thompson, 701-231-8160, asunta.thompson@ndsu.edu

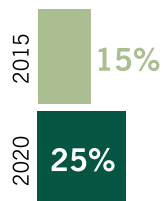


Grower activation on SCN management strategies improves:

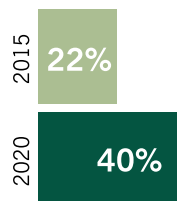
Growers rotating sources of genetic SCN resistance



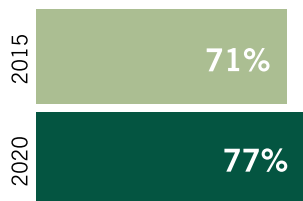
Growers identifying Peking as a source of resistance



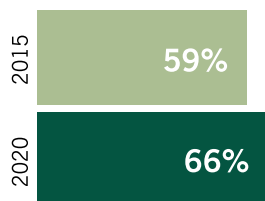
Growers using nematode-protectant seed treatments



Growers rotating non-host crops (i.e., corn, wheat)



Growers planting SCN-resistant soybean varieties



NDSU-led Coalition Advances Fight Against Soybean Cyst Nematode

The Soybean Cyst Nematode (SCN) Coalition, a national public-private partnership led by North Dakota State University Extension, is making a big impact for soybean farmers across the nation.

SCN is the most damaging pathogen of soybean in North America and is adapting to the genetic resistance in most of the soybeans in the U.S. The objective of the SCN Coalition is to help farmers reduce their risk of yield loss by actively managing SCN.

Since its launch in 2018, the SCN Coalition has been mentioned in 753 online articles and generated 31 million potential impressions through agricultural media. Its “Let’s Talk Todes” video series generated over two million views.

The coalition’s messaging is reaching soybean farmers, many of whom are implementing SCN management strategies. In a comparison of two national surveys of grower practices and awareness conducted in 2015 and 2020, the SCN Coalition found that the percentage of U.S. soybean farmers utilizing SCN management strategies increased between 6% and 18%.

“Even the most conservative estimates show the increase of active management practices has likely saved U.S. soybean growers more than \$100 million annually,” says Sam Markell, NDSU Extension plant pathologist and a leader of the coalition.

The impact of SCN Coalition’s campaign is due to the strength of its partnerships. Partners include dozens of companies, universities and soybean checkoff organizations, such as the North Dakota Soybean Council. These partnerships allow the coalition to leverage resources to make an impact in North Dakota and nationwide.

“A coordinated effort from many committed partners is starting to make a big difference for soybean farmers,” Markell says.

The success of the NDSU-led public-private partnership has gained national attention. In May of 2022, the SCN Coalition’s campaign earned a prestigious Silver Anvil Award in Issues Management from the Public Relations Society of America.

FOR MORE INFORMATION:

Visit www.thescncoalition.com.
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“Listening and learning has been my number one priority as I’ve toured the state the past few weeks,” says NDSU President David Cook. “Attending the Research Extension Center field days and talking with researchers, state leaders and citizens has been a highlight of the trip, and I’m excited about the opportunities NDSU has to help solve challenges and contribute to the economic success of North Dakota agriculture.”



NDSU Extension – Sioux County staff were honored to have President Cook visit their office and welcomed him with a traditional blanket.

48,000 Measurements:

Long-term WREC Dryland Research Studies Soil Water Content

Since 2014, Williston Research Extension Center (WREC) soil scientist Jim Staricka, has been measuring the soil water content in 80 field plots every other week from mid-April to the end of October. Measuring at depths of 6, 18, 30, 42 and 54 inches each time, that is 48,000 data points to study and make conclusions from.

At the recent WREC annual field day, Staricka shared his research with the participants.

“This study aims to understand the relationship between water availability and yield on research plots that contain different dryland cropping sequences,” explains Staricka. “Each of the sequences included durum. Other crops included in many of the sequences were pea, safflower, corn, a cover crop, fallow or a perennial mix.”

“Because the MonDak region is water limited, with about 14 inches of precipitation per year, we wanted to understand more about how different crop sequences may have the ability to retain soil water and thus impact yield,” says Staricka.

After studying the measurements, Staricka has made several observations:

1. Soil water changes very little at a 5-foot depth, indicating crops obtain a very small amount of water from that depth.
2. Since 2014, the plot’s soil moisture was the driest ever on August 12, 2021, and the wettest ever on May 17, 2022, and resulting in going from the driest to wettest in less than one year. During most years, the soil was the driest in July, August or September and was the wettest in April, May or June.
3. After measuring the soil water availability following six different crops, Staricka was surprised to find the soil was driest after growing a cover crop. He then realized that the soil was dry because the cover crops were still growing and taking up water long after other crops were harvested and had stopped removing water from the soil. He also then realized it would be better to compare the amount of plant available water in the soil the following spring.
4. Cropping treatments that leave tall standing stubble or plant material are much more efficient at catching snow and replenishing soil water during the winter. Staricka found no over-winter increase in soil water occurring after fallow, a moderate increase occurring after pea, durum and safflower, and the greatest increase occurring after the cover crop and the perennial grass, both of which had been left standing unharvested during the winter.
5. Durum yields ranged from about 20 bushels per acre to nearly 80. Water use varied from seven to 14 inches. But regardless of whether it was a dry year or a wet year, the relationship between water use and durum yield remained constant. It took four inches of water to get the durum crop to the point where it would produce grain. After that, each additional inch of water produced nearly seven bushels of grain.

