SPECIALTY CROP BLOCK GRANT PROGRAM

FISCAL YEAR 2024 AWARDED PROJECTS

NORTH DAKOTA DEPARTMENT of AGRICULTURE

Agriculture Commissioner
Doug Goehring

TABLE OF CONTENTS

A Letter from the Commissioner

Greetings,

Agriculture Commissioner DOUG GOEHRING

The North Dakota Department of Agriculture is pleased to support the specialty crop industry in the state through specialty crop block grants.

The USDA defines specialty crops as "fruits and vegetables, tree nuts, dried fruits, horticulture and nursery crops." Specialty crops grown commercially in North Dakota include dry beans, dry peas, lentils, potatoes, confection sunflowers, grapes, honey and various vegetables.

Projects that enhance the competitiveness of specialty crops in ND are eligible for these grants.

Eligible applications include enhancing food safety; pest and disease control; developing new and improved seed varieties and specialty crops; and increasing child and adult nutrition knowledge and consumption of specialty crops. Projects that directly benefit specific, commercial products or profit a single organization, institution or individual are not eligible.

North Dakota receives funds based on a grant allocation formula that is based on the average of specialty crop cash receipts and specialty crop acreage in the state.

The North Dakota Department of Agriculture has been administering the Specialty Crop Block Grant Program since 2007. Since then, we have administered a total of 298 grants and have received more than $36 million in funding through the past 20 annual funding opportunities; and an additional 28 grants and $4.3 million in additional one-time funding through H.R. 133, the Consolidated Appropriations Act of 2020.

We encourage organizations, institutions and individuals to submit proposals on their own or in partnerships during open application periods. Questions may be directed to Jonathan Leonard at 701-328-2191 or scbg@nd.gov.

Thank you for your interest in specialty crop block grants.

Sincerely,

Doug Goehring
Agriculture Commissioner

ABOUT PROGRAM

The purpose of the Specialty Crop Block Grant Program (SCBGP) is to enhance the competitiveness of specialty crops. Specialty crops are defined as "fruits, vegetables, tree nuts, dried fruits, horticulture, and nursery crops (including floriculture)."

The Food, Conservation, and Energy Act of 2008 (Farm Bill) amended the Specialty Crops Competitiveness Act of 2004. Under the amended Act, the Secretary of Agriculture is directed to make grants to states for each of the fiscal years 2008 through 2012 to be used by state departments of agriculture to enhance the competitiveness of specialty crops. The American Taxpayer Relief Act of 2012 provided funding for fiscal year 2013, section 10010 of the Agricultural Act of 2014 provided funding for fiscal years 2014 through 2018 and section 10107 of the Agriculture Improvement Act of 2018 will provide funding for fiscal years 2019 through 2023.

To be eligible for a grant, the project(s) must "enhance the competitiveness of U.S. or U.S. territory grown specialty crops in either domestic or foreign markets." Projects must also benefit more than one commercial product (e.g., ABC Company brand), organization, or individual.

Examples of enhancing the competitiveness of specialty crops include, but are not limited to: research, promotion, marketing, nutrition, trade enhancement, food safety, food security, plant health programs, education, increased consumption, increased innovation, improved efficiency and reduced costs of distribution systems and environmental concerns and conservation.

Grant funds are not awarded to projects that solely benefit a specific commercial product. It will not benefit products that provide a profit to a single organization, institution, or individual. Grant funds cannot be put toward capital expenditures (equipment, buildings, land). They also may not be used to make improvements to capital assets that materially increase their value or useful life. Each project funded through the Specialty Crop Block Grant Program will be carried out over a two-year timeframe. The Specialty Crop Block Grant Program is funded through the United States Department of Agriculture's Agricultural Marketing Service.

