

Central Grasslands Forum



NDSU Central Grasslands Research Extension Center
Streeter, ND 58483 701-424-3606

NDSU NORTH DAKOTA
STATE UNIVERSITY

Spring 2017

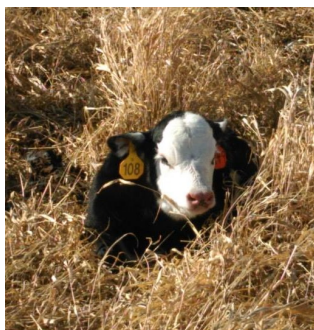
Volume 4, Issue 2

A Walk Through the Pasture: News from CGREC

Kevin Sedivec, Interim Director, Central Grasslands Research Extension Center

Spring appears to have arrived and calving season has started.

The first heifer calved March 12, and cows should start in early April. The snow and blue geese showed up and snow piles are disappearing. Although the pastures are still brown, the sharp-



tailed grouse are dancing and the pintail, our earliest nesting duck, is searching for “just the right place” to nest.

With new life on the prairie comes a new adventure for the Central Grasslands Research Extension Center (CGREC).

We had a few firsts this winter at the CGREC. Our first bale grazing study went off

as planned (well almost) and the cows seemed to do very well. They performed better than expected – even with three blizzards and one winter storm dumping more than 50 inches of snow in a seven-week span, temperatures below -20°F and

Mother Nature testing our spirits. We finally had to bring the cows home when our water tanks were lost in snowdrifts and fences were disappearing as snow piled up.

Our Range and Forage Lab was finished in January (see page 2) and we started moving in equipment. Michael Undi, Rick Bohn, Stephanie Becker and Jessalyn Bachler started working in the lab, weighing, grinding and prepping samples from the 2016 field season. We truly appreciate our North Dakota Legislature for funding this project during the 2013-2015 session.

We installed a new lighting system in our livestock pen area and working facility to help with working cattle and conducting research. It makes a safer environment when working cattle during the dark, long evenings in the winter months.

We said “see you later” (never liked goodbyes) to Fara Brummer, our area Extension livestock systems specialist, as she went back home to a new job with Oregon State University and new adventures with her family. We will truly miss Fara because she was not only a great Extension

(continued on page 2)



IN THIS ISSUE

A WALK THROUGH THE PASTURE	1
IMPACTS OF BALE GRAZING	3
MANAGING KENTUCKY BLUGRASS	5
SOIL HEALTH: LIVESTOCK INTEGRATION	6
COUNTY CORNER: RETURNING TO EXTENSION SERVICE	7

Photos by Bryan Neville, Kevin Sedivec and Rick Bohn

NDSU EXTENSION
SERVICE

A Walk Through the Pasture *(continued from page 1)*

specialist who left her mark with the NDSU Extension Service, but she was a great person who had a passion for working with ranchers and county agents. It was my pleasure to know Fara because she instilled some new life in this old state specialist.



Scott Alm

We welcomed a new staff member to the CGREC. Scott Alm was hired Jan. 23 as our new forage specialist. Scott brings with him a wealth of experience and knowledge that will address the needs of our ranchers and forage growers on new and improved forage research. Scott worked at the CGREC as a summer seasonal worker while he was pursuing his B.S. degree in Animal Science from NDSU. We look forward to you meeting Scott.

We have had the pleasure of hosting a Fulbright Program student at the center this winter. Friederike “Rike” Baumgaertner is from Germany and is working with Carl Dahlen on our collaborative livestock reproduction projects that started in 2016. Rike has been a great asset to the center, helping with data collection and analysis, working cattle, and assisting with day-to-day operations.



Friederike Baumgaertner

Finally, with the 2017 grazing season approaching, new grazing research trials will start in May:

- Ryan Limb, range scientist at NDSU, will be conducting a new study addressing disturbance ecology on our grasslands of the Missouri Coteau. Ryan will concentrate his efforts on studying plant community changes with cattle grazing and spring burned patches, and cattle grazing with a combination of spring and summer burned patches. The overriding question is, “Can we reduce Kentucky bluegrass while increasing native grasses and diversity of flowering forbs, and improve livestock performance?”
- Torre Hovick, range scientist and wildlife ecologist at NDSU, will study the impacts of these treatments on pollinator species and migratory passerine birds. With



new policies being developed to increase native pollinators and bird populations, we must address these serious questions to be proactive in understanding the habitat needs of these declining invertebrates and birds.

