AGRICULTURAL PRODUCTS UTILIZATION COMMISSION

GRANT REPORT 2023-2024

NORTH DAKOTA DEPARTMENT of AGRICULTURE

Agriculture Commissioner
Doug Goehring

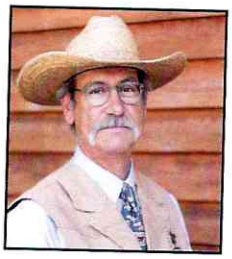
TABLE OF CONTENTS

ADMINISTRATION

APUC COMMISSIONERS

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.

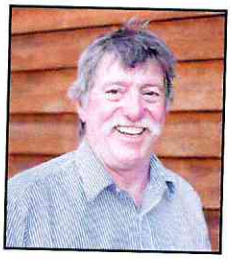
The board also includes three statutory members: the North Dakota Agriculture Commissioner, the Director of the Department of Economic Development & Finance, and the President of North Dakota State University, or their designees.



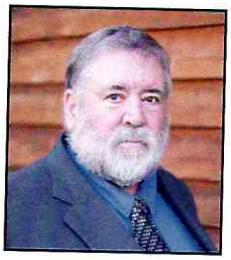
DAN KALIL, CHAIRMAN
Commissioner's Appointee

RACHEL RETTERATH, VICE CHAIR
Commissioner's Appointee

MATTHEW GLESSNER
Commissioner's Appointee



KEITH PELTIER
Commissioner's Appointee



BILL ONGSTAD
Commissioner's Appointee

WADE BOESHANS
Governor's Appointee

DOUG GOEHRING
Agriculture Commissioner

DAVID COOK
NDSU President

KEVIN SONSALLA
Commerce Designee

APUC STAFF

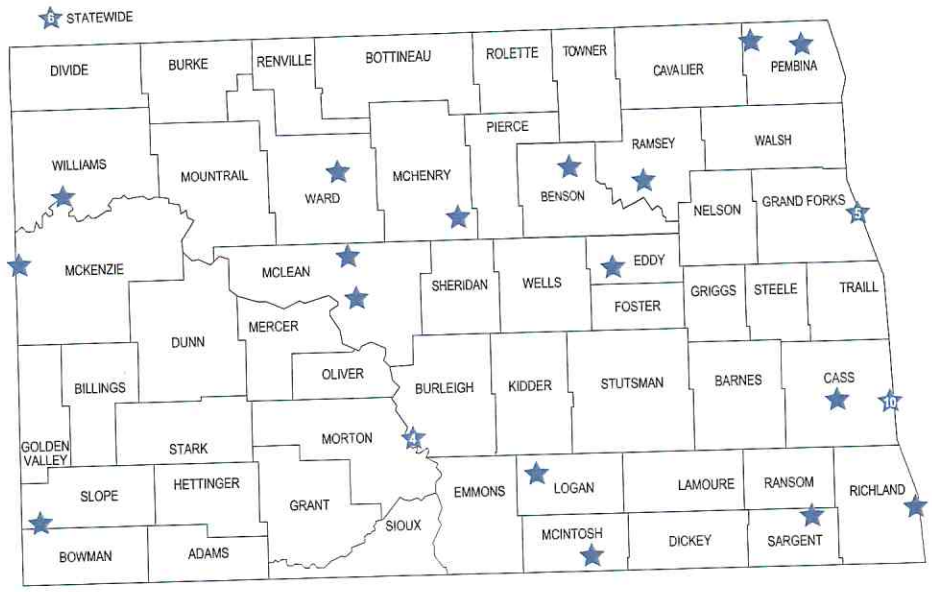
JOHN F. SCHNEIDER
Business, Marketing
& Information Division
Director

HEATHER LANG
Ag Business Development
Coordinator

MADISON BODINE
Ag Services and
Development Specialist

PROJECT MAP

In 2023-24, APUC funded 42 projects in 21 North Dakota communities or statewide.



