

AGRICULTURAL PRODUCTS UTILIZATION COMMISSION

GRANT REPORT 2021-2022



Agriculture Commissioner
Doug Goehring

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ADMINISTRATION

APUC COMMISSIONERS



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Commissioner's Appointee



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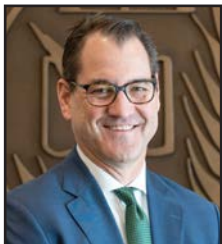
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Governor's Appointee



DOUG GOEHRING
Agriculture Commissioner



DAVID COOK
NDSU President



KEVIN SONSALLA
Commerce Designee

The North Dakota Agricultural Products Utilization Commission (APUC) consists of nine board members. The Agriculture Commissioner appoints five members and the Governor appoints one member.

The board also includes three statutory members: the North Dakota Agriculture Commissioner, the Director of the Department of Economic Development & Finance, and the President of North Dakota State University, or their designees.

APUC STAFF



JOHN F. SCHNEIDER
Business, Marketing
& Information Division
Director



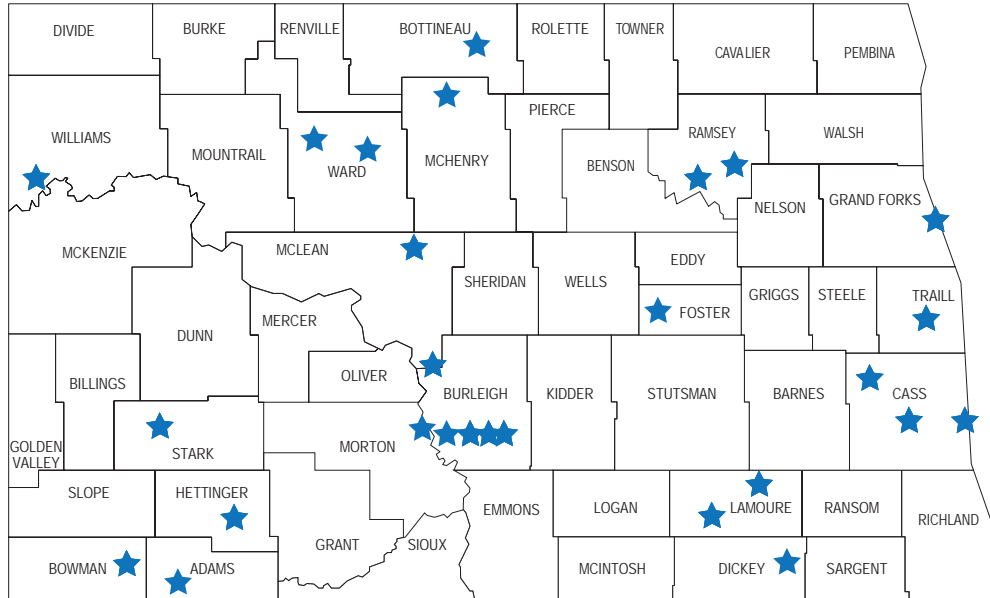
BRADLEY DEAN
Administration



BETTY SCHNEIDER
Administration

PROJECT MAP

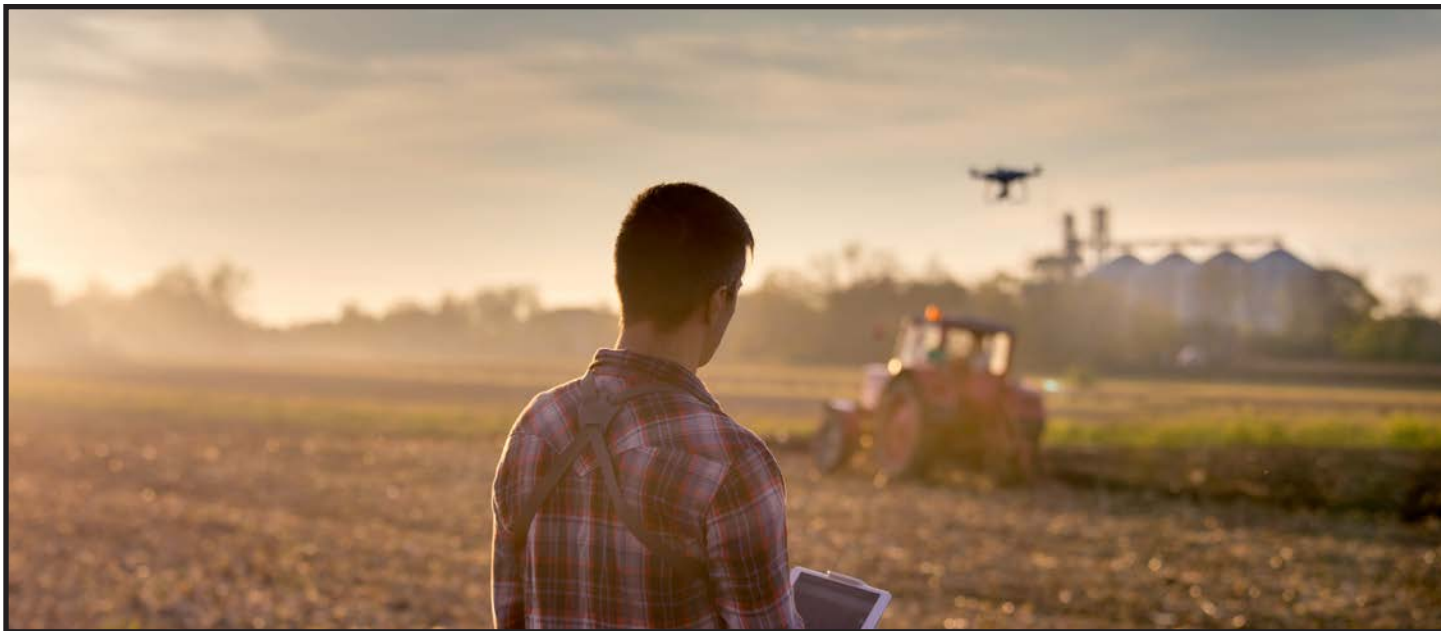
Between December 2020 and December 2022, APUC funded 55 projects in 27 North Dakota communities or statewide, totaling over \$4 million in grants and sponsorships.



APUC is a program within the North Dakota Department of Agriculture.

