North Dakota (North Dakota State University Main Campus)

Plan of Work for 2023-2027

Status: Final (Approved 9/29/2022)

Executive Summary Overview

North Dakota's economy is driven by energy and agricultural production. Agriculture accounts for 90% of the land use in North Dakota, and the state ranks third in the nation in oil production. Our state also contains some of the most important ecological and water resources of the nation, with our rich grasslands, Prairie Pothole region, and the Missouri River basin that cuts through the state. The North Dakota Agricultural Experiment Station (NDAES) and North Dakota State University Extension (NDSUE) serve as major sources of innovation, new tools and knowledge, and educational support to agriculture's continued success. While providing solutions for greater agricultural production, the efforts of the NDAES and NDSUE also strive to improve the ecosystem services. The main campus is located at Fargo, North Dakota. The NDSUE and NDAES serve the citizens of the state through the main campus as well as 53 Extension offices located in 52 counties and one American Indian reservation, seven Research Extension Centers (REC) located across the state, one farm devoted to foundation seed production, and one district Extension office.

Agriculture is a critical component of North Dakota's economy. Although climatic shifts may result in record precipitations in a single year, historic droughts can occur in subsequent years. Despite the extreme climactic variability of North Dakota, the resiliency of our agriculture results in crop and livestock cash receipts between $8 and $10 billion over recent years (USDA Economic Research Service). North Dakota leads the nation in the production of 12-16 crop categories annually.

The mission of the NDAES is to develop and disseminate technology important to the production and utilization of food, feed, fiber and fuel from crop and livestock enterprises. The research of the NDAES provides quality of life enhancements, that contributes to the sustainability of agricultural production and protection of the environment. Our plant breeding research develops high yielding cultivars that cover the unique rotations of our region and are resilient to the dynamic climate of North Dakota. Our animal science research improves the nutritional and reproductive efficiencies for increased regional, national, and global food security. Research in soil health, climate smart agriculture, and water management issues help respond to recent shifts in precipitation associated with climate variability. Our research also contributes to the economics of alternative bio and sustainable energy sources and on feedstock processing for sustainable energy technologies.

The mission of NDSUE is to create learning partnerships that help adults and youth enhance their lives and communities. NDSUE activities contribute to improving crop productivity, adapting new crops; adapting cropping systems, responding to evolving pest issues, improving soil management; assisting

with the development of biofuels as sustainable energy sources; and training families on nutrition and wellness to address childhood obesity. Extension activities will also continue to focus on state identified needs in the areas of agricultural and natural resources; 4-H youth development; family and consumer sciences; and community, leadership and economic development. NDSUE contributes in these areas by providing transformational education and creating/maintaining partnerships with other organizations across the state, region and nation.

Merit and Scientific Peer Review Processes

Research programs are subjected to multiple types of scientific peer review. These reviews occur prior to, during and at the conclusion of each research project. First, NDAES faculty are required to have either a Hatch or Hatch Multistate project. Hatch projects are written according to a set of guidelines that encompasses federal requirements and also specific requirements of the NDAES. Each project is reviewed for scientific merit by a Project Review Committee that is comprised of one faculty member from each discipline. Second, research faculty who participate in Hatch Multistate research projects receive a critical review of their contributing project from fellow committee members, the administrative adviser and the appropriate regional Multi-State Research Committee.

Extension activities are also subject to multiple types of peer review. Educational curriculum and lessons are peer reviewed. Reviewers can be internal, utilizing program planning team members, or external colleagues from other institutions. Extension publications/bulletins/fact sheets are internally peer reviewed prior to publication.