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

- Ashley - Grandma's Kuchen LLC
- Bathgate - Dakota Valley Growers, LLLP
- Bismarck - Carbon Convert LLC
- Bismarck - ND Department of Agriculture (2)
- Bismarck - Peak Anodes LLC
- Casselton - Susterre Technologies USA Inc.
- Coleharbor - Wolf Creek Winery LLC
- Devils Lake - CoJack Snack and Pack LLC
- Drake - Dakota Angus, LLC
- East Fairview - Greenwood Renewable Ventures LLC
- Fargo - 701x Inc.
- Fargo - Aigen Inc.
- Fargo - NDSU (5)
- Fargo - Botlink, LLC
- Fargo - CorVent Medical, Inc.
- Fargo - Independent Data Management, LLC DBA MyAgData
- Grand Forks - Epitome Energy, LLC
- Grand Forks - SafetySpect Inc.
- Grand Forks - Northdale Oil, Inc.
- Grand Forks - BI Biorefinery, LLC
- Grand Forks - Dakota Don's Artisan Waffles, LLC
- Leeds - Golden Plains Frozen Foods, LLC DBA Zalvina Foods
- Marmarth - Pumpkin Pets and Pals, LLC
- Max - Guardian Grains LLC
- Milnor - Sundale Hutterian Brethren Association
- Minot - Strong Communities LLC
- Napoleon - Legendary Steaks LLC
- New Rockford - North American Bison, LLC
- Statewide - Chapul Farms ND One LLC
- Statewide - EcoBalance Global, LLC
- Statewide - Perennial Climate Inc.
- Statewide - PermanentFarming
- Statewide - Hemp Industries LLC
- Statewide - Lake Agassiz Regional Council
- Wahpeton - Dakota Hurd Co LLC
- Walhalla - Smoke Wagon Meats, LLC
- Williston - Buckshot Seeds, LLC

BASIC & APPLIED RESEARCH

Soybean field

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.

NORTH DAKOTA FIELD TESTING

Susterre Technologies USA Inc.
Michael Cully, Casselton

Grant Amount: $25,830

Susterre is pioneering the use of ultra-high pressure water jets in row crop applications. Initial testing in Tennessee, Kentucky, Iowa and Ontario Canada has indicated that the technology significantly increases crop yields, moves farmers towards a permanent state of regenerative ag, gives farmers more time during the planting window, and injects agricultural inputs into the soil. Susterre and Grand Farm have partnered to conduct field testing in North Dakota in 2023. The goal of this farm-based research is to validate value propositions specifically in North Dakota's farming environment.

TRANSFORMING SOYBEAN MEAL INTO A VIABLE SOURCE FOR EDIBLE 3D PRINTING INK

NDSU
Minwei Xu, Fargo

Grant Amount: $7,100

Soybean meal has been considered a side stream of soybean oil extraction and with the majority consumed as animal feed. 3D-print cooking is a new emerging technology that has the potential to be a home-kitchen cooking style to produce food with personalized flavor, appearance, and nutrition. Soybean meal contains a high amount of protein that could be made into a plant-based protein gel as an ingredient of edible 3D-printing ink. However, the insoluble fiber in the soybean meal has a negative effect on nutrition and printability when considered as a 3D-printing ink. The project aims to develop 3D-printing ink using both the

soy protein and fiber in the soybean meal. This research will employ hydrolase to hydrolyze insoluble fiber into the soluble fiber and mitigate the beany flavor, which could increase the gelling properties and sensory acceptability of soybean meal. Ball milling and ultrasonic incubation will be used to assist the enzyme hydrolyzation by reducing particle size and Increasing reaction energy. After hydrolyzation, edible gels such as glucomannan and sodium alginate will be added as the edible binder of the soybean meal. The co-blending of modified soybean meal and edible gels could form a stable structure for 3D-printed food.

EXPLORING LOCAL APPLE GERMPLASM FOR HARD CIDER IN NORTH DAKOTA

NDSU
Wenhao Dai, Fargo

Grant Amount: $15,000

Apple cider production is a multi-billion-dollar industry in the world. In the U.S., hard cider is one of the fast-growing specialty beverages, particularly for the local brands; however, cidermakers in the U.S. usually use low value or unmarketable fruits from apple cultivars that were originally bred for fresh-market use due to lack of supply and knowledge of cider-specific apple cultivars. Due to limited apple production, many cidermakers in North Dakota often purchase juice or apple juice concentrate that is usually made from the fresh eating apples from other states. The project aims to identify local cider apples to provide apple growers and cidermakers first-hand information on apple cultivar selection for quality hard cider production, which will help lead to a successful hard cider industry in North Dakota. This research will also provide apple growers valuable information on winter hardiness, disease resistance, fruit quality, yield, and further cultivation strategies of cider apples.

NORTH DAKOTA SOIL ORGANIC CARBON RESEARCH

Perennial Climate Inc.
James Kellner, North Dakota

Grant Amount: $100,000

This research will build on previous work supported by the APUC program to calculate changes in soil organic carbon (SOC) stocks in North Dakota agriculture over time. Changes in carbon stocks are a critical component of regenerative agriculture and open the door to profitable carbon offset programs in the state. The objectives of the project are to directly observe changes in soil carbon over time using high resolution satellite imaging, validate these remote sensing measurements, and enhance the existing North Dakota sample dataset. Outcomes include: a map of the state of North Dakota showing changes in soil organic carbon stocks over the 2022-to-2024-time interval, and a report of SOC sequestration outcomes across the state. These reports can be used to brief state and local governmental officials and local businesses that support the agricultural community and landowners and family-owned farms.

