

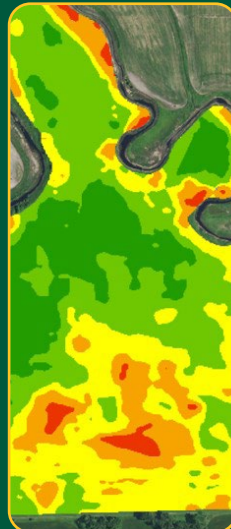
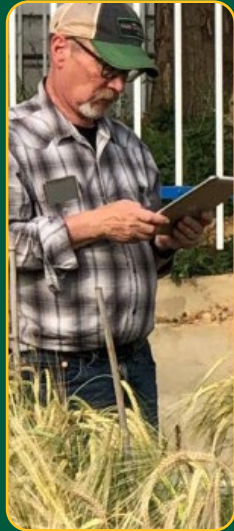
# North Dakota Agricultural Experiment Station

## NDSU Extension

### 2021-2023 Biennial Budget Request

#### Senate Bill 2020

Senate Appropriations Committee | Senator Ray Holmberg, Chair  
Jan. 20, 2021



Dean L. Bresciani – President, North Dakota State University  
Mark Birdsall – Chair, State Board of Agricultural Research and Education  
Greg Lardy – Vice President, Agricultural Affairs  
Director, ND Agricultural Experiment Station  
Director, NDSU Extension

Chris Augustin – Director, Dickinson Research Extension Center  
Kevin Sedivec – Interim Director, Central Grasslands Research Extension Center  
Chris Schauer – Director, Hettinger Research Extension Center  
Randy Mehlhoff – Director, Langdon Research Extension Center  
Shana Forster – Director, North Central Research Extension Center  
Jerry Bergman – Director, Williston Research Extension Center  
Blaine Schatz – Director, Carrington Research Extension Center  
Brian Otteson – Director, Agronomy Seed Farm

**NDSU** NORTH DAKOTA STATE UNIVERSITY

NDSU Extension - Budget No. 630

North Dakota Agricultural Experiment Station  
- Main Station - Budget No. 640  
- Branch Research Extension Centers - Budget No. 628  
- Agronomy Seed Farm - Budget No. 649

[www.ndsu.edu/agforlegislators](http://www.ndsu.edu/agforlegislators)







# SBARE

## State Board of Agricultural Research and Education

# Who we are and what we do

## History



The State Board of Agricultural Research (SBAR) was established by legislative decree in 1997. It was responsible for budgeting and policy-making associated with the supervision of the North Dakota Agricultural Experiment Station.

The law was changed during the 1999 legislative session to include responsibility for the North Dakota State University Extension Service. SBAR became the State Board of Agricultural Research and Education (SBARE).

## Duties

SBARE, within the policies of the State Board of Higher Education (SBHE), is responsible for budgeting and policy-making associated with the North Dakota Agricultural Experiment Station and North Dakota State University Extension.

SBARE responsibilities are to:

- Determine the causes of any adverse economic impacts on crops and livestock produced in the state;
- Develop ongoing strategies for the provision of research solutions and resources to negate adverse economic impacts on crops and livestock produced in this state;
- Develop proactive strategies for NDSU Extension to fulfill the mission of improving the lives and livelihood of the citizens of North Dakota by providing research-based education;
- Implement the strategies developed under bullets 2 and 3, subject to approval by the SBHE;
- Develop, with the North Dakota Agricultural Experiment Station and NDSU Extension, an annual budget for the operations of these entities;
- Develop a biennial budget request based on its prioritized needs list and submit that request to the president of NDSU and the SBHE, and forward its prioritized needs list and request without modification to the Office of Management and Budget and the appropriations committees of the legislative assembly;
- Maximize the use of existing financial resources, equipment, and facilities to generate the greatest economic benefit from research and extension efforts and to promote efficiency;
- Annually evaluate the results of research and extension activities and expenditures, and report the findings to the Legislative Council and the SBHE;
- Advise the President of NDSU regarding the recruitment, selection and performance of the Vice President for Agricultural Affairs, the NDSU Extension Director and the Station Director; and
- Provide a status report to the budget section of the Legislative Council.

## Membership

The State Board of Agricultural Research and Education consists of:

- NDSU President or the President's designee
- NDSU Vice President for Agricultural Affairs\*
- North Dakota Agricultural Experiment Station Director\*
- NDSU Extension Director\*
- Five people appointed by Ag Coalition
- Five people appointed in the geographic areas represented by NDSU Extension's multicounty program units
- North Dakota Agriculture Commissioner\*
- Two members of the legislative assembly appointed by the chair of Legislative Council

\* serve in ex-officio, nonvoting capacity

## Current Membership

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## Agency Overview

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# NDSU Extension

### Agency Statutory Authority

North Dakota Century Code 11-38

### Agency Description

North Dakota State University (NDSU) Extension is part of a nationwide, university-based educational system that provides research-based educational programs to citizens in all 53 counties and four American Indian reservations in North Dakota. Programs focus on selected needs and issues affecting the state's agriculture, youth, families, communities and natural resources. The staff is located at state, area and local/county offices. NDSU Extension combines funding from federal, state, county and grant sources to specifically address local concerns.

### Agency Mission Statement

Empower North Dakotans to improve their lives and communities through science-based education.

NDSU Extension believes:

- In lifelong learning through transformational education
- That all people belong and deserve respect
- In stakeholder input to guide program development
- In science-based, locally relevant information
- In the value of partners and collaboration

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

### Agency Future Critical Issues

The mission of NDSU Extension is to empower North Dakotans to improve their lives and communities through science-based education. In response to current and emerging citizen needs, Extension specialists use their expertise in a particular field to develop recommendations, programs, and find solutions to producer and community problems. Extension agents extend these recommendations and programs to all 53 counties and the four American Indian reservations.

#### Livestock Initiative:

North Dakota's livestock industry offers ample opportunity for growth. Livestock accounts for approximately 44% of gross agricultural receipts in our neighboring states of Minnesota, Montana, and South Dakota, while in North Dakota, livestock sales account for approximately 16% of our gross agricultural receipts. Providing the technical knowledge needed to grow the industry will help close this gap and put North Dakota on par with neighboring states with a more vibrant livestock industry.

Growth in the livestock industry means additional market opportunities for currently non-value added commodity feed grains, coproducts, and other agricultural commodities produced in the state.

Enhanced value added markets for these commodities injects more money into main street businesses across the state and also supports additional employment opportunities in the livestock operations as well as allied support industries such as trucking, feed and input supply sales, and transportation.

NDSU Extension can enhance the livestock industry by serving as a key technical resource and protecting the public health of North Dakotans by enhancing the monitoring and surveillance of zoonotic diseases common to animals and man. Educational programming related to livestock production and management, business and economics, animal health and biosecurity, and grazing management provide needed resources to enhance existing opportunities and develop new opportunities to grow this industry in the state. Educational programs aimed at individuals and communities are needed in order to help the industry grow and thrive. Emphasis on sound business practices, economics and finance are key to taking advantage of the existing opportunities.

#### **Agriculture and Environmental Health and Safety:**

Agricultural health and safety is in the headlines on nearly a daily basis. Unfortunately, the news is not good. In the past year alone, North Dakota has lost at least five farm owners, operators, and skilled workers as a result of work-related accidents. A number of factors contributed to these deaths but nearly all can be avoided. Focused and coordinated educational programs are part of the solution. Responding to farm and ranch work-related accidents is too late. Educating our agriculture community on how to prevent dangerous and perilous situations from occurring is needed.

In addition to safety concerns related to farm work, the increased stress level brought about by low commodity prices, trade wars, and poor farm economy have heightened the need and recognition that mental health is just as important as physical health in our rural farm communities. Farm financial stress also has accentuated the need for additional educational programming related to farm finances and economics.

#### **Big Data:**

Large volumes of data are the norm and future for farming and ranching operations. Soil fertility tests, weather data, yield maps, genomics data, carcass data and other yet unidentified data points are all part of the information overload that farmers and ranchers work with on a daily basis. The stark reality is that data is not useful in farm and ranch management until it is turned into meaningful information that can be used in a decision-making process.

Extension programming that helps producers gather, organize, analyze, and manage data is important to future economic viability of North Dakota farms and ranches. Better data management and decision making will help farmers and ranchers conserve precious natural resources, enhance sustainability through better production decisions tailored to their farms and ranches, and ultimately lead to enhanced economic sustainability for farms, ranches, and rural communities across the state.

#### **4-H:**

Providing additional 4-H opportunities for youth across North Dakota pays countless dividends into the future. 4-H programming has long been recognized for instilling positive character traits and skills in youth through a hands-on learning approach.

Enhancing hands-on learning opportunities related to agricultural biosciences creates interest in important STEM career fields at an early age through career exploration activities, as well as hands on experiential learning. Teaching entrepreneurial skills in a 4-H setting allows youth to learn skills that benefit them later in life as business owners and managers. Ultimately, 4-H programming in these areas produces young people eager to enter the work force as scientists, entrepreneurs, and business owners.

#### **Operating support:**

Operating support enhances the work existing staff can do by providing key resources for Extension to become more nimble in projects and programming related to needs of the states' citizens. Operating support allows specialists to develop innovative programming in a timely fashion, travel or develop new methods to connect with local communities, and leverage resources needed to address larger issues facing our citizens and communities.

**Urban Ag, New Crops, and New Markets:**

Interest in urban agriculture, particularly locally produced foods, is increasing across the state. Helping consumers connect with and understand food production is key to bridging the divide between rural and urban residents. Opportunities are emerging for local food production in and around urban centers. These farms will be smaller and more specialized than their rural counterparts but offer opportunities for entrepreneurs who want to interface directly with consumers through local sales, farmers markets, and other wholesaling and retailing operations.

In addition, North Dakota agricultural producers are constantly evaluating new crops and new markets. Interest in how and where food is produced is growing, and innovative producers are seeking additional market outlets. In addition, new and alternative crops such as hemp, kernza, and others offer opportunities and alternatives to more traditional commodity crops. If these industries are to grow and thrive, additional expertise related to marketing and business development is needed.

**Rural and small business management and entrepreneurship:**

Rural communities need a healthy main street to remain viable. Educational programming helps rural and small businesses compete in today's economy, and results in increased economic activity in rural areas, a stable job base, and enhanced tax revenues for the state. In addition, these rural small business owners and their employees are an important part of the social fabric of the community.

Small businesses across the state are in need of educational programming and technical assistance related to business management and entrepreneurship. Issues surrounding these businesses include evaluating new business and market opportunities; enhancing sales through the internet and social media; intergenerational transfer; and methods to deliver products and services in a cost effective manner.



## **2019-21 Legislation that Included Reporting Requirements to 2021 Appropriation Committees**

### **HB1020 (NDSU Research & Extension, & Agronomy Seed Farm)**

#### **SECTION 13. APPROPRIATION - 2017-19 BIENNIUM - WEBSITE AND DIGITAL UPGRADES.**

There is appropriated out of any moneys in the general fund in the state treasury, not otherwise appropriated, the sum of \$345,000, or so much of the sum as may be necessary, to the North Dakota state university extension service for website and digital upgrades, for the period beginning with the effective date of this Act, and ending June 30, 2019. In accordance with section 11 of chapter 45 of the 2017 Session Laws any unexpended funds from this appropriation may be continued into the biennium beginning July 1, 2019, and ending June 30, 2021.

**Status:** Funded last session out of carryover funds. Contractor has been hired.  
Work in progress. Project expected to be complete in 2021.

## Web and Digital Delivery

**Justification:** SBARE's review of Extension recommended that Extension optimize the use of technology and target younger age demographics to enhance the effectiveness and efficiency of delivery methods. To accomplish this goal, Extension needed a new web strategy and a reimagining of content options to meet future opportunities and ever-changing user needs.

**Need:** This one-time funding request will add temporary support to overhaul and reimagine NDSU Extension's online presence.

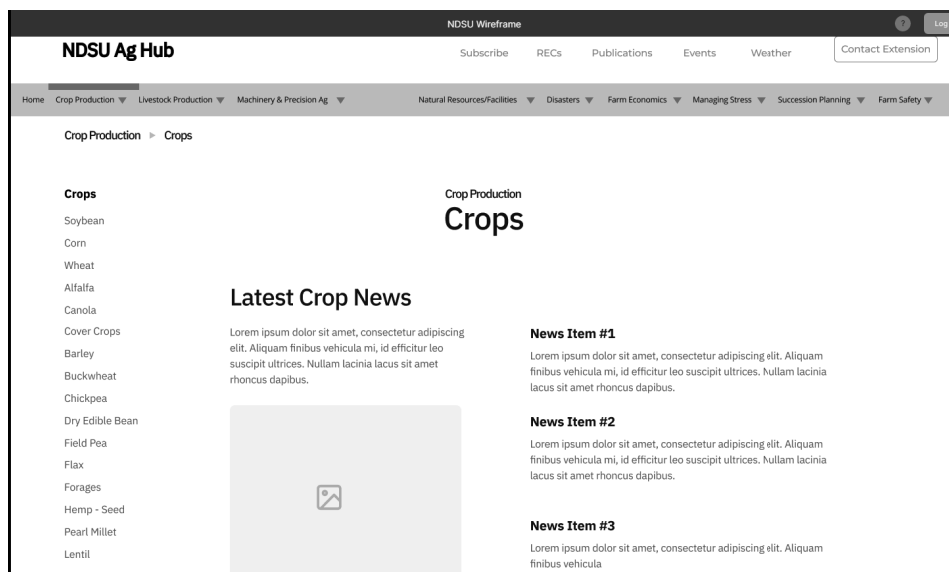
### One-time operating support: \$345,000

NDSU Extension, with temporary support from external contractors, has developed a new web strategy focused on easier access to content, improved search and navigation, and increased opportunities to deepen user engagement. A key element of this new strategy is positioning the website within a broader digital communications strategy alongside social media, e-newsletters, and other channels. Within this strategy, each channel can be focused on its role in serving and engaging the people of North Dakota.

After a thorough external audit of all web content, a new content architecture has been developed to make the website easier to navigate. One highlight of this effort is the development of a central location for actionable information and useful tools that can help agricultural producers improve their operations. A new **Ag Hub** will bring together content and tools spread across Extension topic areas and Research Extension Center websites into a navigable and searchable destination for North Dakota's farmers and ranchers (see image). Other sections of the website are being reimagined as well, with a focus on the section's primary audience and role in user engagement.

To support the new web strategy, a new content management system is in development, based on the Drupal open-source platform. The Drupal platform is highly customizable and scalable. It supports mobile-first development and a flexible content architecture. Drupal is used extensively in government and higher education, including by the State of North Dakota and NDSU.

The new website is on track to launch in June 2021.



*This screen capture shows the NDSU Ag Hub "wireframe," a schematic used to layout possible content and functionality of a webpage*

## CRITICAL PRIORITY

### Request for restoration of general fund reductions:

**Request:** Restoration of 15% budget cut - \$4,156,450



(NDSU photo)



(NDSU photo)

### 1 Livestock Initiative

North Dakota's livestock industry offers ample opportunity for growth. Livestock accounts for 16% of gross agricultural receipts in North Dakota while livestock accounts for approximately 44% of gross agricultural receipts in our neighboring states of Minnesota, Montana and South Dakota. Providing the technical knowledge needed to grow the industry will help close this gap and put North Dakota on par with neighboring states with a more vibrant livestock industry.

During the last 20 years, soybean and corn acreage, two primary feed crops, has grown four to five times, providing an ample supply of feedstuffs for additional livestock production. Growth in the livestock industry means additional market opportunities for currently non-value-added commodity feed grains, coproducts and other agricultural commodities produced in the state.

Enhanced value-added markets for these commodities inject more money into main street businesses across the state and also support additional employment opportunities in livestock operations as well as allied support industries such as trucking, feed and input supply sales, and transportation. In addition, growth in livestock production provides more opportunities for young people to become involved in agriculture. Lastly, grazing livestock also can increase soil health, adding additional benefits to agricultural operations across the state.

NDSU Extension can enhance the livestock industry by serving as a key technical resource and protecting the public health of North Dakotans by enhancing the monitoring and surveillance of zoonotic diseases common to animals and people. Educational programming related to livestock production and management, business and economics, animal health and biosecurity, and grazing management provide needed resources to enhance existing opportunities and develop new opportunities to grow this industry in the state. Educational programs aimed at individuals and communities are needed to help the industry grow and thrive. Emphasis on sound business practices, economics and finance are key to taking advantage of the existing opportunities.

**Request:** Four FTEs total. Off-campus livestock management specialist; agribusiness related livestock development specialist; grazing, forage and cover crop specialist; veterinary epidemiologist. \$160,000 operating support.

**Total:** \$1,010,000

# NDSU Extension Program Initiatives

Final Ranking by SBARE - April 7, 2020

## 2. Agricultural Health and Safety

Agricultural health and safety is in the headlines on nearly a daily basis. Unfortunately, the news is not good. In the past year alone, North Dakota has lost at least five farm owners, operators and skilled workers as a result of work-related accidents. A number of factors contributed to these deaths but nearly all can be avoided. Focused and coordinated educational programs are part of the solution.

Responding to farm and ranch work-related accidents is too late. Educating our agriculture community on how to prevent dangerous and perilous situations from occurring is needed. The workforce of today is less experienced and many did not grow up on farms or ranches, making the need for safety training all the more important.

In addition to safety concerns related to farm work, the increased stress level brought about by low commodity prices, trade wars and the poor farm economy has heightened the need and recognition that mental health is just as important as physical health in our rural farm communities. Farm financial stress also has accentuated the need for additional educational programming related to farm finances and economics.

**Request:** Three FTEs total. Farm safety specialist; mental health/stress specialist; off-campus farm financial specialist. \$120,000 operating support.

**Total:** \$720,000

## 3. Big Data

Large volumes of data are the norm and future for farming and ranching operations. Soil fertility tests, weather data, yield maps, genomics data, carcass data and other yet-undefined data points are all part of the information overload that farmers and ranchers work with daily. The stark reality is that data are not useful in farm and ranch management until they are turned into meaningful information that can be used in a decision-making process.

