SBARE Priorities for the
North Dakota Agricultural Experiment Station

April 8, 2020

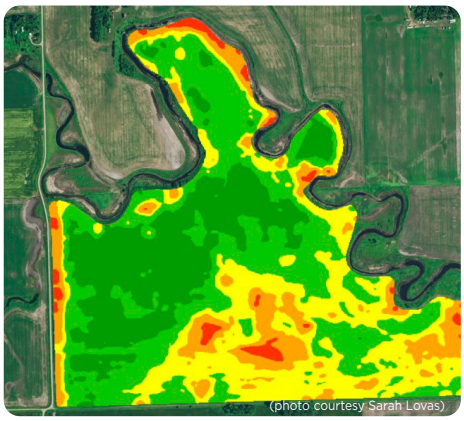
NDSU NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

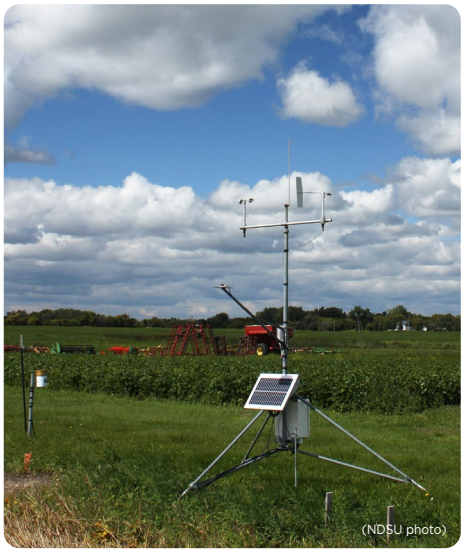
CRITICAL PRIORITY
Request for restoration of general fund reductions:

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

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


(NDSU photo)


(photo courtesy Sarah Lovas)


(NDSU photo)

1 Big Data Initiative

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

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

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

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

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

Total: $1,660,000

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2. Plant Initiative

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

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

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

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

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

Total: $1,580,000

3. Operating Support

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

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

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

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

Total: $1,560,000

4. Farm/Ranch Management

Today's operating climate is much more complex and specialized than even a decade ago. Farmers and ranchers routinely make million-dollar decisions related to financial aspects of their operations with input purchases, grain or livestock marketing and equipment or capital financing operations. Additional expertise in farm and ranch management, especially as it relates to risk management and agricultural finance, are key to enhancing the long-term economic sustainability of farming and ranching in the state.

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

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

Total: $520,000

5. Agricultural Land Reclamation

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

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

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

6. Livestock

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

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

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

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