- Berthold - Genesis Seed Solutions
- Bismarck - Burnt Creek Events
- Bismarck - Homeland Hempcrete
- Bismarck - My Joy Bakery LLC
- Bismarck - North Dakota Dept. of Agriculture
- Bottineau - Pride Dairy Inc.
- Carrington - NDSU Carrington Research Extension Center
- Casselton - Tharaldson Ethanol Plant I LLC
- Casselton - Chapul Farms (2)
- Casselton - Great Plains Greens
- Devils Lake - Aasmundstad Farms
- Devils Lake - CoJack Snack and Pack LLC
- Dickinson - Key-Lix LLC
- Edgeley - Butchers Edge, LLC
- Fargo - 701x Inc.
- Fargo - National Agricultural Genotyping Center
- Fargo - Valley Fiber Processing
- Fargo - NDSU Dept. of Agriculture and Biosystems Engineering (2)
- Fargo - NDSU Dept. of Microbiological Sciences, Dept. 7690
- Fargo - NDSU Dept. of Coatings and Polymeric Materials, Dept. 2760 (2)
- Fargo - NDSU Dept. of Plant Sciences
- Fargo - Prototype Garage, LLC
- Grand Forks - NHS Investments, LLC
- Grand Forks - Red River BioRefinery LLC
- Grand Forks - UND Dept. of Mechanical Engineering (2)
- Grand Forks - Vertical Malt
- Grand Forks - SafetySpect Inc.
- Hettinger - Texas Bee Supply, LLC
- Hillsboro - Agassiz Sustainable LLC
- Mandan - North Dakota Rural Electric Cooperative Foundation
- Marion - Enger Grain & Livestock
- Max - Guardian Grains, LLC
- McKenzie - Black Leg Brewery, LLC
- Menoken - Glimpse of the Prairie
- Minot - Memories of Home by Becky LLC
- Mott - South 40 Farms LLC
- Mott - Merwin Quality Lamb LLC
- Oakes - Dyna-Flo Pump Co.
- Oakes - Hearthside LLC
- Page - InvisionIT LLC (2)
- Scranton - Scranton Equity Exchange
- Statewide - Cloud Agronomics Inc.
- Statewide - LandTrust, Inc.
- Statewide - BASS Genetics Inc.
- Southam - ND Flax Works LLC
- Sterling - Black Leg Ranch Meats
- Trenton - AIC Energy Corp. (2)
- Upham - 1481 Meats
- Wilton - Pearsons Green Acre Meats

BASIC & APPLIED RESEARCH



Agricultural drone

Basic & Applied Research Grants assist in research for processing agricultural products and byproducts in North Dakota. These grants cannot be aimed at business expansion or creation without regard to agricultural products, must not include research that cannot reasonably be expected to result in a marketable product, or cannot have been duplicated by other research efforts.

ND SOIL ORGANIC CARBON RESEARCH

Cloud Agronomics Inc.
James Kellner, Boulder

Grant Amount: \$93,531

Cloud Agronomics has developed a novel soil organic carbon quantification approach using the latest remote sensing and artificial intelligence technology. This project will help Cloud Agronomics localize that technology to the soils of North Dakota. Once localized, Cloud's technology will be used in a joint pilot program with ADM in North Dakota. Farmers and ranchers in North Dakota will be able to enroll their fields into the pilot, understand their baseline soil carbon, and see how that baseline changes over time. Cloud's technology vastly improves the cost and ease of participating in sustainability programs, creating a better experience for farmers and agribusinesses alike.

EVALUATION OF GROUND HYBRID RYE ON THE EFFICIENCY OF GAIN AND CARCASS TRAITS IN BACKGROUNDING AND FINISHING ND STEERS

NDSU Carrington Research Extension Center
Colin Tobin, Carrington

Grant Amount: \$27,966

Research comparing rye to other grains has been limited. Increases in rye production due to hybrid creation and changes in crop rotations has provided the ability to source rye, as grain, locally. Previous research has demonstrated dry-rolled rye is nearly equivalent to dry-rolled corn when fed up to 20% dry matter basis of the diet. Research is needed to determine the effects of hybrid rye as the sole grain source in comparison to corn in a backgrounding diet and as a partial replacement for corn in finishing diets. The proposed research could be very applicable for producers as it follows grain harvesting schedule

in the state of North Dakota.

DEMONSTRATE THE USE OF UAVS TO PLANT COVER CROP SEEDS

NDSU Department of Agriculture and Biosystems Engineering
John Nowatzki, Fargo

Grant Amount: \$53,753

The primary aim of this project is to demonstrate the feasibility of distributing multiple seed types for cover crops and erosion prevention, as well as conservation with woodland restoration, in North Dakota from unmanned aerial vehicles (UAVs). This is the first step in research to demonstrate the efficacy of this method of seed distribution, using a patented method for difficult-to-flow seeds. Follow-up research will prototype optimal methods for this distribution, by seed type, which will be used to test the germination and confirm the economics for the North Dakota farmer and land management specialist.



Soil sampling

TESTING NOVEL FOOD ANTIMICROBIALS ON TOMATOES

NDSU Department of Microbiological Sciences,
Dept. 7690
Birgit Pruess, Fargo

Grant Amount: \$47,620

To expand the foods that our novel food anti-microbial has been tested on and the ultimate goal of commercialization a patented new technology, NDSU will test the efficacy of ethyl acetoacetate against Salmonella on tomatoes. Tomatoes will be spot inoculated with bacterial suspensions of two Salmonella strains and washed with a solution of EAA in water. Bacteria will be enumerated on selective agar. The request to expand the collection of foods that we test our anti-microbial on was made by companies as part of our commercialization efforts.

A NOVEL SOYBEAN SORTING TECHNOLOGY FOR PRODUCING HIGH-QUALITY TOFU PRODUCTS

NDSU Department of Plant Sciences
Minwei Xu, Fargo

Grant Amount: \$38,299

This research project will focus on the core technology of a novel sorting machine, which could sort soybeans based on their physicochemical composition and improve the quality of final products, such as tofu in this project. Hyperspectral imaging (HSI) will be employed for profiling either whole or dehulled soybean seeds. The predictive model between HSI of soybean seeds and tofu quality, such as protein content, color, and texture, will be developed based on the multivariate and machine learning analysis. To verify, the individual soybean seeds will be sorted based on the predictive model for improving the quality of tofu.

This project will finally sort and grade soybean for different usage and result in a price range of different soybean seeds. The success of this technology would initiate a revolution in the sorting and grading system in the whole grain industry.