AZOSPIRILLUM BRASILENSE AS A BIOCONTROL AGAINST PHYTOPATHOGENS

NDSU
Birgit Pruess, Fargo

Grant Amount: $70,099

Plant growth beneficial rhizobacteria have long been added as inoculants to enhance plant growth characteristics, as well as tolerance towards environmental stressors and infectious disease resistance. However, less competitiveness of the inoculant bacteria with native microflora often renders this approach less effective. The project will use a unique approach with adding pre-biotic seedling exudate

North Dakota grapevines

to tomato and pea plants that will add to the ability of the pro-biotic plant growth beneficial bacteria Azospirillum brasilense to increase resistance towards one bacterial and one fungal phytopathogen. Commercialization efforts are ongoing discussions within a growing network of communicators, collaborators, farmers, and stakeholders.

UPDATE OF THE DIFFERENTIAL THERMAL ANALYSIS METHOD AND CORRELATION BETWEEN HIGH TEMPERATURE EXOTHERM AND LOW TEMPERATURE EXOTHERM OF GRAPEVINE BUDS

NDSU
Harlene Hatterman-Valenti, Fargo

Grant Amount: $21,760

Temperatures below freezing present environmental stress for plants around the world, and specifically to grapevine buds within the North Dakota climate. Numerous measurement techniques have been developed to study the tolerance mechanisms in exposure to sub-freezing temperatures. The Differential Thermal Analysis method has become a widely accepted and utilized standard method globally for studying deciduous ND deep supercooling plant species. The project will utilize the respective method to test grape bud hardiness in North Dakota and identify grape varieties for local production.

DEVELOPMENT OF ANTICANCER FORTIFIED OREGANO AND CRANBERRY EXTRACTS

NDSU
Kalpana Katti, Fargo

Grant Amount: $64,748

The goal of the proposed research is to develop health targeted high value crops for North Dakota by evaluating the nutritional and anticancer properties of compounds from the extracts of oregano and related high phenolic crops, targeting effectiveness in treating prostate and breast cancer at the bone sites, which are the terminal stage for these cancers. Currently, there are no anticancer drugs to treat the prostate and breast cancer bone metastasis. The proposed studies expand a prior APUC funded project that showed the anticancer capabilities of oregano and cranberry extracts using the unique testbed for metastasis that is developed at NDSU and helped identify specific phenolic compounds in the extracts that are likely to inhibit cancer.

FARM DIVERSIFICATION

Modern swine facility

Farm Diversification Grants give priority to projects dealing with the diversification of a family farm ...non-traditional crops, livestock, or on-farm, value-added processing of agricultural commodities. ...aditional 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.

HERD AND ENVIRONMENTAL TECHNOLOGY EXPANSION

Dakota Valley Growers, LLLP
Russell Edgar, Bathgate

Grant Amount: $128,500

The project will expand current cattle feeding capacity and add state-of-the-art fertilizer processing equipment. Results will be locally produced, sustainable beef and fertilizer. Environmental engineers will be consulted for the facility advancement, local permitting, and outreach needs.

MARKETING AND SALES EXPANSION OF NORTH DAKOTA BEEF

Legendary Steaks LLC
Chelsie Gross, Napoleon

Grant Amount: $26,250

Marketing expansion will be conducted by Legendary Steaks through wrapping of the company's reefer trailer utilized for sales at farmers markets, local events, and transporting orders.

SWINE FINISHING BARN EXPANSION

Sundale Hutterian Brethren Association
James Hofer, Milnor

Grant Amount: $18,750

A swine finishing facility is to be added that will

house 5,000 pigs. There will be two- 125.5ft x 186ft state-of-the-art barns, housing 2,500 pigs each and will be connected by an 80ft hallway containing an office area. The latest technology and biosecurity measures will be utilized, including significant attention to air quality within and outside the barn to ensure optimal animal health while minimizing potential odors. There will be curtained walls on the north side, with a wall of fans on the south side to ensure constant air flow. They will also contain electronic sorting scales that will separate the pigs into three groups, depending on their size and weight, providing each with feed specific to their needs. The barns will contain slatted concrete floors over an engineer-designed, concrete manure containment pit. This housing method ensures clean housing for the pigs, while containing the manure in an environmentally approved manner. The manure will be applied as a valuable fertilizer to surrounding crop acres, leading to improved soil health and a bump in crop production.