Number of Grants Awarded to the North Dakota Department of Agriculture: 2
Number of Sub-Awarded Projects: 19
Amount of Funds Awarded: $3,380,166.13

These following funding breakdowns are for annual funding:

2024 funding from the Farm Bill (fiscal year 24-27):

21 Projects	$3,131,458.34
Direct	$207,353.91
Indirect	$41,353.88
Total	$3,380,166.13

For more information, please visit the program's website at https://www.ndda.nd.gov/scbgp.

SCBGP STAFF

JOHN F. SCHNEIDER
Business, Marketing & Information Division Director

HEATHER LANG
Ag Business Development Coordinator

JONATHAN LEONARD
Ag Marketing & Development Specialist

PROJECTS FUNDED IN 2024

Checking potatoes in a research field

DEVELOPMENT OF QPCR TO DETECT GLYPHOSATE IN POTATO PLANTS QUICKLY

North Dakota State University (NDSU)
Andrew Robinson, Fargo

Project Budget: $106,444

North Dakota State University will collaborate with the USDA ARS to develop a qPCR method to detect glyphosate in potato leaves and tubers. This will provide quick diagnosis and save seed growers and commercial growers potentially millions of dollars by providing rapid and accurate detection. Glyphosate-resistant crops abound in North Dakota, making the probability of potatoes being exposed to glyphosate high. Glyphosate reduces yield, can make tubers unsaleable, and stores in seed tubers of mother plants. When seed tubers are contaminated with glyphosate, they can lose certification or when planted back cause poor emergence and yield loss. Current methods for glyphosate analysis take two to four weeks to get results. The objective of this project is to develop an aptamer for qPCR analysis that can be used in the field to detect glyphosate in the same day it is sampled or at a laboratory. This will enable potato growers and seed certification to make rapid decisions on managing the crop. At the end of this project, it is expected to have developed a qPCR method for potato tissue that can be utilized in the field or lab.

FIGHTING TWO PHASES OF BLACK DOT DISEASE OF POTATOES

NDSU
Julie Pasche, Fargo

Project Budget: $110,584.80

NDSU potato pathologists will establish baseline sensitivity to QoI and SDHI fungicides in Colletotrichum coccodes, causal agent of potato black dot, and determine if a shift has occurred to these fungicides. The second objective will work towards understanding the relationship between plant colonization by C. coccodes, and tuber blemish severity. Increased stem colonization results in higher pathogen propagules returned to the soil to infect future crops. The foliar phase of black dot can result in premature senescence, reducing total and marketable yield. Tuber black dot symptoms include gray skin discoloration that reduce market value of fresh product and

make processed product difficult to peel. Finding genetic resistance and other management practices that affect both disease phases will be the most effective way combat losses to this disease.

MOLECULAR TESTS TO SUPPLEMENT NORTH DAKOTA'S CERTIFICATION PROGRAM AND FIELD DETECTION OF BACTERIAL BLIGHT PATHOGENS IN DRY, EDIBLE BEAN

National Agricultural Genotyping Center
Zack Bateson, Fargo

Project Budget: $154,818.85

Seedborne diseases, such as bacterial blights, are top threats to production that drive pest management decisions for growers of dry, edible bean (Phaseolus vulgaris). The diagnostic laboratory within the North Dakota State Seed Department (NDSSD) uses a traditional bioassay in their seed certification program to evaluate blight risk of seed submitted for next year's crop. To upgrade their in-house diagnostic capability for blight, the NDSSD has partnered with NAGC to validate a molecular test and supplement the current bioassay test. The integration of a molecular test at both diagnostic laboratories will: 1) strengthen the seed certification program at NDSSD and 2) make new diagnostic tests available to researchers, agronomists, and growers through NAGC's testing services.

A National Agricultural Genotyping Center testing panel

NORTH DAKOTA SPECIALTY CROP OUTREACH AND EDUCATION SERIES

North Dakota Department of Agriculture
Katrina Hanenberg, Bismarck

Project Budget: $138,113.44

The North Dakota Department of Agriculture (NDDA) will focus on outreach and education to promote specialty crops through a variety of channels. Using a farmers market video campai and student specialty crop recipe kits; we hope to target North Dakota populations that need a better understanding of the economic impacts and health benefits of specialty crops. While showing the importance of purchasing specialty crops from local farmers markets. Additional focus will be on educating producers to develop their businesses through food safety, promotion, and better growing practices. Supporting producer knowledge will also increase public support and sales of specialty crops.

