

North Dakota State University Main Campus Combined Research and Extension Plan of Work 2022-2026

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I. Plan Overview

1. Executive Summary

Agriculture continues to be the dominant force in North Dakota's economy even though North Dakota has become the second largest oil producing state in the nation. 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. 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 and accounts for approximately 30 percent of total business activity in the state. According to the USDA Economic Research Service, in 2014 ND had crop and livestock cash receipts of \$8.6B. Crop production accounted for nearly 81 percent of total farm marketing with the remainder livestock, primarily beef cattle. The total business activity attributed to agriculture in North Dakota is approximately \$34.4B. North Dakota leads the nation in the production of 12-16 crop categories annually, including the production of honey.

The combined NDAES and NDSUE plan of work will focus on six program areas: cropping systems; natural resources; livestock systems, economic and community vitality; 4-H youth development; and health and human development education.

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 will provide for an enhancement of the quality of life, sustainability of production, and protection of the environment. In particular, plant breeding efforts will continue to develop high yielding cultivars and animal science research will improve the nutritional and reproductive efficiencies for increased global food security. Expanded research will continue on soil salinity and other water and soil management issues in a response to recent increased precipitation associated with climate variability. Research will continue on the economics of alternative bio and sustainable energy sources and research on feedstock processing will contribute to developing sustainable energy technologies. Applied research on the adoption of nutritional practices will benefit national goals of reducing obesity.

The mission of NDSUE is to create learning partnerships that help adults and youth enhance their lives and communities. The NDSUE educational programs will contribute by improving crop productivity and adapting new crops; adapting cropping systems, responding to evolving pest issues, and 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 programs will also continue to focus on state identified needs in the areas of agricultural and natural resources; 4H youth development; family and consumer sciences; and community, leadership and economic development. Within these program areas, emerging areas of concern include animal welfare, response to natural disasters, transitional plans for farms and rural businesses, and rural business development and entrepreneurship.

2. FTE Estimates

Year	1862 Extension	1862 Research
2022	145.0	95.0
2023	145.0	95.0
2024	145.0	95.0
2025	145.0	95.0
2026	145.0	95.0

II. Merit / Peer Review Process

Merit/Peer Review

Research programs were subjected to four different types of scientific peer review. These reviews occur prior to, during and at the conclusion of each research project. First, research faculty who participate in multistate research projects receive a critical review of their contributing project from fellow committee members, the administrative adviser and the North Central Multi-State Research Committee. Second, most faculty augment their multistate research funding with competitive grants. These grants are awarded on the basis of scientific merit and afford an opportunity for external peer review. Third, each research faculty member with the NDAES is required to have a station project that is reviewed for scientific merit by a Project Review Committee that is comprised of one faculty member from each discipline. Finally, all research is peer reviewed, either internally or externally, prior to publication.

Extension program leaders in agriculture and natural resources, family and consumer science, 4-H and youth development, and community resource development from the North Central Region meet twice a year to evaluate program needs and develop plans of work for the whole region. Ongoing efforts are made to update North Central regional logic models and develop and collect multi-state impact indicators. State Extension specialists frequently submit grant proposals to regional and federal agencies and commodity groups to fund applied-research and Extension program activities. These proposals are externally reviewed prior to selection for funding. Extension bulletins are internally peer reviewed prior to publication.

III. Stakeholder Input

1. Actions to Seek

Actions taken to seek stakeholder input that encouraged their participation:

- 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
- Other (Input from State Board of Agricultural Research and Education)

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,

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 make adjustments to the plan based on crisis situations that may develop in the state, e.g. drought, flood, insect infestations, plant diseases, high-risk issues of youth, bioenergy economics, animal welfare issues. 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 and design is developed to address the issue using a variety of delivery methods. Of special note, an external review of NDSU Extension was conducted in 2017 at the request of the SBARE and the ND legislature.

2. Methods to Identify

Method to identify individuals and groups:

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use 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 evaluating 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 needs.

In 1992, the North Dakota Department of Human Services and NDSU Extension were legislated by the North Dakota state legislature to form a statewide Family Life Education Committee. The committee is composed of state legislators, an Extension specialist, an Extension Human Development Agent, citizens with a parenting self-interest, two administrators from the Child Division of the State Department of Human Services and the Extension Assistant Director, Nutrition, Youth and Family Science. As a result of this partnership, the state Department of Human Services provides funding opportunities to six state family life education centers through a request for proposal process. The availability of designated funds also directs the focus of the parenting education programs provided through the six family life education center coordinators. The six family life education coordinators provide evaluation feedback to the Family Life Education Committee of the state Department of Human Services on program impacts. These impacts are then shared with state legislators.

The ND Department of Health, under the direction of the Governor of North Dakota, formed an alliance of organizations in ND that provide significant support and leadership for health-related initiatives. NDSU Extension is represented on this coalition. Networking among these professionals is invaluable, in addition to the legislative work.