OPTIMIZING THE DRYING AND STORAGE CONDITIONS OF CANNABIDIOL HEMP GROWN IN ND

NDSU Department of Agriculture and Biosystems Engineering
Ewumbua Monono, Fargo

Grant Amount: \$35,462

Growing and processing hemp in North Dakota is still new and many farmers and processors lack suitable infrastructure, equipment, and processing information or data to help guide their practices and produce a consistent high-quality product. There are many different cultivars with different growing challenges. Selecting the best cultivars suitable for our ND climate is important. Studies have shown that the quality of hemp is sensitive to environmental conditions such as temperature, oxygen, and light. Since processing (harvesting and drying) of the hemp is usually done in the fall after flowering and when temperatures may fluctuate greatly, it is important to study the best drying and storage conditions over a 1-year period. The expectation is that the results will provide science-based data to farmers and processors on how to manage the drying and storage processes, especially as they scale up their process.

BIO-BASED PRESSURE-SENSITIVE ADHESIVES FOR MULTISUBSTRATE APPLICATIONS

NDSU Department of Coatings and Polymeric Materials, Dept. 2760
Andriy Voronov, Fargo



Testing tomatoes

Grant Amount: \$43,693

The goal of this project is to employ soy and corn derivatives, including soybean oil- and corn oil-based vinyl monomers (SBM and CBM, developed at NDSU) in making biodegradable PSAs which can be applied for tapes, labels, graphics etc. in food packaging and/or medical industries. The long term goal is to provide soy-based biodegradable PSAs and test them at industrial partner facilities to evaluate perspectives of this new product commercialization.

CONVENTIONAL (NON-GMO) CORN HYBRID DEVELOPMENT

BASS Genetics Inc.
Patrick Baumgartner, Olivia

Grant Amount: \$53,662

BASS Genetics is expanding its testing focus on natural characteristics in corn, such as insect and drought tolerance, to continue to create highly competitive non-GMO hybrids to compete

with more expensive GMO corn and their traits. Bass Genetics will be combining these natural characteristics with tillage and other agronomic techniques, proven in numerous plot trials, to cover most any condition a farmer may have. This will give the farmer confidence and information to be more effective and economical in producing non-GMO corn on their farm. Non-GMO hybrids will open additional markets to the farmers as non-GMO demands grow worldwide.



Corn stalks and chaff (biomass)

DESIGN OF BIOMASS-BASED MATERIALS FOR INFRASTRUCTURE-BASED APPLICATIONS

UND Department of Mechanical Engineering
Surojit Gupta, Grand Forks

Grant Amount: \$56,089

North Dakota is an important source of biomass from different farm-based products like flax, sunflower, hemp, wheat etc. Currently, the excess farm waste is burnt which creates a different environmental issue. The aim of this proposal is design different types of infrastructure-

based materials which can be used for further commercialization. Currently, infrastructure-based materials are designed from Portland cement based compositions which also cause carbon emissions. The new generation of materials designed from biomass will sequester biomass in building-based products and increase the valuation of biomass which will give the esteemed farmers an additional source of income. In addition, different students will be trained in materials and manufacturing who will further enrich the productivity of the state.

EFFICIENCY AND SAFETY EVALUATION OF ENGINEERED AGROCHEMICAL DELIVERY SYSTEMS DERIVED FROM NORTH DAKOTA

NDSU Department of Coatings and Polymeric Materials

Mohiuddin Quadir, Fargo

Grant Amount: \$60,000

NDSU will develop a two-pronged nanotechnology-powered solution to control Sclerotinia fungi that is severely affecting canola plant across the state of ND and nation. We will use biopolymers, such as cellulose or lignin, derived from ND agricultural resources, to prepare bio-based nanoparticles. These particles will be engineered with chemical modalities that can sense and destroy fungi as they start inoculating the canola plant. Successful completion of the project will enable the development of an effective and innovative strategy to control Sclerotinia attack on canola plants and can be translated for other economic crops. Therefore, we anticipate that the proposed product will support growers of economic crops, thus supporting nation's agricultural products. Commercialization efforts will be mediated via ND Department of Commerce and APUC to find out suitable industry partners.

FARM DIVERSIFICATION



Whole wheat rotini

Farm Diversification Grants give priority to projects dealing with the diversification of a family farm to non-traditional crops, livestock, or on-farm, value-added processing of agricultural commodities. Traditional crops and livestock are generally defined as those that the North Dakota Agricultural Statistics Service maintains statistics on. The project must have the potential to create additional income for the farm unit.

LAKEVIEW BOERS

Aasmundstad Farms
Taylor Aasmundstad, Devils Lake

Grant Amount: \$16,209.77

Aasmundstad farms will diversify their operation with the addition of meat goats. The land utilized for raising the goats is currently unproductive land. Goats will assist in restoring the land as well as adding additional income to the farming operation. Initially, 30 does will be utilized with plans to grow the herd to 500 and produce 1,000 market kids per year.

BEEF CATTLE FINISHING BARN

Enger Grain & Livestock
Delray Enger, Marion

Grant Amount: \$23,361

Enger Grain and Livestock is expanding their livestock on feed with the construction of a new state-of-the-art finishing facility. The new facility will increase the capacity of the operation from 1,000 head of cattle to finish to 3,000 head of cattle to finish. The additional increase in capacity will add employment opportunities as well as other economic benefits to the community.

GUARDIAN GRAINS HERITAGE PASTA AND STONE MILL

Guardian Grains, LLC
Deanna Lozensky, Max

Grant Amount: \$40,372

Guardian Grains, in conjunction with Northern Crops Institute (NCI) and Tuttle Rural Innovation Center (TRIC), will develop two whole wheat pastas using 2 heritage wheat varieties: Rouge

De Bordeaux and Einkorn. These ancient whole grains can be easier to digest than pasta made from modern wheats. The pastas will be available through www.guardiangrains.com and select retailers across the state of North Dakota. The grains used in pasta production are grown using soil care principles and people can be assured that their purchase of these pastas will benefit our planet's health and human health. Consumers can actively support our climate by buying products that are produced using regenerative farming practices. In addition to pasta, Guardian Grains will offer fresh stone milled flour to the surrounding communities.

