

NORTH DAKOTA STATE UNIVERSITY

North Dakota Agricultural Experiment Station

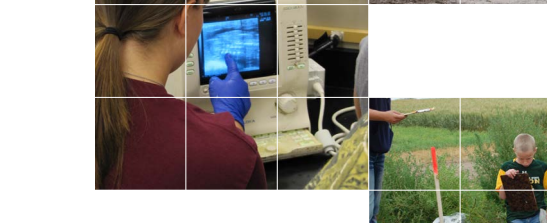
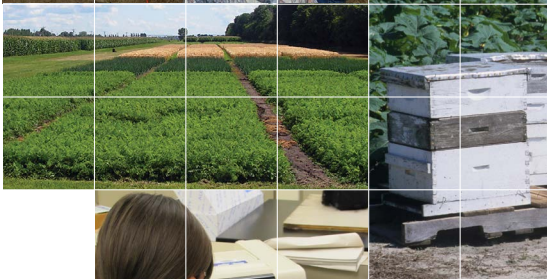
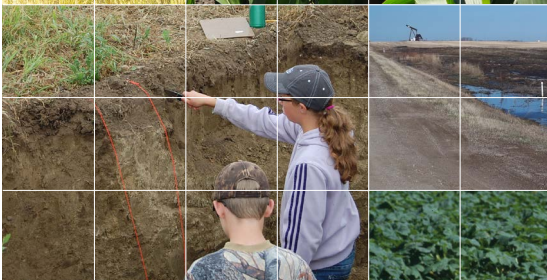
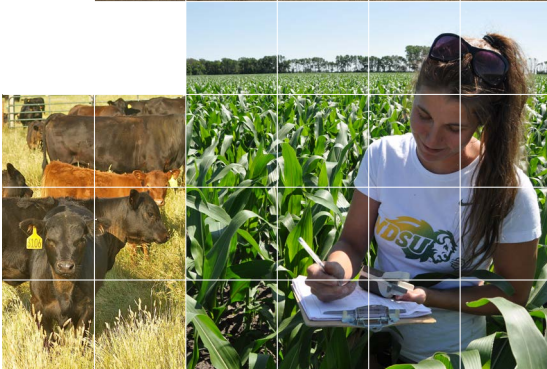
NDSU Extension Service

2017-2019 Biennial Budget Request

Senate Bill 2020

House Education and Environment Division
Representative David Monson, chair

March 7, 2017



NDSU Extension Service - 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

Dean L. Bresciani - President, North Dakota State University

Mike Beltz - Chair, State Board of Agricultural Research and Education

Ken Grafton - Vice President, Dean and Director for Agricultural Affairs, NDSU

Chris Boerboom - Director, NDSU Extension Service

Kris Ringwall - 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

www.ndsu.edu/agforlegislators

Agency Overview

NDSU Extension Service

Agency Statutory Authority

North Dakota Century Code Chapter 4-08.

Agency Description

The North Dakota State University (NDSU) Extension Service 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. The NDSU Extension Service combines funding from federal, state, county and grant sources to specifically address local concerns.

Agency Mission Statement

The purpose of the NDSU Extension Service is "to create learning partnerships that help youth and adults enhance their lives and communities." This purpose is accomplished through the dissemination of research-based information and the implementation of educational programs geared to the changing needs of North Dakotans. Major program areas include agriculture and natural resources; youth development; family and consumer sciences; and community economic development and leadership.

Agency Performance Measures

Per North Dakota Century Code 4-05.1-19, 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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the Legislative Council office.

Agency Future Critical Issues

North Dakotans who were involved in 11 community forums in 2015 prioritized eight areas of concern related to the economic sector: struggling agricultural economy, public disconnect with agriculture, energy development, farm and business transition, labor force, natural resource protection, regulations, and rural communities. They also prioritized six areas of concern related to families and communities: health and wellness, civic engagement, successful families, infrastructure, crime and safety, and education. North Dakota is a great state in which to live, but residents experience frustrations and clearly see the potential for enhancements.

Forum participants recognized that these issues are complex, difficult issues without a single, simple solution. To make progress, multiple agencies and partners may be involved in different aspects of the issue. Because the NDSU Extension Service's mission is to provide research-based information to improve the quality of life of North Dakotans, we lead or collaborate on numerous programs across the state and within local communities that address many of the identified concerns. For instance, Extension cannot solve low commodity prices, but we provide tools for farmers to make better marketing decisions. We cannot create successful families alone, but we provide training to parents so they have better parenting skills.

To continue these relevant, community-driven programs, NDSU Extension needs sustained program support in agriculture, nutrition and wellness, leadership and civic engagement, and 4-H and youth development. Upon review of the issues from the community forums and other stakeholder needs, the State Board of Agricultural Research and Education (SBARE) prioritized the restoration of the NDSU Extension base budget as the most critical Extension need to maintain existing capacity to address state issues.

Prior to the proposed budget reduction, SBARE identified Extension's top need was increased operating funds to increase capacity to respond to the unmet needs identified during the community forums. In a manner similar to the internal grants program funded by the Legislature for precision agricultural research in the last session, Extension proposes to capitalize on existing specialists and agents to develop fixed-term projects, which target needs identified in the community forums. The need to increase Extension's delivery via media technologies must also be enhanced to support the growing demands of different generations of Extension users.

Ongoing state needs that Extension is not able to provide adequate educational programs are in the areas of farm safety, farm financial management, water quality, value added cropping systems, and pollinator management.

2015-2017 Legislation that Included Reporting Requirements to 2017 Appropriation Committees

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

SECTION 2. ONE-TIME FUNDING — EFFECT ON BASE BUDGET — REPORT TO SIXTY-FIFTH

LEGISLATIVE ASSEMBLY. The following amounts reflect the one-time funding items approved by the sixty-third legislative assembly for ... the 2015-17 one-time funding items included in the appropriation in section 1 of this Act:

One-Time Funding Description

Extension master gardener internships — \$12,500

The 2015-17 one-time funding amounts are not a part of the entity's base budget for the 2017-19 biennium. The main research center shall report to the appropriations committees of the sixty-fifth legislative assembly on the use of this one-time funding for the biennium beginning July 1, 2015, and ending June 30, 2017.

Status: \$12,500 received; funds allocated. 3 summer interns hired.

Update of Extension Initiatives Funded in 2013-2015 Budget

- **Costs to continue FY2013 salary increases**

\$540,528 received and allocated July 1, 2013

- **Agents-in-training and summer internship program**

\$250,000 received (no fte), salary pools for two 12- to 18-month agent-in-training positions and three 8-to 12-week summer student internships, hired

- **Livestock development**

\$370,000 received

- \$220,000 salary and fringe benefits and operating, 1.0 FTE Area Livestock Specialist hired in Extension livestock programs at CGREC
- \$150,000 operating support, livestock production economics; allocated and program initiated

- **Crop and resource protection**

\$150,000 received, salary and fringe benefits, 1.0 FTE technical support hired for the weed science or potato programs

- **Rural leadership North Dakota program**

\$125,000 received and allocated

- **Junior master gardener program**

\$25,000 received, 2 interns Burleigh county extension; funds allocated

- **State Soil Conservation Committee**

\$150,000 received and added to previous funding

Additional funding received to fund grants to Soil Conservation Districts as well as help landowners reduce soil erosion/ improve water quality; and enhance tree plantings, grazing lands and wildlife habitat.

- **Video conference equipment**

\$110,000 received, funding allocated

- **North Dakota 4-H camp**

\$950,000 general funds, \$1,650,000¹ other funds; construction completed

Additional Item

NDSU Extension Service received \$10,500 from the general fund pool appropriated to the Office of Management and Budget (OMB) for needs resulting from energy development. This amount was paid to employees in oil impacted communities.

¹March 12, 2014, Budget Section authorized \$700,000 additional Other Funds spending for the North Dakota 4-H camp project increasing total Other Funds from \$950,000 to \$1,650,000.

Update of Extension Initiatives Funded in 2015-2017 Budget

- **Costs to continue FY2015 salary increases**

\$272,281 received and allocated July 1, 2015

- **Agricultural programs and capacity**

\$247,972 received

- \$207,972 salary and fringe benefits and operating, 1.0 FTE Area Livestock Extension Specialist hired — Hettinger REC
- \$40,000 operating support; allocated

- **Junior master gardener program, one-time funding**

\$12,500 received; funds allocated. 3 summer interns hired.

- **State Soil Conservation Committee**

\$75,000 received and added to previous funding

Additional funding received to fund grants to Soil Conservation Districts as well as help landowners reduce soil erosion/ improve water quality; and enhance tree plantings, grazing lands and wildlife habitat.

2017-19 Program Initiatives as Ranked by SBARE

1 Restore Budget to 2015-17 Original Appropriation

Need: Restoration of 10 percent budget cut - \$2,977,569



2 Enhancing Extension Infrastructure

Situation: This initiative to enhance Extension's infrastructure is centered on increasing annual operational support for Extension programs to address new and emerging issues that warrant immediate attention. This initiative will be innovative, invest in North Dakota citizens and regularly inform stakeholders on the impacts made through Extension programs. Funding to provide operational support for NDSU Extension's infrastructure will provide long-term assistance to respond to critical issues affecting North Dakota. This initiative will:

- **Innovate** - Enhance the needs assessment process and the support to act on suggestions from the public, and provide a flexible and nimble response to enhance engagement through applied projects and educational programs
- **Invest** - Develop a competitive funding process to meet new and emerging issues in a timely manner and provide short-term investment in areas of high potential for success
- **Inform** - Provide impact reports upon completion of the projects that were funded through the competitive process and prioritize the development of enhanced access to NDSU Extension project data and research, as well as results and recommendations to the public through an improved web presence, searchable databases and smartphone applications

Need: Operating - \$900,000



3 Farm Safety Education

Situation: This specialist will launch a new statewide farm safety educational program to reduce agricultural and related on-farm accidents, which kill and injure too many North Dakotans. Multi-faceted educational programs will target farmers and youth.

The farm safety initiative responds to a dire need of agriculture in North Dakota. Farm accidents have been increasing steadily in the Midwest. About 374 farmers and 113 youth (age 16 to 19) die each year from farm-related accidents. Approximately 167 workers suffer from farming-related injury every day. North Dakota is not immune to these statistics. Most farmers in North Dakota have experienced or know of someone who lost a life or was injured in a farm accident. The most common accident is tractor rollover. ATV, grain bin and electrical accidents also are common. Farm safety education is effective in reducing farm accidents in other states. Leadership is needed to develop a comprehensive, persistent educational program, which can be delivered in conjunction with Extension agents to create a culture of safety on the farm.

Need: Farm Safety Education Specialist (1.0 FTE) - \$240,000; operating - \$60,000



2017-19 Program Initiatives as Ranked by SBARE (continued)



4 Enhancing the Agricultural Economy

Situation: Extension Farm Financial Management Specialist – This specialist will develop and deliver Extension programs that enhance the financial management skills of farmers, ranchers and agricultural professionals, and increase the likelihood of maintaining successful farm and ranch enterprises. • Farm profitability is a priority issue in agriculture today. Low crop prices, declining livestock prices and high production costs have created an environment in which the financial condition of many farms is deteriorating rapidly. This is especially affecting the younger generation of farmers. Financial management education, including investment analysis (using your money wisely), risk analysis (how much could be lost), financial structuring (financial sources and terms) and business strategy (can the enterprise mix be improved), is a critical need. A farm financial management specialist will be able to improve the financial management skills of farmers and agricultural professionals and increase the efficiency of operations.

Need: Extension Farm Financial Management Specialist (1.0 FTE) - \$240,000; operating - \$60,000

Situation: Extension Water Quality Specialist – This specialist will provide statewide education on water quality and quantity related to human and livestock use, energy production, nutrient management, etc. The water quality specialist was a ranked SBARE need in the last two legislative sessions. • Water is a critical element to life in our state. Science-based answers are needed on topics such as water quality for human and livestock consumption, impacts of saltwater spills, and best management practices to prevent nutrient movement to surface water. Educational programs and information are needed to assist land owners and citizens in making informed decisions when using and protecting our precious water resources. The water quality educational program will work in cooperation with agricultural and conservation groups and state regulatory agencies.

Need: Extension Water Quality Specialist (1.0 FTE) - \$240,000; operating - \$60,000

Situation: Extension Value-added Cropping Specialists – These specialists will develop programs to build the management skills of new and existing farmers to overcome the unique production challenges of these crops and systems. This will build the capacity of North Dakota to meet opportunities in the marketplace. Positions will be located at the Dickinson and Carrington Research Extension Centers to service the state. • The lagging agricultural economy highlights the need and opportunity for diversification, including value-added crops and production systems. Many value-added crops and production systems have high rates of return. The industry is aggressively seeking farmers to fill these increasing demands. North Dakota agriculture can aggressively pursue and invest in alternative crops and productions systems to increase the profitability of its producers. Value-added cropping specialists can educate farmers on the specialized management that is needed to produce these crops and transition into these production systems successfully.

Need: Extension Value-added Cropping Specialists (2.0 FTE) - \$400,000; operating - \$120,000

Situation: Extension Pollinator Specialist – This specialist will provide leadership for statewide education on best management practices for beekeepers and other pollinators. These educational efforts will support the North Dakota Pollinator Plan. • Pollinators, most often honey bees, are beneficial to the production of many of North Dakota's crops. In addition, North Dakota leads the nation in honey production, which has a value of \$84 million. Unfortunately, beekeepers are suffering significant colony losses from a multitude of factors. Extension can provide educational programs on best management practices for beekeepers and education on the North Dakota Pollinator Plan for the mutual benefit of the honey industry, commercial agriculture and North Dakota residents.

Need: Extension Pollinator Specialist (1.0 FTE) - \$240,000; operating - \$60,000

DETAILS:

2017-2019 Program Initiatives as Ranked by SBARE

NDSU Extension Service

1. Restore Budget to 2015-2017 Original Appropriation

2. Enhancing Extension Infrastructure

Operating

\$900,000

This initiative to enhance Extension's infrastructure is centered on increasing annual operational support for Extension programs to address new and emerging issues that warrant immediate attention. This initiative will be innovative, invest in North Dakota citizens and regularly inform stakeholders on the impacts made through Extension programs. Funding to provide operational support for NDSU Extension's infrastructure will provide long-term assistance to respond to critical issues affecting North Dakota. This initiative will:

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3. Farm Safety Education

1.0 FTE Farm safety education specialist

\$240,000

Operating

\$160,000

This specialist will launch a new statewide farm safety educational program to reduce agricultural and related on-farm accidents, which kill and injure too many North Dakotans. Multi-faceted educational programs will target farmers and youth.

The farm safety initiative responds to a dire need of agriculture in North Dakota. Farm accidents have been increasing steadily in the Midwest. About 374 farmers and 113 youth (age 16 to 19) die each year from farm-related accidents. Approximately 167 workers suffer from farming-related injury every day. North Dakota is not immune to these statistics. Most farmers in North Dakota have experienced or know of someone who lost a life or was injured in a farm accident. The most common accident is tractor rollover. ATV, grain bin and electrical accidents also are common. Farm safety education is effective in reducing farm accidents in other states. Leadership is needed to develop a comprehensive, persistent educational program, which can be delivered in conjunction with Extension agents to create a culture of safety on the farm.

4. Enhancing the Agricultural Economy

1.0 FTE Farm financial management specialist	\$240,000
Operating	\$60,000

This specialist will develop and deliver Extension programs that enhance the financial management skills of farmers, ranchers and agricultural professionals, and increase the likelihood of maintaining successful farm and ranch enterprises.

Farm profitability is a priority issue in agriculture today. Low crop prices, declining livestock prices and high production costs have created an environment in which the financial condition of many farms is deteriorating rapidly. This is especially affecting the younger generation of farmers. Financial management education, including investment analysis (using your money wisely), risk analysis (how much could be lost), financial structuring (financial sources and terms) and business strategy (can the enterprise mix be improved), is a critical need. A farm financial management specialist will be able to improve the financial management skills of farmers and agricultural professionals and increase the efficiency of operations.

1.0 FTE Water quality specialist	\$240,000
Operating	\$60,000

This specialist will provide statewide education on water quality and quantity related to human and livestock use, energy production, nutrient management, etc. The water quality specialist was a ranked SBARE need in the last two legislative sessions.

Water is a critical element to life in our state. Science-based answers are needed on topics such as water quality for human and livestock consumption, impacts of saltwater spills, and best management practices to prevent nutrient movement to surface water. Educational programs and information are needed to assist land owners and citizens in making informed decisions when using and protecting our precious water resources. The water quality educational program will work in cooperation with agricultural and conservation groups and state regulatory agencies.

2.0 FTE Value-added cropping specialists	\$400,000
Operating	\$120,000

These specialists will develop programs to build the management skills of new and existing farmers to overcome the unique production challenges of these crops and systems. This will build the capacity of North Dakota to meet opportunities in the marketplace. Positions will be located at the Dickinson and Carrington Research Extension Centers to service the state.

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1.0 FTE Pollinator specialist	\$240,000
Operating	\$60,000

This specialist will provide leadership for statewide education on best management practices for beekeepers and other pollinators. These educational efforts will support the North Dakota Pollinator Plan.

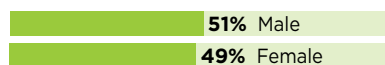
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NDSU EXTENSION SERVICE

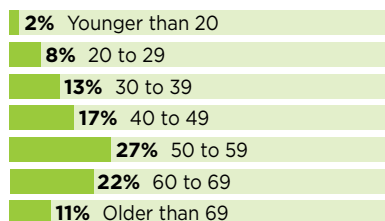
2015 Community Forums STATEWIDE REPORT

327
PARTICIPANTS

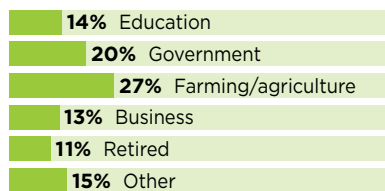
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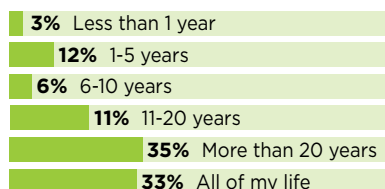
OCCUPATION



ETHNICITY



LIVED IN COMMUNITY



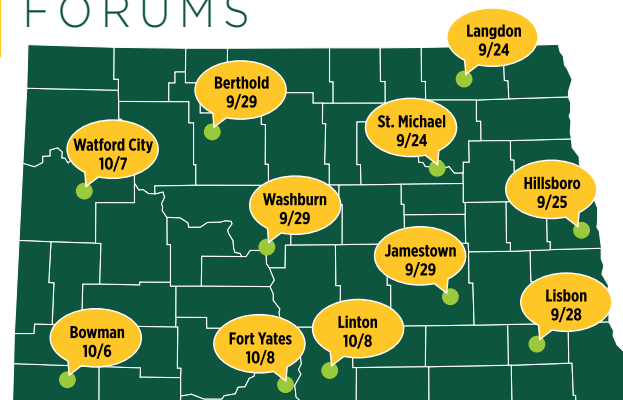
The NDSU Extension Service is listening. NDSU Extension staff recognize that to be most effective, they need to listen to local stakeholders and regularly ask about crucial issues and challenges affecting each region.

Community forums during the fall of 2015 provided an opportunity to listen to North Dakotans across the state as they shared concerns around:



Thank you to the more than 300 people who participated in the 11 community forums. The information will help shape NDSU Extension's strategic planning efforts during the next three to five years and help us create the Extension programs that will most strongly align with the needs and priorities of North Dakota residents.

11 COMMUNITY FORUMS



EXTENDING KNOWLEDGE. CHANGING LIVES.

Agriculture, Energy, Natural Resources and the Economy

NDSU EXTENSION
SERVICE

Priority Issues of Concern to Community Forum Participants



AG ECONOMY

Agriculture is critical to the North Dakota economy. Fluctuations in the agricultural economy bring challenges to farmers, especially in these lean times. More agricultural diversification and value-added products are needed to help farm families and communities.

PUBLIC DISCONNECT WITH AGRICULTURE

We say we can feed the world, yet there is a growing lack of general understanding about where food comes from. Farm-to-table consumer education programs about local foods and food production are needed for all ages.



ENERGY DEVELOPMENT

Fluctuating oil prices can cause dramatic shifts in North Dakota's economy, creating uncertainty. Additional areas of challenge in energy development include protecting natural resources in the Oil Patch Region, developing necessary infrastructure and preparing communities for changing dynamics.

FARM AND BUSINESS TRANSITION

As North Dakota ages, barriers to effectively enter and exit farming operations and other businesses need to be overcome to ensure a successful transition from one generation to the next.



LABOR FORCE

Recruiting and retaining an effective workforce across the state is a growing challenge. Adequate wages and benefits, and options for worker flexibility are two key factors. Retention of a young and vital workforce also requires affordable housing, good-quality child care and local community amenities.