Extension programming that helps producers gather, organize, analyze and manage data is important to future economic viability of North Dakota farms and ranches. Better data management and decision making will help farmers and ranchers conserve precious natural resources, enhance sustainability through better production decisions tailored to their farms and ranches, and ultimately lead to enhanced economic sustainability for farms, ranches and rural communities across the state.

**Request:** One FTE total. Data information specialist. Operating support, \$60,000.

**Total:** \$280,000

## 4. 4-H Youth Development

A justified need exists to escalate the opportunities 4-H provides for youth to practice and develop strong science, technology, engineering and math (STEM) and entrepreneurial skills. Combined with skills such as teamwork, decision making, critical thinking and communication, STEM and entrepreneurial skills are foundational 21st century job skills. They prepare youth to be life- and job-ready.

The need and demand for these skills is greater than what we currently are able to achieve. While these skills are important in all job sectors, developing them to support North Dakota's natural resource-based economy of agriculture and energy is especially important. These areas are critical to North Dakota's current and future economic base. We need to provide youth with as many experiential learning, leadership and entrepreneurship opportunities as we can for them explore and develop workforce skills in these areas.

**Request:** Two FTEs total. One ag bioscience youth specialist. One 4-H entrepreneurship specialist. \$120,000 operating support.

**Total:** \$520,000

## 5. Operating Support

Operating support enhances the work existing staff can do by providing key resources for Extension to become more nimble in projects and programming related to needs of the state's citizens. Operating support allows specialists to develop innovative programming in a timely fashion, travel or develop new methods to connect with local communities, and leverage resources needed to address larger issues facing our citizens and communities.

**Request:** \$300,000 in operating support.

**Total:** \$300,000

## 6. Urban Ag, New Crops and New Markets

Interest in urban agriculture, particularly locally produced foods, is increasing across the state. Helping consumers connect with and understand food production is key to bridging the divide between rural and urban residents.

Opportunities are emerging for local food production in and around urban centers. These farms will be smaller and more specialized than their rural counterparts but offer opportunities for entrepreneurs who want to interface directly with consumers through local sales, farmers markets, and other wholesaling and retailing operations. The COVID-19 pandemic also has heightened consumer interest in locally produced foods, making this initiative all the more relevant.

In addition, North Dakota agricultural producers are constantly evaluating new crops and new markets. Interest in how and where food is produced is growing, and innovative producers are seeking additional market outlets. In addition, new and alternative crops such as hemp and kernal offer opportunities and alternatives to more traditional commodity crops. If these industries are to grow and thrive, additional expertise related to marketing and business development is needed.

**Request:** Two FTEs total. New and emerging enterprise specialist in business and market development. Horticulture, small farm, urban agriculture specialist. \$80,000 in operating support.

**Total:** \$480,000

## 7. Rural and Small-business Management and Entrepreneurship

Rural communities need a healthy main street to remain viable. Educational programming helps rural and small businesses compete in today's economy, and results in increased economic activity in rural areas, a stable job base and enhanced tax revenues for the state. In addition, these rural small-business owners and their employees are an important part of the social fabric of the community.

Small businesses across the state need educational programming and technical assistance related to business management and entrepreneurship. Issues surrounding these businesses include evaluating new business and market opportunities, enhancing sales through the internet and social media, intergenerational transfer, and methods to deliver products and services in a cost-effective manner.

**Request:** One FTE total. Rural business entrepreneurship specialist. \$40,000 in operating support.

**Total:** \$240,000

NDSU EXTENSION

NDSU EXTENSION

EXTENDING KNOWLEDGE » CHANGING LIVES

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.



# NDSU Extension impacts

NDSU | EXTENSION

We are NDSU Extension. We extend education to all North Dakota residents. You'll find us at work in your county, at Research Extension Centers and on the main campus of North Dakota State University. We help empower North Dakotans to improve their lives and communities through science-based education, and our efforts have a special emphasis on strengthening agriculture and developing the potential of youth, adults and communities.

## NDSU Extension builds economic prosperity



### PALMAR AMARANTH EDUCATION

- **7,900+** individuals (since 2018) attended presentations to learn to identify the weed and understand the potential economic impact if not managed
- **60,000+** have been reached through mass media



### AG DISASTER RESPONSE EFFORTS

- Initiated regular meetings to share information and coordinate response efforts
- Provided damage assessments that contributed to the disaster declarations in 2019 and 2020
- Conducted forage availability surveys (fall 2019) resulting in a Feed Transportation Assistance Program through the N.D. Dept. of Agriculture that distributed **\$250,000** to 116 ranchers
- Partnered with U.S.D.A.'s FSA to host webinars on federal assistance programs that reached **750** people live



### SOIL SAMPLING AND TESTING

- **87+ landowners** were helped on **236** unproductive sites in **12 counties** (2018 to 2020)
- Recommendations resulted in landowners applying soil amendments and planting perennial salt-tolerant grasses to eliminate annual revenue losses and improve soil health.



### NATIONAL SOYBEAN CYST NEMATODE (SCN) COALITION

- Multiple forms of mass, social and digital media are used to spread awareness about the cost effects of SCN
- Information to manage the worm saves producers money
- **18 million+** potential impressions through the ag media



### MASTER REMOTE WORK PROFESSIONAL CERTIFICATION PROGRAM

- Equips people with skills needed to work from home as remote employees, freelancers or entrepreneurs
- Businesses partner with the certificate holders
- Stimulates job creation, strengthens the tax base and empowers families to spend more time together



### WATER SAMPLE SCREENING

- Water samples screened from **155 locations** in 20 counties (2020 grazing season)
- 24 sources identified that may contribute to poor livestock performance and negatively impact livestock health
- Saved approximately 363 head of livestock with potential to increase health and performance of an additional 4,477 head

## NDSU Extension strengthens communities through engagement



### 4-H

- Largest and only research-based youth organization in the state
- Hands-on, real-life experience through projects, activities and events to more than **6,300 youth** (in 2019)
- 4-H youth are **four times more likely** to contribute to their communities.



### LEAD LOCAL PROGRAM

- **400 participants** representing more than **1,000** volunteer groups
- Members and emerging leaders better prepared and more confident to serve on boards, councils or committees



### MASTER GARDENER PROGRAMS

- **11,957 hours** of time by **204** interns and volunteers in **32 counties** (2019)
- Help clientele beautify communities, feed their families, educate youth, conserve natural resources and answer consumer gardening questions



### SOIL AND WATER CONSERVATION LEADERSHIP ACADEMY

- Nearly **300 conservation leaders** from 50 of North Dakota's 54 soil conservation districts participated
- Builds skills and enhances the ability to lead community-based watershed conservation projects



### 4-H VOLUNTEERS

- North Dakota's **2,183 4-H volunteers** give seven hours per month (on average) to the 4-H program in their communities
- That time is worth \$2,165 per volunteer for a total value of **\$4.7 million** per year



### 4-H YOUTH VOLUNTEER IN THEIR COMMUNITIES

- In a statewide survey, **75%** of 4-H'ers said, "Because of 4-H, I am comfortable being a leader."
- **Nine out of 10** youth said 4-H has inspired them to volunteer in their communities.
- Youth who spend more days per week on 4-H activities are more inspired to volunteer.

# NDSU Extension empowers citizens to be healthy and safe



## NATIONAL DIABETES PREVENTION PROGRAM

- **79** individuals participated and reduced their weight by **5.6%** on average (since January 2019)
- A reduction of only 5% reduces the risk of developing Type 2 diabetes by 58% for people under the age of 60.
- Prevention is critical because medical expenditures average \$16,750 for someone with diabetes.



## PROMOTING AG SAFETY

- By prioritizing the safety and health of those who work in agriculture, we also are prioritizing the safety and health of the entire food system.
- **8,800+** “Clean the Cab” and universal “Hand Signals” window clings were distributed to promote safety.



## FARM STRESS RESOURCES

- In collaboration with local clergy, human service centers, farm organizations and other partners, **more than 30,000** copies of “You Are Not Alone” wallet-sized resources on depression and mental health in agriculture were distributed.
- **3,000+** copies of the Extension farm stress resource publication “Farming and Ranching in Tough Times” were included in the North Dakota Stockmen’s Association magazine.



## POWERFUL TOOLS FOR CAREGIVERS

- North Dakota has **68,000** family caregivers who provided **57 million hours** of unpaid care, valued at **\$980 million**.
- NDSU Extension provides statewide coordination of a national evidence-based program, Powerful Tools for Caregivers, aimed at helping caregivers learn to take care of themselves, make difficult decisions and find helpful resources.



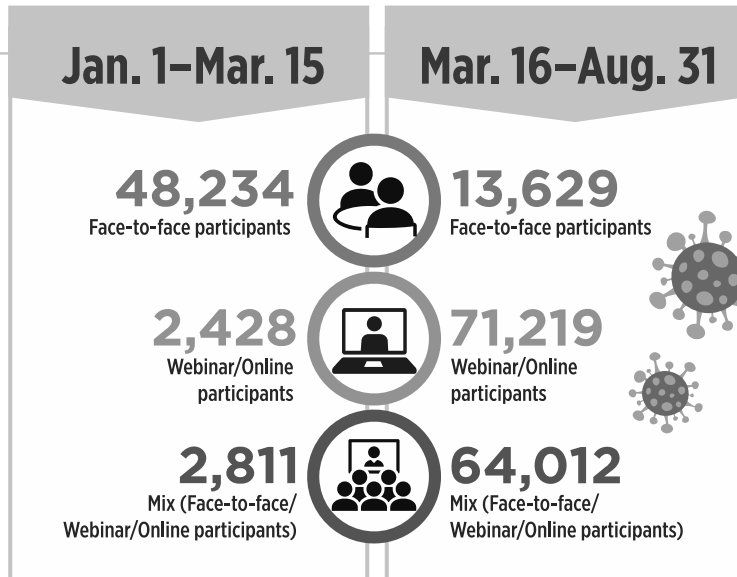
## ON THE MOVE TO BETTER HEALTH: KIDS COOKING SCHOOL

- **1,291** children participated in the multi-session program statewide
- Improved knowledge of nutrition, food safety and health concepts through hands-on learning
- Can increase quality of life and save millions of dollars in collective health-care costs during their lifetime

» NDSU Extension is committed to being innovative and adaptable as it responds to contemporary issues affecting North Dakota.

## NDSU Extension program delivery

As COVID-19 arrived in March 2020, NDSU Extension specialists and agents continued to provide their exceptional service and information to clientele locally and in person but also pivoted quickly to offer programs virtually as needed.



## 2019-2021 IMPACTS

- Instituted a new web-based Program Evaluation and Reporting System (PEARS) which provides up to the moment information on direct contacts, program activities, indirect contacts and program evaluation.
- Provided research-based education to over 348,944 direct contacts in 2018 and 455,067 contacts in 2019.
- Provided research-based education to 1,044 petroleum industry representative and landowners on the impacts of brine spills, strategies for remediation and awareness of consequences if left untreated.
- Provided research-based education to 7,942 people on the incursion of the invasive pest Palmer amaranth and reached an estimated 60,894 people through mass and social media.
- Leveraged \$5.0 million to create and launch a public-private partnership ([www.thescncoalition.com](http://www.thescncoalition.com)) that delivered 20M potential impressions through agricultural media to help growers manage soybean diseases.
- Assisted more than 23,600 North Dakota 4-H youth to develop life skills of teamwork, decision making, critical thinking and public speaking by engaging in a variety of learning experiences.
- Engaged 6,314 youth in a deeper, sustained 4-H youth development experience through enrollment in different types of club experiences with the support of 2,447 registered adult volunteers working directly with them. 1,415 youth participated in day and residential camping experiences with 495 of them participating at the ND 4-H Camp near Washburn during the last reporting year.
- Engaged more than 7,700 people in leadership and civic engagement programs in 2019 to help them feel more confident to serve on boards, councils and committees.
- Reached more than 43,000 people in 2019 and early 2020 through extension nutrition education programs, helping participants learn to eat healthfully and decrease health-care costs.
- Provided parent education classes to 4,080 North Dakota parents in 2019 to strengthen families, that results in reduced costs spent on child welfare and lowers crime by adults.



*Engaged more than 7,700 people in leadership and civic engagement programs in 2019 to help them feel more confident to serve on boards, councils and committees.*







## Agency Overview

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# Main Research Station

## North Dakota Agricultural Experiment Station

### Agency Statutory Authority

ND Constitution Article XIX; North Dakota Century Code Chapter 15-12.1

### Agency Description

The North Dakota State University Main Research Station is located on the campus of the North Dakota State University of Agriculture and Applied Science. The station is the administrative location of the North Dakota Agricultural Experiment Station. The station conducts research and coordinates all research activities of the Agricultural Experiment Station. The purpose of the research is the development and dissemination of technology important to the production and utilization of food, feed, fiber, and fuel from crop and livestock enterprises. The research provides for an enhancement of economic development, quality of life, sustainability of production, and protection of the environment. The Main Research Station keeps detailed records of all activities and publishes the information that will be of value to the residents of this state.

### Agency Mission Statement

The Agricultural Experiment Station shall develop and disseminate technology important to the production and utilization of food, feed, fiber, and fuel from crop and livestock enterprises. The research must provide for an enhancement of the quality of life, sustainability of production, and protection of the environment.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

### Agency Future Critical Issues

SBARE carefully considered stakeholder input and has identified the following Agency Future Critical Issues:

#### Big Data Initiative:

Agricultural research activities have become much more data intensive. Advances in agricultural sensors, computational speeds, and networking technologies produce massive volumes of monitoring data, and advances in precision agriculture will only increase data production at a rapid pace. The demand for data storage, management, and analysis within agriculture and food production is greatly needed in order to provide the producer meaningful management outputs that will improve their operations.

Large volumes of data are part of every conceivable field of agricultural research, including plant varietal selection, soils, livestock production, weather and climate, economics and agribusiness, food production, and many, many others. As an example, our plant breeding programs are increasingly

reliant on large data sets related to not only plant production traits but increasingly include genomic data which dramatically increase the volume of data which must be collected, systematized, analyzed, stored, and archived.

The North Dakota Agricultural Weather Network (NDAWN) is a mesonet of over 150 stations and generates a tremendous amount of data multiple times per hour. The value of this data and its uses have ability to greatly improve agricultural operations through more timely applications of crop inputs, determining planting and harvesting dates, minimizing risk, etc. However, improved data utilization and a more robust mesonet are required to provide these additional capabilities for local producers.

Enhancing the capability of our scientists to better handle the types of data necessary for improvements in research will lead to greater and more impactful breakthroughs in fields which are data intensive.

**Plant Initiative:**

Crops and cropping systems account for over 80% of the gross agricultural receipts in North Dakota. Each year, a new set of challenges and research questions emerge, especially as it relates to crop rotations, agronomic practices, varietal selection, and other considerations.

Research which addresses many of the most challenging problems in cropping systems generates almost immediate return on investment by improving agricultural productivity across the state. For instance, plant disease challenges are a constant concern. Additional funding that helps address new and emerging plant diseases helps ensure farm profitability and reduce expenses. Research that addresses agronomic conditions in western North Dakota at the Dickinson Research Extension Center is critical to helping farmers address issues related to crop rotations, drought concerns, and other issues related to this important growing region. In addition, more emphasis on plant breeding, especially with soybean and pulse crops is important as these legume crops have become an increasingly important part of the crop rotation mixture throughout the state.

In addition, end market quality continues to be a more important factor in crop marketing both domestically and internationally each year. End users are concerned not only with functional attributes of crops such as milling and baking quality, they are also concerned with sensory characteristics of the various crops and crop products produced in the state. Research which continues to improve on sensory characteristics for end users is becoming more important each year.

**Operating Support:**

Scientists have become increasingly reliant on grant funds to conduct research, and consequently their time spent on administering the grant process has greatly increased. The complexity of many grant applications has greatly increased from such issues as compliance and submission processes, and electronic paperwork, which requires scientists to spend more of their time on these items than the science. Administrative support staff dedicated to assisting scientists identify sources of grant funds, navigate complex submission requirements, and gather paperwork that would improve efficiency and increase the ability of our scientists to identify, submit, and compete successfully for grant funds.

Graduate students enhance research programs by providing key labor to complete research activities, collect field data, and conduct various analyses associated with research projects. Graduate students also enhance collaborations between main campus and the REC network by providing a vital link between scientists.

Operating support to enhance collaborative opportunities between the Main Station and REC Network is also a vital way to bring additional scientific collaboration to key projects, facilitate collection of preliminary data, and enhance competitiveness for grant funds.

**Farm/Ranch Management:**

Today's operating climate is much more complex and specialized than even a decade ago. Farmers and ranchers routinely make million dollar decisions related to financial aspects of their operations with input purchases, grain or livestock marketing, and equipment or capital financing operations.



Additional expertise in farm and ranch management, especially as it relates to risk management and agricultural finance are key to enhancing the long term economic sustainability of farming and ranching in the state.

Research in this arena would address the most pressing needs related to agricultural finance as well as leading to a better understanding of how to effectively manage the financial risk associated with operation of farms and ranches. Trade wars, pandemics, volatile market conditions, and other financial challenges have increased the need for expertise in this arena. Research that provides opportunities to better manage these risks and others will offer avenues to enhance the long term viability of agricultural operations across the state and improve opportunities for the next generation to enter agriculture.

**Agricultural Land Reclamation:**

Reclamation of land areas impacted by spills, pipeline installation, and other disturbance associated with various energy development activities continues to be a major challenge for the state. Research related to how best to reclaim these lands is critical to returning them to productive use and ultimately improving the economic returns from these lands.

Landowners throughout western North Dakota have indicated this is a critical research effort. For example, brine spills negatively impact both pasture and cropland and limit the economic capability of future production from this land resulting in lower revenues and the potential for additional negative impacts due to erosion and degradation of soils. Research in this area would identify strategies to improve land reclamation efforts, identify best practices, and restore land to productivity faster. Ultimately, this area of research has the potential to improve landowner relations with land developers and the energy industry as well.

**Livestock:**

Sensory characteristics of meat products are a critical factor in determining consumer acceptance and enhancing value. Research which investigates mechanisms to improve sensory characteristics will result in increased consumer demand for meat products, lead to new product development, and enhance the economic wellbeing of livestock producers.

