

2021-2023 Capital Improvement and One-time Request Update North Dakota Agricultural Experiment Station

AES Equipment Storage Sheds

Purchasing and/or leasing expensive field equipment is an investment that the AES needs to protect. Storing expensive research plot equipment such as tractors, seeders and combines outdoors reduces the life of the equipment and can compromise the sophisticated electronics typically used on such equipment.

21-23 Request: 8 (\$300,000 per shed)

21-23 Funding Received: \$300,000 for Hettinger REC (Regular session – SIIF)

Funds Expended through 12/31/22: \$294,310

Current Status: Hettinger REC storage shed is complete. The size of the shed was decreased from the original planned size to stay within budget.

23-25 Additional Funding Request: \$3,325,000 (\$475,000 per shed)

Central Grasslands Pasture Working Facilities

The Central Grasslands REC currently has damaged, small pens with no alleyways, working pen, or catwalks which are unsafe for livestock and people. Two working facility will be built, one in Barker's Unit and one in Wagon Wheel. These facilities will include holding pens, working facilities, bud box, cat walks, and alleyways to create safe working areas to work cattle, collect livestock data, breeding, and doctor cattle while on grazing research studies.

21-23 Request: \$200,000

21-23 Funding Received: \$200,000 (Regular session – SIIF)

Funds Expended through 12/31/22: \$66,065

Current Status: One of the two pasture facilities is complete. The second pasture facility is approximately 50% complete. Completion is scheduled for May 2023.

Langdon REC Greenhouse

The Langdon REC identifies a need to develop greenhouse space for its plant pathology effort. Greenhouse space would allow for year-round testing of disease issues for crops grown in the region and provide an area for testing chemical control methods.

Because the climatic conditions in North Dakota allow only one crop a year, many researchers must limit their research projects to a certain number a year. If our facility gets a greenhouse, we can accomplish more than what we are doing now. Now, plant pathology greenhouse projects are directed to the main campus in Fargo as we do not have a greenhouse at our center.

Greenhouses accommodate many types of plant research and provide flexible environments to accommodate the growing needs for plant research in a shorter time. We currently have diverse types of research projects that need a greenhouse, such as:

- Isolated environments. For example, clubfoot of canola research first must be conducted in a greenhouse rather than in field conditions where the odds of spreading the disease are higher.
- Ambient conditions to replicate outdoor conditions for control and integrated pest management experiments dealing with local rare and newly introduced diseases and pests.
- Bioassays for crop-specific nematode detection, such as soybean cyst nematode.
- Bioassays for the determination of herbicide resistance.
- Fungicide efficacy tests for quick results. Instead of waiting for next summer, research can be done in winter and conveyed to the research community and growers, for example, fungicides to manage chocolate brown spot of Faba beans as no fungicides are registered so far in ND.

21-23 Request: \$473,000

21-23 Funding Received: \$473,000 (Regular session – SIIF)

Funds Expended through 12/31/22: \$25,729

Current Status: One bid was received for \$724,430 in June 2022. Architect has suggested to rebid the project in spring 2023.

23-25 Additional Funding Requested: \$251,430

Central Grasslands REC Livestock Facility

The CGREC livestock facilities are in dire need of replacement. The existing space used as a support lab is small and inadequate to handle, prepare, and test blood and tissue samples, particularly as the research portfolio at this center has increased recently. This proposed facility would complement the research activities that will be carried out in the new Agronomy laboratory, thereby enhancing the two major research foci of this Center. Livestock holding pens and sheds also are inadequate to address the research and outreach needs for the Coteau region of the state. Specifically, the development of replicated dry lot research pens would allow scientists to answer a broader range of questions relating to beef cow and calf management; a feed handling facility would improve the Center's ability to ensure diet accuracy and improve overall feed management; and a nutrient management/wastewater containment system is lacking and is needed to address possible health and pollution issues.

21-23 Request: \$1,963,000

21-23 Funding Received: \$1,963,000 (Special session – ARPA)

Funds Expended through 12/31/22: \$79,440

Current Status: Bid opening was held on 12/22/22. Several bids were received. Bids were not accepted as there were not adequate funds to complete the project.

