

Central Grasslands Research Extension Center



'Specializing in grassland ecology and rangeland management research.'

Research Focus - in brief

- Grassland ecosystem research in a region of deep glacial till deposits.
- Evaluation of changes in rangeland ecosystems due to changes in management and climate.
- Impact of grazing intensity on native range species composition, soils, economics, hydrology and livestock performance.
- Distribution of research information to producers, agribusiness, educators and government resource personnel.

Director: Paul Nyren

Email: grasland@ndsuet.nodak.edu

Web: <http://www.ag.ndsu.nodak.edu/streeter/>

Tel: (701) 424 3606
Fax: (701) 424 3616
4824 48th Ave SE
Streeter, ND 58483

The Central Grasslands Research Extension Center (CGREC) conducts research on grassland ecosystems as they relate to livestock production systems in the Coteau region of North Dakota.

The Coteau is an area of glacial stagnation and has the unique character of rocky soils and scattered potholes. While many areas have been converted to cropland, much of this area is best suited for the production of grass. These rangeland pastures are an important resource for North Dakota livestock producers. The Center's research focuses on improved management of the grasslands and improved lifestyle for the people living in this area.

Location

The CGREC is located in Stutsman and Kidder Counties near Streeter, North Dakota. It lies on the east shore of Lake George, 9.5 miles south of Crystal Springs.

Operations

CGREC operates on 5,300 acres consisting of approximately 3,800 acres of native mixed grass prairie and 1,500 acres of cultivated annual and perennial forages and crops.

Advisory Board

An advisory board of 12 livestock producers and community leaders from the Coteau area provides valuable guidance. The CGREC also work closely with ND Stockmen's Association and the ND Chapter of the Society for Range Management.

Mission and Goals

- To increase range-carrying capacity, yet conserve and preserve it for generations to follow. Includes fertilization, weed control and management of native and tame grasses to allow full season use and maximum utilization of the land resource.
- To stabilize grass production and discover how best to compensate for the vagaries of the weather and precipitation as it influences forage production in a dryland agriculture.
- To identify the impact of disease problems in different management systems.
- To explore increase use of crop residues and by-products for the maintenance of the cow herd.
- To demonstrate management techniques and to advise operators of results obtained.

Rangeland Ecology Research

The grazing intensity trial, which has been conducted since 1988, will continue to be our main range ecological research trial. This study has laid the ground work for numerous studies on range and soils. It has provided valuable data on species composition changes, forage production, and soil water changes under various levels of grazing. This data forms the baseline for other studies that will assist scientists in explaining the changes in the plant-soil complex ecosystem under various levels of grazing. Several new studies are superimposed on this research including: research on carbon cycling, runoff and erosion, range fertilization, effects of drought, and gas exchange and photosynthesis.

Livestock Research

The CGREC will continue studying the effect of various management systems on the performance of livestock. The center maintains a high quality commercial livestock herd that is utilized on various grassland management studies.

Visiting Scholar Program

The CGREC has signed a visiting scholar's agreement with the Chinese Academy of Science-Institute of Botany and the Inner Mongolia Grasslands Ecosystem Research Station. This program is scheduled to start in June 2004. The CGREC is seeking additional institutions with which to form cooperative research agreements.

Coteau Region is "Red River Valley" of livestock production

The Central Grasslands Research Extension Center (CGREC) was established in 1977 by the passage of HB1528. The legislated mandate in HB1528 was "*....to fulfill those research needs which cannot be accomplished at any presently existing experimental facility, because of peculiar types of grasses, soils, precipitation, and climate, there is hereby established a centrally located North Dakota Grasslands Research Station within an area bounded by the Missouri River on the west and the James River on the east*".

This area, known as the Coteau area of North Dakota, extends from Divide and Burke counties in north western North Dakota in a southeasterly direction through Dickey County. This area contains 5 million acres (44%) of the state's rangeland where 42% of the state's cattle is raised on 38% of the state's farms.

Significance of Grassland Research to North Dakota

- Livestock is the second largest Ag Industry in the state and 42% of the state's cattle are raised in the Coteau area. Long-term research at the CGREC has shown that seeding marginal-highly erodible land to grass and grazing it with beef cattle can return an average profit of \$53.85 per acre versus \$7.81 per acre for the same type of land producing a small grain crop.
- Grasslands of the Great Plains region are important to the economic well being of the livestock industry of the Midwest. There are 13 million acres of **rangeland** in the state of North Dakota. Long term research evaluating grazing systems shows that 1.5 to 2.0 acres of good to excellent condition rangeland in North Dakota are needed to adequately maintain a cow and her calf for one month (one animal unit month (AUM)). Thirteen million acres of **rangelands** equate to approximately 6.5 million animal unit months (AUMs) of grazing in the state per year at an average conservative cost of \$182 per AUM. This translates to more than \$1 billion that is spent annually in communities and businesses throughout the state.

Research tailored to meet the area's needs

- There is an increasing interest in carbon sequestering on native mixed grass prairies in the Northern Great Plains. Future studies at the CGREC will address ecosystem carbon dynamics, including canopy photosynthesis and soil respiration and its relation to grassland health. Studies are planned to evaluate nitrogen uptake potential of dominant cool and warm season grasses.
- The CGREC is evaluating ways to decrease labor inputs on livestock enterprises. A major deterrent to the livestock industry is the large amount of labor required. As the majority of livestock in North Dakota are raised in small herds, many operators have employment off the farm and do not have much time to tend to livestock. A study to evaluate low labor finishing of beef steers has shown that self feeders can be used to decrease the daily labor input for finishing cattle.
- Cooperative studies with the Natural Resources Conservation Service - Plant Materials Center in Bismarck are evaluating new grass varieties under grazing.
- A cooperative study with the Agricultural Research Service at Lincoln, Nebraska and at Mandan, North Dakota will evaluate Switchgrass for use in ethanol production.
- Long term research at the CGREC evaluating grazing systems show that 1.5 acres of good to excellent condition rangeland are needed to adequately maintain a cow and her calf for one month (one animal unit month, AUM). A ten-year economic comparison of grazing marginal highly erodible land shows an average cost of \$104 per acre. There are approximately 5.2 million acres of rangeland in the **Coteau** area of North Dakota. An estimated average of 1.75 acres per AUM is needed to maintain animal health and grassland productivity throughout the Coteau. This calculates to 2.97 million AUMs. At a cost of \$182 per AUM, this translates to more than \$540 million that is spent annually in communities and businesses throughout the **Coteau** region.
- Research is underway to study the impact of slow release fertilizers on poor-condition rangeland. This research will compare the recovery of overgrazed and moderately grazed rangeland on highly erodible land in terms of aboveground biomass production and species composition changes with various fertilization treatments.
- The CGREC is developing programs to assist producers who wish to take advantage of the increased interest in nature-tourism in central North Dakota. Programs will be developed to train and assist with bird identification and locations for best observation of rare non-game birds.
- The CGREC works with Main Station scientists on the effect of drought on photosynthesis and forage production. This study will utilize automated rainout-shelters to simulate drought conditions on native mixed grass prairie.
- To provide a response to producer requests to demonstrate how a prosperous living can be made on rangeland, CGREC will use its Best Management Practices (BMP's) in the areas of grazing management and resource monitoring, livestock management and nutrition, and forage production to design a system which will provide a reference for producers in the Northern Great Plains.
- Studies on the ecology of reseeding marginal cropland to perennial grasses have evaluated the species composition, forage production and economic returns on Conservation Reserve Program (CRP) acres and is applicable to any marginal cropland reseeded to perennial introduced grasses and legumes.