Consumers rely heavily on sensory traits related to flavor to guide meat purchases. Research which better understands factors which control or favorably influence sensory aspects of fresh and cured meat products will help grow market outlets for meat products.



## 2019-21 Legislation that Included Reporting Requirements to 2021 Appropriation Committees

### HB1020 (NDSU Research & Extension, & Agronomy Seed Farm)

#### **SECTION 2. ONE-TIME FUNDING - EFFECT ON BASE BUDGET - REPORT TO SIXTY-SEVENTH LEGISLATIVE ASSEMBLY.**

The following amounts reflect the one-time funding items approved by the sixty-fifth legislative assembly for the 2019-21 biennium one-time funding items included in the appropriation in section 1 of this Act:

##### One-Time Funding Description

Seed cleaning plant - \$750,000

Greenhouse; Other Fund authorization - \$500,000

Extraordinary repairs; Other Fund authorization - \$940,465

The 2019-21 one-time funding amounts are not a part of the entity's base budget for the 2021-23 biennium. The main and branch research center shall report to the appropriations committees of the sixty-seventh legislative assembly on the use of this one-time funding for the biennium beginning July 1, 2019, and ending June 30, 2021.

- Seed Cleaning - Williston REC

**Status:** Project has been bid and awarded. Contracts in progress. Completion expected in 2021.

- Greenhouse - Williston REC

**Status:** Fundraising in progress to construct Greenhouse, carryover requested

- Extraordinary Repairs (SIIF)

**Status:** Additional Deferred Maintenance funds of \$940,465 are on track to be spent by 6/30/2021. Projects completed or in progress using these funds include the Arena roof at DREC, heat pump replacement at NCREC, a roofing project at CGREC, control systems at AES Research Greenhouse Complex, and numerous other projects at the Main and Branch locations.

#### **SECTION 5. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME.**

The Dickinson research extension center may spend up to \$755,000 of revenues received during the 2019-21 biennium from mineral royalties, leases, or easements for ongoing operational expenses. Any revenues received in excess of \$755,000 may be spent only for one-time expenditures for the biennium beginning July 1, 2019, and ending June 30, 2021.

**Status:** Oil Revenue received July 1, 2019 to November 30, 2020 - \$93,855

#### **SECTION 6. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME.**

The Williston research extension center shall report to the appropriations committees of the sixty-seventh legislative assembly on amounts received and spent from mineral royalties, leases, or easements in the biennium beginning July 1, 2017, and ending June 30, 2019, and the biennium beginning July 1, 2019, and ending June 30, 2021.

##### **Status:**

July 1, 2017 to June 30, 2019 - Amounts received \$32,997; Amounts spent \$27,928

July 1, 2019 to June 30, 2020 - Amounts received \$10,960; Amounts spent \$16,060

July 1, 2020 to November 30, 2020 - Amounts received \$1,093; Amounts spent \$0

**SECTION 10. EXEMPTION - WILLISTON SEED CLEANING PLANT.** The \$1,500,000 of special funds appropriation authority for the Williston research extension center included in subdivision 5 of section 1 of chapter 45 of the 2017 Session Laws for a seed cleaning plant is not subject to the provisions of section 54-44.1-11 and may be continued and expended by the Williston research extension center for the seed cleaning plant during the biennium beginning July 1, 2019, and ending June 30, 2021.

**Carryover status:**

	<b>OF carryover</b>	<b>Amount spend 12/31/20</b>	<b>Status</b>
Seed cleaning plant WREC	1,500,000	1,003,781	Project completion 2021

**SECTION 11. EXEMPTION - CARRINGTON RESEARCH CENTER AND NORTH CENTRAL RESEARCH CENTER.** Any amounts continued for seed cleaning plants at the Carrington research center and North Central research center pursuant to section 12 of chapter 45 of the 2017 Session Laws are not subject to the provisions of section 54-44.1-11 and any unexpended funds may be used to defray the expenses of seed cleaning plants at the Carrington research center and the North Central research center during the biennium beginning July 1, 2019, and ending June 30, 2021.

**Carryover status:**

	<b>GF carryover</b>	<b>OF carryover</b>	<b>Amount spend 12/31/20</b>	<b>Status</b>
Seed cleaning plant NCREC	-	1,463,718	1,140,564	Project completion 2021
Seed cleaning plant CREC	-	774,898	116,704	Project completion 2021

# SBARE Priorities for the North Dakota Agricultural Experiment Station

April 8, 2020

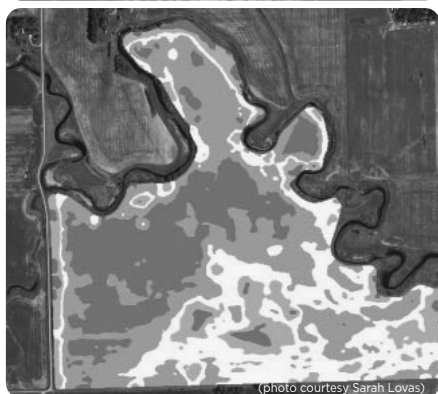
**NDSU** NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

## CRITICAL PRIORITY

### Request for restoration of general fund reductions:

**Request:** Main Station restoration of 15% budget cut - \$7,846,584

**Request:** Research Extension Centers restoration of 5% budget cut - \$903,722



## 1 Big Data Initiative

Agricultural research activities have become much more data intensive. Advances in agricultural sensors, computational speeds and networking technologies produce massive volumes of monitoring data, and advances in precision agriculture will only increase data production at a rapid pace. The demand for data storage, management and analysis within agriculture and food production is greatly needed to provide the producer with meaningful management outputs that will improve their operations.

Large volumes of data are part of every conceivable field of agricultural research, including plant varietal selection, soils, livestock production, weather and climate, economics and agribusiness, and food production. As an example, our plant breeding programs are increasingly reliant on large data sets related to plant production traits but increasingly include genomic data, which dramatically increases the volume of data that must be collected, systematized, analyzed, stored and archived.

In addition, weather is the primary impacting factor on all fields of agriculture, and the ability to monitor, process and analyze weather and climatic data is essential to improve producer management and reduce risk. The North Dakota Agricultural Weather Network (NDAWN) is a mesonet of more than 150 stations and generates a tremendous amount of data multiple times per hour. The value of this data and its uses have the ability to greatly improve agricultural operations through more timely applications of crop inputs, determining planting and harvesting dates, minimizing risk, etc. However, improved data utilization and a more robust mesonet are required to provide these additional capabilities for local producers.

Enhancing the capability of our scientists to better handle the types of data necessary for improvements in research will lead to greater and more impactful breakthroughs in fields that are data intensive.

**Request:** Six FTEs total. Three FTEs to support enhancements to NDAWN. Three FTEs related to data analytics, management and curation. \$320,000 in operating, \$200,000 in equipment.

**Total:** \$1,660,000

# SBARE Priorities for the North Dakota Agricultural Experiment Station

April 8, 2020

## 2. Plant Initiative

Crops and cropping systems account for more than 80% of the gross agricultural receipts in North Dakota. Each year, new challenges and research questions emerge, especially related to crop rotations, agronomic practices, varietal selection and other considerations. Crop rotations in North Dakota are diverse and complex, and the need for specialized research in a wide variety of crops and cropping systems is critical for the success of the agricultural operations across the state.

Research that addresses many of the most challenging problems in cropping systems generates almost immediate return on investment by improving agricultural productivity. For instance, plant disease challenges are a constant concern. Additional funding that helps address new and emerging plant diseases ensures farm profitability and reduces expense.

Research that addresses agronomic conditions in western North Dakota at the Dickinson REC is critical to helping farmers address issues related to crop rotations, drought concerns and other issues related to this important growing region. In addition, more emphasis on plant breeding, especially with soybean and pulse crops, is important because these legume crops have become an increasingly important part of the crop rotation mixture throughout the state.

In addition, end-market quality continues to be a more important factor in crop marketing domestically and internationally each year. End users are concerned not only with functional attributes of crops such as milling and baking quality, they also are concerned with sensory characteristics of the various crops and crop products produced in the state. Research that continues to improve on sensory characteristics for end users is becoming more important each year.

**Request:** Eight FTEs total. One sensory scientist and one sensory technician, one research agronomist at the DREC, one clubroot fungus technician at the LREC, a pulse breeding technician, a soybean breeding technician, and one plant virologist and one plant virology technician. \$120,000 in operating support.

**Total:** \$1,580,000

## 3. Operating Support

Scientists have become increasingly reliant on grant funds to conduct research, and consequently their time spent on administering the grant process has greatly increased. The complexity of many grant applications has increased significantly from such issues as compliance and submission processes, and electronic paperwork, which requires scientists to spend more of their time on these items than the science. Administrative support staff dedicated to assisting scientists to identify sources of grant funds, navigate complex submission requirements and gather paperwork would improve efficiency and increase the ability of our scientists to identify, submit and compete successfully for grant funds.

Graduate students enhance research programs by providing key labor to complete research activities, collect field data and conduct various analyses associated with research projects. Graduate students also enhance collaborations between the main campus and the REC network by providing a vital link between scientists.

Operating support to enhance collaborative opportunities between the Main Station and REC network is also a vital way to bring additional scientific collaboration to key projects, facilitate collection of preliminary data and enhance competitiveness for grant funds.

**Request:** Two FTEs total. Two FTEs will provide administrative support for grant development work, \$360,000. Graduate student funding to hire graduate research assistants (no FTEs), \$720,000. Operating support for Main Station and RECs, \$480,000.

**Total:** \$1,560,000

## 4. Farm/Ranch Management

Today's operating climate is much more complex and specialized than even a decade ago. Farmers and ranchers routinely make million-dollar decisions related to financial aspects of their operations with input purchases, grain or livestock marketing and equipment or capital financing operations.

Additional expertise in farm and ranch management, especially as it relates to risk management and agricultural finance, are key to enhancing the long-term economic sustainability of farming and ranching in the state.

Research in this arena would address the most pressing needs related to agricultural finance as well as lead to a better understanding of how to effectively manage the financial risk associated with operation of farms and ranches. Trade wars, pandemics, volatile market conditions and other financial challenges have increased the need for expertise in this arena. Research that provides opportunities to better manage these risks and others will offer avenues to enhance the long-term viability of agricultural operations across the state and improve opportunities for the next generation to enter agriculture.

**Request:** Two FTEs total. A research scientist to conduct work related to economic contributions. One FTE to conduct research related to agricultural finance. Operating support, \$80,000.

**Total:** \$520,000

## 5. Agricultural Land Reclamation

Reclamation of land areas impacted by spills, pipeline installation and other disturbance associated with various energy development activities continues to be a major challenge for the state. Research related to how best to reclaim these lands is critical to returning them to productive use and ultimately improving the economic returns from these lands.

Landowners throughout western North Dakota have indicated this is a critical research effort. For example, brine spills negatively impact pasture and cropland and limit the economic capability of future production from this land, resulting in lower revenues and the potential for additional negative impacts due to erosion and degradation of soils. Research in this area would identify strategies to improve land reclamation efforts, identify best practices and restore land to productivity faster. Ultimately, this area of research has the potential to improve landowner relations with land developers and the energy industry as well.

**Request:** Two FTEs. Research scientist and technician to address research related to reclamation of agricultural lands negatively impacted by various energy development activities. Operating support at the Main Station and RECs, \$40,000.

## 6. Livestock

Sensory characteristics of meat products are a critical factor in determining consumer acceptance and enhancing value. Research that investigates mechanisms to improve sensory characteristics will result in increased consumer demand for meat products, lead to new product development and enhance the economic well-being of livestock producers.

Consumers rely heavily on sensory traits related to flavor to guide meat purchases. Research that better understands factors that control or favorably influence sensory aspects of fresh and cured meat products will help grow market outlets for meat products.

**Request:** Two FTEs. A sensory scientist and sensory technician to conduct work related to consumer perceptions of meat products. Operating support, \$40,000.

**NDSU** NORTH DAKOTA AGRICULTURAL  
EXPERIMENT STATION

# North Dakota Agricultural Experiment Station

## Main Research Station

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### 2019-2021 IMPACTS

- Established Agribiome programs focused on soils, plants and livestock. Two scientists and two technicians have been hired. Work has started on a statewide study of over 200 wheat fields in 50 counties to characterize the microbiome and health of soils. The work is essential in understanding the relation between the microbiome and the crop, which can improve productivity and quality.
- Conducted human coronavirus testing through the Senator Bill Bowman Veterinary Diagnostic Laboratory. In addition, AES Researchers are testing wastewater from around the state for the coronavirus that causes COVID-19. This surveillance can help to identify emerging hotspots of COVID-19 earlier than human testing.
- Released multiple new varieties in HR spring wheat, HR winter wheat, pulse crops, and soybeans.
- Collaborated with Emerging Prairie to establish research projects on the Grand Farm, which were in collaboration with CHS.
- Enhanced network connectivity to field research locations to move closer to developing the “farm of the future” through advance sensor development and data collection.
- Collaborated between NDAES Range Scientist and Entomologist to investigate, assess and demonstrate scientifically based management options that sustainably enhance livestock productivity while conserving regional biodiversity.
- Researched land and pipeline reclamation solutions. Research aims to restore soil productivity and reduce the cost of reclamation by identifying ways in which land can be reclaimed using crop rotations, tillage, and other methods.
- Collected higher spatial resolutions of weather data from the NDAES’ North Dakota Agricultural Weather Network resulting in greater efficiencies for oil traffic. This data allows for greater spatial oil traffic control across counties after precipitation events.
- Collaborated with the United States Forest Service to evaluate the potential of grazing management practices to facilitate the riparian restoration.
- Developed supplementation strategies to help producers prevent potentially negative consequences of poor maternal nutrition and increase cattle production.



*NDAES released multiple new varieties in hard red spring wheat, hard red winter wheat, pulse crops and soybeans.*









## Agency Overview

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# Carrington Research Extension Center

## North Dakota Agricultural Experiment Station

### **Agency Statutor Authority**

North Dakota Century Code Chapter 15-12.1

### **Agency Description**

The Carrington Research Extension Center (CREC) was established in 1960. The CREC operates on a land base of around 2,100 acres and has infrastructure to irrigate about 260 acres with center-pivot systems and 120 acres by surface methods. The balance of the acreage is managed as traditional dryland and is utilized primarily for dryland field crop research activities and foundation seed production.

The CREC conducts research and educational programs to enhance the productivity, competitiveness, and diversity of agriculture in central North Dakota. Research activities at the CREC include trained scientists and support staff implementing programs in these disciplines: agronomy, plant pathology, soil science, precision agriculture and animal science. These program teams are able to address a broad scope of factors that impact North Dakota agriculture. The crop diversity of the state is addressed in all program areas and is further supported by the ability to conduct research under both dryland and irrigated conditions. Projects addressing organic crop production and a fruit and berry program broaden the constituency being served. The foundation seed program of the center represents an important part of the overall NDSU Foundation Seed program. Based on the research capacity across multiple disciplines, the CREC strives to implement relevant research impacting current agricultural issues and is prepared to contribute significantly to future opportunities to enhance North Dakota agriculture.

The CREC maintains a strong Extension program as four extension specialists base their educational programming from the center. The Extension program emphasis areas addressed by these specialists include: agronomy, livestock, precision agriculture and livestock environmental management.

### **Agency Mission Statement**

The Carrington Research Extension Center conducts research that will lead to the enhancement of agriculture and improve the quality of life across the central region of North Dakota. Specifically, the Carrington Center conducts research on both dryland and irrigated crop production methods and systems, improved crop cultivars, feeding of beef cattle, cow/calf nutrition, and sustainable agricultural production, and produces foundation seedstocks. The objective is to discover the balance between farm enterprise profitability and conservation of the natural resource base. The results of these studies are disseminated to the entire state through an on-going Extension educational program.

### **Agency Performance Measures**

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

## Agency Future Critical Issues

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- The beef research unit requires a series of enhancements to the facilities that support research on optimizing nutrition and management of beef cattle. An expansion of feedlot pens will expedite making research results available to producers and expand projects investigated. A feedlot research support facility would expand the scope of research capabilities, assist in sustaining Institutional Animal Care and Use Committee (IACUC) compliance, address worker protection challenges, and reduce maintenance costs for equipment. Associated facility needs include bulk feed commodity storage, pens within a hoop or mono-slope structure and a smart-feed technology system.
- It is important that grant fund opportunities continue to be widely available in future years. Funds that support crop and livestock production or agricultural related issues in general are needed to leverage public funding. The CREC research programs must continue to have a diversity of opportunities to compete for grant funds that, when successful, allow the center to most effectively empower current research programs.
- The programs of the CREC are supported by a diversity of facilities that include not only the primary buildings like headquarters and laboratory but also feedlot pens, feed and seed storage, animal shelters, water supply features, storage buildings, parking lots, roadways and waste containment. Additional support for maintenance of these facilities is needed.
- Equipment storage capacity at the CREC is critically limited, resulting in a number of high-value pieces of equipment being stored outside year-round and exposed to the elements. This exposure has resulted in repair costs, which would not have been experienced if the equipment was stored indoors, and faster depreciation especially on the higher-value equipment.
- A secure (owned or long-term leases) land base is critical to sustain the current and future research mission of the Carrington Center. The diverse programs of the CREC operate on a relatively small land base, around 2,140 acres, with the state owning around 840 acres. The 1,300 acres not secured by state ownership must be sourced by annual rental agreements with multiple landlords. This heavy reliance upon a willing group of land owners to annually rent a significant portion of the acreage required to support the CREC puts these programs at risk. If any one parcel of rented land was not made available in a given year, the CREC would be forced to reduce or eliminate program contributions that are depended upon by North Dakota producers and are basic to our department mission.

## 2019-2021 IMPACTS

- Improved establishment of cover crops after soybean was achieved by identifying tolerance to common residual herbicides.
- Created opportunities to study the agribiome within the long-term cropping systems project.
- Initiated beef feedlot trials to address rations that expand the use of low-quality wheat and soybean hulls.
- Conducted corn fertility trials that defined rates of sulfur application that optimized yield and economic return.
- Provided crop performance information to farmers and industry for 26 different crops annually.
- Identified strategies to manage the field pea root rot complex using planting date, fungicide and crop rotation.



