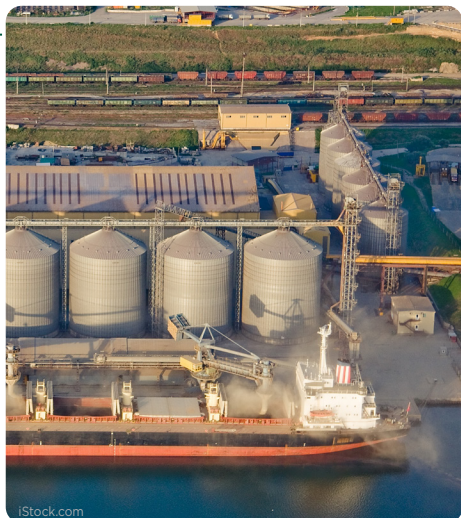


# SBARE Priorities for the North Dakota Agricultural Experiment Station

Final Ranking by SBARE - February 21, 2024

**NDSU** NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION



## 1 Center for Agricultural Policy and Trade Studies (CAPTS)

Research into the effects of national and international policies and trade on North Dakota's agriculture is needed. Export markets for agricultural products have become increasingly more complex, resulting in increasing levels of risk for farmers and agribusinesses in the state. North Dakota's economy, heavily dependent on agriculture and trade, faces vulnerabilities due to tensions in international relations and trade dynamics, impacting food security and global trade patterns. The prosperity of North Dakota's agricultural sector is intricately linked to the success of its farmers, ranchers and agribusinesses. Unique challenges confront the state, including the fact that its location requires rail transport to export markets. Research is crucial to comprehend the repercussions of changes in agricultural policies and global market trends on North Dakota's agricultural community.

**Request:** Three FTEs total. Positions include agricultural policy analyst, market and trade analyst, and economic impact/contributions specialist. \$150,000 in operating.

**Total:** \$975,000

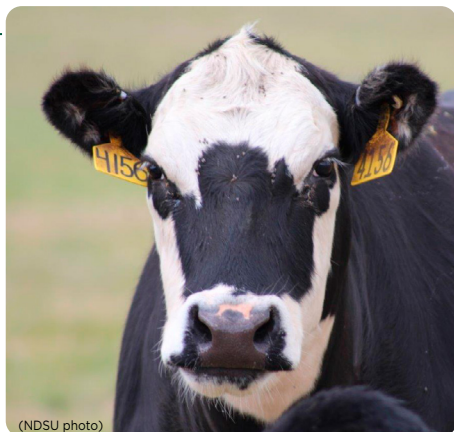


## 2 Digital Transformation of Agriculture

Digital agriculture, precision farming and ranching, and related technologies are advancing rapidly, driven by breakthroughs in artificial intelligence (AI) and machine learning (ML). NDAES scientists are leveraging these technologies to transform food production. Investing in new technologies, staff and infrastructure will equip scientists with the necessary resources to accelerate research in sensor technology, plant breeding, precision livestock farming and other digital initiatives. This effort is key to enhancing global food security through innovations in North Dakota agriculture. Such funding is crucial for improving infrastructure and capabilities in agricultural data analysis and precision agriculture.

**Request:** Six FTEs total. Positions include in prioritized order: 1. AI/ML engineer, 2. Database architect, 3. Data manager, 4. Data scientist, 5. GIS specialist, and 6. Unmanned Aircraft Systems (UAS) chief pilot. Operating request of \$904,000 for software subscriptions for cloud server access, network servers, high-speed computers for AI computations, data archiving, storage architecture specialized for AI and ML, and software licenses.

**Total:** \$2,634,000



## 3 Livestock: Animal Health

North Dakota faces a significant risk of having no veterinary toxicologist available. To address this critical need, a position is requested to fund a toxicology resident. A toxicologist plays a vital role in supporting the state's livestock industry by developing assays for the detection of mycotoxins, ergot, blister beetle toxin, bromethalin in feed and other challenges that affect the industry.

**Request:** One FTE total. Veterinary toxicology resident to support critical needs in the Veterinary Diagnostic Laboratory. \$50,000 in operating.

**Total:** \$325,000

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## 4 Operating, Equipment and Graduate Research Assistantships

Enhanced operating budgets are essential for sustaining growth and achieving ongoing success. The operational costs associated with the NDAES research mission have escalated. Expenses for fuel, equipment maintenance, repairs, feed, fertilizer and more limits the ability of scientists to be responsive to critical research needs. Additionally, operating funds are crucial for fostering the early career development of scientists, enabling them to acquire necessary start-up equipment and supplies, and to support graduate student salaries. Sufficient start-up and operating funds are vital for establishing successful research programs.

Modern research equipment is essential for conducting accurate experiments and advancing new methods to improve North Dakota's livestock and cropping systems. Funding is requested to ensure laboratories and agricultural field operations are equipped with modern equipment needed to generate world-class results.

Graduate research assistants play an indispensable role in the successful completion of every NDAES agricultural research project. They are deeply involved in conducting experiments, analyzing data and applying research findings to solve real-world agricultural problems. Graduate students also share their advancements to the wider community by the dissemination of research through publications and presentations. Additionally, their research prepares them as the next generation of leaders, equipped with the knowledge and skills needed to address challenges facing North Dakota agriculture. This initiative requests an increase in the number of assistantships to support the research activities by attracting talent to NDSU.

**Request:** Equipment and graduate research assistantships funding. \$1,190,000 in operating (\$560,000 for 7 branch stations + \$630,000 for main station units)

**Total:** \$3,090,000

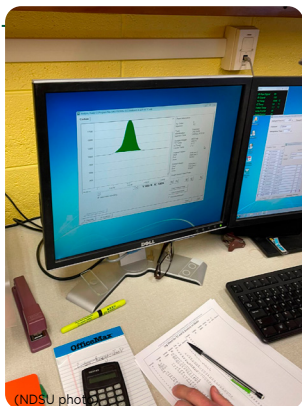


## 5 Biofuels and Carbon Management

As a consequence of national and international agricultural customer base, North Dakota farmers can achieve economic gains through the adoption of carbon and climate-smart farming strategies. This is key to reduce carbon intensity scores to more effectively participate in markets for renewable fuels. There is a significant need for research to develop advanced farming techniques tailored to North Dakota's unique agricultural conditions. This research will focus on practices such as crop rotation, cover cropping and efficient nutrient management aimed to both reduce carbon intensity and enhance the production of biofuel feedstocks. This supports efforts in improving sustainability and profitability in farmers' operations.

**Request:** Two FTEs total. Positions include scientist and research specialist. \$200,000 in operating.

**Total:** \$525,000



## 6 Research Specialists

Technical support staff are critical in assisting agricultural scientists to achieve their research goals. They provide essential expertise in the operation and maintenance of sophisticated laboratory and field equipment that ensures experiments are conducted efficiently and accurately. Staff contribute to the collection and analysis of data, which is fundamental for validating research findings and advancing scientific knowledge in agriculture. By providing logistical and administrative support, they enable scientists to focus on their core research activities, thereby accelerating the progress and impact of agricultural research.

**Request:** Five FTEs total. Positions include technical support in needed areas: grapes/vineyards, agronomy, plant pathology, soybean breeding and biosystems engineering.

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

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