- Devan McGranahan, range scientist at NDSU, will study the impacts of these treatments on the processes: How does cattle grazing and different seasons of fire impact plant growth? If we can figure out the mechanisms behind how certain plants, such as Kentucky bluegrass, thrive “or die” due to grazing and fire, we can prescribe future management strategies that enhance the native plant community. The goal is to create a proper functioning community that creates a stable plant community to support our livestock while creating a landscape that provides habitat for wildlife, including our threatened and endangered species.
- Caley Gasch, soil scientist, will study impacts of Kentucky bluegrass within the rangeland community on the soil chemical and physical properties. If we can determine how Kentucky bluegrass changes soil function and health, then we can determine management strategies that best enhance plant community function while sustaining our livestock herd.
- I will start a study addressing grazing efficiency. My project will be designed to study different rotational grazing schedules to determine levels of harvest efficiency. My goal is to determine if we can increase

(continued on page 3)

(continued from page 2)

harvest efficiency of the plants, thus adding value to the land and more money to our ranchers, if we rotate fast, at a moderate schedule or slow, or don't rotate at all.

- Lastly, Ryan and I will study different management strategies on western snowberry (buckbrush) density and forage quality. Western snowberry has become a nuisance shrub to much of our rangelands found within the Missouri Coteau. We need to have a better understanding of how to control the spread of this plant without totally eliminating it, and in doing so, whether we can increase its palatability to increase cattle grazing.

Well, my short article has become too long! Let me leave you with an invitation to the CGREC 2017 Annual Field Day. Our field day will be July 10, with a tentative time of 4 to 7 pm., This event will take place at the center. We will showcase our new studies and provide site stops showing our livestock

research, including Michael Undi's bale grazing study; Carl Dahlen, Joel Caton and Lauren Hannah's livestock reproduction, behavior and systems research; and Scott Alm's new alfalfa research.

We are excited and thrilled to have Trent Loos at our field day. Trent is best known for his radio show "Dakota Trails and Tales." He will conduct his radio show at the center and speak to you about "Loos Tales" after supper.

Until our next walk through the pasture, may your calving season be stress-free and fruitful, spring rains provide the nutrients to grow a great crop, and you and your family enjoy the fresh smells and sounds of spring.

**CGREC Annual Field Day
July 10, from 4 to 7 pm**

Impacts of Bale Grazing on Herbage Production and Forage Quality in South Central North Dakota

Kevin Sedivec, Fara Brummer, Mary Berg, Chris Augustin, Penny Nester, Sheldon Gerhardt, Jackie Buckley, and Ashley Stegeman; NDSU Extension Service

Bale grazing is the practice of allowing livestock access to hay bales in a hayfield or improved pasture to reduce labor and feed delivery costs. Livestock growers in the northern Great Plains practicing this technique also are interested in improving soil health and forage production through manure distribution while maintaining adequate livestock performance.

Recently published data have shown a positive relationship between bale grazing and nitrogen capture, as well as forage growth; however, local producer concerns in our region prompted the need for further applied research.

This project was conducted on four ranches in North Dakota to examine winter hay bale grazing effects on subsequent years' herbage production and nutritional quality six and 18 months after treatment on improved pastures planted to domesticated cool-season grasses. Parameters measured included: herbage production, nutritional quality, soil nutrient content, cow body condition and system costs. Herbage production and nutritional quality are presented in this article.

The treatments were: 1) winter hay bale grazing (BG) from Jan. 1 to April 1, and 2) the control, with no bales, but grazed from July 1 through the end of the grazing season. Metal pins were placed in the BG pasture to mark bale placement. Pins were placed in the control pasture at corresponding locations with similar soils, slope and vegetation.

(continued on page 4)



Cattle grazing bales in February 2016

Fara Brummer

Impacts of Bale Grazing on Herbage Production and Forage Quality in South Central North Dakota *(continued from page 4)*

Table 1. Grass biomass production on bale grazed and control sites six months after treatment near peak herbage production in 2016.