*The CREC initiated beef feedlot trials to address rations that expand the use of low-quality wheat and soybean hulls.*



## Agency Overview

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# Central Grasslands Research Extension Center—Streeter

North Dakota Agricultural Experiment Station

### Agency Statutory Authority

North Dakota Century Code Chapter 15-12.1

### Agency Description

The Central Grasslands Research Extension Center (CGREC) conducts research for the Coteau region of North Dakota, an area bounded by the Missouri River on the west and the James River on the east, and extends from Divide and Burke counties in northwestern North Dakota in a southeasterly direction through Dickey County.

Research is intended to 1) increase or maintain carrying capacity of native range while emphasizing conservation and preservation, 2) stabilize grass production to compensate for the vagaries of the weather and precipitation as it influences forage production in the dryland agriculture, 3) identify the impact of different management strategies on beef production in the central region, and 4) explore the increased use of cover crops, annual forages and byproducts for the maintenance of the cow herd. CGREC's primary focus is management of grasslands, which occupies about one-third of the agricultural land in the state and aims to improve economic value to the natural resources while enhancing soil health and habitat for pollinators, birds, and mammals.

### Agency Mission Statement

The legislated mission of the CGREC is as follows: "The CGREC shall conduct research designed to fulfill needs within an area bounded by the Missouri River on the west and the James River on the east with research objectives as follows:

1. To increase the range-carrying capacity of native range with emphasis on conservation.
2. Stabilization of grass production to determine how to best compensate for the variability of the weather as it influences forage production.
3. Identification of different management systems on beef production in the central region of the state.
4. Exploration of increased use of crop residues and by-products for the maintenance of the cow herd.
5. To disseminate research results and information for the benefit of the state of North Dakota.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

### **Agency Future Critical Issues**

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- Livestock facilities continue to be deficient and impede potential research. Improvements are required to livestock handling and feeding facilities including replicated working corrals on pasture, dry-lot pens, feed storage, and a new working barn to allow for growth of the animal science research program with animals that come off the range and forage research projects.
- Significant improvements or replacement of the director's residence is needed, as the current residence is dilapidated and no longer safe.
- Deferred maintenance and other repairs that affect both safety and use of facilities continue to be a critical issue.



## Central Grasslands Research Extension Center

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### 2019-2021 IMPACTS

- Initiated a large landscape level-research project that compares innovative grazing strategies on livestock performance; livestock production; habitat for pollinators, birds, and mammals; soil health; and microbiology of the soil. We have increased grazing efficiency by 30 to 60 percent, added economic value to our grazing land by 25 to 35 percent, reduced exotic cool-season grasses by 5 to 15 percent, and increased plant diversity by 2–3 times.
- Conducted winter grazing research to include grazing of corn residues, cover crops, and bale grazing projects that shows reduced costs of fossil fuel use, labor, and depreciation to equipment, and adding value to the land without impacting livestock production or reproductive performance.
- Studied effects of supplementing enhanced mineral and energy feeds to developing heifers on pasture using radio frequency identification technology and GPS technology. We have shown lack of mineral and energy during the first 84 days of pregnancy reduces birth weight, creates a smaller femur bone, and creates deficiencies in mineral levels of internal organs — thus reduced immunity in the offspring.
- Initiated an integrated livestock/cropping system cover crop trial conducted on six ranches, Central Grasslands Research Extension Center, and Main Station. The project design is to research soil chemical and physical properties, livestock performance, crop production, microbial action of microorganisms, and economics to provide education outcomes that show impacts on ecological and economical effects using an integrated system.
- Provided forage production and quality information to ranchers for 16 different forage crop varieties and 24 different corn silage varieties showing which best fits different management operations and the economics costs.
- Initiated projects that collaborated with 13 NDSU main station scientists in five different departments, USDA Agricultural Research Center near Mandan, USDA – NRCS, USDI Fish and Wildlife Service, numerous Extension agents and specialists, and numerous local ranchers.



*The CGREC initiated a large landscape level research project that compares innovative grazing strategies on livestock performance; livestock production; habitat for pollinators, birds, and mammals; soil health; and microbiology of the soil.*



## Agency Overview

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# Dickinson Research Extension Center

## North Dakota Agricultural Experiment Station

### Agency Statutory Authority

North Dakota Century Code Chapter 15-12.1

### Agency Description

The Dickinson Research Extension Center (DREC) has an established record of service to the people in the 13-county region south and west of the Missouri River. The DREC operates 6,506 acres of owned land within the region as well as annual land leases needed to accommodate ongoing projects. The land base provides opportunities for a broad perspective in evaluating various agricultural systems that can serve as engines for economic development. This is a continuation of what has taken place for over 100 years. Currently, the DREC assists agricultural producers in solving production problems with agronomy, animal science, soil science, and range science, while integrating new developments. Six major areas are served: agronomy, beef management, bio-security, range management, soil health, and sustainable agricultural practices. Faculty and staff are committed to engaging people of the region and to the identification of current economic opportunities, while sustaining natural resources for future generations as directed by the mission statement and advisory board. Research data and producer ideas are continually considered so the DREC can leverage the latest knowledge to best benefit the people of North Dakota.

### Agency Mission Statement

The Dickinson Research Center must be located at or near Dickinson in Stark County. The Center shall conduct research on increasing the carrying capacity of native rangeland, with emphasis on conservation and preservation for future generations. The Center shall conduct research on grass production to determine how to best compensate for the vagaries of the weather as it influences forage production in the dry land agriculture of western North Dakota. The Center shall conduct research at the ranch location in Dunn County with beef cattle breeding, feeding, management and disease control for the benefit of livestock producers of western North Dakota and the entire state. The Center shall conduct research designed to increase productivity of all agricultural products of the soil by maintaining or improving the soil resource base in the dry land agricultural region of southwestern North Dakota by the identification of adapted crop species and superior crop cultivars; propagation and distribution of selected seed stock; and development of profitable cropping systems that achieve the necessary balance between profitability and conservation of all natural resources. The Center shall disseminate research results and information for the benefit of this state.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

## Agency Future Critical Issues

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- There is a need to continue soil-plant-livestock-air research emphasizing soil health, agronomy, range management and livestock production. The current research focus and long research history provide a firm foundation to continue cutting edge research to match goals and objectives for work related to the agricultural biome. The integration of sustainable plant and beef systems requires more evaluation. In the future, more avenues for additional compensation need to be explored to enhance the economic viability for beef producers and the rural areas associated with beef production. This compensation may come from not only beef but synergistic crop production. The DREC takes serious the need for sustainable beef, beef and grass systems. Currently, the DREC is striving to develop sustainable and integrated production strategies that match conditions of western North Dakota and surrounding regions. The inclusion of forages into traditional cropping systems can provide the resources necessary for the development of integrated production strategies that increase sustainability and profitability.
- There is a need to develop agro-ecosystems that optimize the balance between forage-based and grain-based crop/livestock systems reflective of the many individual ecosystems. These integrated systems must be synergistic to enhance the native and agronomic plant communities, thus providing the base for future beef production. In addition, enhanced value for commodities produced from forage-based systems is key
- Deferred Maintenance Increase — Additional support for maintenance of facilities is needed.
- Infrastructure — Parking at the DREC main office requires people to park along adjacent streets. The nearest street parking spot is nearly 100 yards from the main office. The parking distance can impair people with special needs and may prevent them from accessing services offered by the DREC. Several workshop attendees have indicated in Extension evaluations that parking needs improvement. A parking lot will increase educational workshop participation. A new building is needed to store and repair the farm and research equipment. The storage will also be used for chemical and hazardous materials.
- Programmatic Needs — Maintain adequate operating funds. Funding an agronomy research specialist would allow improved efforts in cropping systems and soil science. Funding a research specialist with a master's level education would allow for facilitated research and data collection. The Center needs annual support for a multitude of research projects that require a broad understanding of various research techniques and data analysis related to the agricultural biome.

## 2019-2021 IMPACTS

- Researched soil health and provided education to show how soil health is improved by the microbial action of microorganisms and interactions of cropping and livestock systems.
- Shifted research and educational efforts to explore new forage and cattle resources and inputs.
- Evaluated grass cultivars, soil mineral nitrogen, prairie ecosystems, grassland restoration and integrated grazing systems.
- Reduced soil disturbance, increased plant diversity, added animal diversity, maintained living roots to feed soil organisms and covered soil with plants and plant residues.



*The DREC evaluated grass cultivars, soil mineral nitrogen, prairie ecosystems, grassland restoration and integrated grazing systems.*



## Agency Overview

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# Hettinger Research Extension Center

North Dakota Agricultural Experiment Station

### **Agency Statutory Authority**

North Dakota Century Code Chapter 15-12.1

### **Agency Description**

The Hettinger Research Extension Center (HREC) is a semi-arid site located in southwest North Dakota, providing the most southerly NDSU location in the non-glaciated portion of North Dakota as a site for its agronomy research program. The HREC also is located at the center of the North Dakota sheep industry, the focus of one of its animal research programs, and in an area of rapidly growing livestock feeding ventures, another focus of animal research at the HREC. Additionally, the HREC is located in a region where much of the land base is in the Conservation Reserve Program (CRP), which has resulted in additional research evaluating potential changes in the CRP program and how these changes may affect upland native and game bird populations. A new research program evaluating low-cost rangeland monitoring strategies on U.S. Forest Service lands and wildlife/livestock interactions has resulted in a significant increase in the quantity of rangeland research conducted at the HREC throughout the western Dakotas. Research at the HREC involves the disciplines of animal science, range science, wildlife science, agronomy, and agribusiness and applied economics. Collaboration is with Main Station scientists, Branch Station scientists, U.S. Forest Service, grazing associations, university scientists from WY, SD, and MT, and USDA research entities in these research disciplines to improve productivity of livestock, grazing, and cropping systems, and to improve economic development of the region.

### **Agency Mission Statement**

The Hettinger Research Extension Center, an outreach of North Dakota State University, provides applied research and education in agriculture and environmental sciences that will enrich the lives of North Dakotans and support economic development.

### **Agency Performance Measures**

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

## **Agency Future Critical Issues**

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- Technical support for the livestock research program is needed to provide all research programs with a full time technician. This position is needed to meet the research needs of producers in SW North Dakota.
- Operating support for additional prescribed equipment such as UTVs, pumper, drop torches, and personal protective equipment (PPE).
- A modern livestock processing and research support facility is needed to conduct the research by our sheep and cattle research programs. The current facility is a 16' x 32' lean-to, with no ability to utilize today's modern technology, such as web access, in our research program.
- A Sheep Feed Efficiency Research Facility for the evaluation of feed efficiency is needed for the sheep producers of ND to remain competitive. The ND Lamb and Wool Producers Association continues to support such a facility at the Hettinger REC.
- Deferred maintenance and safety issues are over \$1,000,000. Specifically, due to a past wet cycles and heavier than normal traffic, the road to the office is unstable and needs to be replaced. The most recent inspection by the Fire Marshall indicated that the 1970's era bunkhouse needs to be renovated to maintain its use as a housing facility, due to fire and safety concerns. Additional needs include mechanical system renovation of the 1992 office, and parking lot re-paving.



## 2019-2021 IMPACTS

- Evaluated industrial hemp for production and adaptation.
- Variety testing of 18 different crops to find the best performing cultivars.
- Conducted weed science research evaluating new herbicides for weed control and crop safety for crops.
- Evaluated the effects of patch-burning in post Conservation Reserve Program lands on livestock, vegetation, pollinators, and wildlife.
- Received funding to begin honeybee research evaluating shelter belt use.
- Developed a multidisciplinary research project evaluating an integrated crop-livestock system using annual forages, winter wheat, and sheep.
- Conducted a nationally recognized sheep research program evaluating alternative technologies for increasing reproductive efficiency in both males and females and feedlot nutrition.
- Initiated a project evaluating the potential of a genetic marker for structural deformities in Rambouillet rams.
- Trained extension agents certified in *Nitrate QuikTest Certification Program* for annual forages, assisting in the statewide drought response for NDSU Extension.
- Trained five MS and three PhD students in the fields of Natural Resource Management and Animal Science.



*The HREC evaluated the effects of patch-burning in post Conservation Reserve Program lands on livestock, vegetation, pollinators, and wildlife.*



## Agency Overview

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# Langdon Research Extension Center

## North Dakota Agricultural Experiment Station

### Agency Statutory Authority

North Dakota Century Code Chapter 15-12.1

### Agency Description

The Langdon Research Extension Center (LREC) is located one mile east of Langdon on US highway five. The agricultural land base at the station consists of 549 owned acres and an additional 206 acres under lease agreement. The LREC serves a nine-county region located in northeast North Dakota and has North Dakota's highest precipitation rates, coolest temperatures, and richest productive soils. The climate supports diverse crop production and recurring disease problems.

The LREC has a strong tradition of assisting the region's producers to meet agricultural production challenges throughout the course of its existence since 1909. In 1993, the LREC redirected much of its research programming to focus on the significant increase of disease and insect pressure associated with its climate. This redirected applied research programming has provided producers with information regarding disease minimizing cultural farming practices and trusted information regarding chemical applications and other inputs that minimize disease and insect pressures that give growers the best return on investment.

Recently, the LREC has significantly enhanced its overall agricultural research programming with an increase in the foundation seed program, the addition of a crop protection scientist, farm business management instructor, Extension specialist in agronomy and an Extension specialist in soil health. New infrastructure additions in the past 12 years include a full service agricultural based learning center/headquarters building constructed in 2004, agronomy/pathology laboratory in 2015 and a 25 acre field tiling project completed in 2014. The NDSU LREC with its recent personnel and infrastructure additions and improvements will insure that growers can depend on research data that will improve their bottom line for the next 100 years.

### Agency Mission Statement

The Langdon Research Extension Center will conduct applied agricultural research that enhances the quality of life for the region's citizens with a responsive, flexible and accessible overall agricultural based research program. This programming will combine the concepts of agricultural research, information technology and community/economic development while conserving the region's natural resources.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

## **Agency Future Critical Issues**

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- All research and extension programming are supported by all facilities at the Langdon REC. Most facilities are becoming outdated and unsafe. Acquiring additional funds for extraordinary repairs, including upgrades to minimize the spread of COVID19, will help bolster these facilities to support the level of research and extension programming currently supported at Langdon.
- With appropriated funds becoming less and less, the LREC has become more dependent on research grant opportunities. Supporting an atmosphere that readily accepts private funding to leverage public funding will be essential to continue employing problem solving applied research for growers.

## 2019-2021 IMPACTS

- Continued to build research partnerships with agricultural input companies, commodity groups, regional crop improvement associations, growers, and others.
- Produced and distributed the highest quality foundation grade seed of the major crops grown in our region.
- Provided support for main station crop breeding programs and other cropping system research programs.
- Continued to foster and strengthen two new Extension specialists' outreach programs in agronomy and soil health.
- Applied research in agronomy, pathology and soil health is providing growers with answers they need to become more profitable.



*The LREC applied research in agronomy, pathology and soil health is providing growers with answers they need to become more profitable.*



## Agency Overview

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# North Central Research Extension Center – Minot

North Dakota Agricultural Experiment Station

### Agency Statutory Authority

North Dakota Century Code Chapter 15-12.1

### Agency Description

The North Central Research Extension Center (NCREC) was established in 1945 and is located one mile south of Minot on Highway 83. The NCREC conducts research to increase agricultural productivity, with a focus in the north central region of ND. The NCREC serves agriculture producers in the region and state through crop research, foundation seed production, and Extension education programs. Research and Extension programs at the NCREC focus on crop variety and new germplasm evaluation, weed control, cropping systems, crop pest management, reduced tillage, and soil fertility. Research is conducted on cereal grains, oilseeds, legumes, forages, grapes, and emerging specialty crops.

### Agency Mission Statement

The North Central Research Extension Center conducts research to increase agricultural productivity in north central North Dakota. The center serves agricultural producers in a 12 county region surrounding Minot through crop research, foundation seed production and dissemination, and extension education programs in crop and livestock production. Studies at the center focus on crop variety and new germplasm evaluation, weed control, cropping systems, crop pest management, reduced tillage, and soil fertility. Research is conducted on cereal grains, oilseeds, legumes, forages, and new specialty crops.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

### Agency Future Critical Issues

- The primary issue currently is to maintain a level budget through the 2021-23 biennium based on the 2019-21 budget. This is essential to support the research and extension programming at its current level. Further budget cuts would require eliminating FTE(s) which would scale back research and extension efforts demanded by the public.
- Increased base funding to support research and Extension efforts
- Additional technical support
- Increased operating funds
- Equipment replacement
- Drain tile NCREC main yard
- Encroachment from city of Minot
- Sale and purchase of additional land for foundation seed production

**NDSU** NORTH DAKOTA AGRICULTURAL  
EXPERIMENT STATION





## 2019-2021 IMPACTS

- Produced, conditioned, and distributed foundation seed of seven crops grown in the region consisting of 24 unique varieties.
- Assisted in development of new varieties of economically important crops and evaluated production strategies for alternative crops.
- Researched crop production products in order to improve efficiencies and maximize economic return for minor and major acreage crops.
- Provided extension education in the areas of livestock, soil health, crop protection, and cropping systems.
- Conducted residue trials that lead to registration of new agricultural pesticides.



*The NCREC assisted in development of new varieties of economically important crops and evaluated production strategies for alternative crops.*



## Agency Overview

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# Williston Research Extension Center

## North Dakota Agricultural Experiment Station

### **Agency Statutory Authority**

North Dakota Century Code Chapter 15-12.1

### **Agency Description**

The Williston Research Extension Center (WREC), established in 1907 and relocated to the present site in 1954, is an 800-acre rain-fed farm located in northwest North Dakota near the city of Williston. In 2001, an additional 160 acres were purchased in the Nesson Valley and an irrigated research and development project was established. WREC research studies are conducted on crop variety evaluation, herbicide performance and other cultural management research, cropping systems and soil and water conservation practices. The main dryland crops are spring wheat and durum. Barley, oats, safflower, pea, lentil, chickpea, canola, flax, alfalfa and other alternative crops are also grown as cash crops or for livestock feed.