BLACK LEG BREWERY, LLC

Black Leg Brewery, LLC
Jay Doan, McKenzie

Grant Amount: \$66,000

Black Leg Brewery is developing a regional marketing strategy and longterm partnership with North Dakota State University and Learfield. This partnership will be directed specifically towards BISON beer and NDSU's agriculture program. A portion of all packaged products will be given to an educational scholarship fund towards NDSU's agriculture department. The grant funds will be directed to Norland International for their guidance and expertise in the beverage industry. Norland International is a world class leader in offering business solutions and producing state-of-the-art equipment for the beverage industry. Norland International's subsidiary company, American Beer Equipment, will offer their consulting services along with custom engineered design work. Their technicians will also train on key equipment during the start-up process as well as on-going strategies. Our product brand development will focus on healthier, finished products using North Dakota raw materials.

COMMERCIAL KITCHEN AND EVENT SPACE

Glimpse of the Prairie
Kara Winkler, Menoken

Grant Amount: \$90,000

Glimpse of the Prairie will build a facility on the farm to provide a commercial kitchen and event space. This project will allow for more foods made with local ingredients to be available to customers. Products will be sold at BisMarket farmer's market, on their website, BisMan Food Co-op, served at their events, and for catering events off the farm.

BLACK LEG RANCH MEATS

Black Leg Ranch Meats
Jayce Doan, Sterling

Grant Amount: \$20,000

Black Leg Ranch Meats provides premium beef and bison meat to consumers and businesses. The meat includes a variety of high-quality and custom cuts sourced from animals, raised for their entire lifespan, on their ranch, Black Leg Ranch. This project will help establish the branding of Black Leg Ranch Meats by developing resources to market their product through social media, YouTube, and printed materials.

MARKETING & UTILIZATION



North Dakota companies at the Americas Food and Beverage Show in Miami

Marketing & Utilization Grants provide necessary assistance to the research and marketing needs of the state by developing new uses for agricultural products and by-products, and by seeking efficient systems for processing and marketing these products. These grants are also used to promote efforts that increase productivity, provide added value to agricultural products, stimulate and foster agricultural diversification and encourage processing innovations.

FOOD GRADE PROCESSING AND PACKAGING EXPANSION

Genesis Seed Solutions
Harry Kassian Jr, Berthold

Grant Amount: \$79,577.25

Genesis Seed Solutions is seeking certification to be SQF, HCCP, Non-GMO and Halla compliant to expand their sales market access, allowing Genesis to sell directly into food grade processing facilities.

MY JOY BAKERY TUTTLE PROJECT

My Joy Bakery LLC
Prince Owusu, Bismarck

Grant Amount: \$15,000

My Joy Bakery will hire a consulting firm to

perform business planning and the launch of the new My Joy Bakery LLC commercial bakery operations in Tuttle, ND.

SCALING THE INDUSTRIAL HEMP SUPPLY CHAIN IN ND

Homeland Hempcrete
Matt Marino, Bismarck

Grant Amount: \$13,200

Industrial hemp is already being grown in North Dakota, but there are potentially millions of dollars being left in the field that could go directly to our farmers. Homeland Hempcrete is set to change that. The company has been building with hempcrete, a building product made from the hemp stalk, since 2019. They have transitioned to a manufacturing setting and are scaling the business to make it more feasible to justify the

cost of a processing facility for raw materials from farmers. A facility is planned in ND for this year. Homeland Hempcrete's target is to be able to buy at least 50% of the facilities capacity once they have established their production process.

DOMESTIC AND INTERNATIONAL PROMOTION OF NORTH DAKOTA AGRICULTURAL PRODUCTS

North Dakota Department of Agriculture
Kara Haff, Bismarck

Grant Amount: \$56,000

The North Dakota Department of Agriculture is offering a reimbursement project for North Dakota companies, producers, processors, and producer associations attending domestic trade shows and international trade missions marketing raw and value added agricultural products produced in North Dakota.

PRIDE DAIRY NOVELTY ICE CREAM MARKETING PROJECT

Pride Dairy Inc.
Kriss Allard, Bottineau

Grant Amount: \$100,000

Pride Dairy will implement a comprehensive brand strategy to build a foundation and direction for a renewed Pride Dairy identity and development of a brand for Pride Dairy's new product...an ice cream sandwich. Pride Dairy is moving deeper into the novelty ice cream niche, with the creation of their new ice cream sandwich. The ice cream sandwich is created with a specially created stroopwafel with flowing caramel. During years one and two, R&D work and sales discussion with resellers will be critical. By year three, Pride would like to be running the ice cream sandwich production line three times per month. This will add an additional 1.5 million

to their sales and add six positions within the business structure.

DISTILLERS CORN OIL CLEANUP PROJECT

Tharaldson Ethanol Plant I LLC
Rhan Carter, Casselton

Grant Amount: \$110,000

Tharaldson Ethanol is located in Casselton, ND, and would like to purchase manufacturing machinery, equipment, and engineering services for a distillers corn oil (DCO) cleanup project. This project will allow Tharaldson to purify their corn oil production to remove phosphorus and other components to meet the specs for renewable diesel. One-hundred percent of this final product will be sold to Dickinson Oil, a North Dakota Renewable Diesel Plant. This project, once completed, is estimated to bring an additional \$5,000,000 in revenue and annual expenses of \$900,000 each year. Tharaldson has not produced renewable diesel in its past, so this project will allow them to produce ethanol, as well as renewable diesel, for renewable fuels.

INSECT AG TECHNOLOGY APPLICATIONS TO NORTH DAKOTA ECONOMY

Chapul Farms
Patrick Crowley, Casselton

Grant Amount: \$52,000

This project is to accelerate the development of insect agriculture infrastructure to enhance the agricultural economy of North Dakota. The steps taken in this project will move from an initial feasibility analysis, to site and project specific design and engineering of an industrial scale insect farm. The premise of an insect farm is to use under-valued agricultural by-products as upstream feed inputs to the farm. The result is an expedition bio-processing of these materials

PROJECT SPOTLIGHT: PRIDE DAIRY



L to R: The refreshed branding for the signature Pride Dairy brand and the Oh! premium branding

Pride Dairy has been around since the 1930s and is the last small town creamery in the state of North Dakota. They have grown from making milk and butter to manufacturing and selling numerous products, including ice cream shakes, malts, caramels, syrups, toppings and signature dishes.