Stakeholder input: Action Taken to Seek Stakeholder Input

Use of media to announce public meetings and listening sessions

Targeted invitation to traditional stakeholder groups

Targeted invitation to non-traditional stakeholder groups

Targeted invitation to traditional stakeholder individuals

Targeted invitation to non-traditional stakeholder individuals

Targeted invitation to selected individuals from general public

Survey of traditional stakeholder groups

Survey of traditional stakeholder individuals

Survey specifically with non-traditional groups

Statewide community forums every five years

Input from State Board of Agricultural Research and Education

Input from NDSU Extension's Citizen Advisory Council

Building linkages with the public enables us to discover information about community/county/district/state assets and needs. Various methods for stakeholder input are utilized on an on-going basis. Advisory and commodity boards are used annually to identify issues and refine

research and Extension programs. Examples include county Extension advisory boards, Sustainable Agriculture Research and Education (SARE) advisory board, nutrient management advisory board, soil health advisory board, sugar beet research and Extension board, Research Extension Center (REC) advisory boards, Extension Citizen Advisory Council, and the State Board of Agricultural Research and Education (SBARE). Input from stakeholders, the general public and from targeted audiences is used to develop our five-year plan of work and to adjust the plan based on crisis situations that may develop in the state. Using several methods and several venues to collect data ensure that high priority issues are identified, people that have self-interest in the issue are brought to the planning meetings, and the appropriate research project or educational program is developed to address the issue using a variety of delivery methods.

Stakeholder input: Methods to Identify Individuals and Groups

Advisory Committees

Internal Focus Groups

External Focus Groups

Listening Sessions Needs Assessments

Surveys

The State Board of Agricultural Research and Education (SBARE) is charged by the state legislature to determine the causes of any adverse economic impacts on crops and livestock produced in this state; develop ongoing strategies for the provision of research solutions to negate adverse economic impacts on crops and livestock produced in this state; develop ongoing strategies for the dissemination of research information through NDSU Extension. Annually this board evaluates the results of research and extension activities and expenditures; and report the findings to the North Dakota Legislative Council and the State Board of Higher Education. SBARE actively solicits input from all sectors of agricultural interests (i.e. different commodity and livestock groups), other community interests, and meets throughout the state to gather input.

County commissioners actively participate in county Extension program reviews with Extension district directors. The county Extension budgeting process also results in strong engagement from county government. Local needs are also identified through input from county advisory councils, crop and livestock improvement boards, soil conservation districts, 4-H councils, and area focus groups. End of program surveys are used at most county and state Extension programs to identify emerging clientele.

Through our internal annual civil rights audit in each county and for each program area, we compare our Extension audiences to current census data to determine if we reach individuals and groups that are representative of the population in the state. If not, we document how we attempted to reach these populations and how we can continue to improve our reach.

Stakeholder input: Methods for Collecting Stakeholder Input

Meetings with stakeholders

Survey of stakeholders

Focus groups/listening sessions with stakeholders

Meeting one-on-one or with groups of stakeholders is one way we collect input for research and Extension activities. Surveys and focus groups are also used to collect information that can be synthesized to direct the work being done.

Stakeholder input: A Statement of How the Input Will Be Considered

Budget Process

Identify Emerging Issues

Redirect Extension Programs

Redirect Research Programs

Staff Hiring Process

Action Plans Setting of Priorities

The State Board for Agricultural Research and Education (SBARE) is charged with setting priorities for research and Extension based on stakeholder input listening sessions. The staff from the seven RECs use the input from winter meetings with their advisory boards to set program direction for research projects and Extension programs at their centers.

During county staff evaluations each year, program input is gathered from commissioners who take part in the staff evaluations. This arrangement helps assure that Extension programs are grass roots driven and are focused on local issues and needs. County commissioner input is also critical in determining the staffing level and emphasis within county Extension offices as 50 percent of the Extension agent's salary is paid by the county.

Stakeholders are frequently important contributors on search committees of Extension state specialists and county commissioners are partners in the search and interview process of county staff. SBARE members or another stakeholder is often a representative on faculty and administration searches.

Critical Issues

4-H, Youth Development

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

In 4-H we recognize that talent is everywhere, opportunity is not. Youth report that it is increasingly challenging for them to become involved in their communities or become effective leaders, especially within our Native American communities. In a North Dakota statewide survey, 75% of 4-H'ers said “because of 4-H, I am comfortable being a leader.” In the same survey, nine out of ten youth said 4-H inspired them to volunteer in their communities. Investing in our youth by providing opportunities and experiences where life skills are cultivated and sharpened is essential to address as we continue to build our future leaders and capitalize on the talent of our youth. In an effort to fight childhood obesity and other health and wellness related issues, it is important to provide opportunities for youth to learn and

develop healthy behaviors. Diversity, equity and access are critical to the success of all youth to maximize a sense of belonging and connection to a community. Making a priority to reach underserved youth populations is critical as the population of new Americans increase across the state.