The WREC research is intended to increase the producer's net profit, support crop diversification and encourage more intensive cropping and irrigation development. Research on soil and crop management systems for sprinkler irrigation, on alternative irrigated high value and value-added crops, long term no till sustainable cropping systems, unmanned (UAV) drone systems, pipeline reclamation, inter-cropping, horticultural crops and extension outreach are conducted. The WREC also conducts variety development research on winter wheat, spring wheat, barley, durum and variety evaluations in cooperation with NDSU Main Station scientists, USDA-ARS, other land grant universities and private companies. The WREC produces and supplies foundation seed and proven crop varieties to area producers.

### **Agency Mission Statement**

The Williston Research Extension Center conducts research to increase agricultural productivity in the semi-arid region for northwestern North Dakota while achieving a necessary balance between profitability and conservation of natural resources. Research on soil and crop management systems for sprinkler irrigation and alternative irrigated high-value/value-added crop production are conducted at the Nesson Valley irrigated site in cooperation with scientists from the USDA-ARS Northern Plains Agricultural Research Laboratory in Sidney, Montana, NDSU and other collaborators.

### **Agency Performance Measures**

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

## Agency Future Critical Issues

- Increasing operating costs and higher labor costs for research activities continue to impact WREC abilities to carry out research programs vital to the improvement of the economic and environmental performance of agricultural lands. A high priority need is the request to restore the WREC budget to the 100% funding level. Deferred maintenance funding continues to be an important need for WREC to maintain its facilities.
- The joint WREC/EARC Advisory Board has unanimously passed a resolution to request and document the need for an animal research/extension specialist at WREC. Our advisory board feels this position will fill the missing key in our integrated cropping/livestock systems program for northwest North Dakota.
- An additional equipment storage building is needed for WREC high cost farm and plot research equipment to be stored indoors from the elements.
- The switch from a strict small grain-fallow rotation to a more intensive no-till diversified cropping system has resulted in northwest North Dakota farmers growing more than 20 different crops on over an additional million acres of previously fallowed land increasing the demand for pure seed of varieties of pulse crops and other fragile specialty seeds. A capital campaign drive for a horizontal seed conditioning facility/equipment has raised over 1.9 million dollars. Construction is underway and the new seed conditioning facility is expected to be fully operational by September 2021.
- A greenhouse is needed for the WREC plant pathology, agronomy, and horticulture programs to allow for conducting plant disease, agronomic, and horticulture research during the winter months. A capital campaign for \$500,000 was authorized by the North Dakota legislative assembly. The campaign drive has raised over \$400,000 to date.

## Williston Research Extension Center

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### **2019-2021 IMPACTS**

- Established and continue a plant pathology research program to reduce disease and develop management practices to promote naturally occurring beneficial organisms.
- Collaborated with breeders from NDSU, Montana State University, South Dakota State University, Minnesota State University, USDA-ARS and private companies to conduct 50 variety trials each year to identify varieties adapted to dryland and irrigated conditions of the Mon-Dak region.
- Produced over 45,000 bushels of foundation seed of 24 varieties of small grains and broadleaf crops.
- Developed and utilized a 160-acre irrigated site to identify improved irrigated cropping and tillage systems, water use efficiency, and improved soil health.
- Established and continue a pipeline reclamation research project to develop treatments to restore crop yields and soil health.
- Established a high tunnel research project with vegetable crops and cut flowers and initiated research on haskaps.
- Established a saline seep reclamation research and demonstration project in collaboration with the Montana Salinity Control Association.
- Initiated drone based high throughput phenotyping research.
- Determined optimal soybean population (90,000 PLS/A) and row spacing (7 ½") for no-till soybean dryland production in northwest North Dakota.



*The WREC established and continue to conduct a pipeline reclamation research project.*









## Agency Overview

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# Agronomy Seed Farm

## North Dakota Agricultural Experiment Station

### Agency Statutory Authority

North Dakota Century Code Chapter 15-12.1

### Agency Description

The Agronomy Seed Farm (ASF) is a 590 acre farm located near Casselton, which has been a part of the North Dakota Agriculture Experiment Station (NDAES) since it was gifted to the state in 1950. It was the result of a fund drive conducted by the North Dakota Crop Improvement Association, which solicited farmers, seed companies and many others throughout the state to help establish a farm whose main purpose is to increase seed of new varieties as they are developed by the plant breeding and supporting departments of the NDAES. The ASF also propagates seed of older but still desirable varieties for the seedsmen of the area.

### Agency Mission Statement

The mission of the ASF is to produce an adequate supply of foundation-grade seed for the seedsmen of the state and area at a reasonable price and to support the varietal development research of the NDAES.

### Agency Performance Measures

Per North Dakota Century Code 15-12.1-17 the State Board of Agricultural Research and Education (SBARE) presents a status report to the budget section of the legislative council. SBARE's most recent presentation to the budget section was on June 25, 2020. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and NDSU Extension. A copy of the information is on file in the legislative council office.

### Agency Future Critical Issues

- The critical issues facing the ASF are a continued demand for foundation-grade seed, favorable weather for growing seed and a good supply of varieties that are in demand by the seed industry. If these three conditions are present and good commodity prices accompany them, the future of the ASF is secure.



## Agronomy Seed Farm

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# 2019-2021 IMPACTS

- Continued to produce a good supply of high quality foundation seed for the seed producers of North Dakota. This includes 83,457 bushels of 48 varieties of hard red winter wheat, hard red spring wheat, barley, oat and soybean seed over the past two years.
- Continued to provide support to the main station scientists in their effort to develop improved crop cultivars and improved production practices for seed producers and farmers in North Dakota.
- Collaborated with the ND Agricultural Experiment Station, ND Foundation Seedstocks and ND Crop Improvement and Seed Association on the release and distribution of newly released crop cultivars and maintained foundation seed of existing cultivars still in demand by North Dakota seed producers.
- Collaborated with the NDSU Agricultural and Biosystems Engineering Department on precision agriculture research including development of the smart crop farm at Casselton.
- Provided crop tours to farmers, seedsmen, commodity groups and others interested in North Dakota agriculture.



*The Agronomy Seed Farm's main purpose is to increase seed of new varieties as they are developed by the plant breeding and supporting departments of the NDAES.*







# Capital Improvement and One-time Requests North Dakota Agricultural Experiment Station

Final Ranking by SBARE – April 7, 2020

**NDSU** NORTH DAKOTA AGRICULTURAL  
EXPERIMENT STATION

## Capital Improvement Requests

### 1. Agronomic, Pathology and Soils Field Lab Facility

Waldron Hall Replacement—Waldron Hall was built in the mid-1950s to house the field laboratories for the wheat breeding programs in the Department of Agronomy. An addition was built in the mid-1960s to house approximately 16 scientists from the Departments of Agronomy and Plant Pathology. The building now houses field labs and wet labs for nearly 60 scientists, each with numerous projects, at the Main Station involving a number of disciplines. Many of these labs are shared, and the seed drying, cleaning and storage facilities needed by our scientists are now grossly insufficient and a health hazard to anyone working in the facility. A new facility is needed to provide our scientists a safe environment to conduct their research, as well as processing, cleaning and storing seed.

**REQUEST:** \$65,000,000 (approximately)

### 2. Livestock Facilities

**TOTAL REQUEST:** \$6,372,000

#### Carrington REC

**Feedlot Research Support Facility:** Construction of a multi-use Feedlot Research Support Facility at the livestock unit would improve feedlot research operational capability, assist in sustaining Institutional Animal Care and Use Committee (IACUC) compliance, attain worker protection standards and reduce maintenance costs for equipment. The CREC has a critical need for a facility at the livestock unit that would combine a dispensary for processing and storing pharmaceuticals and animal health supplies; laboratory space for feeds, blood, fecal and tissue processing; inside tempered storage for daily use feeding equipment; and a shop area for tools, equipment, and equipment maintenance and minor repairs. This facility has been a longtime priority project for the CREC. The CREC livestock program is the primary outstate program for beef feedlot research and evaluation of feeds and feedstuffs for beef production.

**Feedlot Pen Expansion with Waste Containment:** Meeting the expanding demands for feedlot research is partially limited by available pens. Current pens are fully utilized. The CREC is continually challenged to do more livestock nutrition research; however, feedlot pen availability is a clear limitation. The addition of a minimum of 12 pens that would hold up to 240 head of cattle would allow the CREC to conduct at least one additional experiment per feed-out period. Further, the additional pens will allow more treatments and replications within other feedlot studies, which would improve statistical confidence and precision. Any feedlot pen expansion must include the associated waste containment facilities to remain compliant with state law. The CREC livestock program is the primary outstate program with the mission for beef feedlot research and evaluation of feeds and feedstuffs for beef production. Beyond the ability to conduct additional experiments or evaluate more treatments with greater replication, the additional feedlot pens would be developed to expand the depth and speed of the ability to evaluate other factors that impact feeding livestock in North Dakota. These factors include minimizing animal stress, mitigating winter stress, managing influences on environmental concerns, beef animal efficiency and other issues that ultimately impact the viability of beef cattle production and feeding in the state.

**Bulk Feed Commodity Storage Structure:** A major program research responsibility of the CREC is to conduct research that evaluates how North Dakota-derived feedstuffs may be most appropriately utilized in livestock feeding rations with focus on beef production. The research program utilizes many different types of feedstuffs including those that must be stored in bulk. Presently, feedstuffs such as distiller's grains, soybean hulls, ground hay/straw, etc. are stored outside on the ground, which exposes the products to the weather elements, soil contamination and mixture with adjacent products. Animal nutrition research is compromised when the feed products become degraded or contaminated. This addition will enable the research program to expand the variety and number of commodities utilized in feeding studies, improve precision of mixed rations and reduce feed product waste, lowering costs to both the CREC and producers who consign cattle to the studies.



(NDSU photo)



(NDSU photo)

## One-time Request

**Request:**

One-time deferred maintenance - \$1,440,465

# Capital Improvement and One-time Requests North Dakota Agricultural Experiment Station

Final Ranking by SBARE – April 7, 2020

**Covered Feeding (Hoop barn or Mono-slope):** The expansion of feedlot pens would be implemented in a manner that is conducive to future construction of a covered facility either in the form of a hoop barn or mono-slope. This would allow research to evaluate mitigation of winter and summer extremes on animal performance when compared to open lot production. Covered pens also will provide research data on changes to the waste and environmental issues that often challenge the livestock industry.

**Smart Feed Technology System:** These systems allow for more intensive data collection and individual animal application of treatment rations. Feed intake is one of the main drivers of livestock performance. By increasing the abilities of CREC and collaborating researchers to more accurately measure intake and expand the depth of treatments applied within studies, more detailed information can be provided to area producers. Smart feed systems would increase opportunities to study issues to a greater scope and depth, thereby increasing competitiveness for grant funds to support the broader research program.

**Request:** \$1,188,000

## Central Grasslands REC

The CGREC livestock facilities are in dire need of replacement. The existing space used as a support lab is small and inadequate to handle, prepare, and test blood and tissue samples, particularly as the research portfolio at this center has increased recently. This proposed facility would complement the research activities that will be carried out in the new Agronomy laboratory, thereby enhancing the two major research foci of this Center. Livestock holding pens and sheds also are inadequate to address the research and outreach needs for the Coteau region of the state. Specifically, the development of replicated dry lot research pens would allow scientists to answer a broader range of questions relating to beef cow and calf management; a feed handling facility would improve the Center's ability to ensure diet accuracy and improve overall feed management; and a nutrient management/wastewater containment system is lacking and is needed to address possible health and pollution issues.

**Request:** \$2,017,440

## Hettinger REC

**Hettinger REC Livestock Processing and Research Support Facility:** The HREC Southwest Feeders Feedlot cattle and sheep feedlot (24 pens with a capacity of 192 calves or 960 lambs) has provided significant research and outreach to support the livestock industry in the state and region. Feedlot research results are annually published in refereed journals, the ND Beef Cattle Research Report, and the ND Sheep Research Report, in addition to being the centerpiece for research-related livestock outreach efforts at the HREC. The current feedlot has a small (512 square foot) facility that does not support current research or outreach activities. The facility does not provide a secure area to store and administer veterinary supplies, an area for sorting animals into treatments and pens, an area to hold animals indoors for observation and sample collection or office space for the herdsman and has no restroom facilities. A multi-species processing and research support facility would greatly enhance the livestock research conducted at the HREC and expand AES research capabilities in beef cattle and lamb feedlot nutrition and management.

**Request:** \$1,415,880

**Hettinger REC Sheep Feed Efficiency Research Facility:** Traditionally, high grain prices and volatile commodity prices have raised interest and emphasis on increasing the efficiency of sheep production during all phases of production

(rams, ewes and feedlot performance). No facility exists in the northern Great Plains to evaluate feed efficiency in sheep production, but the HREC is well situated and established in the sheep industry to expand its research capabilities through a new facility that can monitor individual animal intake in a pen setting. Research would evaluate genetic potential of breeding stock (rams and ewes) that measures feed intake in relation to performance, as well as feedlot research to complement and provide additional replication to the large-scale trials conducted at the Southwest Feeders Feedlot at the HREC.

**Request:** \$1,750,680

## 3. Langdon REC Greenhouse

The Langdon REC identifies a need to develop greenhouse space for its plant pathology effort. Greenhouse space would allow for year-round testing of disease issues for crops grown in the region and provide an area for testing chemical control methods.

Because the climatic conditions in North Dakota allow only one crop a year, many researchers must limit their research projects to a certain number a year. If our facility gets a greenhouse, we can accomplish more than what we are doing now. Now, plant pathology greenhouse projects are directed to the main campus in Fargo as we do not have a greenhouse at our center.

Greenhouses accommodate many types of plant research and provide flexible environments to accommodate the growing needs for plant research in a shorter time. We currently have diverse types of research projects that need a greenhouse, such as:

- Isolated environments. For example, clubfoot of canola research first must be conducted in a greenhouse rather than in field conditions where the odds of spreading the disease are higher.
- Ambient conditions to replicate outdoor conditions for control and integrated pest management experiments dealing with local rare and newly introduced diseases and pests.
- Bioassays for crop-specific nematode detection, such as soybean cyst nematode.
- Bioassays for the determination of herbicide resistance.
- Fungicide efficacy tests for quick results. Instead of waiting for next summer, research can be done in winter and conveyed to the research community and growers, for example, fungicides to manage chocolate brown spot of Faba beans as no fungicides are registered so far in ND.

**Request:** \$473,000

## 4. AES Equipment Storage Sheds

Purchasing and/or leasing expensive field equipment is an investment that the AES needs to protect. Storing expensive research plot equipment such as tractors, seeders and combines outdoors reduces the life of the equipment and can compromise the sophisticated electronics typically used on such equipment.

**Request:** 8 (\$300,000 per shed)

## 5. Central Grasslands REC Housing

The current director is living in the house that should be for the center herdsman. A new house will need to be built to provide housing for personnel who need to be on site for day-to-day operations. Construction of a new residence would offset the substantial costs associated with repair to the existing residence.

**Request:** \$325,000

**NDSU** NORTH DAKOTA AGRICULTURAL  
EXPERIMENT STATION

NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.







Introduced by

Appropriations Committee

1 A BILL for an Act to provide an appropriation for defraying the expenses of the North Dakota  
2 state university extension service, northern crops institute, upper great plains transportation  
3 institute, main research center, branch research centers, and agronomy seed farm; to provide  
4 for a report; and to provide an exemption.

5 **BE IT ENACTED BY THE LEGISLATIVE ASSEMBLY OF NORTH DAKOTA:**

6 **SECTION 1. APPROPRIATION.** The funds provided in this section, or so much of the funds  
7 as may be necessary, are appropriated out of any moneys in the general fund in the state  
8 treasury, not otherwise appropriated, and from special funds derived from federal funds and  
9 other income, to the North Dakota state university extension service, the northern crops  
10 institute, the upper great plains transportation institute, the main research center, branch  
11 research centers, and agronomy seed farm, for the purpose of defraying the expenses of the  
12 North Dakota state university extension service, the northern crops institute, the upper great  
13 plains transportation institute, the main research center, branch research centers, and  
14 agronomy seed farm, for the biennium beginning July 1, 2021, and ending June 30, 2023, as  
15 follows:

16 Subdivision 1.

17 NORTH DAKOTA STATE UNIVERSITY EXTENSION SERVICE

	Governor's		
	<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
18			
19			
20	Extension service	\$52,403,891	\$54,396,305
21	Soil conservation committee	<u>1,091,520</u>	<u>1,091,520</u>
22	Total all funds	\$53,495,411	\$55,487,825
23	Less estimated income	<u>28,299,143</u>	<u>27,778,159</u>

Sixty-seventh  
Legislative Assembly

1	Total general fund	\$27,709,666	\$25,196,268	\$27,709,666
2	Full-time equivalent positions	242.51	242.77	242.51

3 Subdivision 2.

4 NORTHERN CROPS INSTITUTE

5			Governor's	
6		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
7	Northern crops institute	<u>\$3,840,027</u>	<u>\$3,819,277</u>	<u>\$3,840,027</u>
8	Total all funds	\$3,840,027	\$3,819,277	\$3,840,027
9	Less estimated income	<u>1,896,217</u>	<u>1,924,224</u>	<u>1,896,217</u>
10	Total general fund	\$1,943,810	\$1,895,053	\$1,943,810
11	Full-time equivalent positions	12.80	13.55	12.80

12 Subdivision 3.

13 UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

14			Governor's	
15		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
16	Upper great plains transportation	<u>\$23,292,223</u>	<u>\$23,347,234</u>	<u>\$23,292,223</u>
17	institute			
18	Total all funds	\$23,292,223	\$23,347,234	\$23,292,223
19	Less estimated income	<u>18,895,894</u>	<u>19,064,184</u>	<u>18,895,894</u>
20	Total general fund	\$4,396,329	\$4,283,050	\$4,396,329
21	Full-time equivalent positions	43.88	43.88	43.88

22 Subdivision 4.

23 MAIN RESEARCH CENTER

24			Governor's	
25		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
26	Main research center	<u>\$109,170,101</u>	<u>\$105,254,423</u>	<u>\$109,170,101</u>
27	Total all funds	\$109,170,101	\$105,254,423	\$109,170,101
28	Less estimated income	<u>56,502,775</u>	<u>57,067,122</u>	<u>56,502,775</u>
29	Total general fund	\$52,667,326	\$48,187,301	\$52,667,326
30	Full-time equivalent positions	344.05	337.56	344.05

31 Subdivision 5.

1	BRANCH RESEARCH CENTERS			
2			Governor's	
3		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
4	Dickinson research center	\$7,015,862	\$6,906,409	\$7,015,862
5	Central grasslands research center	3,510,825	3,454,526	3,510,825
6	Hettinger research center	5,112,403	5,063,420	5,112,403
7	Langdon research center	3,052,060	3,010,806	3,052,060
8	North Central research center	5,137,570	5,109,028	5,137,570
9	Williston research center	5,286,833	5,228,396	5,286,833
10	Carrington research center	<u>9,685,861</u>	<u>9,642,895</u>	<u>9,685,861</u>
11	Total all funds	\$38,801,414	\$38,415,480	\$38,801,414
12	Less estimated income	<u>20,600,388</u>	<u>20,716,476</u>	<u>20,600,388</u>
13	Total general fund	\$18,201,026	\$17,699,004	\$18,201,026
14	Full-time equivalent positions	109.81	108.21	109.81

15       Subdivision 6.

16	AGRONOMY SEED FARM			
17			Governor's	
18		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
19	Agronomy seed farm	<u>\$1,565,975</u>	<u>\$1,582,478</u>	<u>\$1,565,975</u>
20	Total special funds	\$1,565,975	\$1,582,478	\$1,565,975
21	Full-time equivalent positions	3.00	3.00	3.00

22       Subdivision 7.

23	SECTION 1 TOTAL			
24			Governor's	
25		<u>Base Level</u>	<u>Recommendation</u>	<u>Appropriation</u>
26	Grand total general fund	\$104,918,157	\$97,260,676	\$104,918,157
27	Grand total other funds	<u>127,239,408</u>	<u>128,653,627</u>	<u>127,239,408</u>
28	Grand total all funds	\$232,157,565	\$225,914,303	\$232,157,565

29       **SECTION 2. ONE-TIME FUNDING.** The following amounts reflect the one-time funding  
30 items approved by the sixty-sixth legislative assembly for the 2019-21 biennium.

