



Center for Grassland Studies

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Grazing Livestock Systems | PGA Golf Management | Integrated Beef Systems |
Grassland Ecology and Management

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Ag Lenders Panel Provides Insight into Beef Systems Initiative

by Jay Parsons, Department of Agricultural Economics, University of Nebraska-Lincoln, Daren Redfearn, Department of Agronomy & Horticulture, University of Nebraska-Lincoln, Mary Drewnoski, Department of Animal Science, University of Nebraska-Lincoln

In 2017, the University of Nebraska-Lincoln Institute of Agriculture and Natural Resources (IANR) and Nebraska Extension made a commitment to implement a multidisciplinary Beef Systems Initiative (BSI). The BSI is administered by the Center for Grassland Studies and is comprised of six projects designed to develop and support implementation of beef production systems that optimize feed resource use, natural resource conservation and producer success in Nebraska through improved management of perennial grasslands and systems of integrated crop-beef cattle production. In addition to the BSI, a parallel project funded by the Foundation for Food and Agriculture Research (FFAR) is studying the best practices for incorporating beef cattle onto cropping systems while improving ecosystem services to ensure sustainability. Both of these efforts include components focused on producer and community outreach through Nebraska Extension. To this end, an agricultural lenders panel and five geographically identified producer panels have been formed to provide input and feedback on the project results as they become available. Recently, the lenders panel met for the first time to provide their perspectives about the important information that should be communicated to producers who are considering developing an integrated beef enterprise.

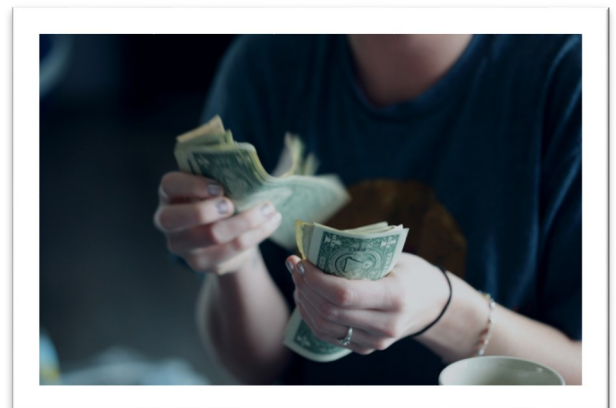


Photo by Sharon McCutcheon on Unsplash

The lender panel consists of eight agricultural lenders associated with banks located throughout Nebraska. The lenders were asked ahead of time to consider two different scenarios: (1) the possibility of a producer looking to add a new enterprise to their operation and (2) the possibility of a producer looking to expand their operation to accommodate the next generation returning to the farm or ranch. They were then asked to consider the question, "what are the key pieces a lender would like to see from a producer seeking financing that would support one or both of these scenarios, especially in the case where the new enterprise is something in which the producer has very little or no experience?" (Continued on Page 3)

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A Tribute to Jack Maddux



Wilfred Jackson "Jack" Maddux

Wilfred Jackson "Jack" Maddux, passed in
Wauneta, Nebraska on November 24 at
the age of 87. Jack worked much of his
life to elevate and advance agricultural
issues across the state.

Jack's family homesteaded the Maddux
Ranch in 1886. The family operation has
grown over the years and now comprises
the Maddux Cattle Co. in Imperial, NE.

Many organizations benefited from Jack's
commitment to agriculture during his
lifetime, including the University of
Nebraska-Lincoln. Jack was the president

of the Nebraska Section for Range Management, served on many boards within the
University of Nebraska Institute of Agriculture and Natural Resources and chaired
the University of Nebraska Foundation. Additionally, Jack and his son, John, have
both been presenters at the Nebraska Grazing Conference over the years.

Jack's interests led him to strive for agricultural improvements in land and cattle.
Water and natural resource policy issues also topped his list of concerns and led to
his participation in forming Nebraska's groundwater management legislation.

Jack was one of the founders of the Center for Grassland Studies. The points that
he made in his letter of endorsement (April 19, 1994) are no less relevant or
accurate today than they were in 1994. His insights, wisdom, passion and support
were critical in creating the Center and for that we and future generations are now
and forever thankful for his leadership in the industry. The lasting tribute to Jack is
sharing his passion and honoring his legacy through our grassland stewardship. His
last sentence said it all: *Establishment of the Center for Grassland Studies would be
a credit to the University and a major resource to the people of Nebraska.* We will
miss his smile, his friendship and his wisdom.