Treatment	At bale center ¹	5 feet from bale center	10 feet from bale center	15 feet from bale center
Pounds per acre produced in late June/early July ²				
Bale grazed	5,262 ^a	5,307 ^a	4,601 ^a	8,583 ^b
Control	5,345 ^a	5,809 ^a	5,874 ^a	6,145 ^a

¹or corresponding location for the control pasture.

²Grass production by treatment and distances from the bale with the same letter (a, b) are not significantly different ($P > 0.1$).



Fara Brummer

Six months after the end of the bale grazing treatment (the following growing season), grass production was higher 15 feet from the bale center on the BG treatment, as compared with the corresponding location on the control (Table 1). However, it was not different at the bale center, and 5 and 10 feet from the bale center, as compared with the control.

Grass sampled the following growing season also had a higher crude protein content on the BG treatment at the bale center, and 5 and 10 feet from the bale center, compared with 15 feet

from the bale center (Table 2). Grass in the BG treatment also had a higher crude protein content, as compared with grass on the control at the bale center, 5 and 10 feet from the bale center. The grass phosphorus content was greater on the BG, compared with the control, at the bale center and 5 feet from the bale center.

These pastures will be sampled again this summer, and soil nutrient content, cow body condition and system costs will be analyzed for a future report.



Janet Patton

Table 2. Grass quality (crude protein and phosphorus) on bale grazed and control sites six months after treatment near peak herbage production in 2016.

Treatment	At bale center ¹	5 feet from bale center	10 feet from bale center	15 feet from bale center
Crude protein (%) content in late June/early July ²				
Bale grazed	17.2 ^{ax}	17.3 ^{ax}	15.9 ^{ax}	13.0 ^{bx}
Control	9.8 ^{ay}	9.8 ^{ay}	10.2 ^{ay}	10.9 ^{ax}
Phosphorus (%) content in late June/early July ²				
Bale grazed	0.30 ^{ax}	0.30 ^{ax}	0.27 ^{ax}	0.27 ^{ax}
Control	0.23 ^{ay}	0.23 ^{ay}	0.22 ^{ax}	0.24 ^{ax}

¹or corresponding location on the control pasture.

²Nutritional parameters by treatment and distances from the bale with the same letter (a, b) within rows are not significantly different ($P > 0.1$), and with same letter (x, y) within columns are not significantly different ($P > 0.1$).

Strategies to Control Kentucky Bluegrass Invasion

Megan Endreson and Ryan Limb
NDSU School of Natural Resource Sciences, Fargo



Early intensive and patch burn grazing by cattle are being tested at the CGREC as management strategies for the control of Kentucky bluegrass (*Poa pratensis* L.).

This invasive, exotic, perennial grass has reduced plant diversity and altered the structure of native pastures. Preliminary results suggest that early intensive and patch burn grazing can increase forage quality and production in Kentucky bluegrass-invaded sites.



Kentucky bluegrass begins growth in early spring and develops a thick sod. Its forage quality is high in the spring during active growth, but as it goes dormant during the summer, its forage value decreases. Pastures dominated by Kentucky bluegrass often produce less annual forage than those with a mix of native species.

The objectives of this study at the CGREC are to determine if:

- 1) early intensive grazing followed by summer rest can shift the balance of the plant community toward native species,
- 2) patch burn grazing will reduce Kentucky bluegrass and promote native species abundance and diversity, and
- 3) livestock weight gains will differ between management strategies.