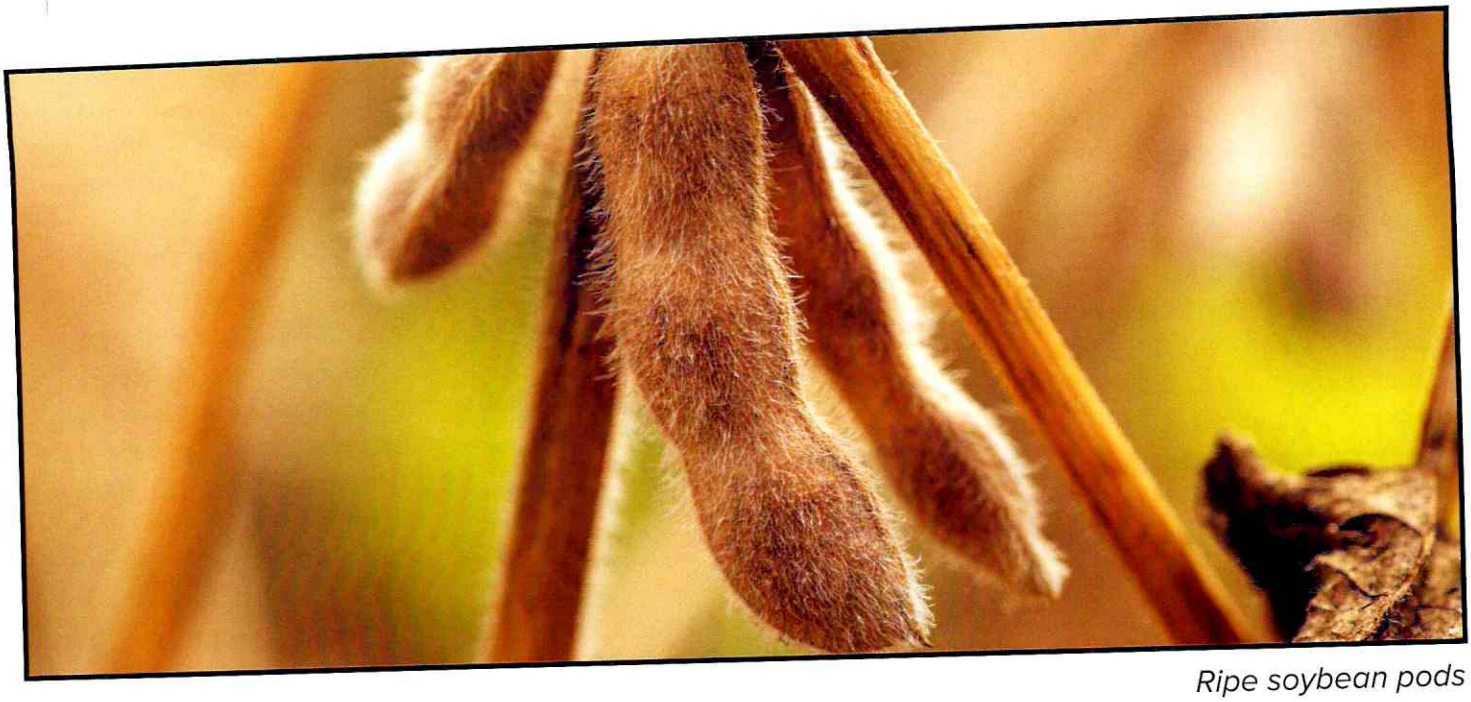
ESTABLISHMENT OF A MEAT PROCESSING FACILITY NEAR WALHALLA

Smoke Wagon Meats, LLC
Autumn Bennet

Grant Amount: $150,000

A new custom-exempt meat processing facility and retail space will be established for the local community and tourists visiting the Pembina Gorge State Recreation Area. Custom smoking services and deer processing will be key aspects of the business alongside beef and pork processing offered for local consumers, farmers, and hunters.

MARKETING & UTILIZATION



Ripe soybean pods

Marketing & Utilization Grants provide necessary assistance to the research and marketing needs of 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.

ESTABLISHMENT OF A SOYBEAN CRUSH FACILITY

Epitome Energy, LLC
Dennis Egan, Grand Forks

Grant Amount: $250,000

Epitome Energy, LLC will build, own, and operate a new soybean crush facility on a +/-70 acre site near Grand Forks, North Dakota. When operating at capacity, the proposed facility will process up to 42 million bushels per year of soybeans into soybean oil, soybean meal, and soybean hulls. The facility will create certainty for soybean growers seeking new market opportunities and will enable investors focused on generating meaningful financial returns to capture basis. When fully operational, 50-60 new permanent jobs will be created while indirectly supporting an additional 800 jobs in and around Grand Forks, helping drive economic growth and adding new value to the area's already thriving agribusiness environment.