3. Methods to Collect

Methods for collecting Stakeholder Input:

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals

The process of collecting stakeholder input was previously described under 'Methods to Identify Stakeholders'.

4. How Considered

How the input will be considered:

In the Budget Process
To Identify Emerging Issues
Redirect Extension Programs
Redirect Research Programs
In the Staff Hiring Process
In the Action Plans
To Set Priorities

The State Board for Agricultural Research and Education (SBARE) is charged with developing ongoing strategies for the dissemination of research information through NDSU Extension; annually evaluating the results of research and Extension activities, recommending faculty and support positions and areas for program expenditures; and reporting the findings to the North Dakota Legislative Council and the State Board of Higher Education. Their findings directly affect the research and Extension budgeting process. The SBARE priority research and Extension needs can be found at: <http://www.ag.ndsu.edu/sbare/>. Commodity councils and research-education boards guide research and Extension program priorities and activities through their call for proposals, proposal review sessions, and grant funding. 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.

SBARE conducted a comprehensive review of NDSU Extension, which included 30 recommendations to endorse existing practices or for improvements. NDSU Extension received the input and has begun to implement changes in response to the review. The review and progress in response can be found at <https://www.ag.ndsu.edu/sbare/ndsu-extension-service-comprehensive-review> .

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.

The statewide Family Life Education Committee, composed of state legislators, an Extension specialist, an Extension Human Development Agent, citizens with a parenting self-interest, two administrators from the Child Division of the State Department of Human Services and the Extension Assistant Director, Nutrition, Youth and Family Science determine the availability of designated funds which direct the focus of the parenting education programs provided through the six family life education center coordinators. The six family life education coordinators provide evaluation feedback to the Family Life Education Committee of the state Department of Human Services on program impacts. These impacts are then shared with state legislators which in turn affect budgeting.

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

IV. Critical Issues

1 Cropping Systems

Description:

Crop production accounts for approximately 75-80% of total farm marketing in North Dakota the state leads the nation in the production of 12-16 crop categories annually, including the production of honey. Three most critical areas have been identified:

Increasing salinity and sodicity awareness from environmental and economic perspectives
Raising awareness of soybean cyst nematode (SCN) and implementing a monitoring and surveillance system, developing exclusion principles, and developing resistant varieties
Create awareness of weeds in row crops, pastures and range, gardens and non-cropped areas, promote scouting activities and teaching weed identification and control measures

Term: Long

Science Emphasis Areas

Agroclimate Science
Environmental Systems
Sustainable Agricultural Production Systems

2 Natural Resources

Description:

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. Critical Issues identified for are:

Peoples understanding of the Endangered Species Policy and Management Act (ESA) and the species protected by the act in ND.
Land reclamation and remediation
Grazing management

Term: Long

Science Emphasis Areas

Agroclimate Science
Environmental Systems
Sustainable Agricultural Production Systems

3 Livestock Systems

Description:

Livestock in North Dakota usually account for 15-17% of total agriculture receipts. The production of beef calves up to weaning weight accounts for the majority of these receipts. Swine, sheep and dairy are also raised, but dairy is steadily declining. Critical issues include:

Proper use of antimicrobials in food producing animals
Manure and nutrient management
Improving meat quality and value

Term: Long

Science Emphasis Areas

Environmental Systems

4 Agriculture Economics

Description:

North Dakota is an agricultural state. As such, weather conditions, unstable markets and fluctuating farm policy has created a very uncertain future for many of our citizens. Critical issues include:

Managing yourself on the farm and ranch
Supporting farm/ranch business owners and successors
Understanding farm policy
Research and development risk management tools to enhance economic sustainability

Term: Long

Science Emphasis Areas

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

5 4-H, Youth Development

Description:

Youth report that it is more and more challenging for them to become involved in their communities or become effective leaders, especially within our Native American communities. Critical issues include:

Adulting
Financial fundamentals
Health boundaries
Develop youth leaders
Childhood obesity
Science, Technology, Engineering, Math

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances
Youth Development

6 Human Development and Education

Description:

North Dakota has a number of health related to mental health and stress, an aging population and chronic diseases related to cultural norms and a sedentary lifestyle. Critical issues include:

Chronic Disease Prevention
Caregiving
Health Aging

Mental Health, Individual and Societal

Term: Long

Science Emphasis Areas

Family & Consumer Sciences

Food Safety

Human Nutrition

7 Community Vitality

Description:

North Dakotans have been concerned with the shortage of leaders in communities and organization across North Dakota, especially in rural areas. Over 8,300 volunteer organizations need leaders in North Dakota at the local, regional and state levels. Critical issues include:

Developing local leaders within a community

Developing state leaders and their network across the state

Entrepreneurship

Term: Long

Science Emphasis Areas

Education and Multicultural Alliances

Sustainable Agricultural Production Systems