<u>One-Time Funding Description</u>	<u>2019-21</u>	<u>2021-23</u>
Seed cleaning plant	\$750,000	\$0
Extraordinary repairs	940,465	0
Greenhouse	<u>500,000</u>	<u>0</u>
Total all funds	\$2,190,465	\$0
Total other funds	<u>1,440,465</u>	<u>0</u>
Total general fund	\$750,000	\$0

**SECTION 3. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**

**INCOME.** The Dickinson research extension center may spend up to \$755,000 of revenues received during the 2021-23 biennium from mineral royalties, leases, or easements for ongoing operational expenses. Any revenues received in excess of \$755,000 may be spent only for one-time expenditures for the biennium beginning July 1, 2021, and ending June 30, 2023.

**SECTION 4. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**

**INCOME - REPORT.** The Williston research extension center shall report to the sixty-eighth legislative assembly on amounts received and spent from mineral royalties, leases, or easements in the biennium beginning July 1, 2019, and ending June 30, 2021, and the biennium beginning July 1, 2021, and ending June 30, 2023.

**SECTION 5. ADDITIONAL INCOME - APPROPRIATION.**

In addition to the amount included in the grand total other funds appropriation line item in section 1 of this Act, any other income, including funds from federal acts, private grants, gifts, and donations, or from other sources received by the North Dakota state university extension service, the northern crops institute, the upper great plains transportation institute, the main research center, branch research centers, and agronomy seed farm, except as otherwise provided by law, is appropriated for the purpose designated in the act, grant, gift, or donation, for the biennium beginning July 1, 2021, and ending June 30, 2023.

**SECTION 6. EXEMPTION - TRANSFER AUTHORITY.**

Notwithstanding section 54-16-04, upon approval of the state board of agricultural research and education and appropriate branch research center directors, the director of the office of management and budget shall transfer appropriation authority within subdivisions 1, 2, 4, and 5 of section 1 of this Act.

**SECTION 7. EXEMPTION - FULL-TIME EQUIVALENT POSITION ADJUSTMENTS.**

Notwithstanding any other provisions of law, the state board of higher education may adjust or

1 increase full-time equivalent positions as needed for the entities in section 1 of this Act, subject  
2 to availability of funds. All full-time or part-time positions must be separate from North Dakota  
3 state university. Annually, the board shall report to the office of management and budget and to  
4 the budget section any adjustments made pursuant to this section.

5 **SECTION 8. EXEMPTION - UNEXPENDED GENERAL FUND - EXCESS INCOME.** Any  
6 unexpended general fund appropriation authority to and any excess income received by entities  
7 listed in section 1 of this Act are not subject to the provisions of section 54-44.1-11, and any  
8 unexpended funds from these appropriations or revenues are available and may be expended  
9 by those entities, during the biennium beginning July 1, 2023, and ending June 30, 2025.











Office of the  
State Auditor

## REPORT HIGHLIGHTS

North Dakota Agricultural Experiment Station, North Dakota  
State University Extension Services, and Northern Crops Institute

Audit Report for the Biennium Ended June 30, 2019 | Client Code 630

### WHAT WE LOOKED AT

Our team audited the North Dakota Agricultural Experiment Station, North Dakota State University Extension Services, and Northern Crops Institute which included reviewing financial transactions, expenditures and blanket bond coverage.

### WHAT WE FOUND

This audit did not identify any areas of concern.



# Audit Results

## ▼ STATUTORY OBJECTIVE

Are there any exceptions to report relating to statutorily required audit testing?

Statutorily required audit testing includes: performing the post-audit of financial transactions, detecting and reporting any defaults, determining that expenditures have been made in accordance with law and appropriation acts, and evaluating blanket bond coverage.

## CONCLUSION

No exceptions to our statutorily required audit testing were identified.





North Dakota University System  
 NDSU Extension, Main & Branch Research Centers, and Agronomy Seed Farm  
 Major Components of current base level

	630	640	641	642	643	644	645	646	647	649
	Extension	Main Station	Dickinson	Central Grasslands	Hettinger	Langdon	North Central	Williston	Carrington	Agronomy Seed Farm
Salaries	\$ 46,328,002	\$ 73,522,974	\$ 2,927,509	\$ 1,873,438	\$ 2,720,220	\$ 1,714,310	\$ 2,814,308	\$ 3,539,081	\$ 5,839,920	\$ 612,932
Operating	6,707,409	26,838,449	2,863,900	1,306,088	2,018,200	1,041,496	1,869,720	964,315	2,577,975	669,546
Equipment	460,000	4,893,000	1,115,000	275,000	325,000	255,000	425,000	725,000	1,225,000	300,000
Capital Projects	-	-	-	-	-	-	-	-	-	-
<b>Total Budget</b>	<b>\$ 53,495,411</b>	<b>\$ 105,254,423</b>	<b>\$ 6,906,409</b>	<b>\$ 3,454,526</b>	<b>\$ 5,063,420</b>	<b>\$ 3,010,806</b>	<b>\$ 5,109,028</b>	<b>\$ 5,228,396</b>	<b>\$ 9,642,895</b>	<b>\$ 1,582,478</b>
Funding:										
Federal Fund*	\$ 8,078,792	\$ 5,986,825	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
General Fund	25,196,268	48,187,301	3,418,657	2,023,434	2,217,507	1,608,784	1,974,162	2,788,807	3,667,653	-
Special Fund*	20,220,351	51,080,297	3,487,752	1,431,092	2,845,913	1,402,022	3,134,866	2,439,589	5,975,242	1,582,478
<b>Total Funding</b>	<b>\$ 53,495,411</b>	<b>\$ 105,254,423</b>	<b>\$ 6,906,409</b>	<b>\$ 3,454,526</b>	<b>\$ 5,063,420</b>	<b>\$ 3,010,806</b>	<b>\$ 5,109,028</b>	<b>\$ 5,228,396</b>	<b>\$ 9,642,895</b>	<b>\$ 1,582,478</b>

Source: IBARS 2021-23, Governor's Recommendation

\*No changes anticipated for 2021-23 biennium









**NDSU Extension Service - 630**

**Comparison of 2019-21 Appropriation and Estimated Spending**

	2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
<b>Total General Fund Appropriation</b>	<b>\$ 28,054,666</b>	<b>\$ 16,885,733</b>	<b>\$ 11,168,933</b>	<b>--Balance will be drawn down for expenditures by end of biennium.</b>

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
<b>Total General Fund Appropriation</b>	\$53,417,326	\$ 20,770,628	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: uncertain changes expected to Federal funding levels.

**NDSU Dickinson Research Center- 641**

**Comparison of 2019-21 Appropriation and Estimated Spending**

	2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
<b>Total General Fund Appropriation</b>	\$ 3,535,980	\$ 2,231,781	\$ 1,304,199	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU Central Grasslands Research Center- 642**

**Comparison of 2019-21 Appropriation and Estimated Spending**

	2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
<b>Total General Fund Appropriation</b>	\$ 2,079,732	\$ 1,438,636	\$ 641,096	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU Hettinger Research Center- 643**

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
\$ 2,277,449	\$ 1,620,857	\$ 656,592	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU Langdon Research Center- 644**

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
\$ 1,653,208	\$ 1,135,006	\$ 518,202	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU North Central Research Center- 645**

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
\$ 2,028,170	\$ 1,100,459	\$ 927,711	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU Williston Research Center- 646**

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
\$ 2,858,302	\$ 2,466,966	\$ 391,336	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**NDSU Carrington Research Center- 647**

**Comparison of 2019-21 Appropriation and Estimated Spending**

2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
\$ 3,768,185	\$ 2,408,360	\$ 1,359,825	--Balance will be drawn down for expenditures by end of biennium.

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants

**Comparison of 2019-21 Appropriation and Estimated Spending**

	2019-21 Appropriation	Actual Expenditures Through 11/30/20	Remaining Balance	Comments
<b>Total Appropriation</b>	\$ 1,565,975	\$ 910,168	\$ 655,807	

Source: November 2020 Appropriation Status Report

Note: No significant changes anticipated in federal formula funds or federal grants







**North Dakota University System  
NDSU Extension, Main and Branch Research Centers  
Reconciliation of 2019-21 Orig. General Fund Appropriation to 2021-23 Executive Recommendation**

	NDSU Extension	Main Research Center	Branch Research Centers
2019-21 Original General Fund Appropriation(5/31/20 Approp.)	\$ 28,054,666	\$ 53,417,326	\$ 18,201,026
5%/10%/15% reduction	(4,156,450)	(7,846,584)	(903,722)
<b>2019-21 Adjusted GF Appropriation</b>	<b>23,898,216</b>	<b>45,570,742</b>	<b>17,297,304</b>
<b>Base Adjustments:</b>			
Capital Bond Payment adjustment		(222)	332
Less 2019-21 One-time Appropriations	(345,000)	-	-
Less 2019-21 Capital Projects		(750,000)	-
Base Payroll adjustments	-	-	-
<b>2019-21 Adjusted Appropriation, Less Base Adjustments- (2021-23 Base Budget Request)</b>	<b>23,553,216</b>	<b>44,820,520</b>	<b>17,297,636</b>
<b>Executive Recommendation Base Increases (Decreases):</b>			
Restore Base Budget Reduction	-	-	-
Livestock initiative	1,010,000	-	
Big Data initiatives		1,659,999	
Deferred Maintenance		500,000	
Compensation package salary/benefit increase and health insurance increases	633,052	1,206,782	401,368
<b>2021-23 Recommended Base General Fund Increases(Decreases)</b>	<b>1,643,052</b>	<b>3,366,781</b>	<b>401,368</b>
<b>2021-23 Total Executive Recommendation - General Fund</b>	<b>25,196,268</b>	<b>48,187,301</b>	<b>17,699,004</b>
<b>Increase (Decrease) From 2019-21 Adjusted Appropriation, Less Base Adjustments</b>	<b>\$ 1,643,052</b>	<b>\$ 3,366,781</b>	<b>\$ 401,368</b>
<b>Full-time equivalent positions 2019-21</b>	127.08	195.75	74.21
<b>Full-time equivalent positions 2021-23 Executive Recommendation</b>	124.67	207.19	78.11

**North Dakota University System  
NDSU Extension, Main & Branch Research Centers and Agronomy Seed Farm  
Reconciliation of 2019-21 Original Other Fund Budget Appropriation to 2021-23 Executive Recommendation**

	NDSU Extension	Main Research Center	Branch Research Centers	Agronomy Seed Farm
<b>2019-21 Original Other Fund Appropriation</b>	<b>\$ 27,778,159</b>	<b>\$ 57,943,240</b>	<b>\$ 20,600,388</b>	<b>\$ 1,565,975</b>
Base Payroll adjustments	-	-	-	-
Remove Capital Project & One Time funds	-	(1,440,465)	-	-
5%/10% Reduction	-	-	-	-
Equip. over \$5000	-	-	-	-
<b>2021-23 Adjusted Other Fund Appropriation(Base Budget Request)</b>	<b>\$ 27,778,159</b>	<b>\$ 56,502,775</b>	<b>\$ 20,600,388</b>	<b>\$ 1,565,975</b>
<b>Executive Recommendation Base Increases (Decreases):</b>				
Compensation package salary/benefit increase and health insurance increases	520,984	564,347	116,089	16,503
One-time extraordinary repairs(SIIF)	-	-	-	-
Oakes irrigation site funding	-	-	-	-
Restoration of 5%/10 Reduction	-	-	(1)	-
<b>Total Executive Recommendation Increases</b>	<b>520,984</b>	<b>564,347</b>	<b>116,088</b>	<b>16,503</b>
<b>2021-23 Total Executive Recommendation - Other Funds</b>	<b>\$ 28,299,143</b>	<b>\$ 57,067,122</b>	<b>\$ 20,716,476</b>	<b>\$ 1,582,478</b>

**North Dakota University System  
Branch Research Centers  
Reconciliation of 2019-21 Orig. General & Other Fund Appropriation to 2021-23 Executive Recommendation**

	Dickinson	Central Grasslands	Hettinger	Langdon	North Central	Williston	Carrington	Total
<b>General Fund:</b>								
2019-21 Original General Fund Appropriation	\$ 3,535,980	\$ 2,079,732	\$ 2,277,449	\$ 1,653,208	\$ 2,028,170	\$ 2,858,302	\$ 3,768,185	\$ 18,201,026
2019-21 Adjusted GF Appropriation	3,535,980	2,079,732	2,277,449	1,653,208	2,028,170	2,858,302	3,768,185	18,201,026
Base Adjustments:								
5% reduction	(176,799)	(101,580)	(113,872)	(82,660)	(97,487)	(142,915)	(188,409)	(903,722)
Capital Bond Payment adjustment		186			146			332
Remove one time funding								-
Remove Capital Project								-
Base Payroll adjustments								-
2021-23 Adjusted Appropriation, Less Base Adjustments	3,359,181	1,978,338	2,163,577	1,570,548	1,930,829	2,715,387	3,579,776	17,297,636
Executive Recommendation Increases (Decreases):								
Restore funding	-							-
Decrease in 2019-21 Capital Bond Payments								-
Compensation package salary/benefit increase and health insurance increases	59,476	45,096	53,930	38,236	43,333	73,420	87,877	401,368
SBARE Initiatives								
2019-21 Recommended Base General Fund increases	59,476	45,096	53,930	38,236	43,333	73,420	87,877	401,368
2021-23 Total Executive Recommendation - General Fund	\$ 3,418,657	\$ 2,023,434	\$ 2,217,507	\$ 1,608,784	\$ 1,974,162	\$ 2,788,807	\$ 3,667,653	\$ 17,699,004
Increase (Decrease) From 2019-21 Adjusted Appropriation, Less Base Adjustments	\$ 59,476	\$ 45,096	\$ 53,930	\$ 38,236	\$ 43,333	\$ 73,420	\$ 87,877	\$ 401,368
Full-time equivalent positions 2019-21	11.25	9.50	9.75	7.70	7.71	12.75	15.55	74.21
Full-time equivalent positions 2021-23 Executive Recommendation	11.70	10.00	10.75	7.70	7.71	12.70	17.55	78.11
<b>Other Funds:</b>								
2019-21 Original Other Fund Appropriation	\$ 3,479,882	\$ 1,431,093	\$ 2,834,954	\$ 1,398,852	\$ 3,109,400	\$ 2,428,531	\$ 5,917,676	\$ 20,600,388
5%/10% reduction	-							-
Remove Capital Project								-
2019-21 Adjusted Other Fund Appropriation	\$ 3,479,882	\$ 1,431,093	\$ 2,834,954	\$ 1,398,852	\$ 3,109,400	\$ 2,428,531	\$ 5,917,676	\$ 20,600,388
Executive Recommendation Increases (Decreases):								
Payroll adjustment in IBARS	-	(1)						(1)
Compensation package salary/benefit increase and health insurance increases	7,870	-	10,959	3,170	25,466	11,058	57,566	116,089
Oakes irrigation site funding								-
2021-23 Recommended Base Other Fund Increases	7,870	(1)	10,959	3,170	25,466	11,058	57,566	116,088
2021-23 Total Executive Recommendation - Other Funds	\$ 3,487,752	\$ 1,431,092	\$ 2,845,913	\$ 1,402,022	\$ 3,134,866	\$ 2,439,589	\$ 5,975,242	\$ 20,716,476