GENOTYPING PANEL TO EXPLORE HOST GENETICS, PATHOGEN DIVERSITY, AND COLONY FITNESS WITHIN BEEKEEPING OPERATIONS AND BREEDING

National Agricultural Genotyping Center
Zack Bateson, Fargo

Project Budget: $257,800.50

The National Agricultural Genotyping Center (NAGC) aims to increase the accessibility of

genetic tools for the beekeeping industry. This project builds a SSR genotyping panel to measure genetic diversity within breeding populations of honey bees and validates a rapid genotyping test for the target-site mutation leading to amitraz resistance in the major pest, Varroa destructor. Together with NAGC's comprehensive pathogen panel, instrumentally inseminated queen cohorts will be monitored to investigate the relationships between host genetic diversity and pathogen dynamics within a closed mating system.

IMPROVING MANAGEMENT RECOMMENDATIONS FOR THREE ECONOMICALLY IMPORTANT DRY EDIBLE BEAN DISEASES

NDSU

muel Markell, Fargo

Project Budget: $131,292.60

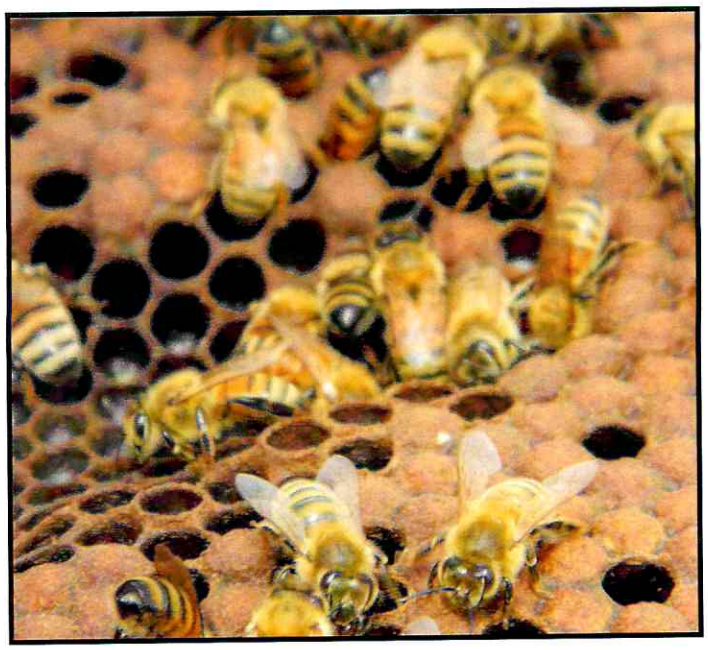
The department of plant pathology at North Dakota State University will mitigate the economic losses that dry edible bean growers experience due to Fusarium root rot, Rhizoctonia root rot and common bacterial blight by evaluating the efficacy and economic viability of seed and foliar applied fungicides and chemical products, developing or modifying management recommendations, and disseminating the results to stakeholders through grower meetings, field days, publications and media partners.

ADVANCING PEA SEED QUALITY ANALYSIS: HARNESSING HYPERSPECTRAL IMAGING AND MACHINE LEARNING FOR PRECISION AGRICULTURE

NDSU

nwei Xu, Fargo

Project Budget: $124,818



North Dakota bees

North Dakota State University (NDSU) is spearheading a groundbreaking project to advance the quality analysis of pea seeds within the agricultural sector. The project's ultimate aim is to develop a user-friendly machine-learning tool capable of predicting the functional properties of pulse ingredients, leveraging detailed genetic and environmental data. By utilizing advanced hyperspectral imaging (HSI) technology combined with machine learning, the project is set to deliver a pilot-scale predictive library for the functional properties of pea ingredients, alongside a validation of these properties through traditional wet chemistry methods. Key activities include meticulous data collection, the development of HSI scanning protocols, and rigorous training and testing of machine learning algorithms. The project will also comprehensively assess the impact of genetic and environmental factors on pea seed quality. Anticipated outcomes include substantial benefits for pea growers and processors, as well as the wider agricultural industry. This initiative aims to improve pea seed quality assessment significantly, fostering the development of superior pea varieties. Such advancements promise to boost the efficiency and profitability of