23-25 Additional Funding Request: \$400,000

Hettinger REC Sheep Feed Efficiency Research Facility

Traditionally, high grain prices and volatile commodity prices have raised interest and emphasis on increasing the efficiency of sheep production during all phases of production (rams, ewes and feedlot performance). No facility exists in the northern Great Plains to evaluate feed efficiency in sheep production, but the HREC is well situated and established in the sheep industry to expand its research capabilities through a new facility that can monitor individual animal intake in a pen setting. Research would evaluate genetic potential of breeding stock (rams and ewes) that measures feed intake in relation to performance, as well as feedlot research to complement and provide additional replication to the large-scale trials conducted at the Southwest Feeders Feedlot at the HREC.

21-23 Request: \$1,891,000

21-23 Funding Received: \$1,891,000 (Special session – ARPA)

Funds Expended through 12/31/22: \$75,594

Current Status: Bid opening was held 1/5/23. Bid was accepted.

23-25 No additional funding requested

Carrington REC Feedlot Research Support Facility

Construction of a multi-use Feedlot Research Support Facility at the livestock unit would improve feedlot research operational capability, assist in sustaining Institutional Animal Care and Use Committee (IACUC) compliance, attain worker protection standards and reduce maintenance costs for equipment. The CREC has a critical need for a facility at the livestock unit that would combine a dispensary for processing and storing pharmaceuticals and animal health supplies; laboratory space for feeds, blood, fecal and tissue processing; inside tempered storage for daily use feeding equipment; and a shop area for tools, equipment, and equipment maintenance and minor repairs. This facility has been a longtime priority project for the CREC. The CREC livestock program is the primary outstate program for beef feedlot research and evaluation of feeds and feedstuffs for beef production.

21-23 Request: \$450,000

21-23 Funding Received: \$450,000 (Regular session – SIFF)

Funds Expended through 12/31/22: \$30,010

Current Status: Bid opening in July 2022 resulted in one electrical bid and no general contractor bids. Project was re-advertised and bids opened in September 2022 resulting in one general contractor bid for \$1,090,000. This bid was not accepted.

23-25 Additional Funding Request: \$640,000

Hettinger REC Livestock Processing and Research Support Facility

The HREC Southwest Feeders Feedlot cattle and sheep feedlot (24 pens with a capacity of 192 calves or 960 lambs) has provided significant research and outreach to support the livestock industry in the state and region. Feedlot research results are annually published in refereed journals, the ND Beef Cattle Research Report, and the ND Sheep Research Report, in addition to being the centerpiece for research-related livestock outreach efforts at the HREC. The current feedlot has a small (512 square foot) facility that does not support current research or outreach activities. The facility does not provide a secure area to store and administer veterinary supplies, an area for sorting animals into treatments and pens, an area to hold animals indoors for observation and sample collection or office space for the herdsman and has no restroom facilities. A multi-species processing and research support facility would greatly enhance the livestock research conducted at the HREC and expand AES research capabilities in beef cattle and lamb feedlot nutrition and management.

21-23 Request: \$1,529,000

21-23 Funding Received: \$1,529,000 (Special session – ARPA)

Funds Expended through 12/31/22: \$61,308

Current Status: Bid opening was held 1/12/2022. Bids are currently under review.

23-25 No additional funding requested

Dickinson REC Agricultural Lab and Shop Facility

The current facilities lack adequate heating and cooling and have inadequate dust collection systems necessary for the safety of the employees at the REC. The current shop facility is not large enough to allow repair of modern agricultural research equipment.

21-23 Request: \$2,200,000

21-23 Funding Received: \$2,200,000 (Special session – ARPA)

Funds Expended through 12/31/22: \$71,914

Current Status: Bid opening was held 1/18/23. Bids are currently under review.

23-25 No additional funding requested

Carrington REC Feedlot Pen Expansion with Waste Containment

Meeting the expanding demands for feedlot research is partially limited by available pens. Current pens are fully utilized. The CREC is continually challenged to do more livestock nutrition research; however, feedlot pen availability is a clear limitation. The addition of a minimum of 12 pens that would hold up to 240 head of cattle would allow the CREC to conduct at least one additional experiment per feed-out period. Further, the additional pens will allow more treatments and replications within other feedlot studies, which would improve statistical confidence and precision. Any feedlot pen expansion must include the associated waste containment facilities to remain compliant with state law. The CREC livestock program is the primary outstate program with the mission for beef feedlot research and evaluation of feeds and feedstuffs for beef production. Beyond the ability to conduct additional experiments or evaluate more treatments with greater replication, the additional feedlot pens would be developed to expand the depth and speed of the ability to evaluate other factors that impact feeding livestock in North Dakota. These factors include minimizing animal stress, mitigating winter stress, managing influences on environmental concerns, beef animal efficiency and other issues that ultimately impact the viability of beef cattle production and feeding in the state.