Owners Kriss and Tonya Allard needed a comprehensive brand strategy to build a foundation and direction for newly-developed products including ice cream sandwiches and ultra-premium pints, as well as a refresh of the signature brand. With funding from APUC, they partnered with The Good Kids brand studio to accomplish these goals, while keeping the history of Pride Dairy. The new Oh! brand for the ice cream sandwiches and ultra-premium pints embodies a timeless malt shop vibe in which its products are sure to dish out smiles with every serving. The refreshed Pride Dairy branding makes it easier for customers to identify the Pride Dairy brand and flavor no matter how the store displays it and the new cardboard packaging is more sustainable.

The new branding has been launched on social media and has been well received and loyal retailers are excited about it. Packaging is anticipated to be ready by end of January 2023.

The Allards' goals are to become a household name, not only in North Dakota, but in the upper Midwest. They are slowly growing outside state lines and hope to eventually become a national brand.



Owners Kriss and Tonya Allard inside their business Pride Dairy of Bottineau

into two products: 1) healthy fats and proteins (insect larvae), and 2) high-value soil fertilizer amendments (insect frass manure). Markets for both of these products exist in North Dakota and are supplied by international imports. This project is a model for sustainability, circular economies, and ag tech job creation in the state.

THE YEAR OF POPCORN AND BEANS

CoJack Snack and Pack LLC
Chase Engstrom, Devils Lake

Grant Amount: \$100,000

CoJack Snack and Pack is a farm to table North Dakota dry bean packaging company. CoJack will develop brand recognition for their bean and popcorn lines by utilizing OMNI marketing. They will also work with distributors to wrap vehicles. Additionally they will increase their social media marketing by creating digital ads.

KEY-LIX NORTH DAKOTA FACILITY

Key-Lix LLC
Jed Archibald, Dickinson

Grant Amount: \$88,625

Key-Lix LLC is looking to expand its livestock supplement manufacturing operation with a new production facility in Dickinson, ND. They are in the process of purchasing land, constructing a new building, and purchasing the necessary equipment to build this facility. This funding will support some of the startup costs that will be incurred in the early phases of this project.

BUTCHER'S EDGE, LLC

Butcher's Edge, LLC
Jay Mathern, Edgeley

Grant Amount: \$61,500

For the past few decades, North Dakota and most other rural areas across the U.S. have experienced a continual decline in the number of local meat slaughter and processing facilities. In the summer of 2020, average wait time for processing was about 10.5 months within a 100-mile radius. The closest multi-species plant is in Oakes, ND - 40 miles from Edgeley - and it is operating at full capacity with a wait list of more than 12 months. The nearest USDA inspected plant is 75 miles from Edgeley (Valley City) and the nearest state inspected plant is also 75 miles from Edgeley (Enderlin). Producers are looking for more options. Butcher's Edge, LLC will be a state inspected meat processing facility that will provide custom slaughter, processing and retail to Edgeley, ND, and the surrounding communities in southeast North Dakota.

701X REGIONAL MARKETING CAMPAIGN AND INITIAL SALES LAUNCH

701x Inc.
Traci Jacobson, Fargo

Grant Amount: \$150,000

701x provides a livestock management system that comprises of a record keeping software and an electronic livestock ear-tag that tracks the location and behavior activities of the animal. The electronic ear-tag transmits the livestock's data to a cloud based database, simplifying the data entry process. The software also analyzes the data and provides alerts to authorized company users if the livestock gets outside the geo-fenced area or an unusual behavior exists that could be a potential health issue. 701x will launch a regional marketing campaign beginning October 1, 2021, to promote 701x and its products in North Dakota, South Dakota, and Minnesota. Campaign efforts will be focused towards owners of high valued cattle, such as animals registered with breed associations, bulls, and Wagyu.

THE SUCCESSFUL MARKETING OF THE NAGC

National Agricultural Genotyping Center
Missy Berry, Fargo

Grant Amount: \$25,000

The Successful Marketing of the National Agricultural Genotyping Center (NAGC) is a project geared towards developing and executing various strategies, tactics, and campaigns to promote NAGC and the available services to the local agricultural community hereby providing solutions to farming challenges. This project will focus on updating social media to increase brand awareness, become a thought leader within agriculture production and research, generate high-quality leads, increase customer value, and improve search engine optimization. This proposal focuses on creating awareness of the services offered by NAGC that benefit North Dakota's agriculture community. It will also focus on ways to expand current relationships in order to meet the changing needs of existing customers. This includes, but is not limited to, updating the current website and social media involvement, as well as the hiring of external consultants to accomplish these tasks.

REAL GOOD COOKIES-MARKETING GROWTH AND COMMERCIAL KITCHEN

NHS Investments, LLC
Sarah Horak, Grand Forks

Grant Amount: \$42,000

Real Good Cookies was created at Brick & Barley in Grand Forks, ND. We had been selling our popular, house made salted bittersweet chocolate chip cookies since 2019. They are made with flours from the North Dakota State Mill, sugars from American Crystal Sugar and other ingredients purchased almost exclusively locally. Brick and Barley closed in March 2020 due to COVID, and had to get creative for the

business to survive. When they were able to re-open for take out only, they created a super small menu and decided to put cookies on the menu, with the hope that this would be an easy upsell to customers and would increase each ticket price slightly. Customers started ordering more and more cookies. To increase sales, Real Good Cookies will hire professional graphic designers to update branding and create logos, social media graphics, shipping graphics, flyers, outreach materials, and more. They will also advertise through Instagram, YouTube, TikTok, and Facebook.

WHEAT BIOREFINING FEASIBILITY STUDY

Red River BioRefinery LLC
Keshav Rajpal, Grand Forks

Grant Amount: \$80,000

The Red River Biorefinery is assessing the feasibility of processing wheat to produce gluten and starches with a zero carbon footprint. The project will look at integration of energy and waste processing to minimize carbon in the production process and produce additional biofuels and renewable natural gas to help power the facility.

CBS - NORTH DAKOTA FIRST STRATEGIC PLAN

Texas Bee Supply, LLC
Lyndon Shook, Hettinger

Grant Amount: \$85,000

North Dakota is the largest honey producer in the United States; however, the nearest store offering products and services to the industry is over 500 miles away. Texas Bee Supply has established a retail business in Hettinger to serve the beekeeping industry. The project will assist in a direct mailing campaign to beekeepers in North Dakota. It will also assist in developing a trade

show booth and attending trade shows to drive business to North Dakota.