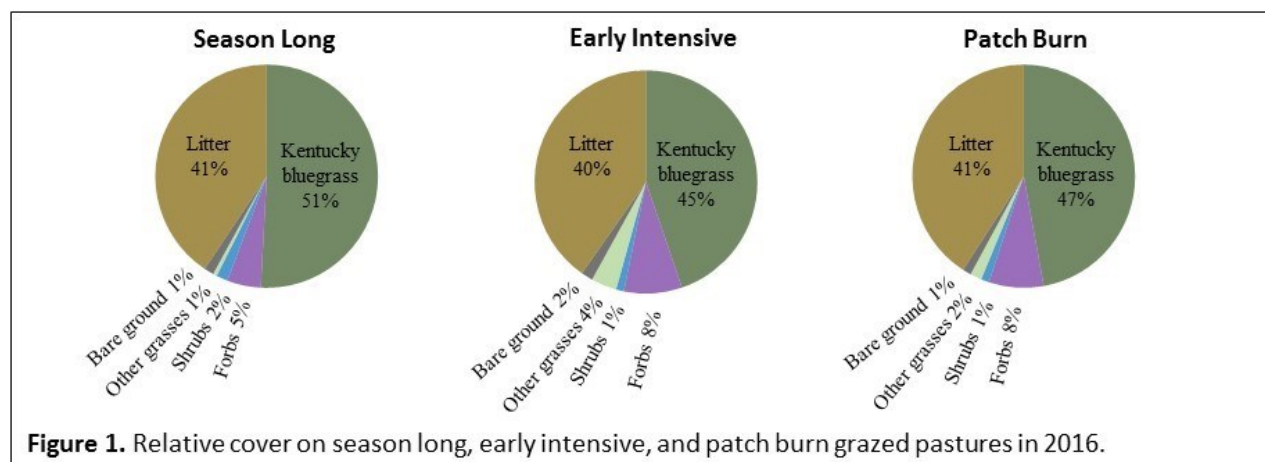
Twelve pastures of about 40 acres each were assigned to one of four treatments: early intensive grazing, season-long grazing, patch burn with season-long grazing, or idle (no grazing). Each pasture receives the same treatment year after year. Season-long pastures are grazed at a moderate stocking rate from mid-May through August.

Early intensive grazed pastures receive the same grazing pressure but in a shorter period of time, 1.2 months. Patch burn grazed pastures incorporate the same stocking rate and length of grazing as season-long grazed pastures, but with one-fourth of each pasture burned later in the fall after a heavy frost or early in the spring after snowmelt. After four years, each patch burn-assigned pasture will have burned in its entirety.

Changes in the plant community are monitored by sampling relative cover and annual forage production. Preliminary results from 2016 suggest that our early intensive grazing treatment has increased diversity (see Figure 1) and production of the plant community. Patch burn grazing also has increased the quality and production of forage, but the forage quality and production have not surpassed that with early intensive grazing.

At this stage of the project, Kentucky bluegrass remains dominant in each pasture. If our grazing management procedures were ceased, the abundance of Kentucky bluegrass would increase quickly. At this time, only two patches within each pasture have burned. The effects of patch burn grazing will become clearer as additional patches are burned. Treatments and monitoring will continue during the next several years.

Photos by Ryan Limb and Megan Endreson



Soil Health: Livestock Integration

Jay Fuhrer, Soil Health Specialist, Natural Resources Conservation Service, Bismarck



The foundation of soil health consists of five principles: soil armor, minimizing soil disturbance, plant diversity, continual live plant/root and livestock integration. This article will discuss the fifth principle, livestock integration.

In this, the fifth of five articles on soil health, Fuhrer explains the concept of "livestock integration" and why animals are important for building soil health.

Animals, plants and soils have played a synergistic role together throughout geological time. In recent years, animals have played a reduced role due to their placement in confinement and fewer farms including livestock as part of their overall operation.

Why do we want to return livestock to the landscape?

- To improve our crop rotation residue for no-till seeding - Fall or winter grazing converts high-carbon annual crop residue to low-carbon organic material, balancing the carbon/nitrogen ratio.
- To allow the plants to regrow and harvest additional sunlight and CO₂ (carbon dioxide) - This occurs during spring or summer grazing of annual and/or perennial plants for short exposure periods, followed by long recovery periods.
- To reduce nutrient export from our cropland and hayland fields - In lieu of transporting feed to a feedlot, we can have the livestock graze the material in place, recycling the majority of nutrients, minerals, vitamins and carbon.
- To manage weed pressure - We can do this by grazing in lieu of applying herbicides.

- Allow us to take the livestock off the perennial grasslands earlier in the fall - Grazing cover crops and/or crop residues makes that possible. It extends the grass recovery period and provides a higher-quality livestock diet.
- Reduce livestock waste associated with confinement, which helps manage our water quality and nutrient load - This also allows cattle and sheep to be herbivores by securing their energy needs from plants.

How do we return livestock to the landscape?

- By winter and fall grazing cover crops and annual crop residues
- By summer grazing a full-season cover crop, allowing adequate plant recovery, followed by a second grazing during the fall or winter
- By winter feeding on hayland fields by rolling out bales or bale grazing
- By seeding rotational perennials, and grazing and managing them as part of the crop rotation

Yearlings and dry ewes graze rotational perennials (grass, legumes and other forbs) at the Menoken Farm. A diversity of plants and animals improves long-term soil health.

