SOUTH DAKOTA GRASSLAND COALITION

Grassroots

VOLUME 23 ISSUE 3 MAY 2021

INSIDE THIS ISSUE:

Range 101: Efficiencies of Rotational Grazing

By Sandy Smart

Rotational grazing has become an important management tool in the grazing livestock industry. This practice has been tested on tens of thousands of farms and ranches for over 50 years. The benefits it provides have been examined by range scientists, land management agencies, conservationists, and policy developers. In this article, I will provide an explanation of the efficiencies of rotational grazing from a spatial and harvest efficiency perspective. I want to be clear that the ability to increase the stocking rate is just one of many benefits of rotational grazing. The key word "ability" also implies that the grazer knows how to implement and monitor an effective rotation without causing negative consequences to animal performance and the plant community. Gaining knowledge (attending a grazing school), getting experience (trying it out slowly), and seeking assistance (NRCS, Extension, or SDGC Mentor) will help you avoid costly mistakes. Let's look at the following to unravel the efficiencies found in rotational grazing.

Spatial Efficiency

Growing up on a small farm in Wisconsin, I did not have an appreciation for the large landscapes of the Great Plains and western U.S. One of my fondest memories from childhood was when our family would travel to California to visit my Grandma. As a youngster, seeing the change in the patch work of crop fields expand into a vast grassland after crossing the Missouri River at Chamberlain, SD, on I-90 was a vivid memory of mine, even 50 years later. In the Great Plains, it is easy to see how the livestock stuck close to riparian areas and avoided grazing steep hillsides in pastures in excess of a 1000 acres. Today, as a range scientist who has worked on grazing research for over 30 years, I have seen how reducing the pasture size increases the spatial efficiencies of grazing. Mapping the utilization of grazing livestock is the best way to observe this phenomenon. At the former SDSU Antelope research station, we had an 1,100 acre pasture that was grazed more heavily near water sources and hardly touched at all in other places. Jim Gerrish once gave a presentation at the Annual Winter Road Show where he showed this on a ranch in Montana. Through cross fencing and water development the rancher was able to double the animal unit days on a winter range unit because they evened out the grazing distribution. I have heard this same story from many South Dakota ranchers. Unfortunately, very few scientific studies have been published to support these observations. The main reason for this lack of scientific validation is because university and USDA Agricultural Research Service

Range 101 Continued on Page 2

Range 101 Continued by Sandy Smart

research stations are generally small in size and replicating large pastures is not practical or economical. In 2013, research conducted by one of my former graduate students, using remote sensing techniques, showed how cross fencing and water development on the Buffalo Gap National Grassland near Wall, SD, improved the vegetation in riparian areas and focused the grazing in the surrounding uplands (Rangeland Ecology and Management 66:479-486). Additional articles by Dr. Richard Teague from Texas A&M University conducted at the ranch scale also supports these spatial efficiencies.

Harvest Efficiency

Harvest efficiency is defined as the percentage of the annual forage produced that is consumed by the grazing livestock. Range scientists in the early years of our profession focused on setting the stocking rate such that it would achieve 50% utilization (consumption + trampling + loss by wildlife and insects + senescence) or the old adage "take half leave half." I published a paper in 2010 which showed that the harvest efficiency from continuous season-long grazing was 25% when targeting 50% utilization (Rangeland Ecology and Management 63:397-406). This means an additional 25% was lost due to trampling, wildlife, insects, and senescence. Rotational grazing, which intensifies the stocking density, decreases the length of the grazing period and increases the rest period in a given pasture. Research from NDSU on a long-term study comparing a 320 acre season-long continuously grazed pasture to a 320 acre rotationally grazed pasture (4-pasture twice over rotation) revealed that both pastures produced the same amount of forage, had the same amount of utilization, and had the same calf averaged daily gain, but the rotationally grazed pasture supported 44% more cow-calf pairs and hence 17.8 lbs more beef/acre than the continuously grazed pasture. When I calculated the harvest efficiency (percent consumption), the rotationally grazed pasture had a 40% harvest efficiency with only 15% loss due to trampling, wildlife, insects, and senescence. The season-long continuously grazed pasture had a 25% harvest efficiency and 29% loss through trampling, wildlife, insects, and senescence. A Nebraska extension report (EC 86-113-C) published in 1986, basically shares the same concept. Under a simple rotation you can plan for a 30% harvest efficiency, 25% loss, and 45% left for plant vigor. Under an intensive rotation you can plan for a 40% harvest efficiency, 20% loss and 40% for plant vigor. Range specialists assume you can leave less residual (percent needed for plant vigor) using a rotation because you provide a longer rest period (without stress from grazing).