Science Emphasis Area

Education and Multicultural Alliances, Youth Development

Agriculture Economics

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

North Dakota is an agricultural state. As such, weather conditions, unstable markets and fluctuating farm policy have created an uncertain future for many of our citizens. Since 2002, we have lost over 15% of our farmers and ranchers. There is a critical need for our producers to understand farm policy to determine how best to invest their resources; marketing products; and using risk management tools to be profitable and stay in business.

Science Emphasis Area

Agroclimate Science, Bioeconomy, Bioenergy, and Bioproducts, Environmental Systems, Sustainable Agricultural Production Systems, Youth Development

Community Vitality

Initiated on: Jan 01, 2021
State: North Dakota

Term Length: Long-term (>5 years)

North Dakota is a rural state with a population density of 11.3 people per square mile and out of 53 counties, 39 are classified as completely rural. However, over the past several years the state has started to see a shift in the population moving to more urban parts of the state. Rural communities are trying to find ways to recruit and retain a skilled workforce. North Dakotans have also been concerned with the shortage of leaders in communities and organizations across North Dakota, especially in rural areas. Over 8,300 volunteer organizations need leaders in North Dakota at the local, regional and state levels.

Science Emphasis Area

Education and Multicultural Alliances, Sustainable Agricultural Production Systems

Cropping Systems

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

Crop production accounts for approximately $6.5 to $8 billion cash receipts annually in North Dakota. The state leads the nation in the production of 12-16 crop categories annually, including spring wheat, durum, flaxseed and canola. Managing crop pests and diseases; sustaining and improving soil health,

fertility, and soil physical and chemical properties; and improving crop productivity are critical for profitable crop production in North Dakota.

Science Emphasis Area

Agroclimate Science, Environmental Systems, Sustainable Agricultural Production Systems

Human Development and Education

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

North Dakota faces a number of health-related and caregiving challenges. In 2018, North Dakota joined for the first time the states with an obesity rate of 35% and higher. In addition, 71% of adults in North Dakota were obese or overweight (3rd highest percentage rate in the nation). Approximately 198,000 North Dakotans have prediabetes, which puts them at risk for developing type 2 diabetes, stroke and heart disease.

Finding qualified caregivers for both children and the aging populations in North Dakota is challenging. Approximately 80% of adults (16-64) currently work. For those with children and aging family members, this can cause some difficulties. While the vast majority of older North Dakotans want to stay living in their home as they age, some communities may not have the resources or services needed to accommodate them.

Science Emphasis Area

Family & Consumer Sciences, Food Safety, Human Nutrition

Livestock Systems

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

Livestock production in North Dakota accounts for $1.5 to $2.0 billion in gross revenue annually, and there is ample opportunity for growth. North Dakota lags its neighboring states in livestock production. The health of livestock is imperative to the state's economy. North Dakota State University (AES and Extension) serves as a key technical resource that helps protect the health of North Dakotans and their livestock by enhancing the monitoring and surveillance of zoonotic diseases common to animals and people. The high cost of feed impacts profitability and in beef production, may account for up to 60% of production costs. Livestock producers need to know how to design cost efficient and effective nutritional programs that will result in high quality livestock products for profitable operations.

Science Emphasis Area

Environmental Systems, Food Safety, Human Nutrition, Sustainable Agricultural Production Systems

Natural Resources

Initiated on: Nov 26, 2019
State: North Dakota

Term Length: Long-term (>5 years)

North Dakota is home to the prairie pothole region, a vast network of lakes, streams, potholes and other water resources that are important in water management, grazing management, maintenance of wildlife habitat and recreational activities. North Dakota is also the second largest producer of oil and a large producer of lignite coal. Land adversely impacted by oil production needs to be remediated and reclaimed for wildlife and other productive uses. North Dakota experienced severe drought over the past several years that adversely impacted rangelands, pastures, water availability and water quality. Impacted land and water need to be effectively managed to sustain wildlife, endangered species, and the livestock industry.

Science Emphasis Area

Agroclimate Science, Environmental Systems, Sustainable Agricultural Production Systems