IMPLEMENTATION OF X-RAY TECHNOLOGY

North American Bison, LLC
Mike Jacobson, New Rockford

Grant Amount: $250,000

X-ray technology to detect foreign materials in meat processing and manage product quality will be installed at the North American Bison, LLC facility in New Rockford, ND. It will be used to meet customer requirements for product safety and allow the continuation to partner with large retailers in the United States and abroad.

DEVELOPMENT OF AN EFFICIENT MARKETING PLAN

Dakota Angus, LLC
Ashley Bruner, Drake

Grant Amount: $ 100,000

An aggressive marketing budget is sought by Dakota Angus to advertise in local communities to show consumers they are present and want to be their choice for local, quality beef, located in North Dakota. They want to expand advertising efforts to more mediums and have a broad approach to hit the variety of media that consumers today are using, beyond the traditional forms of advertising. The project also includes education for kids at schools where Dakota Angus beef is provided and opportunities to learn where their food comes from and showing them the importance of agriculture in their life, even if they don't live on a farm or ranch.

FEASIBILITY STUDY FOR AN INDUSTRIAL HEMP PROCESSING PLANT

Hemp Industries LLC
Amanda Jelinek, North Dakota

Grant Amount: $48,000

The project is for completion of a business plan and feasibility study for an industrial hemp receiving and processing facility in North Dakota with the primary focus on processing of fiber and includes seed and oil product for wholesale distribution for use in manufacturing applications. Site assessments for the respective facility will be completed.

UPDATING NECESSARY EQUIPMENT FOR KUCHEN

Grandma's Kuchen LLC
Lois Vanderwal Dobson, Ashley

Grant Amount: $100,000

Grandma's Kuchen will be updating baking equipment to expand production of kuchen made from locally sourced ingredients to keep up with demand. Additional glass freezers will be purchased for a more functionable retail display to accommodate the expansion.

FEASIBILITY OF A WESTERN NORTH DAKOTA OIL SEED CRUSHING PLANT

Buckshot Seeds, LLC
Mark Erickson, Williston

Grant Amount: $120,000

There is an increased need for crushing capacity as the demand for food grade oils worldwide is outstripping production. Buckshot Seeds intends to build a processing facility that can handle local feedstuffs and process them into premium oil and oil meal products. The project will focus on the completion of a feasibility study to determine if a crushing plant should be built in western North Dakota.

INSECT AG TECHNOLOGY APPLICATIONS TO NORTH DAKOTA AGRICULTURAL ECONOMY

Chapul Farms ND One LLC
Patrick Crowley, North Dakota

Grant Amount: $32,500

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 and completed FEL 2 Design

phase to final stages of design and market development in anticipation of Q2 2024 launch of construction of an industrial scale insect farm at the selected site. 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 bioprocessing of these materials into two products: healthy fats and proteins (insect larvae), and high-value soil fertilizer amendments (insect frass manure). Markets for both 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.

STRENGTH FROM THE SOIL

EcoBalance Global, LLC
Kyle Eichman, North Dakota

ant Amount: $162,000

EcoBalance Strength from the Soil Project seeks to increase the adoption of practices that benefit the climate and monetize these benefits in the form of carbon credits and value-added products and byproducts that can be sold at a premium in response to emerging and growing consumer demand for products with sustainability attributes. Practices further result in a wealth of on-farm benefits for land productivity, including increased durable soil carbon, water holding capacity, nutrient retention, forage quality, and other co-benefits that may positively impact agricultural operations for North Dakota's producers.

E. FAIRVIEW BIOFUELS FACILITY

Greenwood Renewable Ventures LLC
Preston Anderston, East Fairview

ant Amount: $60,000

Greenwood Renewable Ventures (GRV) deploys patented processes to simultaneously produce multiple forms of low-carbon renewable bioenergy. The proposed project will co-produce ethanol, renewable natural gas (RNG) and digestate comprised of a soil amendment, fertilizer, and compost. The facility will utilize grown-for-purpose sugar beet crops as the feedstock for these energy products. Located in North Dakota, the facility is planned to initially process up to 900,000 tons of sugar beets annually and will result in the production of 1 billion cubic feet of renewable natural gas, 22 million gallons of ethanol, and 600,000 tons of soil amendments. GRV anticipates the facility to create 100 full-time jobs and 250 seasonal jobs once it is operational. The planned facility will be adjacent to infrastructure required to transport and deliver the products produced to consumers. Energy products generated from this facility will be sold into the renewable fuels markets around the United States while the digestate products will be used locally to the extent possible.