the industry, marking a significant leap forward in the realm of precision agriculture.

POLYPLOID INDUCTION FOR STERILITY BREEDING OF ORNAMENTAL TREES AND SHRUBS

NDSU
Todd West, Fargo

Project Budget: $63,090

Many woody plants are well adapted for the harsh growing environment of North Dakota. Unfortunately, with non-native plants, there is a risk of invasiveness. Examples of this include Siberian elm and common buckthorn. Both plants are well adapted for growing in very difficult places but are considered to be highly invasive. Woody plant research has reacted to this issue utilizing sterility breeding. This results in new cultivars that are not considered invasive and are allowed to be utilized by the commercial nursery and landscape industry, even in states where they are banned. Sterility breeding through polyploid induction has become a primary focus of many woody plant improvement programs across the United States. This project purpose is to induce, or develop, polyploids of several different woody trees and shrubs that are well-adapted to North Dakota. These tetraploids will be utilized for future breeding efforts to produce sterile cultivars to be used in the North Dakota nursery and landscape trade. This goal aligns with the NDDA research priority of "investing in specialty crop research, including research to focus on conservation and environmental outcomes."

Siberian elm

MOLECULAR APPROACHES TO IMPROVE CHICKPEA TOLERANCE TO FUSARIUM ROOT ROT

NDSU
Malaika Ebert, Fargo

Project Budget: $134,106

Plant breeders and plant pathologists of North Dakota State University will work together to investigate chickpea resistance to different Fusarium species. Furthermore, we will investigate the molecular aspects of how ND-native Fusarium spp. may be used as biocontrol agents.

DEVELOPMENT OF STONE MILLING OPERATION FOR FIELD PEA AND PROCESSING OF FLOUR FOR ENHANCED FUNCTIONALITY

NDSU
Amrita Ray Fargo

Project Budget: $44,285

Northern Crops Institute would potentially improve market demand for pea farmers by developing stone milling technology for production of pea flour and subsequent processing for flour to improve functionality.

North Dakota field peas

OPTIMIZING NITRIC OXIDE-BASED TREATMENT STRATEGY TO IMPROVE SUBERIZATION OF WOUNDED AND CUT SEED TUBERS

USDA-ARS Sugarbeet and Potato Research Unit
Munevver Dogramaci, Fargo

Project Budget: $112,405

Potato Research Program of USDA-ARS, Fargo, North Dakota will establish an agreement with the North Dakota Department of Agriculture to advance research on optimizing nitric oxide (NO) based treatment strategy to improve wound healing (WH) of bruised whole tubers in storage and cut seed pieces prior to the planting. Unintentional wounding of whole tubers can happen during harvest, transportation, or handling in the storage, contributing to significant post-harvest losses. Furthermore, as a common agronomic practice, seed tubers are generally cut into pieces and planting these pieces with open wound surfaces, which makes them susceptible to decay in the field. Both unintentional and intentional wounding of whole or cut seed tubers lead to significant economic losses. Therefore, finding an effective WH strategy to accelerate the formation of protective layer in wounded and cut surface of potato tuber is important to reduce wound-associated losses. We recently observed a positive impact of exogenous NO treatment on improving WH responses of potato tubers. However, the WH responses of potato tuber to NO treatment is dose specific and need further optimization. Additionally, for the utilization of the NO-based treatment strategy towards potato industry, it is essential to investigate its impact on other factors critical for protecting post-harvest storage quality and crop performance in the field. Therefore, the aim of this proposed research is to investigate the effect of optimized NO-based WH treatment on dormancy and sprouting of whole tubers in storage and performance of cut seed pieces in the field as part of optimization process.