Planning

For grazing planning purposes, the stocking rate is calculated based on the amount of annual forage produced and multiplied by the harvest efficiency. We assume an animal unit consumes enough forage equivalent to 2.6% of their body weight to meet their daily requirements. This of course is an average. Cattle consume less when the forage is more mature and their physiological status is less demanding (non-lactating and in the first or second trimester of pregnancy) and more forage when it is vegetative and when they are lactating. Thus one animal unit month (AUM) is equivalent to 780 lbs of oven dried forage or about 912 lbs of air dried forage. For example, if a 1000 acre season-long grazed pasture produces 1800 lbs/acre (air dry) of forage we would multiple it by 25% harvest efficiency and divide by 912 lbs/AUM to get a stocking rate of 490 AUM (1800 x 0.25 x 1000 ÷ 912). If we cross fence the same pasture into four 250-acre paddocks and add a water tank in the middle, we could safely plan for a harvest efficiency of 30%

Range 101 Continued on Page 3

Range 101 Continued by Sandy Smart

giving us 592 AUM or an increase in 102 AUM. This 5% increase in harvest efficiency translates to a 20.8% increase in carrying capacity. If this same pasture was divided into eight paddocks (125 acres each) and we added a second water tank, we could safely plan for 35% harvest efficiency. This would translate to 690 AUM or a 40.8% increase in carrying capacity.

These two efficiencies (spatial and harvest) are the mechanisms which allow the producer to increase the carrying capacity using rotational grazing without the adverse effects of overgrazing (high utilization) which usually accompanies season-long continuous grazing. The increase in ability to move livestock and increase carrying capacity should be used holistically to support synergies in the system.

A WORD OF CAUTION: it is easy to plan something out on paper and altogether different to execute it in real life. Rotational grazing is a science and an art. Deciding how long to graze and when to move livestock is dependent on many factors. The most practical thing you can do is attend a SD Grazing School and learn about grazing. Also, start out slow. Don't design and invest in a cross fencing and water development project that is too much for you to handle. Experienced grazers will say that they started out by splitting the pasture in half and trying that out. Then they would split the halves again, and again, etc. Thus, you should also not increase your stocking rate right away either until you notice you have more grass available (based on the spatial and harvest efficiency principles).

SD Grazing Schools planned for Summer 2021

The South Dakota Grassland Coalition will be hosting three grazing schools this summer.

Wall, *June 22-24*, Guptill Ranch

Marvin, *August 11-13*, Abbey of the Hills Ranch

Chamberlain, *September 14-16*, Totton Ranch

<u>Classroom activities include</u>
Adaptive Management
Concepts of Grazing
Extending the Grazing Season
Fencing and Water Systems
Grazer's Math
Managing Rangelands for Biodiversity
Mineral Nutrition Needs
Monitoring Objectives
Planning for a Forage Shortage
Ranch Inventory
Seasonality of Grazing Nutrition
Visions and Goals

<u>Field activities include</u>
Implementing Grazing Practices
Monitoring Grazinglands
Soil Health and Infiltration
Plant ID, Preferences, Plant Growth and Indicators

Moral Meat Apologetics by Garnet Perman

Proposition 16, a ballot initiative in Colorado would extend prosecution for cruelty to animals to include "the treatment of livestock and other animals used in the farm or ranch production of food, fiber or other agricultural products regardless of whether the treatment is in accordance with accepted agricultural animal husbandry practices." This includes artificial insemination, palpation for pregnancy detection, and intervention in difficult births among other accepted practices. Earth Day triggered a glut of articles about combatting climate change by cutting beef from the menu. A European Union Treaty speaks of animals as "fellow beings." A Palo Alto Whole Foods meat counter employee told me in 2016 they were proud to offer their customers "moral choices."