SLATTED FLOOR CATTLE BARNS WITH RNG CAPTURE

PermanentFarming
Steve Polski, North Dakota

Grant Amount: $172,000

The project will research the engineering and design necessary to integrate three key elements of the "beef feedlot of the future" - a system that would enable large scale beef finishing in North Dakota. This system could allow for an increase in beef feeding capacity in the state and provide significant economic return by keeping more North Dakota raised calves and grains in the state. Research and Engineering needed to select potential sites, test RNG production potential, optimize the pre-treatment process, determine how best to integrate the pre-treatment with the digester will be completed.

RAISING THE GLASS FOR WOLF CREEK WINERY

Wolf Creek Winery LLC
Randal Albrecht, Coleharbor

Grant Amount: $35,000

Raising the Glass for Wolf Creek Winery is developing a strategic and sound marketing plan that enhances and supports the overall business plan. The knowledge, development, education, and application of the Wine Creek Winery wines to influence increase of sales, revenue, and increase customer traffic flow, as a North Dakota winery that produces grape and fruit wine using North Dakota grown grapes and fruit. The need to dismiss past misconceptions about North Dakota wines, such as the belief that they are all fruit-based or exclusively sweet. By focusing on quality improvements in recent years, it's aimed to redefine the reputation of the region's excellent wine making.

UPGRADING PRODUCTION OF KETTLE SYSTEM

Golden Plains Frozen Foods, LLC DBA Zalvina Foods
Tim Roche, Leeds

Grant Amount: $40,157.30

A production mixing and cooking kettle will be added to the company's production room. This addition will enable increased output more than 80% compared to the current one-kettle system. The production team will be able to continuously mix, cook, and package sauces and pasta with sauce. While one kettle is pumping product into packaging, other team members may now be loading ingredients and cooking, enabling continuous pumping of sauce and paste into packaging.

DOMESTIC AND INTERNATIONAL PROMOTION OF NORTH DAKOTA AGRICULTURAL PRODUCTS

ND Department of Agriculture
John Schneider, Bismarck

Grant Amount: $70,000

The North Dakota Department of Agriculture is offering a reimbursement project for ND 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.

MARKET EXPANSION

Guardian Grains LLC
DeAnna Lozensky, Max

Grant Amount: $47,000

Guardian Grains is strategically allocating

marketing funds across various channels to maximize impact and extend reach to a diverse audience. The comprehensive marketing plan encompasses the following initiatives: delivery vehicle wrap, digital ads, static posters, newly designed packaging, social media ads, social media marketing, magazine ads, newspaper ads. Nutritional testing for higher quality products will be completed alongside the marketing efforts.

GRAND FORKS BIO PLANT

Northdale Oil, Inc.
Scott Reck, Grand Forks

Grant Amount: $50,000

Strong Communities, LLC will engage in a feasibility study to support Strengthen ND's efforts to increase sales of North Dakota-grown produce and products to North Dakota consumers, increase exports of North Dakota-grown produce and products, and elevate and expand North Dakota's value-added ag manufacturing sector. Through a partnership with Lund Oil, Inc., an oil and gas company, Strengthen ND can strategically place greenhouses and container farms to utilize industry-specific heat and waste to grow fresh produce. Through the employment of a qualified consultant, Strengthen ND and representatives of Lund Oil will work to understand not only the technical components of the project (square footage required, construction and maintenance costs, management plan, etc.) but also the potential produce output and distribution needs.

GREENHOUSES & CONTAINER FARMS FOR LARGE-SCALE VALUE-ADDED AGRICULTURE & FOOD DISTRIBUTION

ong Communities LLC
Megan Langley, Minot

Grant Amount: $50,000

Strong Communities, LLC will engage in a feasibility study to support Strengthen ND's efforts to increase sales of North Dakota-grown produce and products to North Dakota consumers, increase exports of North Dakota-grown produce and products, and elevate and expand North Dakota's value-added ag manufacturing sector. Through a partnership with Lund Oil, Inc., an oil and gas company, Strengthen ND can strategically place greenhouses and container farms to utilize industry-specific heat and waste to grow fresh produce. Through the employment of a qualified consultant, Strengthen ND and representatives of Lund Oil will work to understand not only the technical components of the project (square footage required, construction and maintenance costs, management plan, etc.) but also the potential produce output and distribution needs.