21-23 Request: \$325,000

21-23 Funding Received: \$325,000 (Regular session – SIIF)

Funds Expended through 12/31/22: \$4,000

Current Status: One bid of \$295,000 was received for the concrete portion of the pen expansion. The bid did not include the needed water and electrical work, feedlot penning and supplies which will be purchased separately.

Estimated cost is \$420,000

23-25 Additional Funding Request: \$95,000

Carrington REC Covered Feeding (Hoop barn or Mono-slope)

The expansion of feedlot pens would be implemented in a manner that is conducive to future construction of a covered facility either in the form of a hoop barn or mono-slope. This would allow research to evaluate mitigation of winter and summer extremes on animal performance when compared to open lot production. Covered pens also will provide research data on changes to the waste and environmental issues that often challenge the livestock industry.

21-23 Request: \$129,600

21-23 Funding received: \$129,600 (Special session – ARPA)

Funds Expended through 12/31/22: \$0

Current Status: This project is contingent on completion of the feedlot pen expansion. Mono-slope structure would better protect the smart feeders from the elements. Estimated cost for this project is \$594,000.

23-25 Additional Funding Request: \$464,400

Carrington REC Bulk Feed Commodity Storage Structure

A major program research responsibility of the CREC is to conduct research that evaluates how North Dakota-derived feedstuffs may be most appropriately utilized in livestock feeding rations with focus on beef production. The research program utilizes many different types of feedstuffs including those that must be stored in bulk. Presently, feedstuffs such as distiller's grains, soybean hulls, ground hay/straw, etc. are stored outside on the ground, which exposes the products to the weather elements, soil contamination and mixture with adjacent products. Animal nutrition research is compromised when the feed products become degraded or contaminated. This addition will enable the research program to expand the variety and number of commodities utilized in feeding studies, improve precision of mixed rations and reduce feed product waste, lowering costs to both the CREC and producers who consign cattle to the studies.

21-23 Request: \$102,600

21-23 Funding Received: \$102,600 (Special session – ARPA)

Funds Expended through 12/31/22: \$2,800

Current Status: Project was put out for bid in June 2022 and was extended into August 2022 with no bids submitted. Project was reassessed and revised cost estimate is \$260,000.

23-25 Additional Funding Request: \$157,400

Carrington REC Smart Feed Technology System

These systems allow for more intensive data collection and individual animal application of treatment rations. Feed intake is one of the main drivers of livestock performance. By increasing the abilities of CREC and collaborating researchers to more accurately measure intake and expand the depth of treatments applied within studies, more detailed information can be provided to area producers. Smart feed systems would increase opportunities to study issues to a greater scope and depth, thereby increasing competitiveness for grant funds to support the broader research program.

21-23 Request: \$213,800

21-23 Funding received: \$213,800 (Special session – ARPA)

Funds Expended through 12/31/22: \$0

Current Status: Installation of this equipment is contingent on completion of the other feedlot projects at the Carrington REC. Since those projects could not be completed, equipment purchase is on hold.

23-25 No additional funding requested

Central Grasslands REC Housing

The current director is living in the house that should be for the center herdsman. A new house will need to be built to provide housing for personnel who need to be on site for day-to-day operations. Construction of a new residence would offset the substantial costs associated with repair to the existing residence.

21-23 Request: \$325,000

21-23 Funding Received: \$325,000 (Regular session – SIF)

Current Status: Project was bid in August 2022 with no bids submitted.

23-25 Additional Funding Request: \$175,000 special funds authorization

Williston REC Greenhouse

A greenhouse is needed for the WREC plant pathology, weed science, agronomy, and horticulture programs to allow for conducting plant disease, weed, agronomic, and horticulture research during the winter months and to provide consistent growing conditions to replicate different environmental challenges.

19-21 Request: \$500,000 special funds authorization

19-21 Funding Received: \$500,000 special funds authorization

Funds Expended through 12/31/22: \$0

Current Status: Special fund authorization in the amount of \$500,000 was authorized by the 67th North Dakota legislative assembly, and \$500,000 has been raised. Unfortunately, the current bidding environment indicates that \$500,000 is no longer enough authorization for the construction of a new greenhouse. Estimated cost is now \$1,250,000.

23-25 Additional Funding Request: \$750,000 special funds authorization