Most Grassland Coalition members understand the importance of a drought plan. We're familiar with the "elevator talk" that gives a short, positive message about what we do. It's probably past time to also think about and plan a response to the evolving moral/ethical conversation around livestock production.

In researching this article I've found some ideas that may be helpful in preparing to answer questions, or better yet, take the offensive in a discussion.

1. Stay calm. Talking about ethics and morality can be threatening. It's easy to get emotional about deeply held beliefs, especially when it feels like not just your livelihood but you are on trial.
2. Treat people with respect and try to establish common ground. Start with motivation. Some anti-meat advocates are motivated by a desire to combat climate change. Some are animal lovers motivated by compassion but don't understand animal husbandry practices. Others truly believe that animals should not be considered property but "sentient" beings with the same legal and ethical rights as humans. Each position reflects a desire to do "right" as they understand it. Ask them to help you understand why they think their position is right or wrong. Walk away from intentionally confrontational people.
3. Ask where they source their information. Be prepared to suggest a credible source advocating the pro-livestock position. Especially regarding the "cows are bad for the climate" position, excellent research and real life examples show livestock help mitigate climate change. Those from a non-agricultural background often fail to understand the complexity of food production, plant and animal. The simple solutions they seek doesn't exist. Talking points could include the importance of livestock in soil health and in maintaining grassland species diversity including plants, insects, birds and animals. If grain production is their issue, most beef cattle live the majority of their lives on grass as opposed to most chicken and hogs that are entirely grain fed. Breeding stock, which comprises about 1/3 of all cattle in the US, consume almost no grain. The environmental costs of beef production in the Amazon and on the North American Plains vary widely, but the anti-meat climate literature doesn't distinguish between them.
4. Distinguish between animal rights and animal welfare. We all agree that cruelty to animals is not OK. Welfare concerns about neutering, feed lot conditions, docking lambs' tails, etc., are legitimate, and people deserve to know why practices that may seem questionable to them exist. Low stress techniques and development of better handling facilities are examples of the industry encouraging improvement in this area.

Moral Meat Apologetics Continued Page 5

Moral Meat Apologetics Continued by Garnet Perman

Fence line weaning, an example of one of many animal husbandry practices aimed at reducing stress in beef production (Photo courtesy of Sandy Smart).

The general public considers farmers and ranchers credible sources of information on animal issues. Your personal experience and passion for the animals under your care speaks loudly.

5. True animal rights believers are a relatively small group but are very dedicated to moving society toward adopting their ethical principles. They use both climate change and animal welfare framed in legislation such as Prop 16 to promote their ultimate goal. The Five Freedoms of Animal Welfare should not be controversial, but activists use them to push the needle on certain practices. An example is neutering is immoral because it makes the animal uncomfortable.

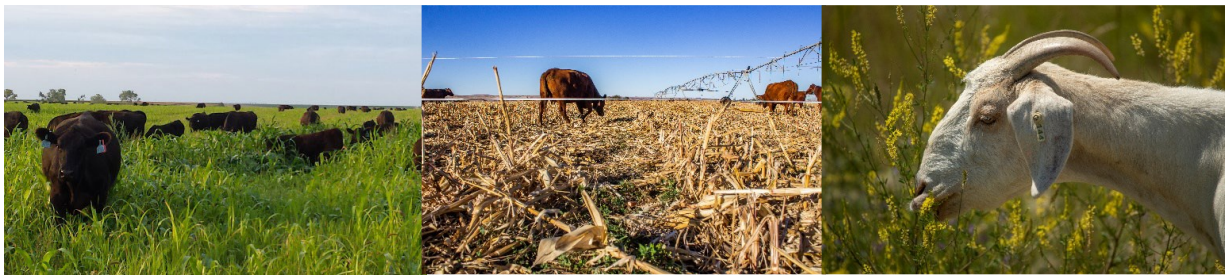
   They will be tough to move but nothing is lost in challenging their philosophy. Understanding that ethical framework and tactics is important to effective debate. https://faunalytics.org/the-animal-rights-movement-history-and-facts-about-animal-rights/ is fairly short, but insightful.