Heartfelt sympathies go out to Jack's family.

*The above excerpts came from the Liewer Funeral Home & Benkelman
Memorial Chapel online obituary for Jack. The full obituary may be accessed at
www.liewerfuneralhome.com/obituaries/Jack-Maddux-2/#!/Obituary.*

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let us know by emailing mmckendree14@unl.edu. Thank you.

Ag Lenders (Continued from Page 1)

The lenders provided many insightful comments, but three key themes came up consistently during the discussion.

Cash flow sensitivity analysis

All of the lenders emphasized the importance of completing a thorough cash flow analysis. Producers need to understand a one-year snapshot of expectations is not enough. A three-year cash flow projection would be ideal to provide to a lender when seeking a loan for a new enterprise or an enterprise expansion. Producers should also consider what will happen in a bad year. A sensitivity analysis that includes a worst case scenario is extremely important information to have available to share with their lender. Multiple lenders described a need for validation of the cash flow. In particular, it is important to make sure all expenses are included and, in the case of a new enterprise, provide information about the origin of the numbers. If the farm is expanding to support more families, it is especially important to validate that family living expenses are being fully accounted for in the projections.

Cattle industry learning curve

Several lenders expressed concerns about the cattle industry learning curve for producers looking to add a cattle enterprise to their operation. One lender described looking for evidence that the producer has a commitment to the cattle industry with a good network of people to work with including a nutritionist and relationships with feedlot operators. Others described producers new to the cattle industry not understanding the scale needed to make it work from an income standpoint. For example, do they understand how many cows it will take to feed a family? Do they have enough capital and access to enough pasture to make it work? Do potential new cattle producers understand the commitment and effort needed to make a cow herd a success?

Beginning farmer barriers

All of the lenders acknowledged that significant barriers impede the flow of new and beginning farmers and ranchers getting started in the business. Farm Service Agency (FSA) programs and various other beginning farmer programs accessible through banks can help, but there are still major issues of concern. Land costs place a tremendous burden on cash flow commitments. At present, there is little chance for the younger generation to start without investor help or significant off-farm income. One lender mentioned that interest from the next generation in beginning a new enterprise has declined over the last six years. Another lender described how some older producers in their area are actively seeking someone from the next generation that is interested in taking over the farm someday.

One other item came up that seemed to have consensus among the lenders, the need for Standard Performance Analysis (SPA) type of data. SPA data allows cattle producers to compare their operation with other producers in the industry. Among the primary things mentioned during this discussion was the importance of understanding cost of production and costs per cow.

Future plans are to continue online meetings with the lender panel over the next two years and an in-person meeting after that when more research results are available. One of the primary purposes of the in-person meeting will be to elicit input from the lenders on the best approach to synthesizing the research results into effective educational programming for producers and other agribusiness audiences. In the meantime, our conversations with the lenders will continue to explore ways to collaborate on communicating with producers.

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The content of this publication is solely the responsibility of the authors and does not necessarily represent the official views of the Foundation for Food and Agriculture Research.

***The Center for Grassland Studies will be closed
Dec. 23, 2019 through Jan. 1, 2020 for the holidays.***

Science with a Story

Condensing a research discovery to a brief and memorable message for end users, while speaking to the relevance and impact of their work, continues to be of importance to grassland scientists. The complexity of science, wealth of data, explosion of knowledge and availability of information positions a thoughtful story to become the compelling first impression of scientific value and real-world relevance.

The Emerging Field of Multi-Faceted, Science-Based Story Telling in Grassland Sciences project was initiated by the Center for Grassland Studies (CGS) to assist graduate students in getting their stories to diverse audiences. The funding required a presentation in a format similar to a TED Talk, as well as a two-page summary that mimics the *Sage Grouse Initiative's* Science to Solutions reports. Recipients of CGS funding include **Caleb Roberts**, a post-doc research associate, and **Victoria Donovan**, a doctoral candidate, both in the Department of Agronomy and Horticulture at the University of Nebraska-Lincoln. Caleb and Victoria presented their research during the 2019 Fall Seminar Series. Summaries of their work follow.

