NDSU NORTH DAKOTA AGRICULTURAL EXPERIMENT STATION

2017-19 Program Initiatives as Ranked by SBARE

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
- 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

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

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