NATURAL RESOURCES PROTECTION

Adequate water supplies, good-quality air and water, soil health and tree renovation are concerns. Being good stewards of the state's natural resources and using green technology, such as wind and other renewables, is recommended, as is expansion of local recycling programs.



REGULATIONS

Sustaining industry is viewed as difficult because of existing and proposed regulations in energy development and agriculture. One-size-fits-all federal agency regulations don't take into consideration variables that are unique to location. Oversight or flexibility at the state or local level is preferred.

RURAL COMMUNITIES

Keeping main streets viable through succession planning for businesses, economic development and updates to infrastructure are essential to sustain rural communities. Quality-of-life amenities are needed to attract and keep people in rural North Dakota.



Children, Families and Communities

NDSU EXTENSION SERVICE

Priority Issues of Concern to Community Forum Participants



HEALTH AND WELLNESS

Awareness education about chemical and other addictions, mental health issues and physical health is needed. Access to and quality of health care is a major concern, particularly in rural areas where medical personnel and emergency medical services volunteers are limited or not available. Also of concern is the increase of unhealthy lifestyles, and ongoing inaccessibility to nutritious foods and exercise programs or facilities.

CIVIC ENGAGEMENT

Gaps exist in participation and commitment at the local level. Positive changes in communities happen when adults and youth are engaged civically as volunteers and leaders. Successful community involvement and volunteerism hinges on the development of leadership skills and mentoring.



SUCCESSFUL FAMILIES

Many families are struggling. Families today are bombarded with competing priorities that are changing family dynamics. Frequently heard are that youth are overscheduled, changing cultures and technology are limiting family time, good-quality child care can't be found, and morals and ethics are on the decline. Financial security also is a major concern with an increase in poverty and the difficult challenges it causes.

INFRASTRUCTURE

Improvement to infrastructure is needed for the long-term development and resiliency of North Dakota. Housing, roads, child-care facilities, schools and public buildings need attention for safety reasons and because a lack of sufficient infrastructure impedes the recruitment and retention of the rural workforce.



CRIME AND SAFETY

Sex trafficking, drug and alcohol abuse, burglaries, sex offenders and an increase in crime are huge concerns, especially in western North Dakota. Ranking just as high, however, is Internet, social media and texting safety, and the increasing prevalence of cyber-bullying and sexting, especially among youth.

EDUCATION

Additional support is needed for pre-K through 12th-grade education systems, including more teachers and programs in many areas. Overcrowding of schools in some communities and declining enrollments in others is creating unique challenges, with discussion of regional collaboration more important than ever in some areas.



EXTENDING KNOWLEDGE. CHANGING LIVES.

NDSU Extension Service Responds with Transformational Education

Extension's educational mission is to provide research-based information to improve the quality of life of North Dakotans. We achieve that outcome using a combination of four educational strategies, which are illustrated below. This matrix has two dimensions with process on one axis and content on the other.

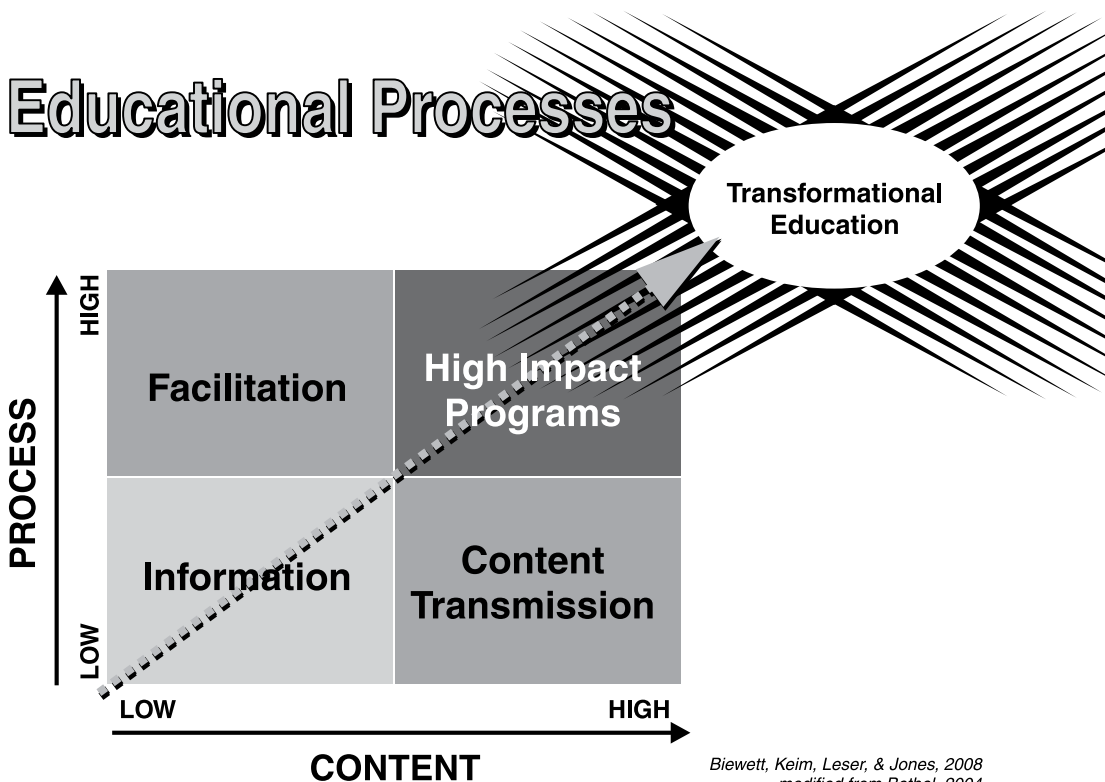
The **low process/low content** cell is identified as "information" or "service" and represents straightforward, non-problem solving items such as soil testing, insect identification, coordinating meetings, or conducting 4-H achievement days.

The **high process/low content** cell is called "facilitation" and represents an important function, especially in contentious group settings. Extension staff frequently provide facilitation, which is a highly valued element in many projects.

The **high content/low process** cell is identified as "content transmission." This function could also be labeled "technology transfer" and represents the dominant function of providing answers to people's problems.

Finally, the **high content/high process** cell called "high impact programs" is seen as the most powerful approach to transforming people as they struggle with solving problems. Engagement at this level is when Extension provides its strongest programs and impacts.

This educational model is **FOUNDATIONAL** to our mission as Extension specialists and agents.



Examples of NDSU Extension programs in the Transformational Education Model

▼ HIGH IMPACT PROGRAMS (Transformational Education)

Design Your Succession Plan

North Dakota will experience a major turnover in farm management as boomers retire. Research indicates the main obstacle is not learning about financial/legal tools, but rather the communications among family members. During sessions key roadblocks and open communication methods are reviewed, and participants compile a file of critical documents that will prepare them to meet with financial/legal professionals.

Soil Health

Soil salinity reduces crop productivity on about 6 million acres of N.D. farmland. An educational program was developed by a team of Extension agents and specialists using Twitter, Facebook, webinars, videos, cafe talks, field demonstrations, conference meetings, soil pits and more. Participating farmers have formed “user” or “soil health support” groups to exchange ideas. The number of farmers adopting cover crops and soil salinity management practices increases each year.

Rural Leadership North Dakota

This 18 month leadership development program is designed for people interested in becoming strong leaders. Each seminar features a mix of personal development, leadership study and location-related subject matter. Graduates are strengthening the agricultural community, their local communities and the state of N.D.

4-H Beef Project

In this project, 4-H members can select either raising a breeding animal or a market animal. Youth first learn the basic knowledge about the animals and then put the information to practice as they raise the animal, keep financial and feeding records, and display their end product in an exhibit.

▼ CONTENT TRANSMISSION

Agricultural Outlook and Ag Lender Conferences

Extension specialists provide the current situation, immediate outlook and long-range agricultural economic forecasts to ag lenders. Specialists provide trend analysis of domestic and foreign production, and markets for crops and livestock.

4-H Drone Program

Members gather in educational settings to learn about drones as part of National Science Day and other project opportunities, but they do not get the supplies to build a drone or practice the aeronautical concepts needed to actually fly the drone.

Lead Local

This is a one day training for aspiring, elected and appointed leaders to feel better prepared to serve on a board, council or committee. The training covers understanding personality types, managing conflict, ethical leadership, parliamentary procedure and organizational management.

▼ FACILITATION

Nutrient Best Management Practices

An Extension soil fertility specialist guided a committee of state agencies and commodity interests to develop a series of best management practices to protect surface waters of North Dakota.

McKenzie County Suicide Prevention Task Force

A significant rise in suicide was noted by many groups in McKenzie County. The local FCS agent was asked to facilitate a community task force to address concerns regarding increased suicides in the county. The group developed a roadmap for the county to follow.

Bringing Together Landowners and Oil Companies

Extension staff convened two community meetings in Watford City and Williston that allowed for concerns from both sides of a difficult issue to be heard. Information was shared on reclamation processes, communication and negotiation strategies between parties.

▼ INFORMATION

NDSU Pest Management App

An information content system combines select information from the Weed Control Guide, Fungicide Guide and Crop Insect Management Guide into an app for easy access by smart phone or tablet. Producer access to the app is available for free on Google Play and the iTunes App Store.

Public Speaking Basics

A web-based collection of public speaking information, pointers and tips help 4-H members prepare for public speaking contests.

Extension helping North Dakota through **agriculture and natural resources**: A SNAPSHOT

Agriculture is critical to the economy of North Dakota and routinely accounts for approximately 30 percent (\$9.1B in 2015) of all business activity in the state. Extension Agriculture and Natural Resources' (ANR) specialists and county based agents work to ensure that the latest research based information is available to all who seek it. These same specialists and agents continually probe and listen for agriculture's next "need", and develop innovative educational programs and field studies to meet those needs as fast as possible.



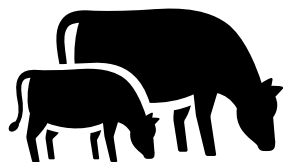
6,100 downloads of the Extension **Pest Management App** since 2014, combining the Extension Plant Disease Management, Insect Control and Weed Control guides into a digital form

Approximately

15,000 producers attended Extension **farm bill education meetings**



90% of respondents used the **Extension-developed farm bill decision aid tool** when making their final decision with FSA; of these respondents, **83% used the decision tool for ALL** of their acres

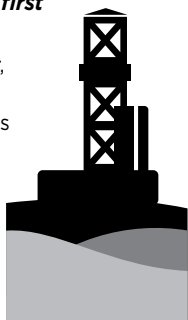


78% of respondents indicated a **\$15,500** increase in whole herd value per operation after participation in the Extension **artificial insemination (AI) breeding education program**

More than **150** landowners, community members and oil company representatives **increased their understanding** of their rights, the land reclamation process, and how to communicate and negotiate at Extension-led workshops

"This was long overdue. This should have happened when the oil industry first came to town."

Thomas Wheeler,
Vice-President
NW Land Owners
Association



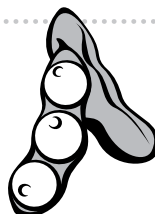
Over

2,860 samples processed



at the self-funded NDSU **Plant Diagnostic Laboratory** in 2015 resulted in **informed pesticide use decisions and economic savings** for North Dakotans

3X more soil samples were tested for **soybean cyst nematode (SCN)** since 2013 because of county Extension office test kit distribution

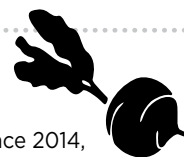


Estimated **\$160** per acre value for SCN detection and management

92%



of responding **gardeners** plan to change their gardening practices after participating in the 2015 online **Spring Fever Garden Forums**



Since 2014, **275** North Dakota families **evaluated 110 home garden varieties** resulting in over 1,000 analyzed trials

85% of responding families reported **more productive gardens**

76% of children in responding families who grew vegetables **improved their diets**

For more information on these and other impacts of the NDSU Extension Service, go to www.ag.ndsu.edu/extension or contact Charlie Stoltenow at 701.231.7171 or charles.stoltenow@ndsu.edu.



Extension helping North Dakota through **4-H**: A SNAPSHOT

NDSU EXTENSION
SERVICE

4-H prepares youth for success and the challenges that face North Dakota. It contributes to the development of new leaders, encourages innovation and entrepreneurship, teaches good stewardship, and helps youth acquire important life skills that prepare them to be career- and work-ready.

Current priorities include helping youth develop science interests, skills and abilities in the areas of agriculture, energy, environmental stewardship and technology. Youth learn the importance of food access, where their food comes from, and how to make healthful food choices and live healthy lives. They develop leadership skills and understand the importance of giving back to their communities and society.

Youth throughout the U.S., including North Dakota, participated in research to define and measure positive youth development (Source: Lerner and Lerner 2011). **Compared with their peers, youth involved in 4-H programs are:**



2X more likely to participate in STEM activities

98% of youth who attended GEAR-Tech-21 camp reported they would feel comfortable **teaching robotics** to others

75% of youth participants in the Drone Discovery/National Youth Science Day Experiment reported it made them **more interested in science**



2X more likely to make healthier choices

90% of youth participating in the Healthy Camp Challenge said they planned to continue to **practice healthful activities**

28 4-H clubs with **433** youth earned the designation of **Healthy 4-H Club** in 2016



2X more likely to be civically active

76% of youth attending **Civic U** reported an increased effort to allow everyone to have a voice in **decision making**

1,000+ youth demonstrate **leadership skills** through 4-H club offices, 4-H Ambassadors, or special projects



4X more likely to give back to their communities

777 volunteer service hours contributed to the state by North Dakota 4-H Ambassadors

49 blankets made and donated to the Project Linus program by youth attending the Extension Youth Conference



North Dakota 4-H Camp

record **558** youth at North Dakota 4-H Camp near Washburn

86% of campers reported learning **new skills**

89% of campers **made new friends**

59% of campers demonstrated **more independence**

50% of campers are **more willing to participate** in other activities

50% of campers improved in **problem solving**



19% 4-H enrollment increase in past five years

North Dakota 4-H in 2015-16

29,306 youth participants

6,247 enrolled 4-H members

1,007 youth in 4-H camping programs

2,534 volunteers

342 youth volunteers

For more information on these and other impacts of the NDSU Extension Service, go to www.ag.ndsu.edu/extension or contact Brad Cogdill at 701.231.7259 or brad.cogdill@ndsu.edu.

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.

Extension helping North Dakota through leadership and civic engagement: A SNAPSHOT

NDSU Extension is working to meet the demand for leadership and civic engagement by helping new and existing leaders build their skills, confidence and willingness to lead through cohort groups and local training sessions. Here are some of those programs:



Lead Local is a training for aspiring, elected and appointed officials to help them feel better prepared to serve as an effective board, council or committee member.



283+ volunteer groups had members participate in Lead Local and become engaged civically in their communities

89% understand their board member tasks

77% feel comfortable handling conflict during a meeting

89% feel prepared to serve on a board, council or committee



Rural Leadership North Dakota (RLND) is an 18-month leadership development program designed to

strengthen agriculture, local communities and the state for the future.

\$4 million acquired by participants to complete local projects

19 participants have run for office; three were elected during the last election cycle



Stronger Economies Together (SET)

enhances the capacity of people in rural communities to implement an economic development blueprint that builds on the region's emerging economic strengths. SET has:

- Strengthened **communication and partnerships** between health-care administrations
- Raised **\$60,000+ in scholarship support** for students who will return to the region in a health-related career
- **Initiated critical conversations** regarding local foods and started groundwork to facilitate change for entrepreneurs at a federal level
- Cultivated **civically engaged youth** by encouraging participation in community planning and training them to be effective board, council or committee members
- Created a **unified tourism vision** for the region

(Funded and in collaboration with USDA Rural Development)

North Dakota Leadership by the numbers:

8,314

North Dakota nonprofit organizations and governmental units requiring people to serve in leadership roles

1 in 24

people age 18 and older needed to meet the leadership demand

Lead Local for Youth and Civic U

give junior and senior high youth an opportunity to become familiar with civic responsibility, service and parliamentary procedure during day-long programs.

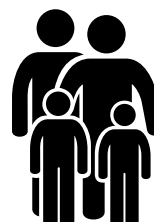


For more information on these and other impacts of the NDSU Extension Service, go to www.ag.ndsu.edu/extension/ccv or contact Lynette Flage at 701.231.7782 or lynette.flage@ndsu.edu.

Extension helping North Dakota through **family and consumer sciences**: A SNAPSHOT

Health and wellness are among North Dakota's biggest challenges. An individual's quality of life can quickly change because of chronic disease, financial hardships and family issues. Preventing these life challenges in many cases can be done by identifying key factors and responding with targeted educational programs.

To help ensure the state has healthy people and communities, NDSU Extension's family and consumer sciences (FCS) programs focus on three key areas: personal and family finance, human development and family science, and nutrition, food safety and health. Programming in these areas prevent future problems and evidence indicates these programs are making a difference. As a result of FCS programs:



82%

of parents completing the Gearing Up for Kindergarten program rated the program as **very/extremely useful**

(Nearly half of all Kindergarten students are not prepared for success when entering school.)



79%

of seniors in the Stepping On program **reduced falling hazards** at home

(Falls are the number one reason for elderly having to leave their homes.)



94%

of farmers/ranchers in the Design Your Succession Plan program **are prepared to meet with professional**

"It gave me a road map of what I want to do."
David Miller, Donnybrook-area producer

8.5% of all North Dakota households are food insecure. 14.5% of all North Dakota children live in poverty, 31.3% of school-enrolled children receive free and reduced meals and 15% of children are obese (source RWJF 2011). Extension's FCS programs are making a difference:

83%



of participants in the Expanded Food and Nutrition Education Program **improved at least one nutrition practice**

and

47%

improved at least one food safety practice



63%

of adults in the Family Nutrition Program **spend their food budget more wisely**



62%

of youth in On the Move to Better Health **increased their daily physical activity**



58%

of youth in On the Move to Better Health chose **more healthful snacks**

and

54%

ate more fruits and vegetables

For more information on these and other impacts of the NDSU Extension Service, go to www.ag.ndsu.edu/extension or contact Deb Gebeke at 701.231.9688 or debra.gebeke@ndsu.edu.

Agency Overview

Main Research Station

North Dakota Agricultural Experiment Station

Agency Statutory Authority

ND Constitution Article XIX; North Dakota Century Code Chapter 4-05.1.

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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

The NDAES continues to focus on developing its infrastructure to effectively conduct research needed by the agricultural sector in the state. Shortfalls occur in laboratory research facilities, especially those for plant-based field research laboratories at the Main Station. Cereal and grain quality laboratories, critical to maintaining and enhancing quality parameters for new crop varieties, are in desperate need of renovation/replacement. Developing separate laboratories for quality evaluation of novel experimental breeding lines also is required, due to the separation of transgenic material required by Federal policies on transgenic material. Laboratory space at the Main Station needs to be renovated/enhanced in order to carry out both applied and fundamental research on crops and livestock.

The Meat Science laboratory, built in the 1950's and last renovated in the 1970's, is in very poor condition. A new facility is needed to allow our scientists to conduct cutting-edge research in meat quality, meat science, muscle biology, and physiology. Such a facility would enhance our ability to

carry out much-needed research for the livestock sector on end-use quality traits. As with other newer facilities, such as the new agronomy labs at the RECs, as well as the AES greenhouse and the animal research complex at the Main Station, a new Meat Science laboratory would have strong positive impacts on the ability of NDAES scientists to carry out high quality research in these state-of-the-art facilities.

New technologies in crop development will provide novel methodology to incorporate disease, insect, and environmental stress resistance, thereby improving the overall adaptation of our many crops grown in the state. Technology is changing almost daily, and we are developing the appropriate public-private partnerships with technology providers to ensure that our scientists have access to the best technologies available for their research programs.

Our scientists travel farther each year in the state to conduct site-specific research to control wheat and barley scab (an ongoing problem) and other important yield-limiting diseases of crop commodities grown in the state. Addressing new issues, such as wheat stem sawfly, new races of existing diseases for which there is little resistance, and identifying and responding to livestock producer concerns over outbreaks of zoonotic diseases are fundamental to the mission of the NDAES. The NDAES has insufficient laboratory space to meet the needs of 21st Century agriculture.

North Dakota is becoming increasingly urban, and urban populations require some products and services that are different than those needed by livestock and crop producers. Continual efforts to improve horticultural research are occurring, and NDAES is actively evaluating new research and demonstration programs in this area. Enhanced efforts in areas including, but not limited to, food security, food safety, natural resources management, and new bioproducts (including fuel) need to continue in order to allow NDAES to serve this segment of agriculture. Similarly, a systems approach (from conception to consumption) for livestock research has been implemented to better serve this important and growing sector of North Dakota agriculture.

Our strength is in our scientists and staff, but they are too few to cover all of the critical issues facing North Dakota agriculture, and the lack of adequate numbers precludes important scientific achievement. Reductions in numbers of scientists to comply with existing state revenues will further hamper our ability to provide unbiased, science-based information to our stakeholders and to one of the pillars of the state's economy.