AGASSIZ SUSTAINABLE PULPING AND MOLDING

Agassiz Sustainable LLC
Hua Sun, Hillsboro

Grant Amount: \$100,000

Agassiz Sustainable LLC (AGS) is building a vertically integrated wheat straw pulping and molding operation that converts wheat straw into compostable containers for use in the food and beverage industry. Emerging regulations in major developed countries, including government entities at various levels (municipal to federal) in the U.S. and China, are banning single use plastic food containers. This is driving up the demand for compostable and biodegradable products for the food and beverage industry. Wood pulp, which has been the traditional source of pulp in the U.S., is less environmentally friendly than AGS's wheat straw pulp. The company is using patented agricultural biotechnology to make pulp from wheat straw. AGS's process consumes significantly less water, energy, and chemicals, than competing pulping processes. Finished molded products, including a variety of trays, bowls, lids, and containers, will primarily be sold through distributors.

FEASIBILITY OF A MULTI-SPECIES PROCESSING FACILITY IN SE NORTH DAKOTA

North Dakota Rural Electric Cooperative Foundation
Lori Capouch, Mandan

Grant Amount: \$30,000

This project is led by a group of farmer/ranchers in southeastern North Dakota who intend to conduct a study to determine the feasibility of

constructing a meat processing facility located within Cass or Richland County. The plant intends to have the capacity to process up to 30 large animal units per week and employ up to 10 people.

Funds will be used to contract with Dakota Global Consulting, LLC, a North Dakota consulting firm that specializes in livestock and food production, to conduct the study. Dakota Global Consulting will subcontract Process Systems Co., LLC (Omaha, NE) to develop a facility plan that includes layout and equipment.



Beef waiting to be further processed at South 40 Beef

MARKETING ND BEEF

South 40 Farms LLC
John Roswech, Mott

Grant Amount: \$75,000

This project will ramp up marketing on social media to export North Dakota beef to the coasts. South 40 is mostly wholesaling and retailing but

would like to expand outside of North Dakota. In order to achieve this goal they need to ramp up their advertising efforts. The objectives of the project are to increase brand awareness, drive sales, generate leads, and create a community around South 40 Beef.

MERWIN QUALITY LAMB

Merwin Quality Lamb LLC
David Merwin, Mott

Grant Amount: \$30,000

This project will focus on the feasibility and site planning of a fully confined lambing operation. If successful the plan will be to establish a large lamb processing facility constructed in southwest North Dakota with the capacity to process 2,000 head per week.

DYNA-FLO: ESTABLISHING A DEALER NETWORK

Dyna-Flo Pump Co.
Dana Rosendahl, Oakes

Grant Amount: \$46,375

Dyna-Flo Pump Co. will be traveling through regions of the USA stopping at irrigation dealerships. The goal is to establish a solid dealer network for Dyna-Flo Pumps. A consignment program will be issued allowing dealers to display a pump for 8 weeks. Then the dealer will deliver the pump to another dealer within the state. Dyna-Flo pumps can be used for flood control, flood irrigation, water transfer, city clean-up, feedlot water control, and more.

BULK CARGO PENDULUM CAMERA MARKETING PLAN

INVISIONit LLC
Steve Johnson, Page

Grant Amount: \$80,000

Phase one has been completed and involves INVISIONit LLC developing a mechanical device to house a video camera to be used in conjunction with an electronic tarp system mounted on a bulk semi trailer. Phase two was to obtain a patent for the device and a patent has been approved and awarded to INVISIONit LLC. Phase three is complete and involves procuring a manufacturer for the device and a video-camera supplier. Both the manufacturer and the camera supplier are located in rural areas of North Dakota. Purchase orders have already been issued to the manufacturer and camera supplier for a first run of 200 of the complete apparatuses. Phase four is the purpose of this grant. A website will be built but will not be published until just prior to receiving finished products for sale. A marketing company has already been retained to help with creation of a budget and to create and implement a marketing plan. Internet search engines and social media influencers will also be utilized to increase market presence. Promotional items, apparel, business cards, flyers, and mailings will be used to create brand awareness and recognition in an effort to grow sales.

FEASIBILITY OF LOCAL CROP PROCESSING FACILITY

Scranton Equity Exchange
Josh Weakly, Scranton

Grant Amount: \$52,500

Scranton Equity's project will evaluate the feasibility of a mechanical oilseed crushing facility near Scranton, ND, to produce crude oil and meal from sunflowers, canola, and/or other feedstocks.

SUSTAINABLE AVIATION FUEL BIO-REFINERY

AIC Energy Corp.
John Melk, Trenton

Grant Amount: \$272,000

AIC Energy is developing a state-of-the-art bio-refinery, which will produce 90 to 100 million gallons per year of sustainable aviation fuel. These renewable fuels are formulated to be a direct “drop-in” replacement for fuels produced from petroleum crude oil. The primary feedstock for the bio-refinery is expected to be soybean oil, although canola oil and other regionally-grown agricultural products are capable of being used as feedstock. The feedstock oil intake capacity of the facility will be 90 to 100 million gallons per year, or about 273,000 gallons per day. The bio-refinery will be located on an 87-acre site southwest of Trenton, ND. The total design build-out cost is estimated at \$318 million. AIC Energy Corp’s bio-refinery is expected to create 300 union-scale jobs, more than 100 long-term jobs, plus additional jobs for truckers, vendors, rail workers, and supplies.

1481 MEATS

1481 Meats
Kelani Welstad, Upham

Grant Amount: \$69,625.43

1481 Meats will provide north central North Dakota with a state-inspected slaughter facility. The label of “state inspected” allows producers to resale the products they have raised. The plant will provide custom slaughter, state-inspected slaughter, and retail of fresh and frozen products.

PURE ADVANTAGE NATIONAL MARKETING CAMPAIGN

ND Flax Works LLC
Angie Wolfe, Southam

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Grant Amount: \$150,000

ND Flax Works LLC is a startup company that sells agriculture value-added products of hemp bedding and cold-milled flax feed supplement locally and nationally. This project will design and produce all necessary labels, brochures, retail store signage and marketing literature. It will also assist in trade show booth set-up and marketing materials for national trade shows.