DIRECT TUBER TESTING OF POTATO AS AN ALTERNATIVE METHOD TO HAWAII POST-HARVEST TESTS

ND State Seed Department
Presley Mosher, Fargo

Project Budget: $78,957.17

The North Dakota State Seed Department (NDSSD) will support potato production in North Dakota by evaluating direct tuber testing as an alternative Potato Virus Y (PVY) detection method to Hawaii Post-Harvest Tests. PVY is the disease of central importance to seed potato certification programs throughout the United States. Visual inspection and serological testing of leaves have become industry standards for detection of PVY in Post-Harvest Tests. However, there is increased interest in direct tuber testing using polymerase chain reaction (PCR) as an alternative detection method.

FIELD TO FORK: EXPANDING KNOWLEDGE AND USE OF SPECIALTY CROPS AMONG ADULTS AND CHILDREN

NDSU
Julie Garden-Robinson, Fargo

Project Budget: $97,050.40

North Dakota State University Extension specialists, faculty and staff from at least 25 counties and external local, state and regional partners will enhance knowledge and safe food handling of specialty fruit and vegetable crops from field to fork. This project addresses three SCBGP issues related to enhancing the competitiveness of specialty crops: 1) enhancing food safety, 2) improving the capacity of all entities in the specialty crop distribution chain to comply with FSMA, GAP, etc. and 3) increasing child and adult nutrition knowledge and consumption of specialty crops. We will work with researchers on the NDDA priorities: disseminating information about pest control and specialty crop varieties (vegetables, herbs). The project will create new educational specialty crop materials targeting both youth and adults. Through the development of curricular materials such as Extension publications, lesson plans and presentations, information releases, displays and presentations, participants will increase their knowledge of specialty crops. As a result of partnerships with the NDDA, NDSU, University of Minnesota and Iowa State University faculty and specialists, farmers markets and growers, the project will offer face-to-face workshops, webinars for growers, small food businesses (including GAPs, FDA acidified food regulations), agricultural water, biological soil amendments, domesticated and wild animals, and worker health and hygiene. The project will increase knowledge and consumption of North Dakota specialty crops through educational programs for children in 4-H programs and schools, including school gardens, related to North Dakota specialty crops.

EXPLORING THE IMPACT OF POTATO GENETIC VARIABILITY ON RHIZOSPHERE MICROBIOME DYNAMICS

NDSU
Julie Pasche, Fargo

Project Budget: $259,361.60

The potato breeder and pathologist from North Dakota State University and the breeder from the University of Minnesota will work to determine the role of host genetics on microbe recruitment from the soil, specifically as it is associated with Verticillium wilt severity. A population of 210 genotypes was generated from a cross between Dakota Trailblazer and Verticillium wilt susceptible Russet Norkotah. This population is segregating for reaction to Verticillium wilt and is currently being studied to determine the genetics of the resistance carried by Dakota Trailblazer. Our goal is to identify microbial groups associated with resistance to Verticillium wilt. However, in the future the research proposed here has the potential to result in identifying regions in the potato genome associated with recruiting beneficial microbes, eventually leading to the

Bean rust

Company demo at the 2024 Americas Food and Beverage Show in Miami, FL

development of molecular markers for microbial recruitment. Additionally, results may help explain the Verticillium resistance in Dakota Trailblazer, and other lines in the NDSU breeding program, in the absence of the common genetic marker for resistance. This proposal is the first step in investigating the potential of this novel research area in improving potato production.