2015-2017 Legislation that Included Reporting Requirements to 2017 Appropriation Committees

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

SECTION 2. ONE-TIME FUNDING — EFFECT ON BASE BUDGET — REPORT TO SIXTY-FIFTH

LEGISLATIVE ASSEMBLY. The following amounts reflect the one-time funding items approved by the sixty-third legislative assembly for ... the 2015-17 one-time funding items included in the appropriation in section 1 of this Act:

One-Time Funding Description

Agronomy laboratories - \$150,000

Rural leadership project - \$150,000

Dust issues technical support - \$100,000

Seed cleaning plants - \$4,500,000

Veterinary diagnostics laboratory - \$18,000,000 (SIIF funds)

Souris River flooding - \$72,500

The 2015-17 one-time funding amounts are not a part of the entity's base budget for the 2017-19 biennium. The main research center shall report to the appropriations committees of the sixty-fifth legislative assembly on the use of this one-time funding for the biennium beginning July 1, 2015, and ending June 30, 2017.

- Agronomy laboratories (CGREC) - \$550,000
 - Status:** \$400,000 received GF carryover from 2013-15
 - \$150,000 OF authorized 2015-17
 - Construction underway - estimated completion Spring of 2017
 - (See Central Grasslands REC forage agronomy lab facilities page 29)
- Rural leadership project
 - Status:** \$150,000 received for leadership program. Includes the following leadership projects:
 - 1) Igniting Legendary Leaders Conference – April 27-28, 2016
 - 120 individuals from North Dakota attended.
 - 17 speakers shared stories of how they “ignited” an idea and turned it into action
 - Key points for conference attendees included:
 - Be more involved in your community.
 - Jump in and get involved.
 - Rethink current processes for engaging with others.
 - Think outside the box and share your story.
 - 2) Inspiring Legendary Leaders Conference – April 11, 2017
 - Speakers will focus on leadership stories about how to take action on ideas you are passionate about.
 - The conference will be held at the Heritage Center in Bismarck.
 - Ignite speakers will include individuals who are working on projects in their community.

- Dust issues technical support
Status: \$100,000 operating support received; allocated. Extensive data gathered summer of 2016 on soil disturbance and dust from truck traffic. Data is currently being analyzed.
- Seed Cleaning
Status: Seed cleaning projects underway at Carrington REC and North Central REC
Carrington REC (\$750,000 General Fund, \$1,500,000 Other Fund authorization)
A 40ft x 75ft with 30ft sidewall building has been constructed to house seed cleaning equipment. The floor is cement at a minimum depth of 7 inches. Equipment bid out and on order include air screen, indent separator, and gravity table. Additional items in the process of requesting bids include seed transfer equipment (grain legs; belt, vibratory and auger conveyors), elevated stands, and platform for mounting equipment.
North Central REC (\$750,000 General Fund, \$1,500,000 Other Fund authorization)
Fundraising is underway and a site is being selected for a seed cleaning facility. Equipment expected to be purchased by June 2017, with construction complete by fall 2017.
- Souris River flooding - \$72,500
Status: (See Souris river research report page 43)
- Veterinary Diagnostics Laboratory - \$18,000,000 (SIIF funds)
Status: (See pages 27-28)

SECTION 5 APPROPRIATION — LANGDON RESEARCH EXTENSION CENTER. There is appropriated out of any moneys in the general fund in the state treasury, not otherwise appropriated, the sum of \$175,000, and from special funds, the sum of \$175,000, or so much of the sum as may be necessary, to the Langdon research extension center for the purpose of purchasing the real property described in section 4 of this Act, for the period beginning with the effective date of this section, and ending June 30, 2017. The funding provided in this section is considered a one-time funding item.

Status: The land was purchased for \$350,000

SECTION 11 DICKINSON RESEARCH EXTENSION CENTER — MINERAL RIGHTS INCOME. The Dickinson research extension center may spend up to \$755,000 of revenues received during the 2015-17 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, 2015, and ending June 30, 2017.

Status: Oil Revenue received July 1, 2015 to November 30, 2016 - \$123,819

SECTION 12 WILLISTON RESEARCH EXTENSION CENTER — MINERAL RIGHTS INCOME. The Williston research extension center shall report to the sixty-fifth legislative assembly on the amounts received and spent from mineral royalties, leases, or easements in the biennium beginning July 1, 2013, and ending June 30, 2015 and the biennium beginning July 1, 2015, and ending June 30, 2017.

Status: July 1, 2013 to June 30, 2015 - Amounts received \$491,230; Amounts spent \$0
July 1, 2015 to November 30, 2016 - Amounts received \$132,048; Amounts spent \$571,788

SECTION 19. EXEMPTION. The amounts appropriated for the agronomy laboratories contained in subdivision 4 of section 1 of chapter 51 of the 2013 Session Laws, are not subject to the provisions of section 54-44.1-11, and any unexpended funds from these appropriations or related revenues are available and may be expended during the biennium beginning July 1, 2015, and ending June 30, 2017.

Agronomy Lab Carryover Status

Project	GF carryover	Amount spend 12/31/2016
Langdon	\$33,457.86	\$33,457.86
Carrington	\$101,024.58	\$101,024.58
Central Grasslands	\$365,654.33	\$365,654.33

Update of NDAES Initiatives Funded in 2013-2015 Budget

- **Costs to continue FY2013 salary increases**

\$1,142,646 received and allocated July 1, 2013

- **Crop initiative-Enhancing crop development and protection efforts**

\$1,815,000 received

- \$1,160,000 Increased operating support: barley, corn, pulse, soybean, wheat, canola, cereal diseases, dry bean and pulse diseases – Main Station, crop pathology – CREC, variety testing – LREC, dryland crop improvement – DREC; allocated
- \$355,000 salary and fringe benefits, 2.0 FTE, Nematologist and technician; hired at Main Station
- \$300,000 NDAWN support
 - \$120,000 salary and fringe benefits, 1.0 FTE technical support; hired
 - \$80,000 increased operating ; allocated
 - \$100,000 software and hardware; allocated

- **Enhancing research capacities at RECs**

\$1,210,000 received

- \$560,000 operating support – LREC, CGREC, NCREC, WREC, HREC, CREC, DREC; allocated
- \$200,000 salary and fringe benefits, 1.0 FTE to focus on chemical and cultural control of weeds and plant pathogens in western ND – HREC; hired
- \$450,000 salary and fringe benefits, 3.0 FTE technical support – CGREC, NCREC, CREC; hired

- **Agronomy laboratories**

\$5,925,000 received for the following:

- CREC - \$2,500,000
- HREC - \$1,800,000
- LREC - \$1,225,000
- CGREC - \$400,000

Construction completed for Carrington, Hettinger, and Langdon

Central Grasslands project carryover to FY 2015-17

\$400,000 received:

- CGREC – (\$400k General, \$150k Other)

Construction underway – estimated completion Spring of 2017

- **Equipment – vet diagnostic lab**

\$400,000 received

The NDSU Veterinary Diagnostic Lab purchased a liquid chromatography/mass spectrometer to expand forage testing for harmful mycotoxins occurring in moldy storage feedstuffs, additional spectrophotometers to expand livestock water testing for potentially toxic chemicals, a stereo microscope to identify harmful blue-green algae in livestock water samples, and a steam sterilizer to maintain uniform sterile testing requirements.

- **Permanent oil tax trust fund (Dickinson REC)**

\$800,000 received and allocated

- **Grasslands recovery: Souris river flooding research funding**

\$82,000 received; Post doc hired

- **Animal science position**

\$140,000 received; hired

Additional Item

The RECs received \$14,500 (DREC \$4,750, HREC \$1,750, NCREC \$3,750, WREC \$4,250) from the general fund pool appropriated to the Office of Management and Budget (OMB) for needs resulting from energy development. These amounts were paid to employees at the previously listed RECs.

Update of NDAES Initiatives Funded in 2015-2017 Budget

SBARE ranked/unranked initiatives:

- **Costs to continue FY2015 salary increases**

\$741,779 received and allocated July 1, 2015

- **Bioinformatics**

\$800,000 received; salary and fringe benefits, 2.0 FTE bioinformaticists; hired

- **Precision ag**

\$600,000 received; operating support — Internal grant committee formed; 25 proposals totaling \$1.8M submitted; funding allocated to 9 projects (see precision ag initiative impacts preliminary results page 41)

- **Enhancing research infrastructure for greater research efficiencies and effectiveness**

\$1,100,000 received operating support- revolving equipment fund; allocated

- **Enhancing research capacities at RECs**

\$670,000 received

- \$130,000 salary and fringe benefits , 1.0 FTE Animal Science technical support staff — HREC; position descriptions being developed
- \$330,000 salary and fringe benefits , 2.0 FTE plant pathologist and technical support — WREC; hired
- \$210,000 operating support — LREC, CGREC, NCREC, WREC, HREC, CREC, DREC; allocated

Capital and one-time funding:

- **Veterinary diagnostic lab replacement**

\$18,000,000 received; Construction underway — estimated completion Summer of 2017

- **Seed cleaning facilities**

\$4,500,000 received (\$1.5M General, \$3M Other)

- Carrington REC (\$750,000 General Fund, \$1,500,000 Other Fund authorization)
A 40ft x 75ft with 30ft sidewall building has been constructed to house seed cleaning equipment. The floor is cement at a minimum depth of 7 inches. Equipment bid out and on order include air screen, indent separator, and gravity table. Additional items in the process of requesting bids include seed transfer equipment (grain legs; belt, vibratory and auger conveyors), elevated stands, and platform for mounting equipment.
- North Central REC (\$750,000 General Fund, \$1,500,000 Other Fund authorization)
Fundraising is underway and a site is being selected for a seed cleaning facility. Equipment expected to be purchase by June 2017, with construction complete by fall 2017.

- **Dust Issues technical support**

\$100,000 operating support received; allocated. Extensive data gathered summer of 2016 on soil disturbance and dust from truck traffic. Data is currently being analyzed.

- **Grasslands recovery: Souris river flooding research funding**

\$72,500 received and allocated
(See Souris river research report page 43)

- **Land purchase — LREC**

\$350,000 received (\$175k General, \$175k Other); purchased

- **Leadership program**

Status: \$150,000 received for leadership program. Includes the following leadership projects:

1) Igniting Legendary Leaders Conference – April 27-28, 2016

- 120 individuals from North Dakota attended.
- 17 speakers shared stories of how they “ignited” an idea and turned it into action
- Key points for conference attendees included:
 - Be more involved in your community.
 - Jump in and get involved.
 - Rethink current processes for engaging with others.
 - Think outside the box and share your story.

2) Inspiring Legendary Leaders Conference – April 11, 2017

- Speakers will focus on leadership stories about how to take action on ideas you are passionate about.
- The conference will be held at the Heritage Center in Bismarck.
- Ignite speakers will include individuals who are working on projects in their community.

Capital and one-time funding:

- **Agronomy laboratories**

\$400,000 received

- CGREC (\$400k General, \$150k Other)

Construction underway, estimated completion Spring 2017.

North Dakota Agricultural Experiment Station

Veterinary Diagnostic Lab

FACILITIES

A new and modern facility to house the veterinary diagnostic laboratory (VDL) should be a minimum of 20,000 square feet and be designed to allow cost effective addition of laboratory space, as needed, to meet future testing demands (i.e. meat testing, analysis of feed and animal samples for petroleum residues, international export testing). The facility should include adequate laboratory and office space for sample receiving, toxicology, serology, information technology, administration, clinical pathology, gross pathology, histology, quality assurance, bacteriology/mycology, virology and molecular diagnostic sections.

This was SBARE's #1 ranked Capital Project for the 2015-17 Legislative Session. The Legislature provided \$18,000,000 from the Strategic Investment and Improvements Fund (SIIF).

Timeline:

- April 2015 — HB 1020 Passed, including \$18,000,000 for new VDL, which is declared to be an emergency measure
- Summer 2015 — Architects are interviewed and hired
- Fall 2015 - Jan. 2016 — Architects design building
- January 2016 — Project is bid, low bids accepted
- Spring 2016 — Construction begins
- November 2016 — Building is enclosed
- Summer 2017 — estimated completion

Architectural Design:

GROUND VIEW FROM SOUTHWEST

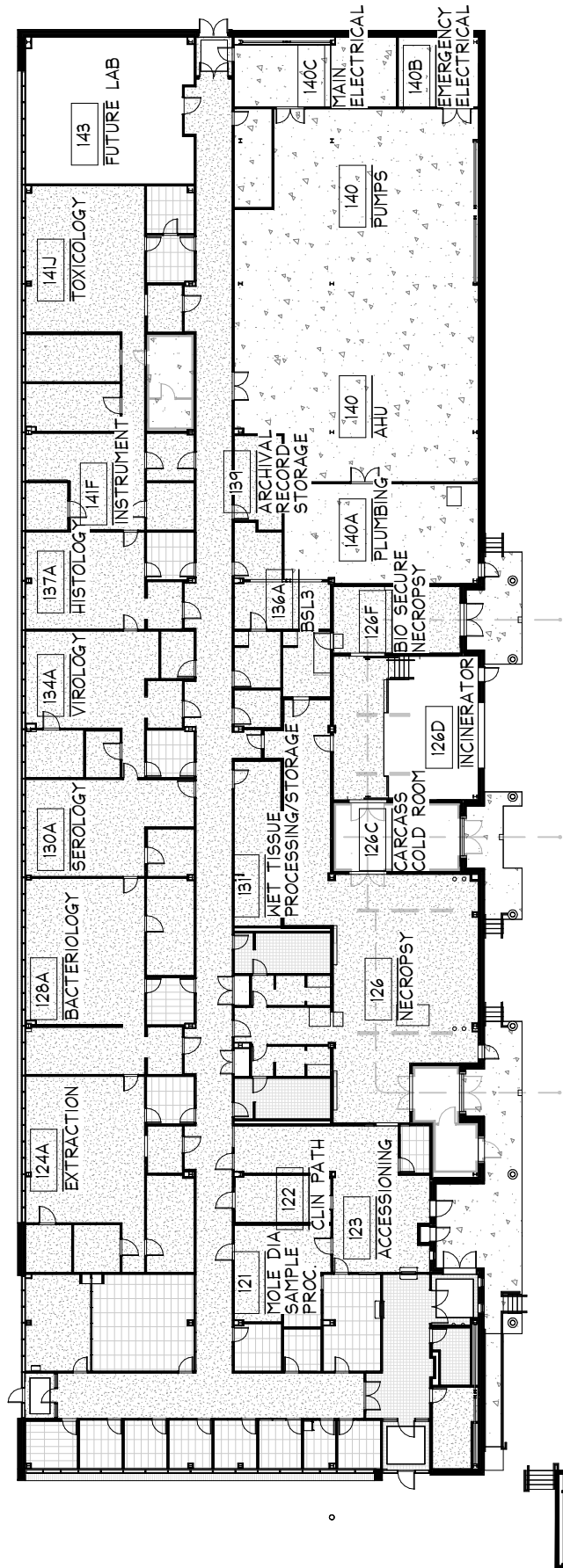


November 2016 view:



ZIRKBERG CANNON DESIGN

Floor plan of the veterinary diagnostic laboratory



Central Grasslands REC Forage Agronomy Lab

FACILITIES

Central Grasslands REC Forage Agronomy Lab

\$550,000 Project (\$400,000 GF, \$150,000 OF)

Construction underway, estimated completion Spring 2017.

Timeline:

- May 2013 — Legislature authorized funding as requested \$400,000 in SB 2020, General Funds
- Fall/Winter 2013 — Project design
- Feb. 2014 — Project was bid and came in significantly over budget
- Spring 2015 — Additional Authorization of \$150,000 in Other Funds included in HB 1020
- Fall 2015 — Addition design work completed
- Feb. 2016 — Successful bid opening
- Spring 2016 — Construction began
- Spring 2017 — Estimated completion

Architectural Design:



November 2016 view:



1 Restore Budget to 2015-17 Original Appropriation

Need: Restoration of 10 percent budget cut: Branch RECs \$1,979,845
Main Station \$5,734,511
Total AES \$7,714,356



2 Oakes Irrigation Site

Situation: The Oakes Irrigation Site has been funded through the Garrison Conservancy District. This funding no longer will be available in the near future (as committed funding) due to reallocation to other projects. The facility has been supervised by the Carrington REC; salaries, operating and equipment are entirely grant supported. Stakeholders in the region have made commitments to providing support for the center; one commitment was a gift of 40 acres to increase the research footprint. State resources would be used for operating support. The facility conducts research on irrigated, high-value crops for the southeastern region of North Dakota.

Need: Operating - \$600,000



3 Enhancing Research Infrastructure for Greater Research Efficiencies and Effectiveness

Situation: Graduate student funding (Increase pool of funds for additional graduate research assistantships)

Graduate research assistantships are critical to ongoing, vibrant research programs. These students are hard-working, intelligent and driven to succeed. They carry out research under the supervision of scientists at the Main Station and RECs, and these research topics broaden the overall research agenda of AES projects. The students work for approved research programs in the AES, attend classes to improve their understanding of their respective disciplines and carry out their individual research topics (all part of educating and training the next generation of scientists). Access to a small pool of funding to increase the number of students in Agriculture has been very successful, not only in terms of enhancing research activities but also by leveraging funds from other sources to increase the number of students. In 2011-13, the AES was provided funds for 20 students; departments and individual scientists were able to leverage these funds to increase the number of students to 36. Of these 36 students, 33 were from the state (23) or region (10). Because of the importance of agriculture in North Dakota, jobs are plentiful and many students will remain in the state upon graduation. This request is to provide funds for an additional 20 research assistantships.

Need: Graduate Research Assistantships (20 @ \$20,000/year) - \$800,000

Situation: Operating Funds

The NDAES received \$600,000 last biennium for precision agriculture research. These funds were used as a grants pool for research/Extension programs, with scientists in the AES and specialists in Extension eligible for funding. The call for proposals resulted in 25 proposals addressing issues in precision ag ranging from economics, crops issues (management, pest control) and livestock production to engineering. Of these proposals, which totaled \$1.8 million in requests, nine were funded. Increasing the total funding available through the competitive program will allow more projects to be carried out in this important and rapidly changing area of agriculture. The activity and output of important programs such as the Soil Health Initiative, wheat improvement, pulse pathology and weed-resistance research could benefit from increased operating funds. Impacts on soil by the oil industry in western North Dakota have been reported. Many of these may have long-term impacts on land quality, which may reduce agricultural productivity. Brine spills and soil compaction have reduced land quality and crop productivity in western North Dakota. The Center for Ag Policy and Trade Studies, which is the premier agricultural policy center in the region, evaluates state, domestic and international policies that affect demand-supply of grains and net farm income. Identifying ways to enhance operations support for all programs in the AES would address increased costs of materials, supplies and small equipment, and allow scientists to increase their scope of work.

Need: Operating support for precision ag - \$600,000	Land reclamation and soil restoration due to oil impacts - \$80,000
Soil Health Initiative - \$80,000	Center for Ag Policy and Trade Studies (CAPTS) - \$80,000
Wheat improvement - \$80,000	
Pulse pathology - \$50,000	
Weed resistance research - \$50,000	





4 Enhancing Research Infrastructure at RECs

Situation: REC Operating support - Operating costs for research activities continue to increase. At the RECs, despite very high levels of funding obtained by scientists through grants, other costs, such as state motor pool costs, new project development, equipment repairs and supplies, and new issues facing the state's agricultural sector, continue to impact their ability to carry out their mission to serve their area of the state. A portion of the requested amount for increased operating funds for the RECs was authorized in the 2015-17 session and is greatly appreciated. This request is to provide the remainder of the requested amount.

Need: Operating funds (7 @ \$30,000/biennium) - \$210,000

Situation: The salary and fringe benefits of the director's position at the North Central Research Extension Center were paid equally by the center (AES) and Extension. Upon the retirement of the previous director, the Extension Service reduced its salary support to that (5 percent) for other REC directors. This results in a shortfall of salary and fringe benefits funds for the next director. The request is to stabilize the funding line for this important position.

Need: Stabilizing salary line (and fringe benefits) for NCREC director - \$95,000



5 Enhancing Research Capacity in Plant Virology and Pulse Pathology

Situation: Virologist - North Dakota has a highly diverse crop agriculture sector, producing more than 40 crop commodities and leading the nation in the production of 15 commodities. Many of these crops are impacted by diseases caused by plant viruses. Also, recent reports of new (for this area) virus diseases have occurred. Cereals, pulse crops and other broad-leafed crops such as soybean, potato and sugar beet can have virus problems. Potato and pulses, in particular, have a number of virus diseases that are present in the state. Efforts to study the cause, spread and elimination of virus diseases at NDSU have been hampered by the lack of a dedicated virologist position that can focus on these unique diseases. Viruses can be spread by insect pests; increased numbers of insect vectors can spread the virus disease rapidly. Working with entomologists, geneticists and plant breeders, the virologist position will fill a critical void in reducing damage caused by disease.