   One point here is that their solution may not produce the results they desire. Consider the consequences of the horse slaughter bill enacted a few years ago. The mental picture of horses running free is appealing, but real life implementation resulted in an equestrian and environmental disaster. Other questions that could be posed are: If animals are given the same legal rights as people, how do we hold them accountable for damage they may do to property, people, or other animals? Can dangerous animals be euthanized? Does what you eat really make you a good or bad person? If killing animals for food is immoral, is it not also immoral to kill animals in the process of growing food crops through destruction of habitat or running over a pheasant nest with a tractor? “Sacred Cow” by Diana Rodgers and Robb Wolff has a thought provoking section on the moral aspects of livestock production. Heidi Carroll, Extension Livestock Stewardship Field Specialist & Beef Quality Assurance Coordinator at SDSU, is also knowledgeable on this topic and served as a resource for this article.

In addition to developing some pro-beef talking points, it may also be helpful to articulate why you believe what you believe. Just like with a drought plan, writing down some sources and ideas will prepare you ahead of time to continue advocating effectively for keeping cattle on grass.

Garnet Perman is a freelance writer and ranches with her husband, Lyle, near Lowry, SD.

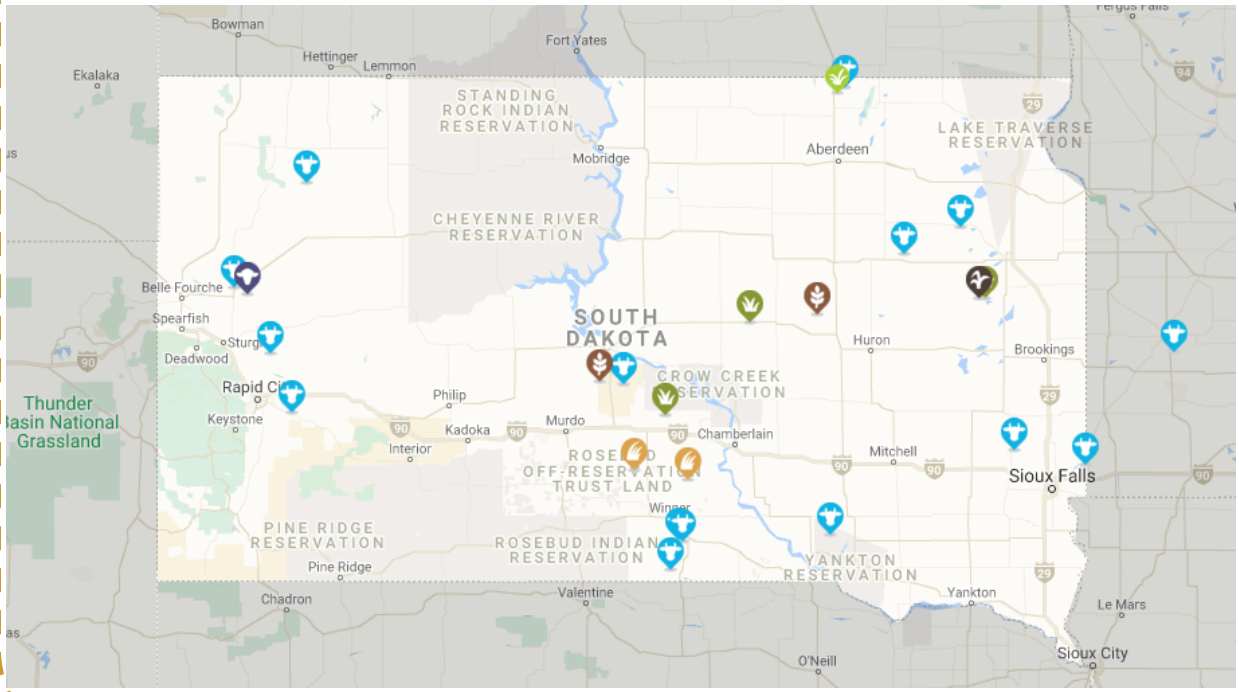
South Dakota Grazing Exchange by Cindy Zenk



Farmers and ranchers like to come together and help each other in times of crisis, and this year's drought could very well turn into such a crisis for South Dakota producers. Thankfully, there's a website that will allow producers and landowners to work together and help each other weather the drought.

Livestock producers in the drier portions of the state need to start planning now for additional forage resources later this summer. Producers who may have pasture, cover crops or crop residue available for grazing later this year can help by listing their available forage on the South Dakota Grazing Exchange so that livestock producers can connect with them to form a grazing agreement. With the advances in temporary fencing, any field with crop residue or a cover crop could potentially be grazed. By using the South Dakota Grazing Exchange (www.sdgrazingexchange.com), producers can help each other weather this dry year.