Funding Changes from Original 2015-17 through 2021-23 Executive Recommendation

	Extension Service	Main Research Center	Branch Research Centers
2015-17 Original Base General Fund Appropriation	\$ 29,775,688	\$ 57,450,184	\$ 19,798,447
1st Allotment, Feb. 2016 (4.05%)	\$ (1,206,422)	\$ (2,392,238)	\$ (812,975)
2nd Allotment, Aug. 2016 (2.5%)	\$ (744,705)	\$ (1,476,690)	\$ (501,835)
Base after Allotment	\$ 27,824,561	\$ 53,581,256	\$ 18,483,637
Cut in Base funding by 65th Legislative Assembly	\$ (2,191,241)	\$ (4,023,841)	\$ (1,328,380)
2017-19	\$ 25,633,320	\$ 49,557,415	\$ 17,155,257
<b>2019-2021</b>			
2017-19 Original Base General Fund Appropriation	\$ 25,633,320	\$ 49,557,415	\$ 17,155,257
Additional Base Funding by 66th Legislative Assembly	\$ 2,076,346	\$ 3,109,911	\$ 1,045,769
2019-21 Base	\$ 27,709,666	\$ 52,667,326	\$ 18,201,026
<b>2021-2023</b>			
2019-21 Base	\$ 27,709,666	\$ 52,667,326	\$ 18,201,026
5/10/15% Cut Recommendation	\$ (4,156,450)	\$ (7,846,806)	\$ (903,390)
Budget after 5/10/15 reduction, % compared to 15-17	\$ 23,553,216	\$ 44,820,520	\$ 17,297,636
Exec Rec. Compensation	\$ 633,052	\$ 1,206,782	\$ 401,368
Exec Rec. SBARE Initiative	\$ 1,010,000	\$ 1,659,999	
Exec. Rec. One time Deferred Maintenance		\$ 500,000	
Exec. Recommendation	\$ 25,196,268	\$ 48,187,301	\$ 17,699,004

Changes to make to Executive Recommendation:

Hold Even Budget	\$	4,156,450	\$	7,846,806	\$	903,390
Add SBARE #2 Priority	\$	720,000	\$	1,160,000	\$	420,000
Extension Agricultural Health and Safety						
AES Plant Initiative						







Federal Coronavirus Relief Fund  
 CARES Act  
 Federal Funding made available by Emergency Commission and Budget Section Action  
 As of 01/13/2021

**June 25, 2020**

Agency	Amount Awarded	Amount Spent	To Be Spent/Invoiced	Purpose
Main Research Center	\$ 989,968	\$ 903,223	\$ 86,745	Technology and equipment for remote work, additional labor, travel, PPE, additional cleaning & physical barriers
Branch Research Centers (total)	\$ 726,007	\$ 653,137	\$ 72,870	Technology and video conferencing, employee teleworking, additional labor, travel, PPE, additional cleaning and physical barriers, other
NDSU Extension	\$ 855,400	\$ 802,538	\$ 52,862	Technology to enhance remote program delivery, PPE, sanitizing supplies/kiosks, telework for Extension programs
	\$ 2,571,375	\$ 2,358,898	\$ 212,477	

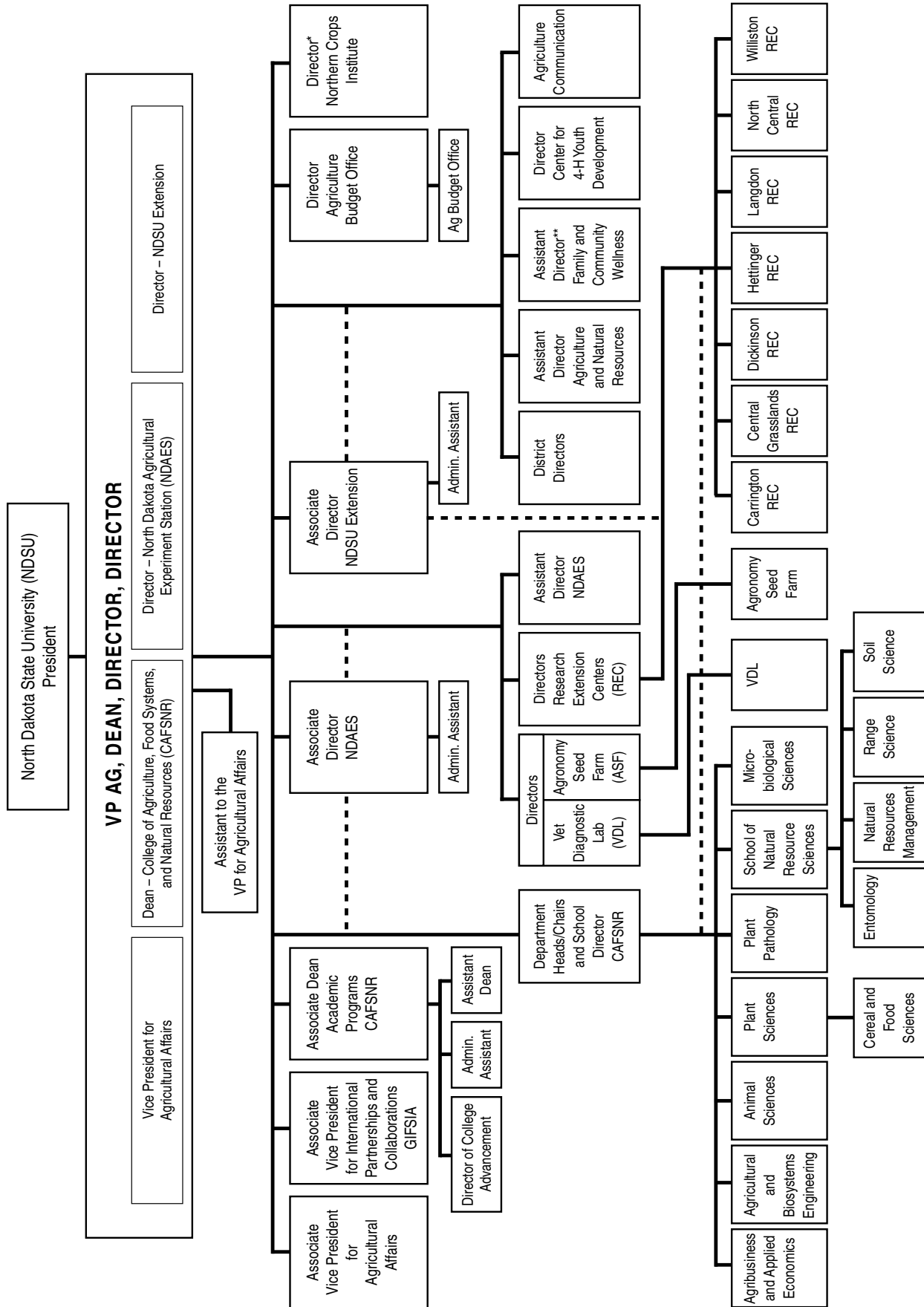
**August 13, 2020**

Agency	Amount Awarded	Amount Spent	To Be Spent/Invoiced	Purpose
Main Research Center	\$ 174,999	\$ 174,999	\$ -	Digital Pathology slide scanner; Install HVAC Ionization equipment
Branch Research Centers (total)	\$ 105,000	\$ 105,000	\$ -	Install HVAC Ionization equipment at each location
	\$ 279,999	\$ 279,999	\$ -	





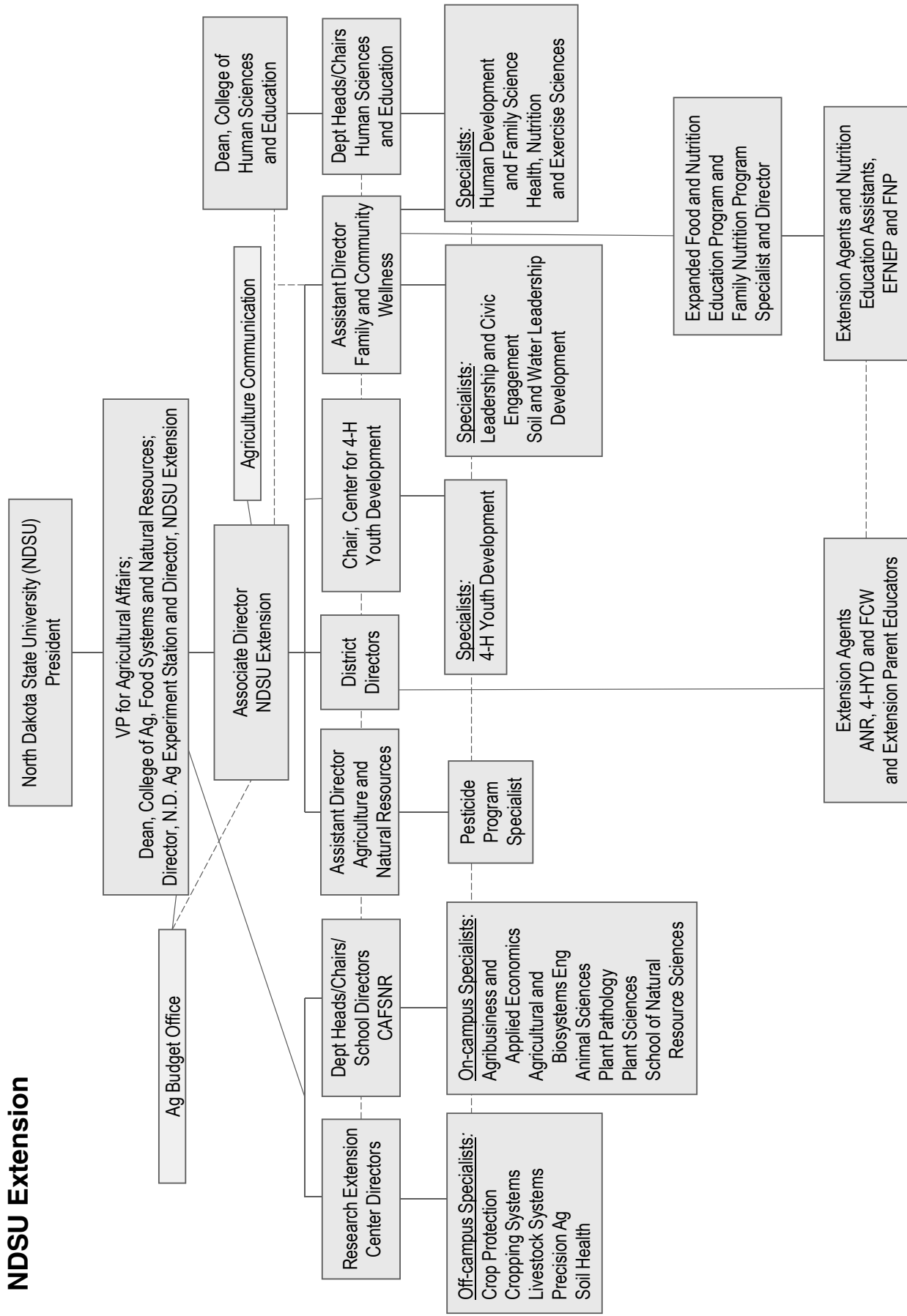




\*Director reports to Northern Crops Council. NDSU administrative reporting only.

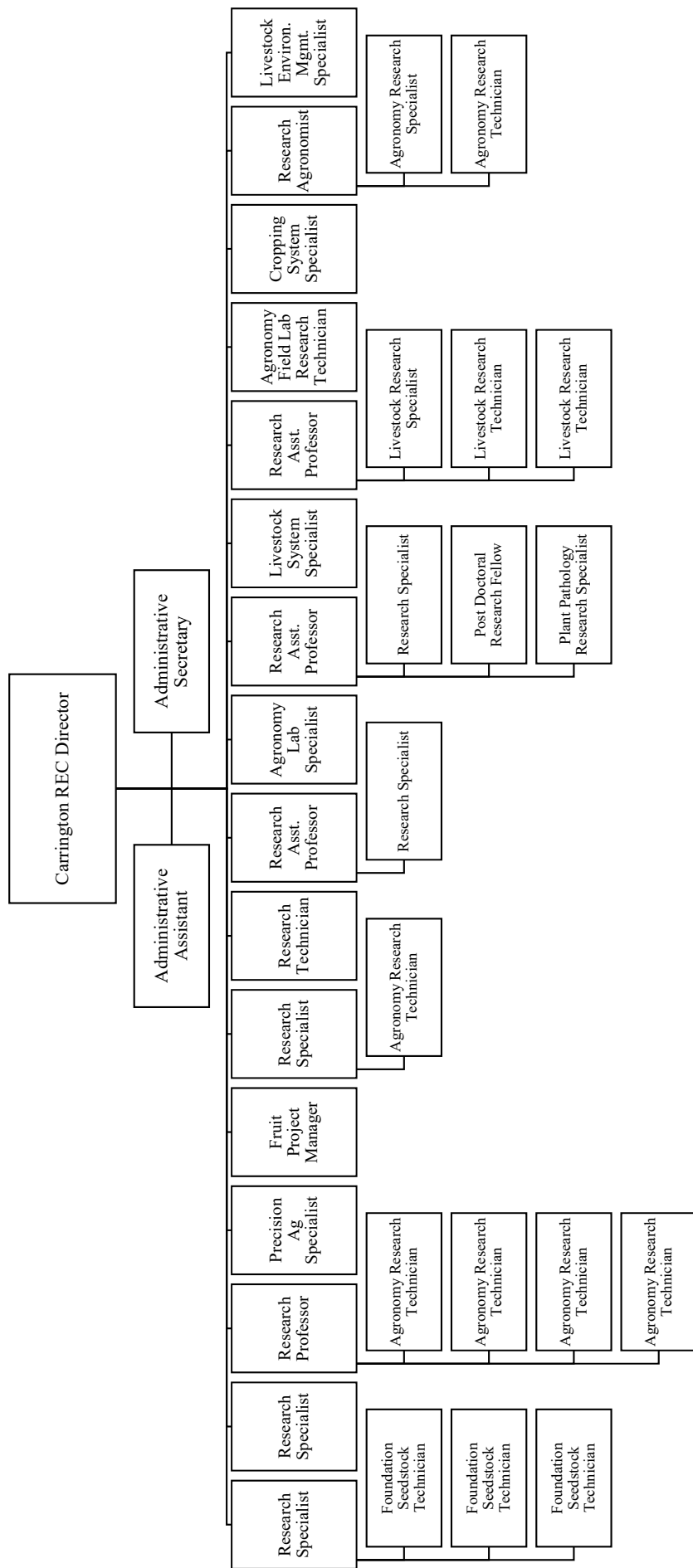
\*\*Extension faculty and staff in the Department of Human Development and Family Science and the Department of Health, Nutrition and Exercise Sciences (not shown on this chart) report to their respective department head/chair and are co-supervised by the Assistant Director for Family and Community Wellness.