Need: Scientist (1.0 FTE) - \$355,000; Operating - \$200,000; TOTAL - \$555,000

Situation: Pulse Pathology Technical Support Staff - The Pulse Pathology program is responsible for carrying out research and finding solutions to disease problems affecting pulse crops. The program focuses on a wide range of diseases affecting dry edible bean, pea, lentil and chickpea. Each of these crops is affected by different diseases, and many diseases for each crop are of economic concern to growers in North Dakota. The wide breadth of this program is in need of additional technical support.

Need: Pulse Crop Technical Support (1.0 FTE, Main Station) - \$180,000



6 Harnessing the Microbiome for Improved Plant, Animal and Soil Health

Situation: Microbiome Initiative (operating support) - The microbiome is the ecological community of organisms that can be beneficial (symbiotic), neutral (commensalistic) or antagonistic (pathogenic) to other organisms, including humans, animals and plants. Microbiome research is most advanced in humans - impacts on human health and phenotype have been reported widely - and the genomic interactions of microbes in the body and human DNA play a role in a wide number of phenotypic and human health-related issues, including diabetes, obesity and cardiac issues. Similarly, plants and animals have their respective microbiomes that affect health and productivity of the higher organism. Understanding the microbiome will aid in improved nutrition, and the disease and environmental impact of animal and crop production, ultimately benefitting human health. In addition, understanding the soil microbiome may allow for improving and maintaining soil health.

Need: Operating for improving microbiome in plant, animals, food and soils - \$600,000

DETAILS:

2017-2019 Program Initiatives as Ranked by SBARE

North Dakota Agricultural Experiment Station

1. Restore Budget to 2015-2017 Original Appropriation

2. Oakes Irrigation Site

Operating

\$600,000

The Oakes Irrigation Site has been funded through the Garrison Conservancy District. This funding no longer will be available in the near future (as committed funding) due to reallocation to other projects. The facility has been supervised by the Carrington REC; salaries, operating and equipment are entirely grant supported. Stakeholders in the region have made commitments to providing support for the center; one commitment was a gift of 40 acres to increase the research footprint. State resources would be used for operating support. The facility conducts research on irrigated, high-value crops for the southeastern region of North Dakota.

3. Enhancing Research Infrastructure for Greater Research Efficiencies and Effectiveness

Graduate research assistantships (20 @ \$20,000/year)

\$800,000

Graduate student funding (Increase pool of funds for additional graduate research assistantships) — Graduate research assistantships are critical to ongoing, vibrant research programs. These students are hard-working, intelligent and driven to succeed. They carry out research under the supervision of scientists at the Main Station and RECs, and these research topics broaden the overall research agenda of AES projects. The students work for approved research programs in the AES, attend classes to improve their understanding of their respective disciplines and carry out their individual research topics (all part of educating and training the next generation of scientists). Access to a small pool of funding to increase the number of students in Agriculture has been very successful, not only in terms of enhancing research activities but also by leveraging funds from other sources to increase the number of students. In 2011-13, the AES was provided funds for 20 students; departments and individual scientists were able to leverage these funds to increase the number of students to 36. Of these 36 students, 33 were from the state (23) or region (10). Because of the importance of agriculture in North Dakota, jobs are plentiful and many students will remain in the state upon graduation. This request is to provide funds for an additional 20 research assistantships.

Operating support for precision ag

\$600,000

Soil Health Initiative	\$80,000
Wheat improvement	\$80,000
Pulse pathology	\$50,000
Weed resistance research	\$50,000
Land reclamation and soil restoration due to oil impacts	\$80,000
Center for Ag Policy and Trade Studies (CAPTS)	\$80,000

Operating Funds — The NDAES received \$600,000 last biennium for precision agriculture research. These funds were used as a grants pool for research/Extension programs, with scientists in the AES and specialists in Extension eligible for funding. The call for proposals resulted in 25 proposals addressing issues in precision ag ranging from economics, crops issues (management, pest control) and livestock production to engineering. Of these proposals, which

totaled \$1.8 million in requests, nine were funded. Increasing the total funding available through the competitive program will allow more projects to be carried out in this important and rapidly changing area of agriculture. The activity and output of important programs such as the Soil Health Initiative, wheat improvement, pulse pathology and weed-resistance research could benefit from increased operating funds. Impacts on soil by the oil industry in western North Dakota have been reported. Many of these may have long-term impacts on land quality, which may reduce agricultural productivity. Brine spills and soil compaction have reduced land quality and crop productivity in western North Dakota. The Center for Ag Policy and Trade Studies, which is the premier agricultural policy center in the region, evaluates state, domestic and international policies that affect demand-supply of grains and net farm income. Identifying ways to enhance operations support for all programs in the AES would address increased costs of materials, supplies and small equipment, and allow scientists to increase their scope of work.

4. Enhancing Research Infrastructure at RECs

Operating funds (7 @ \$30,000/biennium)

\$210,000

REC Operating support — Operating costs for research activities continue to increase. At the RECs, despite very high levels of funding obtained by scientists through grants, other costs, such as state motor pool costs, new project development, equipment repairs and supplies, and new issues facing the state's agricultural sector, continue to impact their ability to carry out their mission to serve their area of the state. A portion of the requested amount for increased operating funds for the RECs was authorized in the 2015-17 session and is greatly appreciated. This request is to provide the remainder of the requested amount.

Stabilizing salary line (and fringe benefits) for NCREC director

\$95,000

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5. Enhancing Research Capacity in Plant Virology and Pulse Pathology

1.0 FTE Virologist

\$355,000

Operating

\$200,000

Total

\$555,000

Virologist — North Dakota has a highly diverse crop agriculture sector, producing more than 40 crop commodities and leading the nation in the production of 15 commodities. Many of these crops are impacted by diseases caused by plant viruses. Also, recent reports of new (for this area) virus diseases have occurred. Cereals, pulse crops and other broad-leafed crops such as soybean, potato and sugar beet can have virus problems. Potato and pulses, in particular, have a number of virus diseases that are present in the state. Efforts to study the cause, spread and elimination of virus diseases at NDSU have been hampered by the lack of a dedicated virologist position that can focus on these unique diseases. Viruses can be spread by insect pests; increased numbers of insect vectors can spread the virus disease rapidly. Working with entomologists, geneticists and plant breeders, the virologist position will fill a critical void in reducing damage caused by disease.

1.0 FTE Pulse pathology technical support staff

\$180,000

Pulse Pathology Technical Support Staff — The Pulse Pathology program is responsible for carrying out research and finding solutions to disease problems affecting pulse crops. The program focuses on a wide range of diseases affecting dry edible bean, pea, lentil and chickpea. Each of these crops is affected by different diseases, and many diseases for each crop are of economic concern to growers in North Dakota. The wide breadth of this program is in need of additional technical support.

6. Harnessing the Microbiome for Improved Plant, Animal and Soil Health

Operating

\$600,000

The microbiome is the ecological community of organisms that can be beneficial (symbiotic), neutral (commensalistic) or antagonistic (pathogenic) to other organisms, including humans, animals and plants. Microbiome research is most advanced in humans – impacts on human health and phenotype have been reported widely – and the genomic interactions of microbes in the body and human DNA play a role in a wide number of phenotypic and human health-related issues, including diabetes, obesity and cardiac issues. Similarly, plants and animals have their respective microbiomes that affect health and productivity of the higher organism. Understanding the microbiome will aid in improved nutrition, and the disease and environmental impact of animal and crop production, ultimately benefitting human health. In addition, understanding the soil microbiome may allow for improving and maintaining soil health.

North Dakota Agricultural Experiment Station

Main Research Station

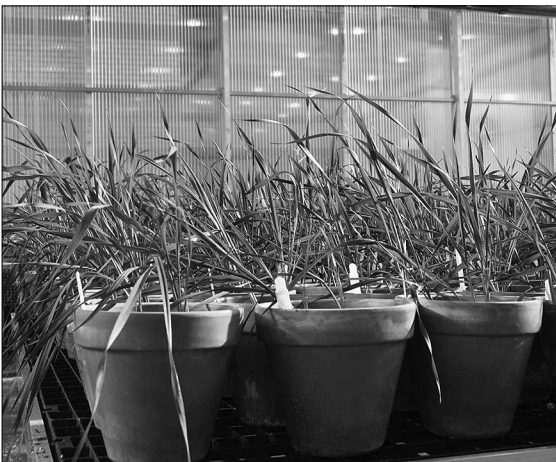
2015-2017 IMPACTS

- Artificial insemination (AI) offers beef producers the potential to make genetic progress within their herd at a fraction of the cost it would require to purchase herd bulls of equivalent genetic value. Research conducted by NDAES scientists indicates that the value of replacement heifers can be increased by over \$500 per head through the use of artificial insemination. If an additional 10% of the 375,000 replacement heifers maintained in North Dakota were generated from AI breeding, the net increase in their value would be over \$18 million annually.
- Research efforts on the nutrient requirements for beef cattle have impacts on production and economic efficiencies for all beef cattle in North Dakota. The product of this NDAES research was the text, '2016 Nutrient Requirements of Beef Cattle'. This text is utilized around the world by livestock producers, nutritionists, and scientists to more accurately formulate beef cattle diets. Conservative estimates in North Dakota indicate that a 5% improvement in feed efficiency by using more precise nutrient recommendations could save North Dakota beef cattle producers over \$25 million in feed costs annually.
- Research related to the interactions between reproduction and nutrition, and research concerning regulation of ovarian, uterine, and placental functions in non-pregnant and pregnant domestic animals, have identified selected mechanisms critical for reproductive efficiency that may ultimately improve fertility and embryo survival. A 1% increase in pregnancy rate in North Dakota livestock would potentially result in more than \$10 million in increased revenue for North Dakota ranchers annually.
- North Dakota currently operates with four active mines which produce approximately 32 million tons of coal annually. Reclamation is required on nearly 2,000 acres of land each year to begin the 10-year bond release process. NDAES scientists are working with industry to improve both reclamation practices using native plant species and efficiencies, as well as reduce soil compaction. The average cost to reclaim is \$60,000/ac. or \$120 million per year.
- Soil health is of primary concern for farmers and ranchers in the state. Salinity or sodicity may affect nearly 25% of North Dakota's soils to some degree. Nearly 2 million acres in the Red River Valley are impacted by salt contents that reduce yields significantly. NDAES scientists, in collaboration with Extension and many commodity groups, are identifying ways to reduce the negative impacts of salinity and sodicity in our northern Plains production area. These programs have helped producers adopt management practices that help improve long-term soil productivity, such as managing soil salinity.

NDAES scientists, in collaboration with Extension and many commodity groups, are identifying ways to reduce the negative impacts of salinity and sodicity in our northern Plains production area.



- Fertilizer is one of the highest input costs that farmers require each year. Proper use and application is critical to ensure maximum yield while maintaining the environment. NDAES scientists are identifying methods to optimize nutrient use efficiencies for various commodities (e.g. wheat, corn, sugarbeet, specialty crops, wheat, soybeans) for our extreme northern production system. Based on fertilizer tonnage sales in ND, it is estimated that improving fertilizer efficiency by just 5% would save ND farmers \$25 million annually.
- Cooperative work with wheat, barley, soybean, potato, and other breeding programs at NDSU has resulted in the development of disease-resistant germplasm and varieties for North Dakota. The genetic resistance in accepted cultivars grown on wide acreage saves producers tens to hundreds of millions of dollars in disease losses and in fungicide applications each year.



Cooperative work with wheat, barley, soybean, potato, and other breeding programs at NDSU has resulted in the development of disease-resistant germplasm and varieties for North Dakota.

- For crops or situations where fungicides are a necessary disease management tool, our research helps determine optimum timing for and rates of fungicide applications and helps identify new fungicide chemistries to control diseases. This work also assists North Dakota in obtaining Section 18 emergency exemptions that increases fungicide options for producers. Proper and judicious use of fungicides has saved North Dakota producers tens of millions of dollars per year through disease control.
- Disease forecasting systems that were developed, maintained, improved, and/or made accessible to the public by NDAES scientists are important tools for managing a variety of important diseases on several crops such as wheat, barley, sugarbeet, potato, and canola. These systems help producers make “spray or no spray” decisions with regards to fungicide applications throughout the growing season. The timely application of fungicides is necessary to achieve disease control when and where needed. Equally important, the decision to not apply fungicides when they are not needed saves producers significant input costs.
- NDAES microbiologists are helping producers to meet requirements of the Food Safety Modernization Act (FSMA). As an example, FSMA requires flaxseed processors to implement controls to reduce the levels of microbial pathogens. Research has shown that treatment with steam at sub-atmospheric pressures reduces the numbers of bacterial pathogens on flaxseed without affecting product quality, and can therefore be used by producers to help meet FSMA requirements. North Dakota produces 95% of the U.S. flaxseed with an estimated value of between \$50 and \$80 million.
- The use of legume cover crops planted after wheat reduces the need for nitrogen (N) fertilization in corn following in the rotation by 100 lbs N/acre/year. With an N credit of only 50 lbs N/acre, the economic value of reducing the fertilization of the 2.66 million acres of corn in North Dakota is \$39.8 million per year.
- NDAES agronomists found that canola grown in narrower row widths generated higher grow revenue per acre (nearly \$100/acre) than when grown in conventional row widths. If applied to all acres of canola sown in North Dakota (1,400,000 acres in 2015), the economic impact of proper row spacing would be \$140 million.
- Research carried out on herbicide-resistant weeds identified genes and mutations responsible for resistance. Based on their results, NDAES scientists have identified strategies to minimize the occurrence of herbicide-resistant weeds, which are estimated to cost \$10 to \$40 more per acre to control than non-resistant weeds.

- Leafy spurge has been reduced from 1.5 million to less than 800,000 acres due to research carried out by the NDAES. The annual savings to the state from reduced leafy spurge infestation is estimated to be \$13.9 million in direct costs including increased grazing land for cattle, increased hay production and decreased negative environmental impact.
- On average North Dakota produces over 60% of the durum in the United States and over 90% of the ND durum acreage is sown with varieties developed by the NDAES durum wheat breeding program. Varieties developed by this program generate over \$400 million directly to producers annually. Carpio and Joppa, two new varieties developed by the NDAES durum breeding program are quickly being adopted by producers and have high yield and excellent quality potential.
- In 2015, 53% North Dakota's spring wheat acreage was sown to varieties developed by the NDAES. According to NDAES Ag Economist Dr. William Wilson, a variety released from the NDSU spring wheat breeding program has an estimated economic impact to the state ranging from \$69 to \$284 million over the period it remains in the marketplace, when compared to other competitive varieties.
- Based on a 2015 survey done by the American Malting Barley Association on barley varieties grown in North Dakota, about 50% of the North Dakota acres sown to two-rowed barley were done so with varieties developed by the NDAES. Changes in the malting and brewing industries in the US are resulting in an increased demand for two-rowed barley. In 2015, approximately 25% of North Dakota's 1.12 million barley acres were sown to two-rowed barley. Assuming 50% of these acres were sown with NDAES varieties and a \$0.25 per bushel premium for two-rowed barley over six-rowed barley, growers across the state realized an additional \$2.24 million in revenue from growing NDAES-developed two-rowed varieties.
- North Dakota is the leading producer of dry beans in the U.S. Based on the grower surveys in the MIN-DAK region from the last three years (2013-2015), approximately 90% of the black bean acreage, 10% of the navy bean acreage, and 30% of the pinto bean acreage is sown with varieties developed by the NDAES dry bean breeding program. Assuming an average

grower price of \$0.35/lb across the different market classes, these varieties contributed approximately \$93 million per year to the state's economy during the last three years. This means that theoretically, for every dollar invested in the dry bean breeding program, there is an approximate return of \$375 each year.



NDAES Ag Engineers provided statewide leadership in applied research and education on UAS application in agriculture

- NDAES Ag Engineers provided statewide leadership in applied research and education on UAS application in agriculture by bringing industries from across the country and around the world to North Dakota on economic development projects where industry investment amounted to many million dollars. The NDAES is working with state departments, the economic development commission, industries, farmers and rural cooperatives to address the precision agriculture needs of the state and to bring economic prosperity.
- An NDAES Ag Engineer is determining drawbar power requirements for chisel plowing under different calcium-based surface amendments. Subsurface drainage practices on sodic soil will help establish best management practices for soil surface amendments and drainage for improving soil health in sodic soils. Over 18,000,000 acres of saline/sodic soils in North and South Dakota may be at risk of conversion to sodic soils due to resumption/initiation of tillage and installation of subsurface drainage, and could benefit from this research.

- NDAES research on livestock manure and waste management helps develop new knowledge to develop and implement best management practices to mitigate environmental concerns from livestock facilities. NDAES researchers were instrumental in helping producers with bird flu incidence to put down and compost the birds to avoid further spread the disease.



NDAES research on livestock manure and waste management helps develop new knowledge to develop and implement best management practices to mitigate environmental concerns from livestock facilities.

- NDAES researchers are studying the use of optical sensing data collected via unmanned aerial systems for the detection and management of crop stress, such as nutrient deficiency and disease of several major crops grown in North Dakota. Other researchers are measuring the adoption rates of precision agriculture technologies, especially the adoption of automatic section control (including row control) for planting and spraying, in different regions of the state. It is envisaged that this technology could substantially improve input use efficiency for farmers with the irregular field shapes and large numbers of in-field obstacles typical of the Prairie Pothole Region.
- The Center for Agricultural Policy and Trade Studies is completing research on evaluating the importance of commodity programs, the conservation reserve program, and crop insurance on farm income, efficiency, and productivity for the new Farm Bill. The Center also is evaluating the importance of the structure of farm programs on agriculture production functions and efficiency using farm level Agricultural Resource Management Survey (ARMS) data.
- Technology in agriculture is changing very rapidly and it is essential to partner with technology developers and end-users. The reason is simply to be assured that the state-of-the-art technology is accessible to North Dakota growers. NDAES researchers are working as a multi-disciplinary team to identify and create technology partnerships. Two commercial partnerships have been created, and there are three that are near fruition, in addition to a research/educational partnership. The partnerships with technology providers and major end-users involves joint research, simultaneous access to technology, and funding.

North Dakota Agricultural Experiment Station

Main Research Station

Precision Ag Initiative Impacts Report

Approved projects

1. Delineation of Chlorosis in Soybean Fields Using Unmanned Aerial Systems; PI:John Nowatzki, Agricultural and Biosystems Engineering
2. Drone-based Remote Sensing to Predict Sugarbeet in Season Nitrogen Demand and Yield; PI:Amitava Chatterjee, SNRS — Soil Sciences
3. Identification and Mapping of Resistant Weeds and Herbicide Drift Injury with High Resolution UAS Images; PI:Sreekala Bajwa, Agricultural and Biosystems Engineering
4. Increasing UAV Related Research Capacity at the Carrington Research Extension Center; PI:Paulo Flores, Carrington Research Extension Center
5. Optimizing Barley Quality Across a pH and Organic Matter Gradient; PI:Mike Ostlie, Carrington Research Extension Center
6. Precision Application of Herbicides for Sustainable Crop Systems; PI:Kirk Howatt, Plant Sciences
7. Use of Electronic Monitoring Systems for Precision Management of Cow/Calf and Cattle Feeding Enterprises; PI:Carl Dahlen, Animal Sciences
8. Using Crop Growth Models to Incorporate Temporal Variability into Precision Farming; PI:Joel Ransom, Plant Sciences
9. Whole-farm Analysis of the Decision to Invest in Automatic Section and Row Control Tech for planting and spraying in ND; PI:David C. Roberts, Agribusiness and Applied Economics

Preliminary Results

- Preliminary research indicates that efforts to control spray drift through the use of pulse-width modulation sprayers may result in less effective weed control than spraying with more conventional droplet sizes.
- Interest in Unmanned Aerial Systems (UAS) is growing rapidly. Preliminary research conducted at the Carrington REC indicates that UAS technology can be used to predict soybean relative maturity and to assess the level of leaf disease on barley.
- Research conducted by the NDSU Agricultural and Biosystems Engineering Department indicates that UAS technology may be a useful tool for estimating the prevalence of herbicide resistant weeds and potentially allow for earlier detection of weed infestations.
- NDSU research using UAS to measure iron deficiency chlorosis may lead to better systems of matching varietal selection to field conditions for improvement of overall yield response in soybean fields.