Below is the grazing map from the website showing icons for people who have cattle (blue), sheep (purple), pasture to graze (green), native rangeland to graze (yellow), cover crop to graze (brown), and crop residue to graze (olive). The SD Grazing Exchange needs more producers to sign up. Visit our website and create an account. Let's help make the grazing exchange work!



SRM CORNER - *News from the SD Section of the Society for Range Management*

By: Jessalyn Bachler

Jessalyn Bachler Joins SDSU as the New Range Field Specialist, Lemmon Regional Center

Jessalyn Bachler, SDSU Range Field Specialist (Photo courtesy of Jiyoung Kim).

I was raised on a multigeneration farm/ranch near Almont, ND, a little over an hour north of Lemmon, SD. My dad works on the operation and my mom is a preschool teacher. I have two older siblings, both whom are married with kids. I currently reside near a small town west of Hettinger, ND, that has a little acreage with enough room for a few cows, horses, chickens, a cat, and a bulldog.

I received my bachelor's degree in ranch management from Dickinson State University and my master's degree in animal and range sciences from North Dakota State University. During the time that I was working on my masters, I also worked full-time for NDSU at the Central Grasslands Research Extension Center as a livestock technician. For the past three years I taught introductory agriculture and animal, range, and soil science courses at a community college in Williston, ND as the agriculture instructor and program coordinator.

I am the new range field specialist out of the Lemmon Regional Center. My position is 100% extension where I facilitate public education on South Dakota rangelands.

Some specific areas that I am interested in include: drought and whole ranch/grazing planning, multispecies grazing systems, winter grazing/feeding systems, youth education in range, women's range programming, and partner collaboration on range projects. Overall, I want to produce relevant range-related, research-based programming that can help operations be more successful. I enjoy working one on one with producers, helping them find innovative ways to increase grazing efficiency and reduce related costs. In our area both the sheep and cattle industries are very strong, so I hope to look into finding ways that both species can work together for the best use of the range while grazing. There is also opportunity to graze late in the season in our area, and I want to look into the best way to do so without it being detrimental to rangeland. Working with youth and young producers in range management has always been a passion of mine, as I have many mentors that have helped me along the way! I look forward to working collaboratively on many projects with extension colleagues, producer groups, stakeholders, and other conservation partners.

Growing up on a farm and ranch, I understand that the lifestyle isn't always easy. I hope to help producers live sustainably and be able to hand over their operations to the next generation in better condition than when they started. My love for the land was instilled in me at a very young age and has since grown into a passion for rangeland and grazing management. I believe viewing the vast array of grasslands throughout South Dakota as a system that incorporates soil, plant, wildlife, and livestock interactions as one is beneficial for all involved in range management. Keeping these natural ecosystems intact is challenging with the ever changing agriculture industry. I think it is our role as managers of the land to educate the public on the importance of rangelands and the role that they play in not only food production but also their vitality as a natural resource.

SOUTH DAKOTA GRASSLAND COALITION
Sandy Smart
Box 2140B, 139C McFadden
Biostress, SDSU
Brookings, SD 57007

Calendar of Events

Event	Date	Location	Contact Person	Phone
SD Grazing School	June 22-24	Wall	Judge Jessop	605-280-0127
Ranch Management School for Young Adults (ages 15-26)	July 13-16	Edgemont	Dan Rasmussen	605-685-3315
Pasture Walk	August 10 August 12	Cooper Gordon Ranch, Tulare Pat Guptill Ranch, Wall	Dan Rasmussen	605-685-3315
SD Grazing School	August 11-13	Marvin	Dan Rasmussen	605-685-3315
Pasture Walk	August 17	Dugan Bad Warrior Ranch, Dupree	Dan Rasmussen	605-685-3315
SD Grazing School	Sep 14-16	Chamberlain	Judge Jessop	605-280-0127

Please remit any comments, suggestions, or topics deemed necessary for further review to: Sandy Smart, SDSU Box 2140B, Brookings, SD 57007, alexander.smart@sdstate.edu, (605) 688-5503