NRCS



County Corner: Schmidt Joins NDSU Extension for 3rd Time

Bruce Schmidt, NDSU Extension Agriculture and Natural Resources Agent, Burleigh County



I was hired in December 2016 by the NDSU Extension Burleigh County office as the agriculture and natural resources agent. This actually was the third time that NDSU Extension has hired me.

My first position was with Barnes County, coming right out of NDSU with an agricultural economics degree. I moved on to Ward County and served for five years total before leaving NDSU Extension. After two years as an agriculture loan officer, I returned to NDSU Extension to work in Pembina County, and later Mercer County, and I served for 15 years.

So, after 20 years of NDSU Extension, I started a new career, answering the call to the ministry. I served as a pastor in Beulah and Bismarck for 13 years. In 2016, I returned to Extension work for a third time, serving in my fifth county.

The question I get often is: How has NDSU Extension changed? The most obvious answer is in technology.

When I started, we had an Execuport computer terminal. It had a dial-up modem, and once you had a signal, you placed the phone into the terminal. The software programs were a simple feed ration, a job search program and a food calorie

counter called Dietcheck. We have come a long way, with laptops, smartphones and too many online programs and apps to mention.

The second area is the evaluation of programs, and programs vs. programming. The old model was count the noses in the audience, and the programs were for the general public. Well, that model is no more. The new model is needs assessment and measureable educational outcome. The old model needed to be retired, but being a recent hire, I will reserve my opinion on the present model until I can better measure the outcome.

What has not changed is the talent and the caliber of my co-workers. I really see a strong dedication to the state, county and multicounty programming. This year, the NDSU football team's key phrase was "the next man up" due to the many injuries, and someone always was there to step in and step it up. That same phrase fits the NDSU Extension staff - the next person up, working together to create learning partnerships that help adults and youth enhance their lives and communities.

Party Mix

Sandi Dewald, Administrative Secretary, CGREC

Put the following ingredients in a large roasting pan:

- 1 large container of shoestring potato sticks
- 1 box of wheat Chex
- 1 regular box of Cheerios
- 1 large box of rice Chex
- 1 box of Crispix
- 1 bag of pretzels
- 1 large bag of Bugles
- 1 container of mixed nuts

Melt the following ingredients in a small pan over very low heat just until margarine is melted:

- 1 teaspoon garlic salt
- ½ teaspoon of regular salt
- 1¼ cup of oil
- 1¼ cup of margarine
- 1¼ teaspoon of Worcestershire sauce

Pour over cereal mixture and gently mix. Bake at 250 to 275°F for 2½ hours, gently turning every 45 minutes. It will brown very easily and does not taste as good if browned.



NDSU Central Grasslands Research Extension Center*
Department 7070
P.O. Box 6050
Fargo ND 58108-6050

Non Profit Org.
U.S. Postage
PAID
Permit 818
Fargo ND



*Street address:
4824 48th Ave. S.E., Streeter, ND 58483

www.ag.ndsu.edu/CentralGrasslandsREC
Editor: Janet Patton

In this Issue:

Impacts of Bale Grazing on Herbage Production and Forage Quality
Early Intensive and Patch Burn Grazing of Kentucky Bluegrass
Soil Health: The Importance of Livestock Integration



Upcoming Events

**May 25: Range and Livestock In-service Training
at CGREC - 10 am to 3 pm**

*Topics: Stocking rates, carrying capacity,
determining forage production, weed management
and plant identification*

July 10: CGREC Annual Field Day - 4 to 7 pm
Special Guest: Trent Loos

July 20 to 23: North Dakota Range Youth Camp
At Hanson's Logging Camp Ranch near Amidon

North Dakota State University does not discriminate on the basis of age, color, disability, gender expression/identity, genetic information, marital status, national origin, public assistance status, race, religion, sex, sexual orientation, or status as a U.S. veteran. Direct inquiries to: Vice Provost for Faculty and Equity, Old Main 201, 701-231-7708 or Title IX/ADA Coordinator, Old Main 102, 701-231-6409. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.

Photos by Janet Patton