North Dakota Agricultural Experiment Station

Main Research Station

Souris River Research Report

Current research on the Souris River flood impacts project builds on the work accomplished in Phase I. Soil, vegetation and seed bank analysis revealed differences among sampling locations. However, differences were not consistent with macro-scale elevations and distances from the river. Given that, we have broken down the current investigations into two components::

1. Subtle topographical differences in the landscape create micro watersheds that effectively holding water for different times. To determine where these locations are on the landscape we are using DEM (digital elevation models) and LIDAR (light detection and ranging) maps to overlay soil and vegetation data with more accurate elevations. With this we can identify basin and sinks to determine flood duration and better utilize the existing soil chemistry and vegetation from the previous project. Thus far, we have downloaded the appropriate data layers and started to overlay existing data within ArcGIS.
2. Following the initial flooding, the majority of exiting vegetation was killed by extended ponded water. After flood waters receded, much of the subsequent standing vegetation and seed bank was exotic grass and yellow sweet clover. Greenhouse trials revealed that as yellow sweet clover (a biennial) dies, nitrogen is released into the soil (Figure 1). Kentucky bluegrass was able to uptake the available nitrogen more readily than native plants which evolved under limited, rather than excess soil nitrogen (Figures 2 and 3). Understanding the vegetation dynamics existing after flood events can help predict where management actions will be required. Further, when combined with regional elevation and soils maps, vegetation data enables us to make tailored restoration/recovery recommendations to the broader region.

Figure 1

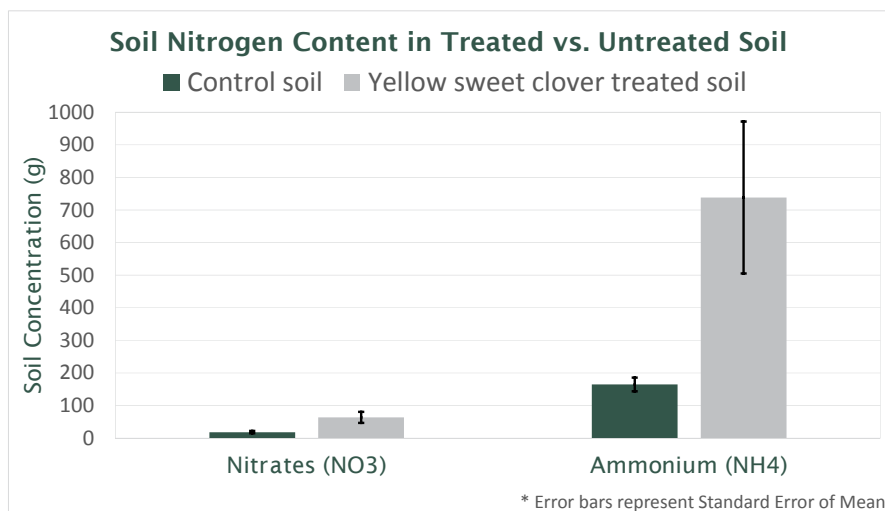


Figure 2

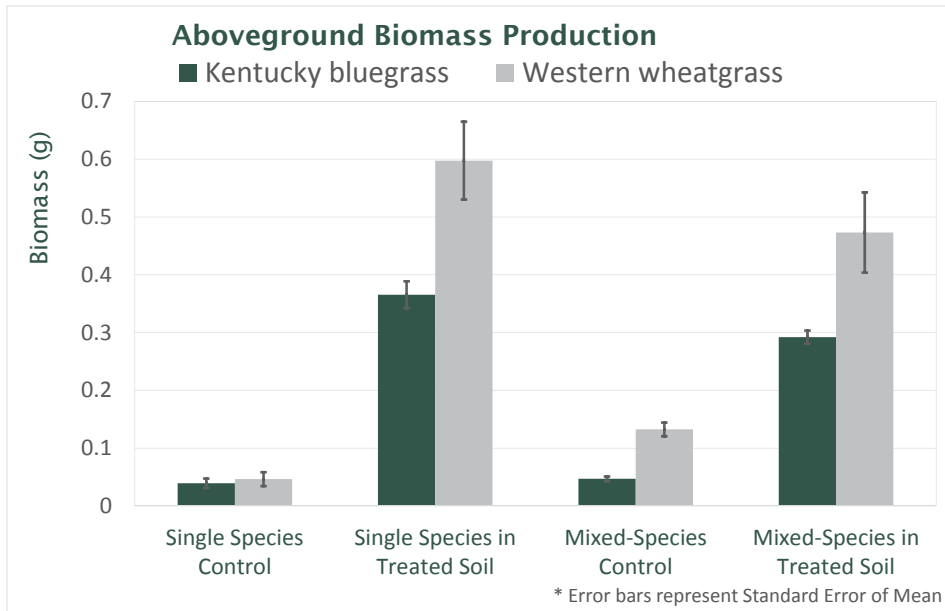
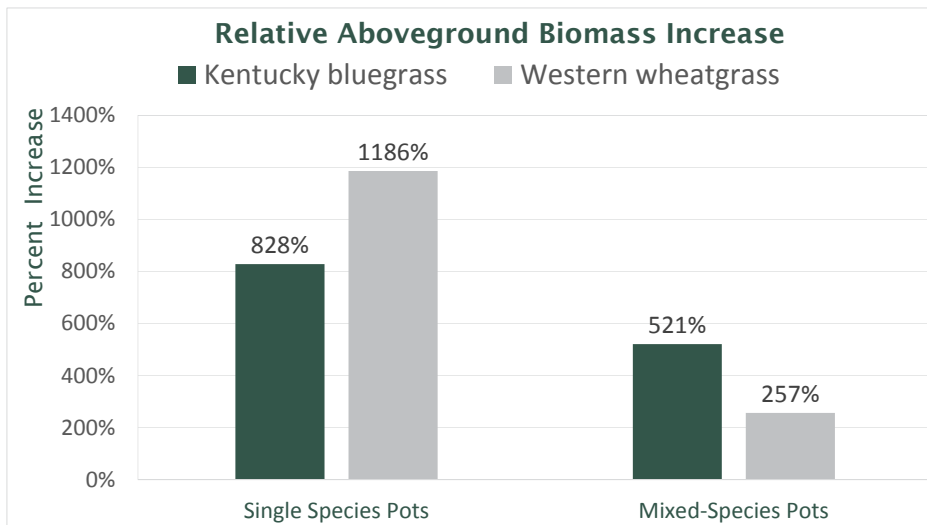


Figure 3



Agency Overview

Carrington Research Extension Center

North Dakota Agricultural Experiment Station

Agency Statutor Authority

North Dakota Century Code Chapter 4-05.1

Agency Description

The Carrington Research Extension Center (CREC) was established in 1960. CREC operates on a land base of around 1,940 acres where the majority of acreage is managed as traditional dryland and is utilized primarily for field crop research activities and foundation seed production. CREC has infrastructure to irrigate about 270 acres with center-pivot systems and to mist or micro-irrigate 55 acres with hand-set systems.

The research effort at the CREC focuses on these general program areas: traditional crop variety evaluation, crop production and management, plant disease management, crop fertility and soil management, cropping systems, alternative crop development, beef cattle nutrition, intensive cow/calf production, feedlot management, integration of crop and livestock production, livestock waste and nutrient management, irrigation, northern hardy fruit production, and foundation seedstocks production. Through these efforts, the CREC research program has gained a national reputation for its ability to investigate a broad base of agricultural challenges that benefit both producers and the agriculture based businesses that support them.

CREC maintains a strong Extension program as five extension specialists base their educational programming from the center. The extension program emphasis areas addressed by these specialists include: agronomy, livestock, plant pathology, and livestock waste – nutrient 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, 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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

- 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 and broad based programs of the CREC operate on a relatively small land base. The Carrington REC operates on a land base of around 1,940 acres with the state owning around 840 acres. The 1,100 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 minimum amount of acres the CREC requires is risky at best. If any one parcel of rented land were not made available in a given year, the CREC would be forced to greatly reduce or eliminate program contributions that are depended upon by North Dakota producers and are basic to our department mission.
- The 2015 ND Legislative Assembly provided \$750,000 from the general fund for a seed cleaning plant at the CREC and an additional \$1,500,000 of authorization. The CREC is using the appropriation to purchase the primary conditioning equipment (e.g. air screen, indent, gravity table and spiral separator) and other funds to construct a basic building to house this equipment. Additional funding will be required to complete the integration of the equipment to make it a functional seed conditioning facility.
- The beef research unit needs a multi-use 'feedlot research support facility'. This facility would expand the scope of research capabilities, assist in sustaining IACUC compliance, address worker protection challenges, and reduce maintenance costs for equipment. An associated need for this program is an additional set of feedlot pens that would include a subset placed within a hoop structure. Current pens are fully utilized and feedlot research projects are often backlogged. An additional set of pens would allow the CREC to conduct at least one additional experiment per feedout period. Alternatively, these pens would allow more treatments or replications within other studies, thereby expanding research capacity and quality. Any feedlot pen expansion must include associated waste containment facilities to remain compliant with regulations.
- 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 us 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. Current support for maintenance of these facilities is fully inadequate to address the current deferred maintenance costs.

2015-2017 IMPACTS

- Established UAV flight capacity to assess producer applications of this new technology for management of weed, fertility, disease and cultural issues.
- Conditioned and sold foundation grade seed of 29 varieties and nine crops to a diversity of seedsmen.
- Evaluated the use of corn ethanol co-products as sources of phosphorus for crop nutrition.
- Provided producers with data to quantify their cattle performance in the feedlot with the Dakota Feeder Calf Show Feedout and the North Dakota Angus University.
- Trained producers and crop consultants in weed identification, nitrogen application techniques, soybean management and more resulting in an estimated value to participants of \$10/acre.
- Provided data on summer confinement beef cow production to producers throughout the Midwest.
- Improved Sclerotinia disease control and soybean yield by delaying fungicide application to the R2 growth stage.

The CREC trained producers and crop consultants in weed identification, nitrogen application techniques, soybean management and more resulting in an estimated value to participants of \$10/acre.



Agency Overview

Central Grasslands Research Extension Center – Streeter

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

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 objectives must increase the range-carrying capacity of native range emphasizing conservation and preservation, stabilize grass production to compensate for the vagaries of the weather and precipitation as it influences forage production in the dryland agriculture, identify the impact of different management systems upon beef production in the central region and explore the increased use of crop residues and byproducts for the maintenance of the cow herd. CGREC's primary focus is management of grassland acreage which occupies about one-third of the agricultural land in the state and aims to improve production and increase returns to cattle producers.

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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

- Livestock facilities continue to be deficient and impede potential research. Improvements to livestock handling and feeding facilities including replicated drylot pens, feed storage, and a new working barn are needed to allow for growth of the animal science research program.
- Significant improvements or replacement of the director's residence is needed as the current residence has water, mold, and foundational issues in the basement.
- Deferred maintenance and other repairs that affect both safety and use of facilities continue to be a critical issues.

2015-2017 IMPACTS

- Continued research on control of invasive grass species through early intensive grazing study and prescribed burning.
- Conducted research exploring the impacts of stocking rate and advancing season of forage intake of grazing beef cattle.
- Concluded 26 year grazing project evaluating the impacts of stocking rate on plant species composition.
- Continued to expand on collaborative research efforts evaluating the impacts of management on reproductive performance of beef cattle.
- Expanded winter grazing research to include grazing of corn residues, cover crops, and bale grazing projects.
- Hosted first annual Winter Grazing Workshop in collaboration with NDSU Extension Service.



The CGREC conducted research exploring the impacts of stocking rate and advancing season of forage intake of grazing beef cattle.

Agency Overview

Dickinson Research Extension Center

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

Agency Description

The NDSU 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 and range science, while integrating new developments. Five major areas are served: agronomy, beef management, bio-security, range management, 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 Extension 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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

- Sustainable and Integrated Beef Systems — Expandable, hopefully, more sustainable systems need to be evaluated to assess current trends. In the future, all 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. For example, small grain production systems that integrate rotational cropping practices, high residue management and annual forages, with attention to wildlife habitat enhancement, could be used to diversify income while opening the door to other value-added opportunities for beef production in concert with crop production.

The Dickinson Research Extension Center, as part of North Dakota State University, takes serious the need for sustainable beef systems. Currently, the Center 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, or 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. As the general population requires protein, a need met by meat and high protein crops, meeting this demand is a unique opportunity that a forage based system integrated with crop production can respond to, in addition to current crop land use. These thoughts are changing how the Dickinson Research Extension Center addresses the future.

Previous work has certainly set baseline production for high residue cropping systems, grassland systems and livestock systems. However further definition, integration and refinement of these system efforts is critical. Beef production needs to think outside the box and the Center also needs to do the same. Challenging the limits of conventional thinking by linking the components of agricultural management systems with value added opportunities ensuring long term sustainability of beef and cropping systems within the environment is critical. In response, a new approach needs to be embraced, a concept of integrated agricultural systems that truly entwines crop, beef and forage production as a working unit for betterment of all.

- Deferred Maintenance Increase — Deferred maintenance funding continues to be an important issue at the DREC. Updates and repairs to facilities that enhance worker safety and productivity are needed. The DREC, specifically, has maintenance issues with the main public use and cattle working facility at the ranch. The facility needs major roof repair and 1,800 square feet of additional cattle working space.
- Soil reclamation and dust issues in western ND — Soil disturbance and dust created by the extensive truck traffic servicing the oil industry in western ND has led to a number of potential soil reclamation, cropping and livestock issues. Subsequent productivity of disturbed soil, establishment of cropping systems following disturbance and the reduction of dust is critical. Production impacts may include reduced yields for both crop and forage production. The result is that soil disturbance and dust is creating an undocumented and potentially negative effect on crop and livestock enterprises. Research to assist livestock and crop producers is necessary to identify ways to document and minimize any adverse effect on soil and the agricultural industry in this region of the state.

2015-2017 IMPACTS

- Continued work in agronomic, beef and range agricultural practices and developed managerial options reported in the Center's annual report located on the Center's web page <https://www.ag.ndsu.edu/DickinsonREC>.
- Continued and expanded work regarding soil disturbance and dust created by the extensive truck traffic servicing the oil industry in western ND.
- Shifted to explore new forage and cattle resources and inputs that shifts from a grain-based beef production model to a grass-based beef production model.
- Studied various management techniques involving grass cultivars, soil mineral nitrogen, prairie ecosystems, grassland restoration, grazing systems with the integration of beef cattle.
- Investigated conventional and organic agronomic systems, tillage systems, cropping systems, pest control systems, variety development, cover crops and the integration of beef cattle.

The Dickinson Research Extension Center continues work on integrated crop and livestock systems research.



Agency Overview

Hettinger Research Extension Center

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

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 agricultural research programs. Research at HREC involves the disciplines of animal science, range science, wildlife science, agronomy, and weed science. The HREC conducts research in both sheep and cattle production and management systems, serving as the only REC in the ND Agricultural Experiment Station system with sheep. Livestock research is focused on feedlot nutrition and management, as well as enhancing reproductive efficiency in ruminants. Additionally, the HREC is located in a region where much of the land base is in the Conservation Reserve Program or has been recently removed from it, 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 while enhancing livestock grazing opportunities. Agronomic and Weed Science research is focused on conducting variety and weed control trials in a no-till, semi-arid production system that is prone to drought. 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

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Agency Future Critical Issues

- Technical support for the livestock research program is dependent on restoration of the base budget. This position is needed to meet the research needs of producers in SW North Dakota.
- A modern livestock processing and research support facility is needed to enhance both quality and quantity of 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.
- Housing of graduate students and technicians is needed for a nationally competitive program, and continues to be a struggle in western ND. Permanent housing, in a bunkhouse format, is needed to ensure the HREC program can continue to recruit these valuable members of our team on an annual basis.
- Deferred maintenance and safety issues will likely reach \$1,000,000 by the end of the current biennium. 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.

Hettinger Research Extension Center

2015-2017 IMPACTS

- Evaluated new varieties and technologies to grow drought tolerant crops and new and emerging bio-fuels.
- Conducted multiple land use research evaluating: the nest ecology of an indicator species (sharp-tailed grouse) on National Grasslands, grazing strategies to complement pheasant habitat concerns, and native prairie restoration techniques on less productive farmland in the badlands.
- Collaborated with Sitting Bull College on the Standing Rock Sioux Reservation, USDA-ARS, NDSU, and SDSU on a multi-agency project evaluating the reclamation of lands degraded by prairie dogs.
- Conducted a nationally recognized sheep research program evaluating alternative technologies for increasing reproductive efficiency in both males and females and feedlot nutrition.
- Established a new Weed Science research program to evaluate weed control in dryland no-till cropping systems and control of invasive weeds of pasture and rangeland.
- Established a new Livestock Extension program.
- Completed the 8,000 sq. ft. Agronomy and Range Research Laboratory funded the previous biennium.



The HREC conducts a nationally recognized sheep research program evaluating alternative technologies for increasing reproductive efficiency in both males and females and feedlot nutrition.

Agency Overview

Langdon Research Extension Center

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

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. It 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 stocks 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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

- The number one issue currently for the NDSU Langdon Research Extension Center is to maintain a level budget through the 2017/19 biennium based on the 2015/17 budget. This is needed to support the research and extension programming that has grown based on growers needs the past several years.
- In 1962, a seed cleaning plant was constructed at Langdon to provide local seedsmen and producers the ability to purchase and grow the highest quality seed available (foundation grade seed). The region's seedsmen and producers have come to depend on this program to supply them with foundation grade seed. Langdon still uses the same facility and equipment that was constructed in 1962. The inefficiencies associated with the plant forces Langdon's seed cleaners to run individual lots of dirty seed through the plant two to five times to achieve foundation grade seed. Because of this and the ability to only clean 20 to 30 bushels of seed per hour, Langdon does not complete its seed cleaning operation until the start of the growing season beyond the prime time for producers to acquire seed. In addition, numerous safety violations have been identified that can only be resolved with a new seed cleaning plant.

2015-2017 IMPACTS

- Continue to build and foster strong research and extension partnerships with commodity groups, regional crop improvement associations, area growers, and others associated with the ag industry in ND. These partnerships allow us to identify and address critical production issues as quickly as possible to protect growers' investment in their operations.
- Produced and distributed NDSU varieties of foundation grade seed of the major crops grown in our region. Our region is the number one producing region of HRSW in ND and 50 percent of the HRSW grown here is an NDSU variety originating from the NDSU foundation seed stocks program.
- Concluded successful negotiations with an absentee landowner to purchase 160 acres of crop land adjacent to Langdon REC land for research and extension purposes at fair market value. The state provided \$175,000 of the funding and the other \$175,000 was raised locally.
- Provided dependable support for main station crop breeding programs and other cropping system research programs based at the main station in Fargo at NDSU.
- Continue to foster and strengthen two new Extension Specialists outreach programs in agronomy and soil health that fills a vital educational need for growers in our region. They have also been very helpful mentoring several new extension agent hires recently in our region.

Center staff produced and distributed NDSU varieties of foundation grade seed of the major crops grown in our region.



Agency Overview

North Central Research Extension Center – Minot

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

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 1,200-acre center specializes in crop research and extension education activities and foundation seed production. Approximately 1,500 owned, rented, and contracted acres are planted for foundation seed production each year. The NCREC evaluates conventional and new crops for production in the region and explores weed management and cropping systems to improve the economic potential of crop production in the north central region. The NCREC is a leader in North Dakota on production and disease research of canola, pea, lentil, and chickpea crops, in addition to the conventional crops of hard red spring and durum wheat, barley, flax, sunflower, and oats. The NCREC works closely with business and economic development leaders in the region to improve the economic vitality of north central North Dakota.

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 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. A copy of the information is on file in the legislative council office.

Agency Future Critical Issues

- Increased base funding to support research and extension efforts
- Additional technical support
- Increased operating funds
- Equipment replacement
- Removal of old seedhouse
- Drain tile NCREC yard
- Encroachment from city of Minot
- Sale and purchase of additional land for seed production

2015-2017 IMPACTS

- Produced, conditioned, and distributed foundation seed of nine 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 such as carinata, fava bean, and energy beets.
- Researched crop production products in order to improve efficiencies and maximize economic return for minor and major acreage crops grown in ND.
- Provided extension education in the areas of livestock, soil health, crop protection, and cropping systems.
- Conducted residue trials with the USDA IR-4 program that lead to registration of new pesticides to control weeds, diseases, and insects in minor acreage crops important to ND agriculture.



Center staff assisted in development of new varieties of economically important crops and evaluated production strategies for alternative crops such as fava bean.

Agency Overview

Williston Research Extension Center

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1

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 23 miles northeast of Williston and an irrigated research and development project was established. In 2012 an additional 1,100 acres of land were leased from the North Dakota Game and Fish Department for pure seed production and dryland research. WREC research studies are conducted on crop variety evaluation, herbicide performance and other cultural management research, plant disease control and management research in cropping systems, soil and water conservation practices, pipeline reclamation, and horticulture.

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 and on western malting barley programs are conducted. WREC also conducts variety development research on safflower, winter wheat, and durum and variety evaluations in cooperation with NDSU Main Station scientists. WREC produces and supplies foundation seed to area farmers of new and old varieties adapted to the region.

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 at the Nesson Valley site are conducted in cooperation with the Montana State University Eastern Agricultural Research Center at the USDA-ARS Northern Plains Agricultural Research Laboratory in Sidney, Montana and other cooperating NDSU and University of Minnesota scientists.