TRADE SHOW BLITZ

CoJack Snack and Pack LLC
Kris Volden, Devils Lake

Grant Amount: $73,750

CoJack Snack and Pack will attend multiple trade shows throughout the United States to promote and market its products utilizing North Dakota agriculture products both domestically and internationally, and further grow its snack food division.

DOMESTIC AND INTERNATIONAL PROMOTION OF NORTH DAKOTA AGRICULTURAL PRODUCTS

North Dakota Department of Agriculture
Shanna Johnson, Bismarck

Grant Amount: $81,000

The North Dakota Department of Agriculture is offering a reimbursement project for ND 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.

REVITALIZATION OF AN ETHANOL PROCESSING FACILITY IN GRAND FORKS

BI Biorefinery, LLC
Drew Leehan, Grand Forks

Grant Amount: $205,000

The project aims to revitalize an existing ethanol facility in Grand Forks through the adoption of technology to improve wastewater management. Market analysis will determine feedstocks and uses for high-grade ethanol production. Outputs are set to be pharmaceutical-grade ethanol for industrial and medical uses, animal feed, and renewable natural gas. The process changes within the facility will materially alter the co-products produced. BI Biorefinery seeks to utilize grant funding to bring these co-products to market in the region.

DEVELOPMENT OF HIGH-PROTEIN AND GLUTEN-FREE WAFFLE MIXES

Dakota Don's Artisan Waffles, LLC
Don Miller, Grand Forks

Grant Amount: $12,000

Consumer demand is on the rise for more health-targeted foods and food sources. Dakota Don's Artisan Waffles strives to enter new markets with the development of gluten-free and high-protein waffle mixes. Ingredients will continue to be locally sourced when possible, and marketing efforts will include focus of North Dakota products.

NATURE-BASED TOURISM

Kids at a pumpkin patch

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 ... 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.

ESTABLISHMENT OF A PUMPKIN PATCH

Pumpkin Pets and Pals, LLC
Crystal Sonsalla, Marmarth

Grant Amount: $51,620

A pumpkin patch will be established in rural Southwest North Dakota for not only family entertainment, but to provide an insight into agriculture for children, parents, and the public. The project includes purchasing of equipment for pumpkin production and improving safety measures, as well an upgrade of a water well to support irrigation. Advertising will be done through radio stations and social media platforms.

PROTOTYPE & TECHNOLOGY

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 agricultura 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.

TRACEABILITY OF INDIVIDUAL BEEF CATTLE

701x Inc.
Max Cossette, Fargo

Grant Amount: $50,000

The project will focus on design and development of an RTLS (real time locating system) for feedlots to capture individual beef cattle data. Prototypes will be used to prove data traceability of individual cattle from ranch origination, during transportation, time at feedlots, and at the processing plant for carcass data. 701xTLite tags will be placed on the cattle designated for a feedlot and later to a processing plant at various ranches. Prototype RTLS and camera systems will be installed at the designated feedlots to provide data on the individual cattle. The data from the RTLS prototypes will be verified and validated with the camera footage. The 701x software app will store and display the individual cattle data and records.

HEMP DECORTICATION PROCESS STARTUP

Dakota Hurd Co LLC
Aaron Templin, Wahpeton

Grant Amount: $146,352

Dakota Hurd Company is working with regional experts and equipment manufacturers to create a system to efficiently and effectively decorticate, separate, clean, and sort the two major elements making up the industrial hemp plant, fiber and hurd. This process will allow farmers in the region to have the option to produce industrial hemp in their fields, as well as to fulfill regional demands

for these products. It will also give hemp grain producers in the region an outlet for a product currently being left out in the field.

PIONEERING SUSTAINABLE, AI-ASSISTED AGRICULTURE

Aigen Inc.
AnnaMaria White, Fargo

Grant Amount: $50,000

Aigen, an agricultural tech startup, has introduced the Aigen Element - an autonomous, solar and wind energy powered, AI-driven farming solution. The system is designed to remove herbicide resistant weeds, decrease herbicide reliance, and minimize fossil fuel use. The product seeks to reduce workload and dependence on fossil fuels farmers, but also contribute to improving crop d soil health, and become a major innovation in the pursuit of sustainable agriculture.

PROTOTYPE OF ARTIFICIAL PHOTOSYNTHESIS FOR CO2 REDUCTION

Carbon Convert LLC
Jim Silrum, Bismarck

Grant Amount: $100,000

The project aims to develop technology that employs artificial photosynthesis to reduce carbon dioxide (CO2) into two commercially viable elements - oxygen and carbon monoxide. Initiated from an idea proposed by Marlo Anderson, the project leverages a unique thin-film technology developed by NASA. Currently, the process of constructing a small-scale prototype to demonstrate the ability to harness light energy to break down CO2 into ygen and carbon monoxide is in process. These by-products hold potential for various industries, including healthcare, water treatment, pharmaceutical, metal fabrication, and food and beverage sectors. By combining the produced carbon monoxide with hydrogen extracted from water, diverse combustion fuels may be generated, further enhancing the technology's commercial appeal.