# NDSU Extension

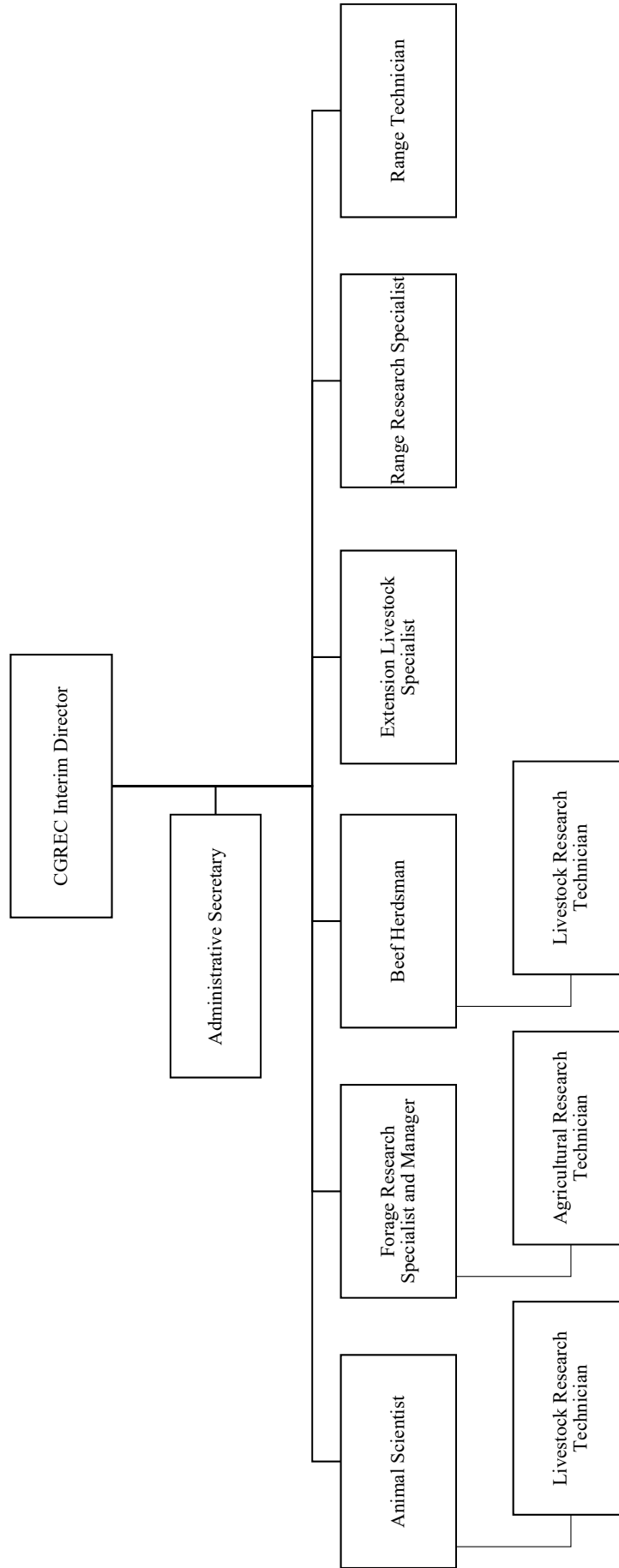


January 2021

# Carrington Research Extension Center

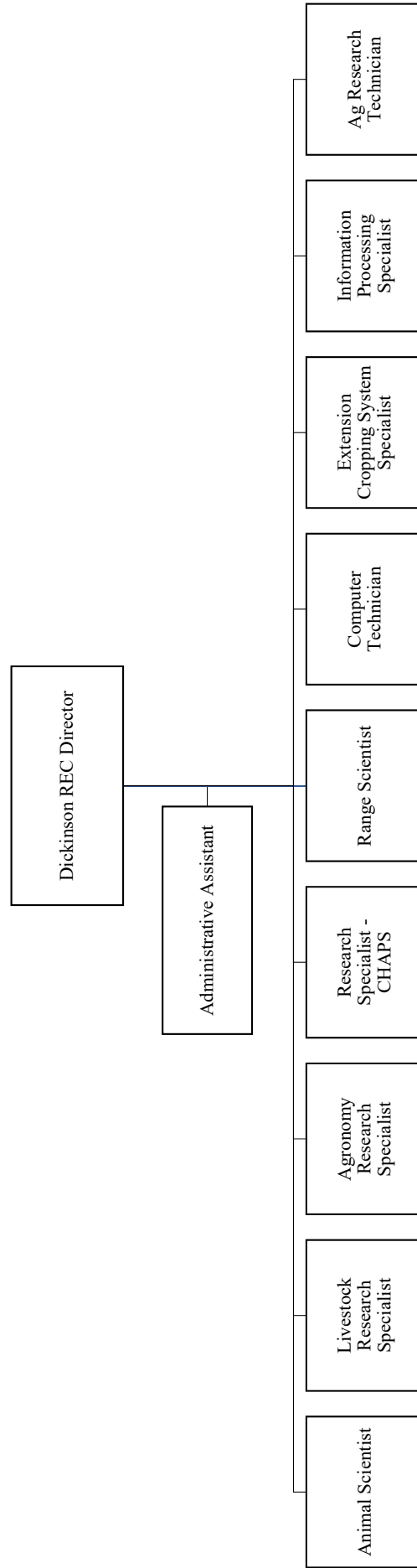


# Central Grasslands Research Extension Center

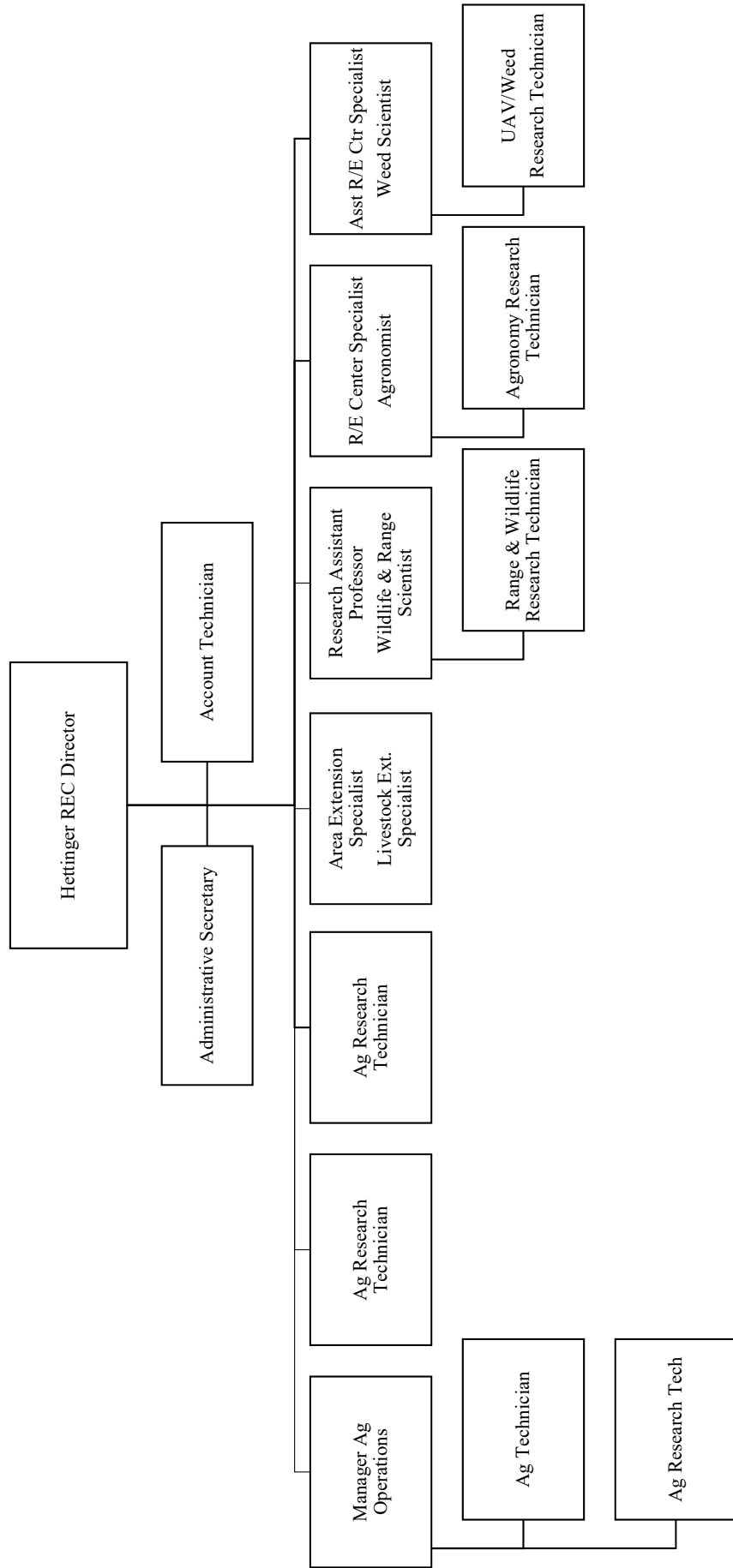




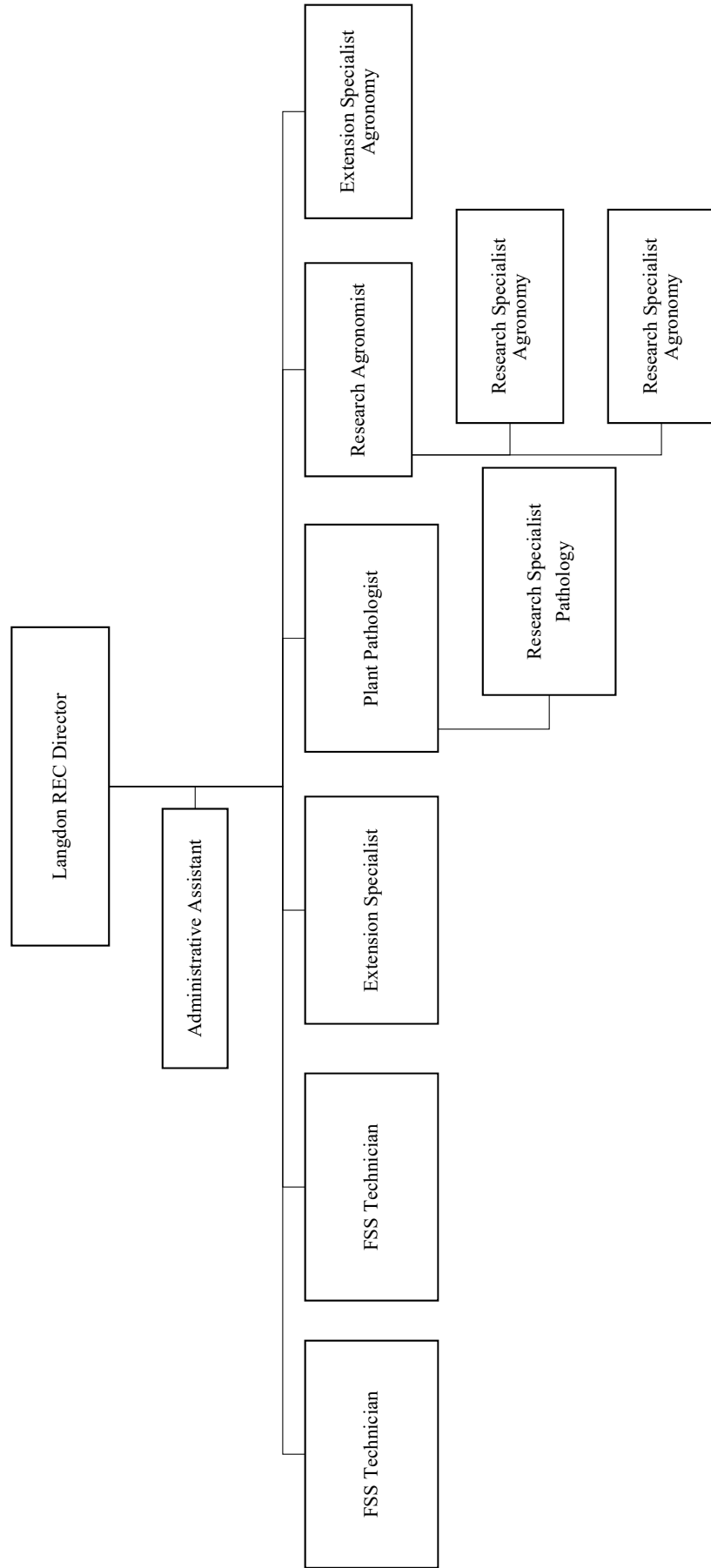
# Dickinson Research Extension Center



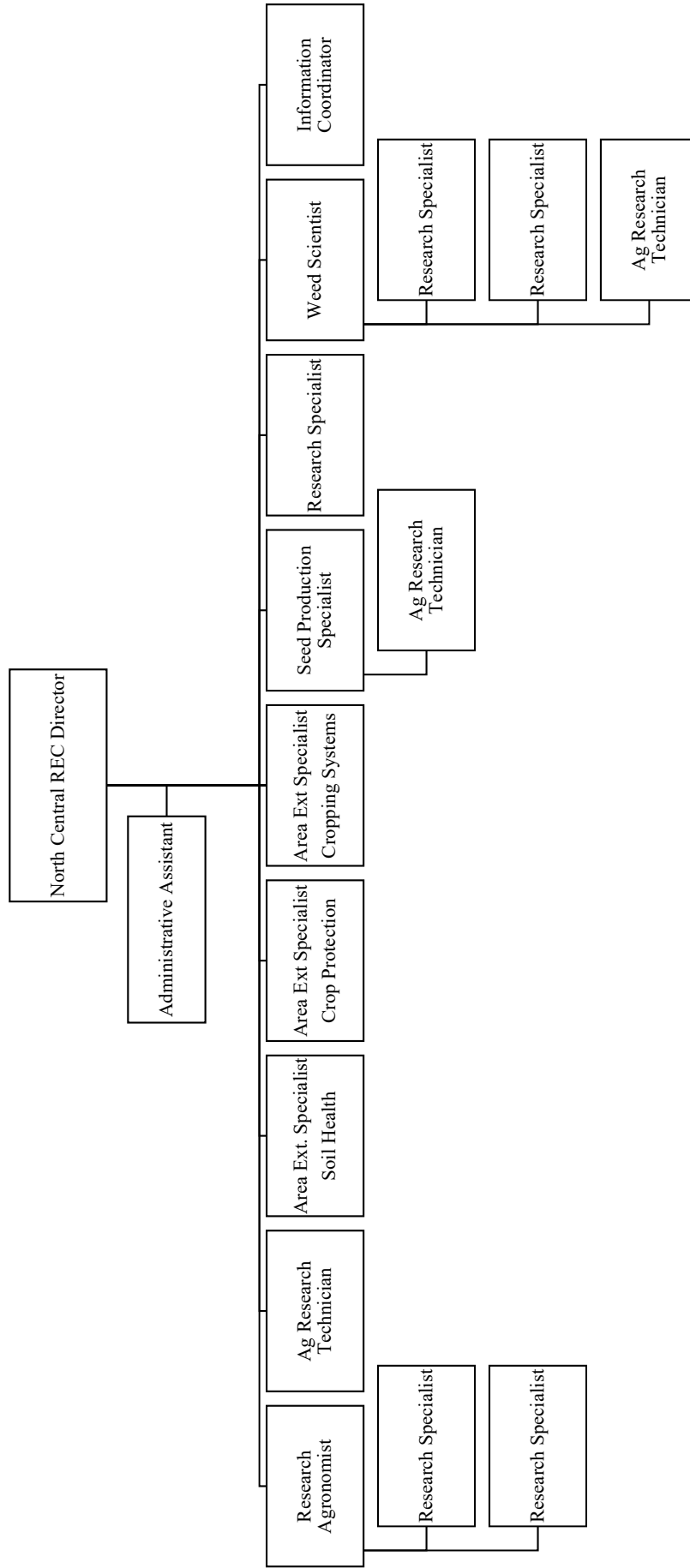
# Hettinger Research Extension Center



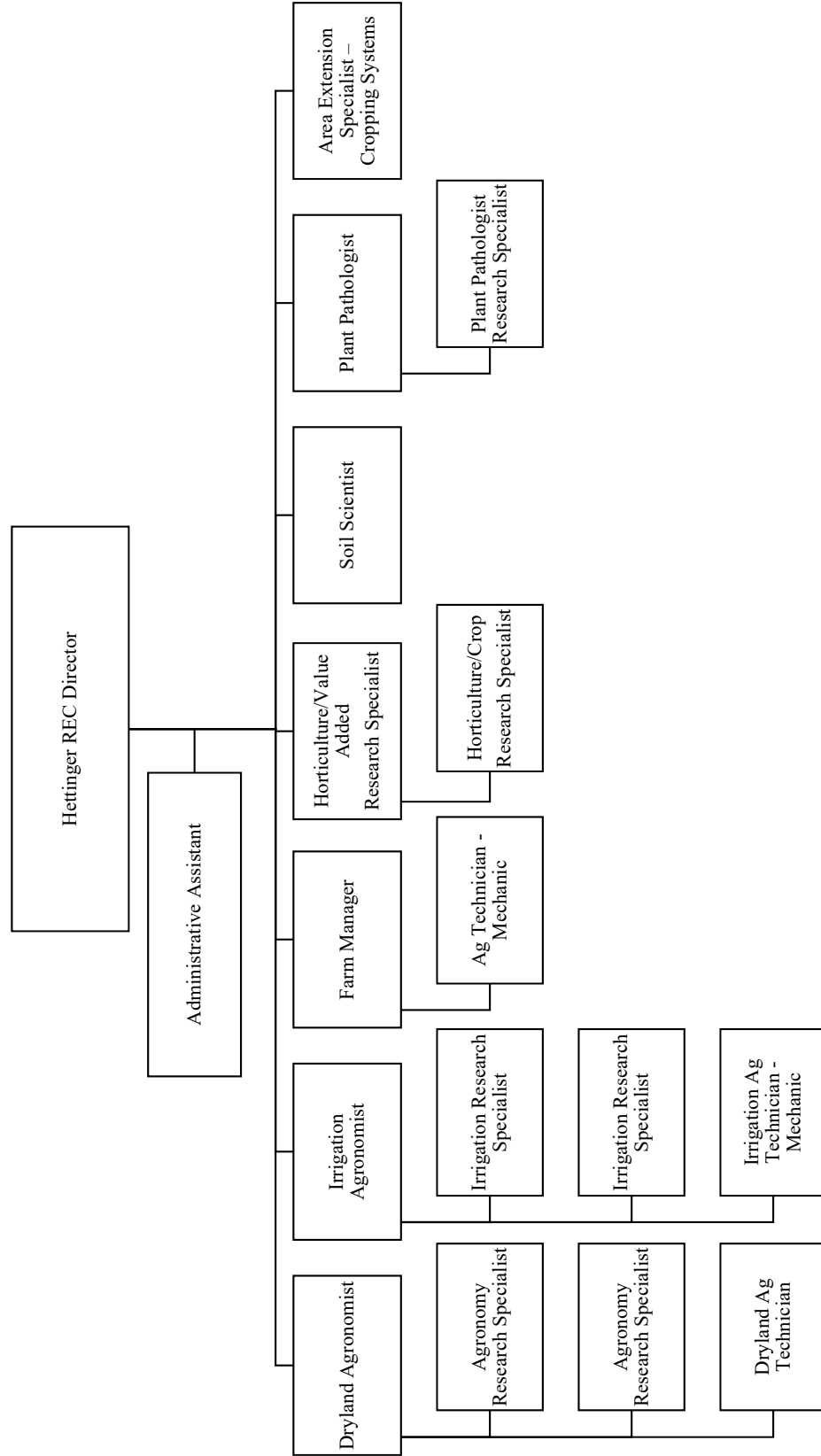
# Langdon Research Extension Center



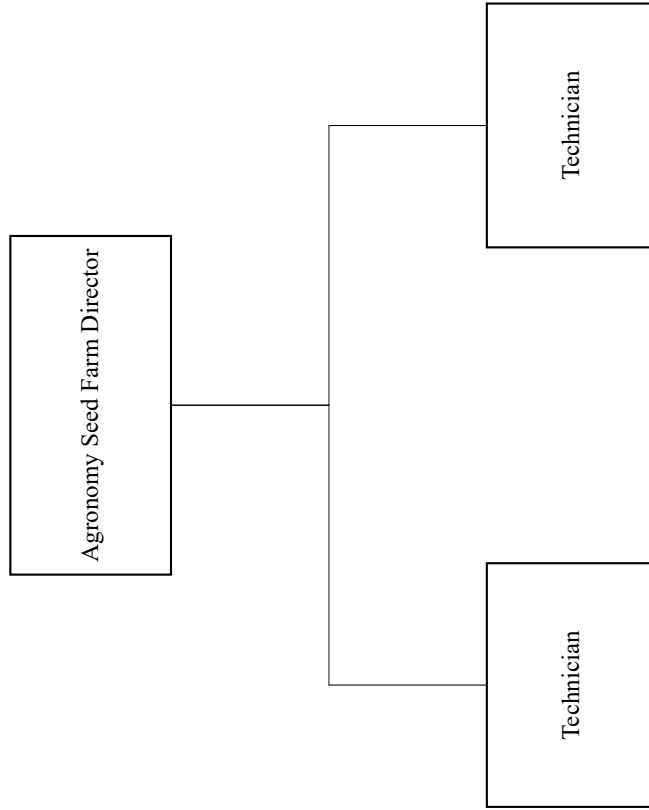
# North Central Research Extension Center



# Williston Research Extension Center



# Agronomy Seed Farm





# **North Dakota Agricultural Experiment Station**

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## **NDSU Extension**

**2021-2023  
Biennial Budget Request**

**Senate Bill 2020**  
**Senate Appropriations Committee**  
Senator Ray Holmberg, Chair  
Jan. 20, 2021