Agency Performance Measures

Per North Dakota Century Code 4-05.1-19 the State Board of Agricultural Research and Extension (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 27, 2016. The report they gave and provided in written form included the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. 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 our research programs vital to the improvement of the economic and environmental performance of our agricultural lands. A high priority need is the request to restore the 2015-2017 WREC budget to the 100% funding level. Deferred maintenance funding also continues to be an important need for WREC to maintain its facilities.
- 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. The WREC seed conditioning plant built in 1954 is antiquated and was designed to only handle cereal crops and does not have the capability of cleaning peas, lentils, chickpeas, and other fragile seeds that are in high demand by our farmers. The outdated seed conditioning plant also poses considerable safety issues. A horizontal seed conditioning plant with optical color sorter and higher bushel per hour capacity is needed to allow WREC to condition Foundation seed of a wide array of new crop varieties to provide pure seed to growers.
- An additional equipment storage building is needed for WREC farm and plot research equipment to allow all WREC high cost farm and research equipment to be stored indoors from the elements.
- A greenhouse is needed for the new WREC Plant Pathology Program and the Horticulture Program to allow these programs to conduct plant disease and horticulture research during the winter months.
- Increased state operating costs due to state fleet rate/policy change.

Williston Research Extension Center

2015-2017 IMPACTS

- Continued a multi-disciplinary team long term dryland cropping system research project to evaluate and develop diversified cropping systems recommendations for improving soil health, water use efficiency, crop performance, and economic and environmental sustainability.
- The WREC Foundation Seed Program in 2015 produced over 50,000 bushels of Foundation seed of 21 varieties of small grains and broadleaf crops as a result of an acquired lease of 1,184 acres from the North Dakota Game and Fish Department that increased the WREC land base for Foundation seed program.
- New plant pathologist research program assembled a WREC plant pathology laboratory, established collaborations with USDA-ARS, Hettinger Research Extension Center, and NDSU Plant Pathologists, initiated plant pathology investigations on peas, lentils, durum, barley, and sugarbeets and obtained grant funding for a pulse crop pest scout to serve northwest North Dakota.
- WREC has developed and utilized a 160-acre irrigated site in its tenth year of research to identify improved irrigated cropping systems, tillage systems, and best management practices to improve water use efficiency, soil health, crop management systems, and economic and environmental sustainability.
- Evaluated the performance and adaption of new and established dryland and irrigated crop cultivars and crop cultural practices to improve productivity of agricultural products.
- Initiated a new long-term pipeline reclamation research project on WREC land to assess the economic impact of the disturbed soils on crop performance and to demonstrate reclamation treatments to restore crop yields and soil health.
- Horticultural program initiated high tunnel research with vegetable crops and cut flowers.
- Organized and assisted with outreach programming opportunities in the region: National Hard Red Spring Wheat Show, Irrigation Workshop, Pulse Days, offstation trials and tours, field day events, and MonDak Ag Showcase.
- Established a new reclamation research and demonstration project to reclaim a saline seep area on WREC land in collaboration with the Montana Salinity Control Association.

The WREC Foundation Seed Program in 2015 produced over 50,000 bushels of foundation seed of 21 varieties of small grains and broadleaf crops.



Agency Overview

Agronomy Seed Farm

North Dakota Agricultural Experiment Station

Agency Statutory Authority

North Dakota Century Code Chapter 4-05.1.

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

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 4-05.1-19, the State Board of Agricultural Research and Extension (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 27, 2016. The report provided the status of the North Dakota Agricultural Experiment Station and the NDSU Extension Service. 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.

2015-2017 IMPACTS

- Produced 35,000 to 50,000 bushels of seed for availability to the seed industry annually.
- Conditioned 35,000 to 50,000 bushels of seed for availability to the seed industry annually.



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.



1. Seed Cleaning Facilities – CREC, LREC, NCREC, WREC

(Priority No. 2 capital improvement request in 2013-15 and No. 3 in 2015-17 request)

Seed cleaning facilities at the CREC, LREC, NCREC and WREC need to be replaced. Current facilities are antiquated, lack reliable capability to ensure high-quality seed, and are slow and inefficient. Current facilities were designed to handle cereal crops and have limited/no capability of cleaning pulse crops and other fragile seed that are in high demand. These facilities pose considerable worker safety issues. Partial funding (\$1,500,000) was received to purchase equipment for the Carrington and North Central REC seed cleaning plants, along with authorization to raise \$3,000,000 in other funds for building construction. Difficulties in the farm economy reduce the opportunities to raise funds for building construction. No funding was received for the Williston or Langdon REC. - \$3,750,000



2. Animal Science Meats Research Facility – Main Station

(Priority No. 2 capital improvement request in 2015-17)

A new/upgraded facility is needed urgently. The current Meats Lab was built in the 1950s and no longer serves the needs of modern meat science research. Annual repair and maintenance costs to the current facility continue to increase. Additionally, the lab continues to struggle to meet the U.S. Department of Agriculture inspection requirements for safe meat handling and processing. A new facility is necessary because opportunities to grow the state's livestock industries are tied to the knowledge of the end product and how that product meets the needs of national and international consumers. - \$7,600,000



3. 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 another 16 scientists from the Departments of Agronomy and Plant Pathology. The building now houses field labs and wet labs for nearly 40 scientists 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 grossly insufficient and a health hazard to anyone working in the facility. A new facility is needed to provide our scientists with a safe environment to conduct their research, as well as process, clean and store seed. - \$39,000,000

4. Deferred Maintenance Increase

Deferred maintenance funding continues to be an important issue. Updates and repairs to facilities that enhance worker safety and productivity are needed across the AES. Various and ongoing issues exist at the Main Station and all RECs, primarily with respect to facility updates and repairs. - \$1,440,465

One-time Requests:

1. Utility Costs of Main Station
AES Greenhouse - \$400,000
2. Assessments for Road
Improvement - TBD

5. Equipment Storage Sheds

Expensive purchased and/or leased 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 machines and can compromise the sophisticated electronics typically used on equipment. - 8 @ \$306,250 = \$2,450,000

DETAILS:

2017-2019 Capital Improvement and One-time Requests as Ranked by SBARE

ND Agricultural Experiment Station

1. Seed Cleaning Facilities

\$3,750,000

(Priority No. 2 capital improvement request in 2013-15 and No. 3 in 2015-17 request)

Seed cleaning facilities at the CREC, LREC, NCREC and WREC need to be replaced. Current facilities are antiquated, lack reliable capability to ensure high-quality seed, and are slow and inefficient. Current facilities were designed to handle cereal crops and have limited/no capability of cleaning pulse crops and other fragile seed that are in high demand. These facilities pose considerable worker safety issues. Partial funding (\$1,500,000) was received to purchase equipment for the Carrington and North Central REC seed cleaning plants, along with authorization to raise \$3,000,000 in other funds for building construction. Difficulties in the farm economy reduce the opportunities to raise funds for building construction. No funding was received for the Williston or Langdon REC.

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\$7,600,000

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A new/upgraded facility is needed urgently. The current Meats Lab was built in the 1950s and no longer serves the needs of modern meat science research. Annual repair and maintenance costs to the current facility continue to increase. Additionally, the lab continues to struggle to meet the U.S. Department of Agriculture inspection requirements for safe meat handling and processing. A new facility is necessary because opportunities to grow the state's livestock industries are tied to the knowledge of the end product and how that product meets the needs of national and international consumers.

3. Agronomic, Pathology and Soils Field Lab Facility

\$39,000,000

(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 another 16 scientists from the Departments of Agronomy and Plant Pathology. The building now houses field labs and wet labs for nearly 40 scientists 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 grossly insufficient and a health hazard to anyone working in the facility. A new facility is needed to provide our scientists with a safe environment to conduct their research, as well as process, clean and store seed.

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\$1,440,465

Deferred maintenance funding continues to be an important issue. Updates and repairs to facilities that enhance worker safety and productivity are needed across the AES. Various and ongoing issues exist at the Main Station and all RECs, primarily with respect to facility updates and repairs.

5. Equipment Storage Sheds

8 @ \$306,250 = **\$2,450,000**

Expensive purchased and/or leased 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 machines and can compromise the sophisticated electronics typically used on equipment.

One-time Funding Requests

1. Utility Costs of Main Station AES Greenhouse - \$400,000
2. Assessments for Road Improvement - TBD

17.0528.01000

Sixty-fifth
Legislative Assembly
of North Dakota

SENATE BILL NO. 2020

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.

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

5 **SECTION 1. APPROPRIATION.** The funds provided in this section, or so much of the funds
6 as may be necessary, are appropriated out of any moneys in the general fund in the state
7 treasury, not otherwise appropriated, and from special funds derived from federal funds and
8 other income, to the North Dakota state university extension service, the northern crops
9 institute, the upper great plains transportation institute, the main research center, branch
10 research centers, and agronomy seed farm, for the purpose of defraying the expenses of the
11 North Dakota state university extension service, the northern crops institute, the upper great
12 plains transportation institute, the main research center, branch research centers, and
13 agronomy seed farm, for the biennium beginning July 1, 2017, and ending June 30, 2019, as
14 follows:

15 Subdivision 1.

16 **NORTH DAKOTA STATE UNIVERSITY EXTENSION SERVICE**

17		Adjustments or	
18		<u>Base Level</u>	<u>Enhancements</u> <u>Appropriation</u>
19	Extension service	\$52,517,908	\$0 \$52,517,908
20	Soil conservation committee	<u>1,133,362</u>	<u>0</u> <u>1,133,362</u>
21	Total all funds	\$53,651,270	\$0 \$53,651,270
22	Less estimated income	<u>25,826,708</u>	<u>0</u> <u>25,826,708</u>
23	Total general fund	\$27,824,562	\$0 \$27,824,562
24	Full-time equivalent positions	263.91	0.00 263.91

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1	Subdivision 2.			
2		NORTHERN CROPS INSTITUTE		
3			Adjustments or	
4		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
5	Northern crops institute	<u>\$3,712,202</u>	<u>\$0</u>	<u>\$3,712,202</u>
6	Total all funds	\$3,712,202	\$0	\$3,712,202
7	Less estimated income	<u>1,747,735</u>	<u>0</u>	<u>1,747,735</u>
8	Total general fund	\$1,964,467	\$0	\$1,964,467
9	Full-time equivalent positions	12.00	0.00	12.00
10	Subdivision 3.			
11		UPPER GREAT PLAINS TRANSPORTATION INSTITUTE		
12			Adjustments or	
13		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
14	Upper great plains transportation	<u>\$22,076,448</u>	<u>\$0</u>	<u>\$22,076,448</u>
15	institute			
16	Total all funds	\$22,076,448	\$0	\$22,076,448
17	Less estimated income	<u>18,175,657</u>	<u>0</u>	<u>18,175,657</u>
18	Total general fund	\$3,900,791	\$0	\$3,900,791
19	Full-time equivalent positions	54.98	0.00	54.98
20	Subdivision 4.			
21		MAIN RESEARCH CENTER		
22			Adjustments or	
23		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
24	Main research center	<u>\$110,529,780</u>	<u>\$0</u>	<u>\$110,529,780</u>
25	Total all funds	\$110,529,780	\$0	\$110,529,780
26	Less estimated income	<u>56,948,525</u>	<u>0</u>	<u>56,948,525</u>
27	Total general fund	\$53,581,255	\$0	\$53,581,255
28	Full-time equivalent positions	353.85	0.00	353.85
29	Subdivision 5.			
30		BRANCH RESEARCH CENTERS		

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1			Adjustments or	
2		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
3	Dickinson research extension center	\$6,996,678	\$0	\$6,996,678
4	Central grasslands research	3,531,779	0	3,531,779
5	extension center			
6	Hettinger research extension center	5,086,767	0	5,086,767
7	Langdon research extension center	3,045,836	0	3,045,836
8	North central research extension center	5,044,213	0	5,044,213
9	Williston research extension center	5,267,400	0	5,267,400
10	Carrington research extension center	<u>9,328,093</u>	<u>0</u>	<u>9,328,093</u>
11	Total all funds	\$38,300,766	\$0	\$38,300,766
12	Less estimated income	<u>19,817,130</u>	<u>0</u>	<u>19,817,130</u>
13	Total general fund	\$18,483,636	\$0	\$18,483,636
14	Full-time equivalent positions	113.94	0.00	113.94

15 Subdivision 6.

16 AGRONOMY SEED FARM

17			Adjustments or	
18		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
19	Agronomy seed farm	<u>\$1,521,007</u>	<u>\$0</u>	<u>\$1,521,007</u>
20	Total special funds	\$1,521,007	\$0	\$1,521,007
21	Full-time equivalent positions	3.00	0.00	3.00

22 Subdivision 7.

23 BILL TOTAL

24			Adjustments or	
25		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
26	Grand total general fund	\$105,754,711	\$0	\$105,754,711
27	Grand total other funds	<u>124,036,762</u>	<u>0</u>	<u>124,036,762</u>
28	Grand total all funds	\$229,791,473	\$0	\$229,791,473

29 **SECTION 2. ONE-TIME FUNDING.** The following amounts reflect the one-time funding
30 items approved by the sixty-fourth legislative assembly as adjusted for the 2015-17 biennium:

<u>One-Time Funding Description</u>	<u>2015-17</u>	<u>2017-19</u>
Agronomy laboratories	\$150,000	\$0
Rural leadership project	141,252	0
Seed cleaning plants	4,408,224	0
Upper great plains transportation institute road study	628,823	0
Junior master gardener program	12,500	0
Veterinary diagnostic laboratory	18,000,000	0
Dust issues technical support	100,000	0
Land purchase - Langdon	350,000	0
Flooded lands study	<u>67,952</u>	<u>0</u>
Total all funds	\$23,858,751	\$0
Total other funds	<u>21,325,000</u>	<u>0</u>
Total general fund	\$2,533,751	\$0

SECTION 3. 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, 2017, and ending June 30, 2019.

SECTION 4. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME. The Dickinson research extension center may spend up to \$755,000 of revenues received during the 2017-19 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, 2017, and ending June 30, 2019.

SECTION 5. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME - REPORT. The Williston research extension center shall report to the sixty-sixth legislative assembly on amounts received and spent from mineral royalties, leases, or easements in the biennium beginning July 1, 2015, and ending June 30, 2017, and the biennium beginning July 1, 2017, and ending June 30, 2019.

1 **SECTION 6. TRANSFER AUTHORITY.** Upon approval of the state board of agricultural
2 research and education and appropriate branch research center directors, the director of the
3 main research center may transfer appropriation authority within subdivisions 1, 2, 4, and 5 of
4 section 1 of this Act. Any amounts transferred must be reported to the director of the office of
5 management and budget.

6 **SECTION 7. FULL-TIME EQUIVALENT POSITION ADJUSTMENTS.** The state board of
7 higher education may adjust or increase full-time equivalent positions as needed for the entities
8 in section 1 of this Act, subject to availability of funds. All full-time or part-time positions must be
9 separate from North Dakota state university. Annually, the board shall report to the office of
10 management and budget and to the budget section any adjustments made pursuant to this
11 section.

12 **SECTION 8. UNEXPENDED GENERAL FUND - EXCESS INCOME.** Any unexpended
13 general fund appropriation authority to and any excess income received by entities listed in
14 section 1 of this Act are not subject to the provisions of section 54-44.1-11, and any
15 unexpended funds from these appropriations or revenues are available and may be expended
16 by those entities, during the biennium beginning July 1, 2019, and ending June 30, 2021.

Sixty-fifth
Legislative Assembly
of North Dakota

SENATE BILL NO. 2080

Introduced by

Appropriations Committee

(At the request of the Governor)

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; and to
4 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, 2017, and ending June 30, 2019, as
15 follows:

16 Subdivision 1.

17 NORTH DAKOTA STATE UNIVERSITY EXTENSION SERVICE

		Adjustments or	
	<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
19 Extension service	\$52,517,908	\$37,277	\$52,555,185
21 Soil conservation committee	<u>1,133,362</u>	<u>(41,842)</u>	<u>1,091,520</u>
22 Total all funds	\$53,651,270	(\$4,565)	\$53,646,705
23 Less estimated income	<u>25,826,708</u>	<u>941,881</u>	<u>26,768,589</u>

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1	Total general fund	\$27,824,562	(\$946,446)	\$26,878,116
2	Full-time equivalent positions	263.91	10.93	252.98
3	Subdivision 2.			
4	NORTHERN CROPS INSTITUTE			
5			Adjustments or	
6		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
7	Northern crops institute	<u>\$3,712,202</u>	<u>\$1,243</u>	<u>\$3,713,445</u>
8	Total all funds	\$3,712,202	\$1,243	\$3,713,445
9	Less estimated income	<u>1,747,735</u>	<u>10,008</u>	<u>1,757,743</u>
10	Total general fund	\$1,964,467	(\$8,765)	\$1,955,702
11	Full-time equivalent positions	12.00	(0.20)	11.80
12	Subdivision 3.			
13	UPPER GREAT PLAINS TRANSPORTATION INSTITUTE			
14			Adjustments or	
15		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
16	Upper great plains transportation	<u>\$22,076,448</u>	<u>\$145,575</u>	<u>\$22,222,023</u>
17	institute			
18	Total all funds	\$22,076,448	\$145,575	\$22,222,023
19	Less estimated income	<u>18,175,657</u>	<u>482,465</u>	<u>18,658,122</u>
20	Total general fund	\$3,900,791	(\$336,890)	\$3,563,901
21	Full-time equivalent positions	54.98	(11.10)	43.88
22	Subdivision 4.			
23	MAIN RESEARCH CENTER			
24			Adjustments or	
25		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
26	Main research center	<u>\$110,529,780</u>	<u>\$11,812</u>	<u>\$110,541,592</u>
27	Total all funds	\$110,529,780	\$11,812	\$110,541,592
28	Less estimated income	<u>56,948,525</u>	<u>2,263,756</u>	<u>59,212,281</u>
29	Total general fund	\$53,581,255	(\$2,251,944)	\$51,329,311
30	Full-time equivalent positions	353.85	(17.73)	336.12
31	Subdivision 5.			

1		RESEARCH CENTERS		
2			Adjustments or	
3		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
4	Dickinson research center	\$6,996,678	(\$48,789)	\$6,947,889
5	Central grasslands research center	3,531,779	(40,136)	3,491,643
6	Hettinger research center	5,086,767	(29,081)	5,057,686
7	Langdon research center	3,045,836	(25,004)	3,020,832
8	North central research center	5,044,213	(18,626)	5,025,587
9	Williston research center	5,267,400	(45,697)	5,221,703
10	Carrington research center	<u>9,328,093</u>	<u>(18,220)</u>	<u>9,309,873</u>
11	Total all funds	\$38,300,766	(\$225,553)	\$38,075,213
12	Less estimated income	<u>19,817,130</u>	<u>492,980</u>	<u>20,310,110</u>
13	Total general fund	\$18,483,636	(\$718,533)	\$17,765,103
14	Full-time equivalent positions	113.94	(3.65)	110.29

15 Subdivision 6.

16		AGRONOMY SEED FARM		
17			Adjustments or	
18		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
19	Agronomy seed farm	<u>\$1,521,007</u>	<u>\$17,788</u>	<u>\$1,538,795</u>
20	Total special funds	\$1,521,007	\$17,788	\$1,538,795
21	Full-time equivalent positions	3.00	0.00	3.00

22 Subdivision 7.

23		BILL TOTAL		
24			Adjustments or	
25		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
26	Grand total general fund	\$105,754,711	(\$4,262,578)	\$101,492,133
27	Grand total other funds	<u>124,036,762</u>	<u>4,208,878</u>	<u>128,245,640</u>
28	Grand total all funds	\$229,791,473	(\$53,700)	\$229,737,773

29 **SECTION 2. ONE-TIME FUNDING.** The following amounts reflect the one-time funding
30 items approved by the sixty-fourth legislative assembly for the 2015-17 biennium:

<u>One-Time Funding Description</u>	<u>2015-17</u>	<u>2017-19</u>
Agronomy laboratories	\$150,000	\$0
Rural leadership project	141,252	0
Seed cleaning plants	4,408,224	0
Upper great plains transportation institute road study	628,823	0
Junior master gardener program	12,500	0
Veterinary diagnostic laboratory	18,000,000	0
Dust issues technical support	100,000	0
Land purchase - Langdon	350,000	0
Flooded lands study	<u>67,952</u>	<u>0</u>
Total all funds	\$23,858,751	\$0
Total other funds	<u>21,325,000</u>	<u>0</u>
Total general fund	\$2,533,751	\$0

SECTION 3. ADDITIONAL INCOME - APPROPRIATION. In addition to the amount included in the grand total special 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, 2017, and ending June 30, 2019.

SECTION 4. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME. The Dickinson research extension center may spend up to \$755,000 of revenues received during the 2017-19 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, 2017, and ending June 30, 2019.

SECTION 5. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS INCOME. The Williston research extension center shall report to the sixty-sixth legislative assembly on amounts received and spent from mineral royalties, leases, or easements in the biennium beginning July 1, 2015, and ending June 30, 2017, and the biennium beginning July 1, 2017, and ending June 30, 2019.