MULTI-MODE UAV IMAGING SYSTEM AND AI FOR PRECISION AGRICULTURE

SafetySpect Inc.
Joe Vacek, Grand Forks

Grant Amount: $20,000

SafetySpect, Inc. strives to revolutionize agricultural practices with innovative multimode imaging technology, integrated with edge computing. This advanced system, designed for drone implementation, offers a transformative solution for agricultural monitoring. Their vision is to commercialize this technology, making it accessible to a broad range of users including individual farmers, applicators, and agricultural cooperatives. The system's scalability ensures its adaptability for varying field sizes and types of crops. Traditional farming methods often involve preemptive use of fungicides and insecticides to combat prevalent plant diseases like rust, root rot, stem rot, or leaf blight. SafetySpect's approach, utilizing cutting-edge hyperspectral imaging technology, either permanently installed or drone-mounted, focuses on precise disease detection in crops. This method facilitates targeted treatments, presenting a more efficient alternative to conventional practices. The result may offer a significant reduction in farming input costs, aligning with our commitment to enhance agricultural productivity and sustainability.

IDENTIFYING CANADIAN THISTLE AND PALMER AMARANTH UTILIZING DRONES AND AI

Botlink, LLC
Matt Sather, Fargo

Grant Amount: $48,000

The project will consist of multiple phases, including aerial image collection of both Canadian thistle and palmer amaranth, uses those images to train machine learning algorithms to automatically detect those species, and then deploying that software to commercial audience to use across multiple industries. This project is a culmination of various technologies (imagery drones, artificial intelligence/machine learning, spray drones) merging into a single useful tool for agriculture and weed mitigation efforts.

MANUFACTURING VETERINARY VENTILATORS IN NORTH DAKOTA

CorVent Medical, Inc.
Richard Walsh, Fargo

Grant Amount: $84,000

CorVent Medical seeks to adapt outdated human critical care ventilators for veterinary use. The project will involve modifying ventilators for in-field use and implementing the ability for specific clinical settings for both medium and large animals. Market development, training, and education tools will be additionally developed within commercialization efforts.

ELECTRONIC ACREAGE REPORTING

Independent Data Management, LLC DBA MyAgData
Michelle Tressel, Fargo

Grant Amount: $30,000

MyAgData aims to provide electronic acreage reporting services to growers in North Dakota and nationwide. It will be a SaaS platform for providing high-quality data reporting, empowering growers and commercial sellers to utilize their data to work for them by leveraging core agricultural technology to remove regulatory and compliance burdens and harness efficiency. Work will be completed alongside the USDA to provide a digitized way for farmers to conform to the required regulatory process.

DEVELOPMENT OF HIGH-PERFORMANCE ANODE MATERIALS FROM NORTH DAKOTA AGRICULTURAL BY-PRODUCTS

Peak Anodes LLC
David Straley, Bismarck

Grant Amount: $100,000

Peak Anodes seeks to evaluate and validate the electrochemical behavior of composite anode materials consisting of developed polymer-derived ceramic resin and North Dakota corn or corn stover as a carbon source to demonstrate a viable alternative to battery-grade graphite. The proposed technology may offer benefits for reduced reliance on foreign sources, produce stable anode material with competitive energy capacity, offer lower energy requirements, and utilize agricultural waste, creating a circular economy.

DEVELOPMENT OF A NORTH DAKOTA ODOR FOOTPRINT TOOL

Lake Agassiz Regional Council
Mitch Calkins, North Dakota

Grant Amount: $27,040

Lake Agassiz Regional Council will spearhead the development of an Excel-based odor footprint tool for North Dakota (NDOFT). It will follow a similar format to that of the South Dakota Odor Footprint Tool (SDOFT) and establish appropriate setback distances between animal production facilities and their neighbors to minimize unacceptable odor annoyance. The NDOFT is planned initially to be a downloadable Excel spreadsheet, and then advance to an interactive website for public access.

FUNDING SOURCES

APUC's appropriation for the 2023-2025 biennium totaled $5,110,417 and was provided from the following sources:

- $3,000,000 from Bank of North Dakota
- At the beginning of the biennium, an additional $2,110,417 authorized as carry-over authority from the previous biennium.
- No funding was appropriated directly from the state general fund.