PATHOGEN PREVALENCE, HOST RESISTANCE, AND ECONOMICS OF BEAN RUST RESISTANCE VIA GENETICS AND FUNGICIDE EFFICACY

NDSU
Upinder Gill, Fargo

Project Budget: $ 150,048

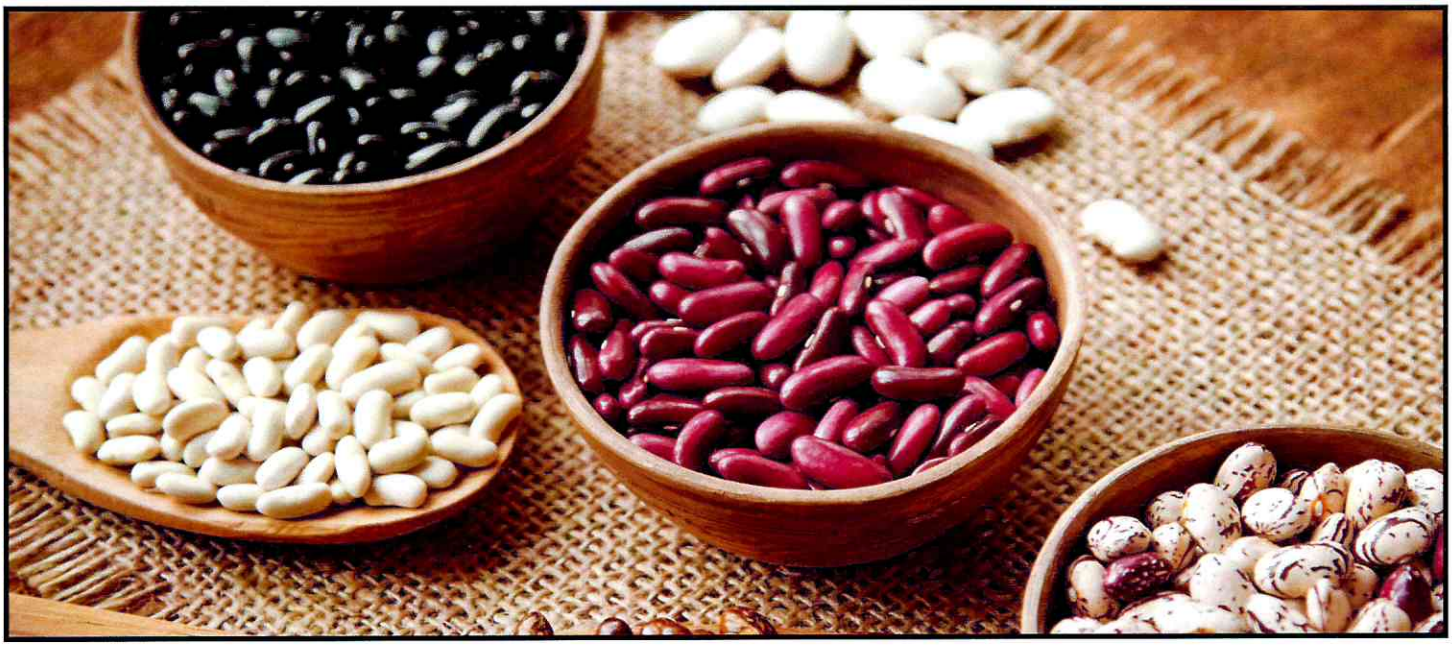
Rust is one of the most significant diseases of dry beans in the Northarvest region. A comprehensive management strategy to protect dry bean yield losses includes understanding the pathogen races in the region, fungicide application, and deploying host resistance in cultivars. The prevalence of rust in the region will be studied by conducting disease surveys. Any changes in virulence or development of infectious rust races will be examined via classical and genomics tools, including DNA sequencing. To study the economics associated with using rust-resistant bean cultivars and fungicide applications, field trials will be established at two locations each year. The project will support the development of new rust-resistance cultivars and generate new knowledge about the economics of host resistance in relation to fungicide and/or biological applications. The project activities will improve the economic returns to North Dakota dry bean growers.