1 **SECTION 6. TRANSFER AUTHORITY.** Upon approval of the state board of agricultural
2 research and education and appropriate branch research center directors, the director of the
3 main research center may transfer appropriation authority within subdivisions 1, 2, 4, and 5 of
4 section 1 of this Act. Any amounts transferred must be reported to the director of the office of
5 management and budget.

6 **SECTION 7. FULL-TIME EQUIVALENT POSITION ADJUSTMENTS.** The board of higher
7 education may adjust or increase full-time equivalent positions as needed for the entities in
8 section 1 of this Act, subject to availability of funds. The board shall report any adjustments to
9 the office of management and budget prior to the submission of the 2019-21 budget request.

10 **SECTION 8. UNEXPENDED GENERAL FUND - EXCESS INCOME.** Any unexpended
11 general fund appropriation authority to and any excess income received by entities listed in
12 section 1 of this Act are not subject to the provisions of section 54-44.1-11, and any
13 unexpended funds from these appropriations or revenues are available and may be expended
14 by those entities, during the biennium beginning July 1, 2019, and ending June 30, 2021.

15 **SECTION 9. EXEMPTION.** The amounts appropriated for the veterinary diagnostic
16 laboratory and the seed cleaning plants contained in subdivision 4 of section 1 of chapter 20 of
17 the 2015 Session Laws, are not subject to the provisions of section 54-44.1-11, and any
18 unexpended funds from these appropriations or related revenues are available and may be
19 expended during the biennium beginning July 1, 2017, and ending June 30, 2019.

Sixty-fifth
Legislative Assembly
of North Dakota

ENGROSSED SENATE BILL NO. 2020

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 amend
4 and reenact sections 4-05.1-05 and 4-08-10 of the North Dakota Century Code, relating to main
5 research center experiment station and extension service position adjustments; and to provide
6 an exemption.

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

8 **SECTION 1. APPROPRIATION.** The funds provided in this section, or so much of the funds
9 as may be necessary, are appropriated out of any moneys in the general fund in the state
10 treasury, not otherwise appropriated, and from special funds derived from federal funds and
11 other income, to the North Dakota state university extension service, the northern crops
12 institute, the upper great plains transportation institute, the main research center, branch
13 research centers, and agronomy seed farm, for the purpose of defraying the expenses of the
14 North Dakota state university extension service, the northern crops institute, the upper great
15 plains transportation institute, the main research center, branch research centers, and
16 agronomy seed farm, for the biennium beginning July 1, 2017, and ending June 30, 2019, as
17 follows:

18 Subdivision 1.

19 NORTH DAKOTA STATE UNIVERSITY EXTENSION SERVICE

20			Adjustments or	
21		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
22	Extension service	\$52,517,908	(\$961,158)	\$51,556,750
23	Soil conservation committee	<u>1,133,362</u>	<u>(41,842)</u>	<u>1,091,520</u>
24	Total all funds	\$53,651,270	(\$1,003,000)	\$52,648,270

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1	Less estimated income	<u>25,826,708</u>	<u>847,676</u>	<u>26,674,384</u>
2	Total general fund	\$27,824,562	(\$1,850,676)	\$25,973,886
3	Full-time equivalent positions	263.91	(10.93)	252.98

4 Subdivision 2.

5 NORTHERN CROPS INSTITUTE

6			Adjustments or	
7		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
8	Northern crops institute	<u>\$3,712,202</u>	<u>(\$66,993)</u>	<u>\$3,645,209</u>
9	Total all funds	\$3,712,202	(\$66,993)	\$3,645,209
10	Less estimated income	<u>1,747,735</u>	<u>8,480</u>	<u>1,756,215</u>
11	Total general fund	\$1,964,467	(\$75,473)	\$1,888,994
12	Full-time equivalent positions	12.00	(0.20)	11.80

13 Subdivision 3.

14 UPPER GREAT PLAINS TRANSPORTATION INSTITUTE

15			Adjustments or	
16		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
17	Upper great plains transportation	<u>\$22,076,448</u>	<u>(\$7,704)</u>	<u>\$22,068,744</u>
18	institute			
19	Total all funds	\$22,076,448	(\$7,704)	\$22,068,744
20	Less estimated income	<u>18,175,657</u>	<u>447,773</u>	<u>18,623,430</u>
21	Total general fund	\$3,900,791	(\$455,477)	\$3,445,314
22	Full-time equivalent positions	54.98	(11.10)	43.88

23 Subdivision 4.

24 MAIN RESEARCH CENTER

25			Adjustments or	
26		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
27	Main research center	<u>\$110,529,780</u>	<u>(\$1,812,588)</u>	<u>\$108,717,192</u>
28	Total all funds	\$110,529,780	(\$1,812,588)	\$108,717,192
29	Less estimated income	<u>56,948,525</u>	<u>2,162,877</u>	<u>59,111,402</u>
30	Total general fund	\$53,581,255	(\$3,975,465)	\$49,605,790
31	Full-time equivalent positions	353.85	(17.73)	336.12

Sixty-fifth
Legislative Assembly

1	Subdivision 5.			
2		BRANCH RESEARCH CENTERS		
3			Adjustments or	
4		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
5	Dickinson research extension center	\$6,996,678	(\$167,861)	\$6,828,817
6	Central grasslands research	3,531,779	(105,667)	3,426,112
7	extension center			
8	Hettinger research extension center	5,086,767	(108,523)	4,978,244
9	Langdon research extension center	3,045,836	(79,363)	2,966,473
10	North central research extension center	5,044,213	(87,451)	4,956,762
11	Williston research extension center	5,267,400	(145,037)	5,122,363
12	Carrington research extension center	<u>9,328,093</u>	<u>(145,655)</u>	<u>9,182,438</u>
13	Total all funds	\$38,300,766	(\$839,557)	\$37,461,209
14	Less estimated income	<u>19,817,130</u>	<u>471,108</u>	<u>20,288,238</u>
15	Total general fund	\$18,483,636	(\$1,310,665)	\$17,172,971
16	Full-time equivalent positions	113.94	(3.65)	110.29
17	Subdivision 6.			
18		AGRONOMY SEED FARM		
19			Adjustments or	
20		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
21	Agronomy seed farm	<u>\$1,521,007</u>	<u>\$15,744</u>	<u>\$1,536,751</u>
22	Total special funds	\$1,521,007	\$15,744	\$1,536,751
23	Full-time equivalent positions	3.00	0.00	3.00
24	Subdivision 7.			
25		BILL TOTAL		
26			Adjustments or	
27		<u>Base Level</u>	<u>Enhancements</u>	<u>Appropriation</u>
28	Grand total general fund	\$105,754,711	(\$7,667,756)	\$98,086,955
29	Grand total other funds	<u>124,036,762</u>	<u>3,953,658</u>	<u>127,990,420</u>
30	Grand total all funds	\$229,791,473	(\$3,714,098)	\$226,077,375

SECTION 2. ONE-TIME FUNDING. The following amounts reflect the one-time funding items approved by the sixty-fourth legislative assembly as adjusted for the 2015-17 biennium:

<u>One-Time Funding Description</u>	<u>2015-17</u>	<u>2017-19</u>
Agronomy laboratories	\$150,000	\$0
Rural leadership project	141,252	0
Seed cleaning plants	4,408,224	0
Upper great plains transportation institute road study	628,823	0
Junior master gardener program	12,500	0
Veterinary diagnostic laboratory	18,000,000	0
Dust issues technical support	100,000	0
Land purchase - Langdon	350,000	0
Flooded lands study	<u>67,952</u>	<u>0</u>
Total all funds	\$23,858,751	\$0
Total other funds	<u>21,325,000</u>	<u>0</u>
Total general fund	\$2,533,751	\$0

SECTION 3. 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, 2017, and ending June 30, 2019.

SECTION 4. AMENDMENT. Section 4-05.1-05 of the North Dakota Century Code is amended and reenacted as follows:

4-05.1-05. North Dakota state university main research center position adjustments - Budget section report.

The North Dakota state university main research center must be located on the campus of North Dakota state university of agriculture and applied science. The center is the administrative location of the agricultural experiment station. The center shall conduct research and coordinate all research activities of the agricultural experiment station. The research must have, as a

1 purpose, the development and dissemination of technology important to the production and
2 utilization of food, feed, fiber, and fuel from crop and livestock enterprises. The research must
3 provide for an enhancement of the quality of life, sustainability of production, and protection of
4 the environment. Subject to the availability of funds, the station director may adjust or increase
5 full-time equivalent positions in order to carry out activities to accomplish the mission of the
6 agricultural experiment station. Twelve-month employees whose employment is not limited in
7 duration must accrue leave pursuant to provisions of section 54-06-14. All full or partial
8 positions must be separate from North Dakota state university. Annually, the station director
9 shall report to the office of management and budget and to the budget section any adjustments
10 or increases made pursuant to this section. The center may conduct baseline research,
11 including production and processing in conjunction with the research and extension centers of
12 the state, regarding industrial hemp and other alternative industrial use crops. The center may
13 collect feral hemp seed stock and develop appropriate adapted strains of industrial hemp which
14 contain less than three-tenths of one percent tetrahydrocannabinol in the dried flowering tops.
15 The agriculture commissioner shall monitor the collection of feral hemp seed stock and
16 industrial hemp strain development and shall certify appropriate stocks for licensed commercial
17 cultivation.

18 **SECTION 5. AMENDMENT.** Section 4-08-10 of the North Dakota Century Code is amended
19 and reenacted as follows:

20 **4-08-10. Extension agent to submit monthly account of expenditures - Position**
21 **adjustments - Budget section report.**

22 The extension agent shall submit monthly an accurate itemized account of all expenditures
23 incurred by the agent in the regular conduct of duties to the North Dakota state university
24 extension service for examination and audit. When charges are made by an extension agent for
25 money expended in the performance of official duties, all items of one dollar or more expended
26 and charged for must be covered by a subvoucher or receipt that must be signed by the person
27 to whom the money was paid. The subvoucher or receipt must show at what place, on what
28 date, and for what the money expended was paid. The extension agent shall forward the
29 subvouchers or receipts with the bill, claim, account, or demand against the county. When
30 charges are made for transportation expenses, they may not exceed the amounts provided by
31 section 11-10-15, and must be in itemized form showing the mileage traveled, the days when

1 and how traveled, and the purpose thereof, verified by affidavit. The account must be
2 transmitted and recommended for payment by the North Dakota state university extension
3 service which shall audit the same and which may approve or disallow any expense item
4 therein. The state board of agricultural research and education and the president of North
5 Dakota state university shall control and administer the North Dakota state university extension
6 service subject to the supervision of the state board of higher education. Funds appropriated to
7 the North Dakota state university extension service may not be commingled with funds
8 appropriated to North Dakota state university. An appropriation request to defray expenses of
9 the North Dakota state university extension service must be separate from an appropriation
10 request to defray expenses of North Dakota state university. Subject to the availability of funds,
11 the director of the North Dakota state university extension service may adjust or increase
12 full-time equivalent positions in order to carry out activities to accomplish the mission of the
13 extension service. Twelve-month employees whose employment is not limited in duration must
14 accrue leave pursuant to provisions of section 54-06-14. All full- or part-time positions must be
15 separate from North Dakota state university. Annually, the director of the North Dakota state
16 university extension service shall report to the office of management and budget and to the
17 budget section any adjustments or increases made pursuant to this section.

18 **SECTION 6. DICKINSON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**

19 **INCOME.** The Dickinson research extension center may spend up to \$755,000 of revenues
20 received during the 2017-19 biennium from mineral royalties, leases, or easements for ongoing
21 operational expenses. Any revenues received in excess of \$755,000 may be spent only for
22 one-time expenditures for the biennium beginning July 1, 2017, and ending June 30, 2019.

23 **SECTION 7. WILLISTON RESEARCH EXTENSION CENTER - MINERAL RIGHTS**

24 **INCOME - REPORT.** The Williston research extension center shall report to the sixty-sixth
25 legislative assembly on amounts received and spent from mineral royalties, leases, or
26 easements in the biennium beginning July 1, 2015, and ending June 30, 2017, and the
27 biennium beginning July 1, 2017, and ending June 30, 2019.

28 **SECTION 8. TRANSFER AUTHORITY.** Upon approval of the state board of agricultural
29 research and education and appropriate branch research center directors, the director of the
30 main research center may transfer appropriation authority within subdivisions 1, 2, 4, and 5 of

1 section 1 of this Act. Any amounts transferred must be reported to the director of the office of
2 management and budget.

3 **SECTION 9. FULL-TIME EQUIVALENT POSITION ADJUSTMENTS.** The state board of
4 higher education may adjust or increase full-time equivalent positions as needed for the entities
5 in section 1 of this Act, subject to availability of funds. All full-time or part-time positions must be
6 separate from North Dakota state university. Annually, the board shall report to the office of
7 management and budget and to the budget section any adjustments made pursuant to this
8 section.

9 **SECTION 10. UNEXPENDED GENERAL FUND - EXCESS INCOME.** Any unexpended
10 general fund appropriation authority to and any excess income received by entities listed in
11 section 1 of this Act are not subject to the provisions of section 54-44.1-11, and any
12 unexpended funds from these appropriations or revenues are available and may be expended
13 by those entities, during the biennium beginning July 1, 2019, and ending June 30, 2021.

14 **SECTION 11. EXEMPTION.** The amounts appropriated for the veterinary diagnostic
15 laboratory and the seed cleaning plants contained in subdivision 4 of section 1 of chapter 20 of
16 the 2015 Session Laws, are not subject to the provisions of section 54-44.1-11, and any
17 unexpended funds from these appropriations or related revenues are available and may be
18 expended during the biennium beginning July 1, 2017, and ending June 30, 2019.

Extension Service, Main, and Branch Research Centers
Reconciliation of 2015-17 Original General Fund Appropriation to 2017-19 Executive Recommendation (SB 2020 /2080) to Senate Version SB 2020

	Extension Service	Main Research Center	Branch Research Centers
2015-17 Original General Fund Appropriation	\$ 29,788,188	\$ 59,067,612	\$ 20,073,447
Reduction of 6.55% for Allotment	\$ (1,951,126)	\$ (3,868,929)	\$ (1,314,811)
	27,837,062	55,198,683	18,758,636
Less: Capital and One-time	(12,500)	(1,617,428)	(275,000)

2015-17 Adjusted Appropriation

2017-19 Changes in Executive Recommendation (SB 2080)			
Adjustment between Allotment and Gov. Guidelines			
(10% Gov vs. 6.55% Allotment)		(1,970,656)	(665,035)
Base payroll adjustment	(1,026,443)	596,490	181,396
1% salary/benefit increase FY19 and	302,125		
Change in Bond payments	495,078	851,324	303,670
Funding change GF to Special	-	42,448	15,056
Equipment Reduction	(200,000)	(1,600,000)	(350,000)
Reduction in Health Insurance for decreased FTE	-	(100,000)	(175,000)
Further Reduction	(37,206)	(71,550)	(28,620)
Total Changes	(480,000)	-	-
	(946,446)	(2,251,944)	(718,533)

Executive Recommendation

	\$ 26,878,116	\$ 51,329,311	\$ 17,765,103
Gov. Burgum Proposed Adjustments:			
Remove compensation adjustment 1%	(97,887)	(183,642)	(59,179)
Remove 5% Health Insurance	(208,071)	(349,770)	(128,079)
Reduction of 3% General Fund	(806,343)	(1,539,879)	(532,953)
Total Proposed Adjustments	(1,112,301)	(2,073,291)	(720,211)

Gov. Burgum Adjustments included by Senate:

Remove Compensation	\$ (97,887)	\$ (183,642)	\$ (59,179)
Reduction	\$ (806,343)	\$ (1,539,879)	\$ (532,953)
Total	\$ (904,230)	\$ (1,723,521)	\$ (592,132)

Appropriation

	\$ 25,973,886	\$ 49,605,790	\$ 17,172,971
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No optional items submitted were funded in the Executive Recommendation

Reconciliation of 2015-17 Original Other Fund Appropriation to 2017-19 Executive Recommendation (SB 2020 / 2080) to Senate Version SB 2020

2015-17 Original Other Fund Appropriation	\$	25,826,708	\$	78,098,525	\$	19,992,130
Remove Capital Project		-		(21,150,000)		(175,000)
2015-17 Adjusted Other Fund Appropriation / SB 2020 Appropriation	\$	25,826,708	\$	56,948,525	\$	19,817,130
2017-19 Changes in Executive Recommendation (SB 2080)						
Base Payroll adjustments		265,427		196,105		30,744
1% salary/benefit increase FY19 and						
2018-19 health insurance increases		476,454		467,651		112,236
Other changes in estimated income		200,000		1,600,000		350,000
SB 2080 Other Fund changes		941,881		2,263,756		492,980
Executive Recommendation - Other Funds	\$	26,768,589	\$	59,212,281	\$	20,310,110
Gov. Burgum Proposed Adjustments:						
Remove compensation increase 1%		(94,205)		(100,879)		(21,872)
Remove 5% Health Insurance		(200,244)		(192,136)		(47,338)
Total Proposed Adjustments		(294,449)		(293,015)		(69,210)
Gov. Burgum Reductions included by Senate:						
Remove Compensation increase		(94,205)		(100,879)		(21,872)
Appropriation, Other Funds	\$	26,674,384	\$	59,111,402	\$	20,288,238
Total All Funds	\$	52,648,270	\$	108,717,192	\$	37,461,209

Branch Research Centers Detail
Reconciliation of 2015-17 Original General Fund Appropriation to 2017-19 Executive Recommendation (SB 2020 / 2080) to Senate Version SB 2020

	Dickinson REC	Grasslands REC	Central Hattinger REC	Langdon REC	North Central REC	Williston REC	Carrington REC	Total
2015-17 Original General Fund Appropriation	\$ 3,992,095	\$ 2,302,107	\$ 2,510,254	\$ 2,004,271	\$ 2,179,057	\$ 3,155,573	\$ 3,930,090	\$ 20,073,447
Reduction of 6.55% for Allotment	\$ (261,483)	\$ (150,788)	\$ (164,421)	\$ (131,280)	\$ (142,728)	\$ (206,690)	\$ (257,421)	\$ (1,314,811)
	3,730,612	2,151,319	2,345,833	1,872,991	2,036,329	2,948,883	3,672,669	18,758,636
Less: Capital and One-time	(100,000)			(175,000)				(275,000)
2015-17 Adjusted Appropriation	3,630,612	2,151,319	2,345,833	1,697,991	2,036,329	2,948,883	3,672,669	18,483,636
2017-19 Changes in Executive Recommendation (SB 2080)								
Adjustment between Allotment and Gov. Guidelines (10% Gov vs. 6.55% Allotment)	(127,727)	(79,423)	(86,804)	(51,647)	(75,178)	(108,867)	(135,588)	(665,034)
Base payroll adjustment	34,610	27,255	22,330	16,560	29,819	24,560	41,212	196,346
1% salary/benefit increase FY19 and 2018-19 health insurance increases	48,089	39,584	43,101	29,528	31,079	48,007	64,283	303,671
Change in Bond payments	-	40	-	-	64	-	-	104
Funding change GF to Special	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(50,000)	(350,000)
Equipment Reduction	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(175,000)
Reduction in Health Insurance for decreased FTE	(5,724)	(4,293)	(2,862)	(4,293)	(2,862)	(5,724)	(5,724)	(28,620)
Total Changes	(125,752)	(91,837)	(99,035)	(83,421)	(93,509)	(114,162)	(110,817)	(718,533)
Executive Recommendation	3,504,860	2,059,482	2,246,798	1,614,570	1,942,820	2,834,721	3,561,852	17,765,103
Gov. Burgum Adjustments included by Senate:								
Remove compensation increase	(11,292)	(7,036)	(7,285)	(5,403)	(6,705)	(8,013)	(13,445)	(59,179)
Additional 3% Reduction	(106,591)	(58,625)	(69,284)	(47,965)	(58,625)	(85,272)	(106,591)	(532,953)
Total Reductions - Gov. Burgum / Senate	(117,883)	(65,661)	(76,569)	(53,368)	(65,330)	(93,285)	(120,036)	(592,132)
Appropriation	\$ 3,386,977	\$ 1,993,821	\$ 2,170,229	\$ 1,561,202	\$ 1,877,490	\$ 2,741,436	\$ 3,441,816	\$ 17,172,971

No optional items submitted were funded in the Executive Recommendation

Reconciliation of 2015-17 Original Other Fund Appropriation to 2017-19 Executive Recommendation (SB 2020 / 2080) to Senate Version SB 2020

2015-17 Original Other Fund Appropriation	\$ 3,366,067	\$ 1,380,460	\$ 2,740,933	\$ 1,522,845	\$ 3,007,884	\$ 2,318,517	\$ 5,655,424	\$ 19,992,130
Adjustments				(175,000)				(175,000)
2015-17 Adjusted Other Fund / SB 2020 Appropriation	3,366,067	1,380,460	2,740,933	1,347,845	3,007,884	2,318,517	5,655,424	19,817,130
Executive Recommendation Increases (Decreases):								
Base Payroll adjustments	21,220	2,045	10,347	6,692	1,548	3,366	(14,474)	30,744
1% salary/benefit increase FY19 and 2018-19 health insurance increases	9,471	1,666	9,987	2,625	22,051	13,999	52,437	112,236
Estimated income increase	50,000	50,000	50,000	50,000	50,000	50,000	50,000	350,000
SB 2080 Other Fund changes	80,691	53,711	70,334	59,317	73,599	67,365	87,963	492,980
Executive Recommendation - Other Funds	3,446,758	1,434,171	2,811,267	1,407,162	3,081,483	2,385,882	5,743,387	20,310,110
Gov. Burgum Reductions included by Senate:								
Remove compensation increase	(4,918)	(1,880)	(3,252)	(1,891)	(2,211)	(4,955)	(2,765)	(21,872)
Total Other Funds	3,441,840	1,432,291	2,808,015	1,405,271	3,079,272	2,380,927	5,740,622	20,288,238
Total All Funds	\$ 6,828,817	\$ 3,426,112	\$ 4,978,244	\$ 2,966,473	\$ 4,956,762	\$ 5,122,363	\$ 9,182,438	\$ 37,461,209

NDSU Extension Service - 630

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$27,837,061	20,608,774	7,228,287	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Main Research Station - 640

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	* \$55,698,821	\$38,394,862	17,303,959	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

Note: uncertain changes expected to Federal funding levels.