VERTICAL MALT EXPANSION - PHASE 1 - DRUM MALTING

Vertical Malt
Adam Wagner, Grand Forks

Grant Amount: \$250,000

Vertical Malt is a craft malthouse that puts brewers, bakers, millers and distillers in direct contact with the people who grow and malt the grains by vertically integrating the growing and malting processes. Operating today at pilot scale, Vertical Malt is currently capacity limited. Interest in Vertical Malt has grown to the point we can no longer satisfy demand at current production levels. This has prompted plans to greatly expand capacity allowing us to serve a wider market. The first phase of this plan is the rapid deployment of new “drum” style malting vessels to ease our existing capacity bottleneck allowing us to maintain momentum and growth in the near term. Vertical Malt sells directly to millers, craft brewers and distillers enabling a traceable field-to-table supply chain for our customers while giving us leverage over pricing and flexibility in our ability to promote and market Vertical Malt. This emphasis on local production and tight supply chain highlights the “Vertical” part of Vertical Malt.

HEARTHSIDE LLC ARCHITECTURE AND PLANNING PROJECT FOR WINERY FACILITY

Hearthside LLC
Haley Moen, Oakes

Grant Amount: \$84,500

This project will help Hearthside LLC grow in the grape and wine industry in the state. They will seek to elevate the industry by creating the largest and most known winery in the state. They will do this through a carefully crafted plan for facility and site needs. By facilitating this plan, they will advocate and elevate the agri-tourism industry, the grape and wine industry, and the value added ag industry in North Dakota.

MEMORIES OF HOME BY BECKY EXPANSION

Memories of Home by Becky LLC
Becky Zahn Walcker, Minot

Grant Amount: \$42,033.75

This project will expand the Memories of Home by Becky commercial kitchen. The addition will include a bakery garage addition (30x24) where all the goods will be produced and packaged. This space will hold all the commercial baking equipment, work tables, refrigeration, convection oven, ranges and some shelving for supplies. This space allows for more commercialization of goods in a shorter amount of time. This space will allow me to take on larger orders plus take on a distributor for some of the goods. The new addition will also have a bakery storage room attached to the bakery garage (27x16) which will house all the shelving units needed to store all the supplies to make product, and all the completed canned good products. There will also be a bakery "drive in" garage (27x16) attached to the bakery storage space that will be utilized for order pickups, deliveries and miscellaneous business storage. Will possibly use shelving unit in this space to store supplies, freezers and

equipment.

INSECT AG TECHNOLOGY COMING TO NORTH DAKOTA

Chapul Farms
Patrick Crowley, Casselton

Grant Amount: \$197,500

This project is to accelerate the development of insect agriculture infrastructure to enhance the agricultural economy of North Dakota. The steps taken in this project will move from an initial feasibility analysis, to site and project specific design and engineering of an industrial scale insect farm. The premise of an insect farm is to use under-valued agricultural by-products as upstream feed inputs to the farm. The result is an expedition bio-processing of these materials into two products: 1) healthy fats and proteins (insect larvae), and 2) high-value soil fertilizer amendments (insect frass manure). Markets for both of these products exist in North Dakota and are supplied by international imports. This project is a model for sustainability, circular economies, and agtech job creation in the state.

PEARSONS GREEN ACRE MEATS LAUNCH

Pearsons Green Acre Meats
Debbie Pearson, Wilton

Grant Amount: \$75,600

This project will focus on the launch of a new state inspected meat processor in Wilton, North Dakota. Funding for the project will go toward marketing efforts for the plant. The advertising will focus mainly on TV, radio, and boosted and sponsored posts on social media.

NATURE-BASED TOURISM



The historic barn at Burnt Creek Events

Nature-Based AgriTourism Grants are for enterprises which seek to attract visitors to a working farm or ranch, or any agricultural, horticultural or agribusiness operation to enjoy, be educated or be involved in activities. Eligible projects include but are not limited to farm or ranch tours, hands-on chores, self-harvesting of produce, hunting operations, fishing operations located on applicants' land, bird watching, trail rides and corn mazes.

BURNT CREEK EVENTS

Burnt Creek Events
David Lehman, Bismarck

Grant Amount: \$88,125

Burnt Creek Events is a farmstead with a historic background. The land was procured as a Timber Culture Act patent in 1890. Most of the original buildings on this historic property are still intact. The property is currently undergoing a full restoration in the interest of preserving and educating the general public about North Dakota's rich ag history. This project covers the first stage of incorporating a cidery (with pizzeria and event space) and U-Pick orchard into this historic farmstead. By adding these attractions, it is an opportunity to provide a rural experience and ag education to those that maybe otherwise wouldn't have the opportunity.

LANDTRUST ND MARKET LAUNCH

LandTrust, Inc.
Mark Young, Bozeman

Grant Amount: \$65,000

LandTrust connects landowners with outdoor enthusiasts seeking recreational land access in an easy to use online marketplace. With over 1 million acres of private recreational lands, they are a leading recreation access network that brings people together to create income for landowners and opportunity for outdoor enthusiasts. LandTrust is now officially launching into North Dakota, partnering with ND Farm Bureau and hiring regional success managers to work with farmers and ranchers to offer exciting new agritourism activities. Outdoor enthusiasts looking to experience ND will now have new opportunities, helping to keep agricultural producers profitable, drive conservation of habitat, and contribute to the economic wellbeing of North Dakota's rural communities.

PROJECT SPOTLIGHT: BURNT CREEK EVENTS



An orchard was planted at Burnt Creek Farm with nearly 500 trees and vines

Burnt Creek Farm is a historic farmstead dating back over 140 years and was one of the few farms established under the Timber Culture act of 1878. Over 27,000 trees were planted on the property in the 1880s by a Bohemian immigrant in return for the quarter of land. Title to the land was granted in 1889, the year North Dakota was granted statehood. Constructed in 1922, Burnt Creek Farm was one of the first farms in the state with electricity and running water. The farm is said to have been designed in part by the North Dakota Agricultural College (NDAC/NDSU) and has ties to the Non-Partisan League (NPL) responsible for putting in place the state bank, mill and elevator. A noteworthy neighbor was Linda Slaughter who played a large role in the development of the region and state.

Burnt Creek Farm's owner Dave Lehman says the main goal of this project is to preserve North Dakota's ag history and educate others about agriculture in North Dakota. There are relatively few fully intact farmsteads in North Dakota from the 1920s. This was a very transformational period in time as horse power transitioned to tractor power. This is also the era North Dakota put into place the nation's only state-owned bank, mill and elevator. Burnt Creek Farm has very strong ties to all of this history and the historic buildings are still intact and relatively unchanged.