INTERNATIONAL AND DOMESTIC PROMOTION OF NORTH DAKOTA SPECIALTY CROPS

North Dakota Department of Agriculture
Shanna Johnson, Bismarck

Project Budget: $300,000

The North Dakota Department of Agriculture (NDDA) will partner with local and regional specialty crop companies, producers, processors, and producer associations to increase promotion



Assorted dry beans

and sales of specialty crops. NDDA will provide two North Dakota companies the opportunity to exhibit at four trade shows: (1) Expo West in Anaheim, CA in March, (2) National Restaurant Show in Chicago, IL, in May, (3) the Summer Fancy Food Show in New York, NY in June, and (4) Americas Food & Beverage Show in Miami, FL in September. Additionally, we will provide North Dakota companies the opportunity to participate in one trade mission to Taiwan in fall of 2024. This gives companies the potential to grow the consumption of North Dakota specialty crops both domestically and internationally.

DIGGING DEEPER IN POTATOES BY DEVELOPING AN ELECTRONIC POTATO STORAGE BOOK

NDSU
Andrew Robinson, Fargo

Project Budget: $70,070

North Dakota State University Extension Potato Agronomy program will develop an electronic potato storage book complete with photo galleries, research data and other information that will assist potato growers in storing potatoes to improve management decisions. The electronic book will be accessible online with a computer or smart phone. We expect potato growers to be able make more accurate and quicker decisions that will enable them to improve storages and profitability. The book will include information on best practices to store potato tubers. We will develop the text, organize previous taken pictures, and provide links to previous research articles and Extension articles for specific topics in the book. This will allow potato growers to be able to dig as deep as they desire in a subject and gain the knowledge they need and not have to questionably search the internet. Once this framework is built for the electronic book, we will be able to continue to build upon it with more pictures, data, and links to articles on specific topics.

INCREASING BIOLOGICAL NITROGEN FIXATION IN DRY BEANS BY USING NEW HYDROGEN-RECYCLING RHIZOBIUM STRAINS

NDSU
Juan Osorno, Fargo

Project Budget: $199,700

The NDSU dry bean breeding program will promote sustainable bean production by developing breeding lines that either maintain or increase their productivity under a combination of reduced application of nitrogen fertilizer plus efficient N-fixing strains of Rhizobium. Improving SNF capacity and reducing the use of nitrogen fertilizers provide an opportunity to enhance the position of the US dry bean sector as an environmentally sustainable food and plant protein source. The availability of ...wer high-throughput genotyping techniques ...ows the identification of critical genomic regions controlling important agronomic traits. This project aims to i) breed dry beans that fix more N2, ii) compare the nodulation ability of the NDSU dry bean breeding germplasm in non-inoculated plants vs. Hup+ bean rhizobial strains under greenhouse conditions, and iii) validate and identify genomic regions associated with nodulation and SNF abilities and develop molecular markers for genetic improvement of SNF in dry beans.

INTEGRATED ROOT ROT MANAGEMENT IN FIELD PEAS WITH PLANTING DATE, SEED TREATMENT, AND TOLERANT VARIETIES

NDSU Carrington Research Extension Center
Michael Wunsch, Carrington

Project Budget: $97,817.48

...e NDSU Carrington Research Extension Center seeks to conduct field research and outreach to stakeholders on improving management of Fusarium and Aphanomyces root rots and

Freshly harvested potatoes at a research plot

Fusarium wilt in field peas, diseases that are serious constraints on field pea production in North Dakota. The project will evaluate the integrated use of early planting, fungicide seed treatment, and tolerant varieties for management of Fusarium and Aphanomyces and will assess the stability of disease tolerance across fields. Extended crop rotation intervals improve disease management but are insufficient as a stand-alone management tool. Early planting before soil temperatures become favorable for Fusarium and Aphanomyces combined with fungicide seed treatment has increased yields by an average 7 to 14 bu/ac in field trials, and recent findings suggest that an additional 10 to 20 bu/ac can be gained with selection of less susceptible varieties. No varieties are resistant to Fusarium and Aphanomyces root rots but some are more tolerant, and this tolerance should be stable across fields. Some varieties carry resistance to specific races of Fusarium oxysporum wilt, the impact of which is dependent on the races of the pathogen in a field. Diagnostic laboratory testing combined with disease symptom expression will be utilized to characterize the basis of differences in disease susceptibility. Nine commercial field