NDSU Dickinson Research Center- 641

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 3,730,612	\$ 2,614,030	1,116,582	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Central Grasslands Research Center- 642

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 2,151,319	\$ 1,685,027	466,292	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Hettinger Research Center- 643

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 2,345,833	\$ 1,938,755	407,078	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Langdon Research Center- 644

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 1,872,991	\$ 1,432,178	440,813	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU North Central Research Center- 645**Comparison of 2015-17 Appropriation and Estimated Spending**

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 2,036,329	\$ 1,460,420	575,909	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Williston Research Center- 646**Comparison of 2015-17 Appropriation and Estimated Spending**

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 2,948,883	\$ 2,213,492	735,391	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Carrington Research Center- 647**Comparison of 2015-17 Appropriation and Estimated Spending**

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total General Fund Appropriation	\$ 3,672,669	\$ 2,618,565	1,054,104	No major variances. Balance will be drawn down for expenditures by end of biennium.

Source: January 2017 Appropriation Status Report

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

NDSU Agronomy Seed Farm- 649

Comparison of 2015-17 Appropriation and Estimated Spending

	2015-17 Appropriation	Actual Expenditures Through 01/31/17	Remaining Balance	Comments
Total Appropriation	\$ 1,521,007	\$ 1,024,024	496,983	

Source: January 2017 Appropriation Status Report

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

640 - Main Research Center

"Original 2015-17 budget and the effects of the budget reductions approved August 2016"

Total Budget

	Original Appropriations	Reductions	Adjusted Appropriations
Total all funds	\$137,166,137	(\$3,868,929)	\$133,297,208
Less estimated income	78,098,525	0	78,098,525
Total general fund	\$59,067,612	(\$3,868,929)	\$55,198,683

One-Time, General Fund

Original One-time items	Original Appropriations	Reductions	Adjusted Appropriations
Rural leadership project	\$150,000	(\$8,748)	\$141,252
Flooded lands study	72,500	(\$4,548)	67,952
Seed cleaning plants	1,500,000	(\$91,776)	1,408,224
Total	\$1,722,500	(\$105,072)	\$1,617,428

Ongoing, General Fund

Programs	Original Ongoing Appropriations	Ongoing Appropriation Reductions	Adjusted Ongoing Appropriations
Main Research Center	\$57,345,112	(\$3,763,857)	\$53,581,255

Effects of the allotment:

The Main Station addressed the allotment with a combination of operating and position cuts. Positions are frozen as they become vacant. If a position is deemed critical, a recruitment may take place. A Voluntary Separation Incentive Program was initiated and resulted in a reduction of 7.53 FTE with annual Main Station salaries totaling \$605,671. Operating allocations were reduced by 10% in FY 2017. Equipment funds were reduced.

630 - NDSU Extension Service

"Original 2015-17 budget and the effects of the budget reductions approved August 2016"

Total Budget

	Original Appropriations	Reductions	Adjusted Appropriations
Extension service	\$54,402,096	(\$1,871,688)	\$52,530,408
Soil conservation committee	1,212,800	(79,438)	1,133,362
Total all funds	\$55,614,896	(\$1,951,126)	\$53,663,770
Less estimated income	25,826,708	0	25,826,708
Total general fund	\$29,788,188	(\$1,951,126)	\$27,837,062

One-Time, General Fund

One-time items	Original Appropriations	Reductions	Adjusted Appropriations
Burleigh Co Junior Master Gardener Program	\$12,500		\$12,500
Total	\$12,500	\$0	\$12,500

Ongoing, General Fund

Programs	Original Ongoing Appropriations	Ongoing Appropriation Reductions	Adjusted Ongoing Appropriations
Extension service	\$28,562,888	(\$1,871,688)	\$26,691,200
Soil conservation committee	\$1,212,800	(\$79,438)	\$1,133,362

Effects of the allotment:

The NDSU Extension Service addressed the allotment with a combination of operating and position cuts. Positions are frozen as they become vacant. If a position is deemed critical, a recruitment may take place. A Voluntary Separation Incentive Program was initiated and resulted in a reduction of 5.27 FTE with annual NDSU Extension Service salaries totaling \$385,462. Operating allocations were reduced by 10% in FY 2017.

628 - Branch Research Centers

"Original 2015-17 budget and the effects of the budget reductions approved August 2016"

Total Budget

Line item	Original Appropriations	Reductions	Adjusted Appropriations
Dickinson REC	\$7,358,161	(\$261,483)	\$7,096,678
Central Grasslands REC	3,682,567	(150,788)	3,531,779
Hettinger REC	5,251,188	(164,421)	5,086,767
Langdon REC	3,527,116	(131,280)	3,395,836
North Central REC	5,186,941	(142,728)	5,044,213
Williston REC	5,474,090	(206,690)	5,267,400
Carrington REC	9,585,514	(257,421)	9,328,093
Total all funds	\$40,065,577	(\$1,314,811)	\$38,750,766
Less estimated income	19,992,130	0	19,992,130
Total general fund	\$20,073,447	(\$1,314,811)	\$18,758,636

One-Time, General Fund

One-time items	Original Appropriations	Reductions	Adjusted Appropriations
Dust issues tech support - DREC	\$100,000		\$100,000
Cavalier County property purchase	175,000		175,000
Total	\$275,000	\$0	\$275,000

Ongoing, General Fund

Programs	Original Ongoing Appropriations	Ongoing Appropriation Reductions	Adjusted Ongoing Appropriations
Dickinson research center	\$3,892,095	(\$261,483)	\$3,630,612
Central grasslands research center	\$2,302,107	(\$150,788)	\$2,151,319
Hettinger research center	\$2,510,254	(\$164,421)	\$2,345,833
Langdon research center	\$1,829,271	(\$131,280)	\$1,697,991
North central research center	\$2,179,057	(\$142,728)	\$2,036,329
Williston research center	\$3,155,573	(\$206,690)	\$2,948,883
Carrington research center	\$3,930,090	(\$257,421)	\$3,672,669
	\$19,798,447	(\$1,314,811)	\$18,483,636

Effects of the allotment:

The Branch Stations addressed the allotment with a combination of operating and position cuts. Positions are frozen as they become vacant. If a position is deemed critical, a recruitment may take place. A Voluntary Separation Incentive Program was initiated and resulted in a reduction of 3.0 FTE with annual Branch Station salaries totaling \$151,021. Operating allocations were reduced by 10% in FY 2017. Equipment funds were reduced.

The 10% adjustment necessary to meet the Governor's Budget request guideline was entered into IBARS via Change Package AA1 and described as follows:

NDSU Extension Service

The Governor's budget guidelines called for all state agencies to submit a 90 percent budget request. The 10 percent reduction equals \$2,977,569 for Extension. To meet this amount, Extension would eliminate 10 positions (\$1.6M) in administration, state specialist, area specialist, county, technician, and support staff positions. The budget for new equipment purchases would be reduced by \$300,000 and operating budgets would be reduced by \$956,289. Extension program areas in agriculture, 4-H, family and consumer sciences, and agricultural communications would be affected.

Funding for Soil Conservation Committee assistance would be reduced by 10% (\$121,280).

Branch RECs

The Governor's budget guidelines called for all state agencies to submit a 90 percent budget request. The Directors of the REC collectively proposed a reduction strategy that was approved by SBARE on August 2, 2016. The plan calls for a reduction of General Funded positions, reduced State Fleet vehicles, reduced travel, and a shifting of expenses from General Fund to Other Funds.

Between elimination and shifting to Other Fund sources (if available), General Fund FTE are estimated to be reduced as follows:

DREC 2.0 FTE up to \$330,000 biennial impact

CGREC 1.0 FTE up to \$120,000 biennial impact

HREC 1.5 FTE up to \$200,000 biennial impact

LREC 1.0 FTE up to \$80,000 biennial impact

NCREC 1.5 FTE up to \$180,000 biennial impact

WREC 1.0 FTE up to \$165,000 biennial impact

CREC 2.0 FTE up to \$250,000 biennial impact

Total 10.0 FTE up to \$1,325,000 biennial impact

The remaining \$654,845 reduction is from operating expenses.

Main Station

The Governor's budget guidelines called for all state agencies to submit a 90 percent budget request. The 10 percent reduction equals \$5,734,511 for the Main Station. To meet this amount, the Main Station would eliminate 25 FTE (\$4.25 M) in administrative, faculty, technical, and support staff positions. Operating budgets would be reduced by \$1,484,511 through strategic program cuts and/or closures, as approved by the State Board of Agricultural Research and Education.

STATE AUDITOR
ROBERT R. PETERSON

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STATE OF NORTH DAKOTA
OFFICE OF THE STATE AUDITOR
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Transmittal Letter

March 14, 2016

The Honorable Jack Dalrymple, Governor
Members of the North Dakota Legislative Assembly
State Board of Higher Education
Dr. Dean Bresciani, President, North Dakota State University

We are pleased to submit this audit of North Dakota State University for the biennium ended June 30, 2015. This audit resulted from the statutory responsibility of the State Auditor to audit or review each state agency once every two years. The same statute gives the State Auditor the responsibility to determine the contents of these audits.

In determining the contents of the audits of state agencies, the primary consideration was to determine how we could best serve the citizens of the state of North Dakota. Naturally we determined financial accountability should play an important part of these audits. Additionally, operational accountability is addressed whenever possible to increase efficiency and effectiveness of state government.

The in-charge auditor for this audit was Cory Wigdahl, CFE. Robyn Hoffmann, CPA was the audit manager. Inquiries or comments relating to this audit may be directed to the audit manager by calling (701) 239-7291. We wish to express our appreciation to President Bresciani and his staff for the courtesy, cooperation, and assistance they provided to us during this audit. Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Rob Peterson".

Robert R. Peterson
State Auditor

Executive Summary

Introduction

North Dakota State University is distinctive as a student-focused, land-grant, Research University, ranked by the Carnegie Commission on Higher Education among the top 108 public and private universities in the country. NDSU is in the elite category of "Research Universities/Very High Research Activity," with several programs ranked in the Top 100 by the National Science Foundation. NDSU is fully accredited as an institution by the Higher Learning Commission of the North Central Association of Colleges and Secondary Schools.

The Legislative Audit and Fiscal Review Committee (LAFRC) requests that certain items be addressed by auditors performing audits of state agencies. Those items and the Office of the State Auditor's responses are noted below.

Responses to LAFRC Audit Questions

1 . What type of opinion was issued on the financial statements?

The financial statements for North Dakota State University were included in the Annual Financial Report of the North Dakota University System; an unmodified opinion was issued on the annual financial report of the North Dakota University System.

2. Was there compliance with statutes, laws, rules, and regulations under which the agency was created and is functioning?

Other than our findings addressing "Noncompliance with Public Improvement Bidding" (page 23), North Dakota State University was in compliance with significant statutes, laws, rules, and regulations under which it was created and is functioning.

3. Was internal control adequate and functioning effectively? Yes.

4. Were there any indications of lack of efficiency in financial operations and management of the agency?

Yes, there was one reportable indication of a lack of efficiency in financial operations and management of North Dakota State University addressing "Noncompliance with Public Improvement Bidding" (page 23).

5. Has action been taken on findings and recommendations included in prior audit reports? Yes, all prior findings were implemented.

6. Was a management letter issued? If so, provide a summary below, including any recommendations and the management responses.

Yes, a management letter was issued and is included on page 26 of this report, along with management's response.

LAFRC Audit Communications

7. *Identify any significant changes in accounting policies, any management conflicts of interest, any contingent liabilities, or any significant unusual transactions.*

In fiscal year 2015, North Dakota State University changed accounting policies related to pensions by adopting Statement No. 68, *Accounting and Financial Reporting for Pensions*. There were no management conflicts of interest or significant unusual transactions noted.

8. *Identify any significant accounting estimates, the process used by management to formulate the accounting estimates, and the basis for the auditor's conclusions regarding the reasonableness of those estimates.*

The most significant accounting estimates used by North Dakota State University include useful lives of capital assets and allowance for uncollectible receivables. Estimated useful lives are used to compute depreciation on capital assets and are based on industry standards and experience. Management's estimate of the allowance is based on aging categories and past history. We evaluated the key factors and assumptions used to develop the estimated useful lives and allowances in determining that they are reasonable in relation to the financial statements taken as a whole.

9. *Identify any significant audit adjustments.*

There were no significant audit adjustments.

10. *Identify any disagreements with management, whether or not resolved to the auditor's satisfaction relating to a financial accounting, reporting, or auditing matter that could be significant to the financial statements.* None.

11. *Identify any serious difficulties encountered in performing the audit.* None.

12. *Identify any major issues discussed with management prior to retention.*

This is not applicable for audits conducted by the Office of the State Auditor.

13. *Identify any management consultations with other accountants about auditing and accounting matters.* None.

14. *Identify any high-risk information technology systems critical to operations based on the auditor's overall assessment of the importance of the system to the agency and its mission, or whether any exceptions identified in the six audit report questions to be addressed by the auditors are directly related to the operations of an information technology system.*

ConnectND Finance, Human Resource Management System (HRMS), and Campus Solutions are high-risk information technology systems critical to North Dakota State University. No exceptions related to the operations of an information technology system were noted.

Audit Objectives, Scope, and Methodology

Audit Objectives

The objectives of this audit of North Dakota State University for the biennium ended June 30, 2015 were to provide reliable, audited financial statements and to answer the following questions:

1. What are the highest risk areas of North Dakota State University's operations and is internal control adequately designed in these areas?
2. What are the significant and high-risk areas of legislative intent applicable to North Dakota State University and are they in compliance with these laws?
3. Are there areas of North Dakota State University's operations where we can help to improve efficiency or effectiveness?

Audit Scope

This audit of North Dakota State University is for the biennium ended June 30, 2015. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives,

North Dakota State University's main campus is in Fargo, with Extension Service and Research Experiment Station locations all across the state. All locations were included in the audit scope.

Audit Methodology

To meet the objectives outlined above, we:

- Prepared condensed financial statements from the fiscal years 2015 and 2014 annual financial reports of the North Dakota University System and developed a discussion and analysis of the financial statements.
- Performed detailed analytical procedures including computer-assisted auditing techniques. These procedures were used to identify high-risk transactions and potential problem areas for additional testing.
- Tested internal control and compliance with laws and regulations which included selecting representative samples to determine if laws were being followed consistently. Non-statistical sampling was used and the results were projected to the population. Where applicable, populations were stratified to ensure that particular groups within a population were adequately represented in the sample, and to improve efficiency by gaining greater control on the composition of the sample.
- Tested potential improvements to operations.
- Reviewed segregation of duties in all program areas.
- Interviewed appropriate agency personnel.
- Queried the ConnectND (PeopleSoft) system. Significant evidence was obtained from ConnectND.
- Observed North Dakota State University's processes and procedures.

In aggregate there were no significant limitations or uncertainties related to our overall assessment of the sufficiency and appropriateness of audit evidence.

Discussion and Analysis

The accompanying financial statements have been prepared in a condensed form to present North Dakota State University's financial position and results of operations in a manner similar to that used for financial reporting in the private sector. Also, the related note disclosures have not been included in this report. Accordingly, the accompanying financial statements are not intended to be presented in accordance with generally accepted accounting principles (GAAP).

For the biennium ended June 30, 2015, operations of North Dakota State University were primarily supported by appropriations from the state's general fund. This is supplemented by federal funding and fees credited to the agency's operating fund.

Financial Summary

Assets increased \$65 million in fiscal year 2015 due to:

- Accounts receivable increased \$3.6 million due to recording a receivable for the Minard Hall settlement for \$3 million;
- Due from the state general fund increase of \$5 million was due to the timing of the state distribution of funds; and
- Capital assets increase of \$57 million due to construction in progress additions of \$23 million for the Sanford Health Athletic Complex, \$14 million for the STEM building, and an increase in building additions of \$19 million for Minard Hall, and \$5 million for the Research building.

Liabilities increased \$31 million in fiscal year 2015 due to:

- NDSU recorded \$23 million pension liability because of the implementation of GASB 68, *Accounting and Financial Reporting for Pensions*;
- Accounts payable increased \$5 million for an increase in payments to vendors for work done on the Sanford Health Athletic Complex and the STEM building; and
- Due to others increased \$3 million because of an increase in bonds payable.

Revenues increased \$35 million in fiscal year 2015 due to:

- \$4.3 million increase in student tuition and fees reflects a 4.23% increase approved by the Board of Higher Education;
- \$15.6 million increase in state appropriations-capital asset reflects the timing of drawdowns for the STEM building (\$9.4 million), AES Beef Research facility (\$4 million), and various capital improvements of \$2.9 million; and
- \$15 million increase in capital grants and gifts reflects funding received from the Foundations for the Sanford Health Athletic Complex.

Total expenses for North Dakota State University were \$405,483,852 for the year ended June 30, 2015, as compared to \$387,003,390 for the prior year. The increase in total expenses for the audited period reflects primarily salaries and wages (\$13.6 million) and operating expenses (\$5.8 million), which also account for 89% of total expenses in both years. The increase in salaries and wages was primarily due to an average increase of \$3.1% in fiscal year 2015. The increase in operating expenses reflects an overall increase in utilities and repairs.

All other expenses remained fairly constant.

Analysis of Significant Changes in Operations

There were no significant changes in operations.

Analysis of Significant Variances - Budgeted and Actual Expenditures

There were no significant variance between budgeted and actual expenses.

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

	630 Extension	640 Main Station	641 Dickinson	642 Central Grasslands	643 Hettinger	644 Langdon	645 North Central	646 Williston	647 Carrington	649 Agronomy Seed Farm
Salaries	\$ 44,764,402	\$ 67,429,797	\$ 3,484,657	\$ 1,742,228	\$ 2,513,421	\$ 1,651,900	\$ 2,757,304	\$ 3,419,229	\$ 4,960,666	\$ 538,519
Operating	8,336,868	38,309,983	2,512,021	1,389,551	2,223,346	1,143,936	1,736,909	1,348,171	3,117,427	672,488
Equipment	550,000	4,790,000	1,000,000	400,000	350,000	250,000	550,000	500,000	1,250,000	310,000
Capital Projects	-	-	-	-	-	-	-	-	-	-
Total Budget	\$ 53,651,270	\$ 110,529,780	\$ 6,996,678	\$ 3,531,779	\$ 5,086,767	\$ 3,045,836	\$ 5,044,213	\$ 5,267,400	\$ 9,328,093	\$ 1,521,007
Funding:										
Federal Fund	\$ 7,740,790	\$ 8,419,260	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
General Fund	27,824,562	53,581,255	3,630,611	2,151,319	2,345,834	1,697,991	2,036,329	2,948,883	3,672,669	-
Special Fund	18,085,918	48,529,265	3,366,067	1,380,460	2,740,933	1,347,845	3,007,884	2,318,517	5,655,424	1,521,007
Total Funding	\$ 53,651,270	\$ 110,529,780	\$ 6,996,678	\$ 3,531,779	\$ 5,086,767	\$ 3,045,836	\$ 5,044,213	\$ 5,267,400	\$ 9,328,093	\$ 1,521,007

Source: IBARS 2015-17, Agency Submitted, less 6.55% allotment

North Dakota Agricultural Experiment Station

NDSU Extension Service

2017-2019 Biennial Budget Request

Senate Bill 2020
House Education and Environment Division
Representative David Monson, chair

March 7, 2017

NDSU NORTH DAKOTA
STATE UNIVERSITY