APUC funds were used for site and orchard development, consultant fees for site design and facility analysis and ADA-compliant guest restroom facilities. The grant has been a major factor in getting the grounds and facilities to the point to where they can accommodate ag history tours and small events. It has also started the clock on getting the orchard planted and established in order to eventually support a cidery and U-Pick operation.

Farm tours focused on the history of the farm and agriculture in North Dakota have been given and feedback from the tours has been overwhelmingly positive regarding the history, ambiance and work that has been done to restore the farm and prepare it to accommodate these types of activities.



A field of North Dakota hemp

APUC provides grants in two areas of agricultural innovations: Prototype Development & Technology Grants. A huge array of equipment can be useful in conducting business in rural living and agricultural economics. Prototype Grants are restricted to inventions improving the operations of food processing equipment and agricultural equipment. Technology Grants are to encourage innovation and APUC maintains a broad view of technology, such as hardware, software, devices or processes. Biotechnology will be considered as long as those advances improve agricultural product utilization such as food, feeds, fuels and fiber.

GREAT PLAINS GREENS

Great Plains Greens
Jon Wyffels, Casselton

Grant Amount: \$75,000

Great Plains Greens will purchase and operate a prototype hydroponic vertical farm that is retrofitted from a shipping container. With the flexibility and mobility of a container farm, they can grow 100% organic produce within minutes from the end consumer giving a significant advantage and providing the freshest produce. The farm is fully capable of growing 500 different varieties of plants and can support over 8,000 plants from seedling to full stage growth.

SCO2 RECLAMATION PROJECT

Prototype Garage, LLC
Jacob Knoll, Fargo

Grant Amount: \$100,000

Prototype Garage, LLC has developed and patented SC02 Extraction Technology, a novel methodology for the extraction of materials using supercritical CO2. There is active interest in utilizing SC02 technology for the extraction of DOG (Dried Distiller's Grains) oil, both pre- and post-ethanol milling. The applications can benefit animal feed, ethanol production, and corn oil production. Due to the high volume of DDG's that would be processed, a CO2 reclamation and reformation device is essential to the efficiency of the system. Positive results from these tests will be the catalyst for engaging with NDSU

and the EERC to explore and develop new applications and efficiency improvements to benefit agriculture and energy production, as well as bringing more manufacturing to North Dakota.

HEMP PRODUCT PROTOTYPES

Valley Fiber Processing
Justin Berg, Fargo

Grant Amount: \$101,000

Valley Fiber Processing will develop and prove out three industrial hemp hurd based prototypes. To house the equipment and inventory needed, Valley Fiber Processing has identified a 4,500 square foot facility in Wahpeton. This project will demonstrate the manufacturing of three different industrial hemp-based prototypes for proof-of-concept and scaling of Valley Fiber Processing's decortication business located in Wahpeton, ND.

DESIGN AND DEVELOPMENT OF BIOFOAMS FOR FUNCTIONAL APPLICATIONS

UND Dept. of Mechanical Engineering
Surojit Gupta, Grand Forks

Grant Amount: \$42,420

Biomass has emerged as an important source of raw material for designing valuable materials which can be commercialized. The United States has the potential to produce over 1 billion dry tons of biomass which can be potentially used for manufacturing valuable materials, products, and other derivatives for different high-end applications. In other words, we can create a win-win situation by significantly valorizing biomass which will increase consumption of environmentally friendly materials and will concomitantly increase the income for farmers. This project will perform applied research to formulate biofoam compositions by using agricultural feedstock. Thereafter, these biofoams

will be studied for application in membrane related applications like water filtration, oil-water separation, and construction applications like thermal insulation. In the future, they will partner with local companies to commercialize the prototypes designed during this study.

BULK CARGO PENDULUM CAMERA

INVISIONit LLC
Steve Johnson, Page

Grant Amount: \$15,000

Phase one has already begun and involves INVISIONit LLC developing a mechanical device to house a smart phone friendly video camera to be used in conjunction with an automated tarp system. This device will make it much easier and safer to monitor the loading and unloading of grain trailers, seed tenders or any bulk container equipped vehicle from the drivers seat or cab that have a motorized tarp covering/retracting system on it without having to leave the safe confines of the drivers seat or cab of the vehicle. There are two prototypes being manufactured



Hydroponic vertical farm

and “real world” trials will be performed for 30 days to prove the utility of the device while patents are being filed. Phase two will begin when the patent process has been completed and patents have been obtained. INVISIONit will begin the manufacture, marketing and commercialization of the product. A website is already being built but will not be published until a patent is approved. Internet search engines and social media influencers will also be utilized to increase market presence. A sales force will need to be hired as well for point of contact sales and customer service. INVISIONit LLC will then pursue additional grant monies for the marketing and commercialization of the patented product.

SafetySpect, Inc. proposes to employ its proprietary multimode imaging technology and edge computing to develop a multimode imaging system that can be mounted on drones for agricultural applications. The technology can be commercialized and sold to individual farmers, applicators, agricultural co-ops, or other users. The technology will be scalable to address any desired field size and agricultural product. Current farming practices use the preventative application of fungicide or insecticide to suppress common plant diseases such as rust, root rot, stem rot, or leaf blight caused by pathogens. SafetySpect proposes to use hyperspectral imaging technology mounted permanently or attached to drones to watch for and automatically identify such plant diseases. The affected crops can then be treated as needed as an alternative to the current practice which will greatly reduce farm input costs.



Drone in a wheat field

HYPERSPECTRAL IMAGING OF PLANT PATHOGENS IN NORTH DAKOTA USING FIXED-IN-PLACE CAMERAS AND DRONES

SafetySpect Inc.
Joe Vacek, Grand Forks

Grant Amount: \$149,700

FUNDING SOURCES

APUC's appropriation for the 2021-2023 biennium totaled \$5,858,810.27 and was provided from the following sources:

- \$2,7000,000 from Bank of North Dakota
- \$733,889.47 from the North Dakota Mill and Elevator
- At the beginning of the biennium, an additional \$2,424,920.80 authorized as carry-over authority from the previous biennium.
- No funding was appropriated directly from the state general fund.

Financials as of October 31, 2022

Total Operating Expenditures	\$23,502.63
Total Grant Expenditures	\$1,746,031.84
Grant Commitments	\$1,143,376.11
Remaining Appropriation	\$2,889,923.07

**Includes current plus carry-over commitments*

NORTH DAKOTA DEPARTMENT OF AGRICULTURE

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