pea varieties will be evaluated with and without fungicide seed treatment across multiple planting dates in two fields in Carrington and at an on-farm site in west-central North Dakota, with testing conducted in fields with elevated Fusarium and Aphanomyces pressure.

GLOBAL GROWTH OPPORTUNITIES FOR NORTH DAKOTA SPECIALTY CROP PRODUCERS AND PROCESSORS

North Dakota Trade Office
Amanda Nordick, Fargo

Project Budget: $388,695.50

The North Dakota Trade Office (NDTO) will create and expand opportunities for ND Specialty Crop Companies to showcase and establish their products in the global market. This will be accomplished by:

1. Exhibiting at three prominent global tradeshows, each with its own unique opportunities for growth and global exposure. Gulfood, hosted in Dubai, UAE, in February 2025, is the largest annual food event serving as a gateway to the emerging Middle East and North Africa regions. FoodEx Japan in March 2025 will be an excellent opportunity for Asian market access for ND producers and processors. In Germany, the Anuga Tradeshow in the October 2025 is an opportunity to support companies in European markets. Each show promises growth potential for the up to 16 ND companies anticipated to exhibit.

2. A Reverse Trade Mission hosted by the NDTO will highlight the region's specialty crop producers and processors. The attendees will include potential buyers from Taiwan and Vietnam. Hosting buyers builds upon relationships and will work towards cementing trust and business partnerships for the future. Similar agendas included nine stops throughout the state to visit and understand the region's unique landscape, quality products, and ND hospitality.

3. Individual-focused sales trips are an additional opportunity for specialty crop companies to build relationships on promising opportunities in an individualized market of their choice.

Each of these activities is designed to promote maximum exposure and foster positive business growth through increased awareness of ND specialty crops.

Lentil field

Green pea flour and green split peas

INCREASING PULSE-BASED FIBER UTILIZATION IN FOODS BY UNDERSTANDING ITS NUTRITIONAL AND FUNCTIONAL PROPERTIES

NDSU
Bingcan Chen, Fargo

Project Budget: $112,000

North Dakota State University will explore the potential applications of ND pulse grain based dietary fiber (DF) in the food systems to benefit both consumers and growers. The aim of this project is to help fill the current Fiber Intake Gap, a deficiency between current and recommended fiber consumption by using pulse grains (dry pea and lentil) based DF as functional ingredients in food systems. Research approach will utilize various milling techniques to mill seed hull and dehulled kernels and the milling parameters will be recommended for application in real practices. The DF will be extracted, purified, and fractionated from these two streams. The source, variety, and milling/micronization methods on the composition and physical structure of ND pulse grain based dietary fiber will be determined. The functional properties and physiological effects of these DF fractionations will be evaluated. The relationship between structure and functionality of fractionated dietary fibers will be established, which is essential for the successful application and utilization of ND pulse grain based dietary fiber as functional ingredients in various foods. Performing this research will generate valuable information to promote the utilization of pulse grains in the food industry, as well as assisting in raising consumer's awareness of pulse consumption. The accomplishment of this project will in return increase the profitability and competitiveness of ND pulse growers and promote a healthy local food system. The research findings will be shared with diverse audiences including pulse growers, processors, consumers, industrial professionals through publications, and conferences, web pages, workshops, etc.

NORTH DAKOTA DEPARTMENT OF AGRICULTURE
600 E. Boulevard Ave., Dept. 602
Bismarck, ND 58505-0020
701-328-2191
800-242-7535
FAX 701-328-4567
www.ndda.nd.gov/scbgp
scbg@nd.gov