“We also are looking at long-term trends in soil organic matter, soil pH and other soil properties,” says Staricka. “Based on these observations, I think we can make some practical recommendations to area farmers about how different management practices can increase their durum yields.”

FOR MORE INFORMATION:

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New Pond Adds Value to North Dakota 4-H Camp

This summer, youth attending North Dakota 4-H Camp have a new opportunity for learning and recreation with the addition of a new pond for aquatic activities and programming.

The 1-acre pond allows youth to fish, kayak, canoe and swim.

"Campers are loving the opportunity to cool off on a hot day," says camp counselor, Brianna Mohs. "The pond gives kids a camp experience they won't forget."

North Dakota 4-H youth development staff are working on additional programming opportunities, including topics such as aquatic life, water quality, watersheds, conservation and ecosystems. Eventually, North Dakota 4-H plans to extend the camping and rental season to include winter months and activities such as ice fishing and ice skating.

The pond started as a dream of being able to offer aquatics programming without the added cost of transporting youth to another location. Last summer, a team of agents and specialists began working to develop a detailed proposal and secure funding.

After hours of research and writing, the team submitted their proposal to the AO1 Foundation and the North Dakota Game and Fish Department. Both organizations recognized the potential impact for North Dakota youth and supplied a significant portion of the funding for the project.

With funding secured, the North Dakota 4-H Camp partnered with Scott Elstad, aquatic habitat supervisor with the North Dakota Game and Fish department, to make the dream a reality. Elstad helped ensure the pond would be successful by determining the best location, proper slopes and other details.

"We are grateful for the support of all those involved from design and construction expertise to financial contributions," says Leigh Ann Skurupey, North Dakota 4-H Youth Development assistant director. "Thank you especially to the AO1 Foundation, the North Dakota Game and Fish Department and the North Dakota 4-H Foundation for seeing the opportunity to invest in exciting experiences for our future leaders."

The pond will also be available to outside groups renting the camp facilities throughout the year.

FOR MORE INFORMATION:

<https://www.ndsu.edu/agriculture/extension/extension-topics/4-h-youth-development/camps>

Leigh Ann Skurupey, 701-231-7253, leighann.skurupey@ndsu.edu
To book the North Dakota 4-H Camp for your next event, contact Mark Lemm at 701-460-0145.





Partnership Brings Opportunities for Collaboration on Fort Berthold

Nueta Hidatsa Sahnish (NHS) College and NDSU Extension joined together to open a new greenhouse and community garden at the NHS College Four Sisters Gardens in New Town, North Dakota.

The new greenhouse facility will be used by NHS College and NDSU Extension staff for educational programming as a part of their land-grant mission. The improvements to the community garden will increase their capacity to teach youth and adult audiences about Native agriculture, gardening and how to incorporate fresh fruits and vegetables in their diets to address food-related diseases such as diabetes and obesity. Additionally, Fort Berthold residents will be able to use the community gardens to grow their own fresh produce.

“The Mandan Hidatsa Arikara Nation’s culture and lifeways were deeply and intrinsically tied to land and agriculture, and I’m so pleased to be able to continue that legacy with modern methods that adapt and respect our traditional values,” says Twyla Baker, president of NHS College. “This is a great partnership that I believe will be of benefit to so many students and community members moving forward.”

NHS College and NDSU plan to collaborate on a soil health research program on the impact of soil health on nutritional quality of vegetables. The program will incorporate educational opportunities led by NHS College and NDSU Extension educators for NHS students, local schools, 4-H clubs, families and the community.

“Healthier soils lead to more nutritious food, which leads to healthier people,” says Rebecca Hager, NDSU Extension agent in Fort Berthold who will help lead educational programming.

“From research to education, this program is a truly collaborative effort,” says Hager.

The greenhouse and community garden project was funded by a \$112,410 subaward from NDSU Extension to NHSC as a part of a Federally Recognized Tribes Extension Program (FRTEP) grant. FRETP is administered by the U.S. Department of Agriculture’s National Institute of Food and Agriculture.

FOR MORE INFORMATION:

<https://www.facebook.com/NHSCHolisticGardening>
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The collaboration is a soil health research program on the impact of soil health on nutritional quality of vegetables.



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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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Precision Agriculture Team Develops Multifunctional Robotic Platform

What do you get when you combine 20 undergraduate students, three years of weekly meetings and a vision to create the future of precision agriculture?

You get the multifunctional robotic vehicle system in precision agriculture, says Xin (Rex) Sun, NDSU Agricultural and Biosystems Engineering (ABEN) assistant professor.

In 2019, Sun had a goal to build a robotic vehicle that had multiple precision agriculture capabilities, but he knew he could not build it alone. After reaching out NDSU ABEN senior design instructors Tom Bon and Brian Gregor about how students in the senior design course could help, 20 students have now brought their ideas and enthusiasm to the project over the last three years.

"The robotic platform's first stage of use is to collect various formats of weed imagery sensor data, and then eventually use Artificial Intelligence and robotic technologies to perform site-specific weed management functions with a smart sprayer boom," says Sun.

"The vision for the vehicle also potentially includes automatic collecting of soil samples and a smart weather station. We hope this could be the prototype for similar robotic systems to help farmers scout crops, detect disease, spray weeds and reduce labor-intensive work."

While Sun is excited about the future direction of the multifunction vehicle for precision agriculture use, he is just as excited about the opportunities it affords students for hands-on learning.

"If we can provide students with opportunities to use their strengths and ideas in a real-world setting, they'll be better prepared to help direct the future of agriculture technology on their own farms or in their careers," adds Sun.

The robotic platform research is funded through a U.S. Department of Agriculture-ARS project.

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