Characterizing Patterns & Outcomes of Large Wildfire in Great Plains by Victoria Donovan



Victoria (Tori) Donovan

Wildfires in the western United States have become a common story in the news. But many do not think of the Great Plains as a part of the U.S. wildfire problem. While fire used to be frequent in the Great Plains, fire suppression activities since European settlement almost completely eradicated large wildfires from this region. Recently, however, that has changed. Great Plains states have seen many newsworthy fires over the last decade. In fact, our recent research documented a 350% increase in wildfire number and a 400% increase in hectares burned by large wildfires between the 1980's to 2010's in the Great Plains. Across the Great Plains, we found woody vegetation was associated with the highest large wildfire risk. This was particularly apparent in areas that have experienced the greatest increases in large wildfire. Woody vegetation can create extreme wildfire behavior that is difficult to suppress and has been increasing in the Great Plains over the last century. These trends beg the question, are we growing our own wildfire problem? Fire suppression activities have allowed woody vegetation to spread across Great Plains grasslands. Tree plantings like windbreaks encourage the spread of trees into our grasslands and near our homes.

Could our continued promotion of woody vegetation across this grassland biome be promoting large wildfires? While there is still much that we need to understand about changing wildfire in the Great Plains, the tie between woody vegetation and large wildfire risk provides us with a clear path forward for managing increasing large wildfires- control woody vegetation. Here in Nebraska, landowners in the Loess Canyons are using controlled fires to kill woody vegetation and prevent further woody spread. Fighting fire with fire and embracing fire as a part of our grassland landscapes is an actionable step that we can take to combat increasing large wildfires here in the Great Plains.

(Continued on Page 7)

The Center has much to celebrate in 2019 – its 25th anniversary, first comprehensive external review and the opportunity to welcome Dr. Walt Schacht as the new interim director. As always, we are thankful for the support of a wonderful group of stakeholders, faculty, staff, students and alumni. We wish each of you and your families the peace and celebration of the holidays, and the health and prosperity of a new year. Enjoy 2020.

Helping Cows Cope with Cold Stress

By Mary Drewnoski, Nebraska Extension Beef Systems Specialist, University of Nebraska-Lincoln and Karla Wilkie, Cow/Calf Systems and Stocker Management, University of Nebraska-Lincoln

Cold stress increases a cow's energy requirement and can pull down her body condition. We think many cow/calf producers experienced this last year. While we don't know what mother nature has in store for us this year, it is good to think ahead and have a plan. A good start is to evaluate body condition score (BCS) now, and if cows are not at a 5 to 5.5 BCS, then taking steps to improve BCS before cold weather hits can help reduce the impacts of cold weather on the cows.

The threshold at which cattle have to start using energy to maintain their body temperature is called the lower critical temperature (LCT). Cows in good condition (BCS 5.0) that have a heavy winter coat that is dry do not need to use energy to maintain body temperature until the wind chill index is below 19°F.

Body condition is a risk management strategy and affects the LCT. A thin cow with a BCS 4 and a dry winter coat has a LCT of 27°F vs the 19°F of a cow in BCS 5. Getting cows into good condition early in the winter can be useful for managing risk of bad weather in that they have condition they can lose but also because cows with higher BCS will lose less than those with lower body condition. Additionally, a practical management strategy may be to consider putting thin cows in a group with your first calf heifers as both have higher energy requirement in the winter, which can allow for strategic supplementation.

It is also important to understand that a wet hair coat is a completely different ball game. A wet coat increases the LCT of a cow in good condition to 53°F. Thus, essentially anytime a cow's coat is wet in the winter they will be using energy to maintain body temperature. Therefore, in winters with more precipitation, especially freezing rain, we often see greater decreases in BCS.

To figure out how much more energy a cow needs you would take the cow's LCT minus the wind chill index and that would tell you the percent increase in energy requirement. For instance, if ambient temperature is 20°F and wind speed is 10 miles per hour, the wind chill index is 10°F. For a BCS 5 cow with a dry winter coat and a LCT of 19°F, then $19 \text{ LCT} - 10 \text{ WCI} = 9\%$ increase in energy needs. A 1200 lb cow in late gestation has a 13 lb/d TDN requirement and the cold increased this an additional 1.2 lbs of TDN for a total of 14.2 lb/d.

Now, this brings up another point. By providing wind protection, you can decrease energy needs by removing wind as a factor. If cows have protection from wind, the ambient temperature can be used to determine energy needs. Providing wind protection in the winter can be huge for reducing supplementation needs due to cold in the winter.

It is not advisable to change rations daily, but for extended cold or wet periods, consider feeding more of the same ration, if cattle can eat more of the typical ration. If not, then providing a supplement is a good idea. When feeding lower quality hay, dormant range grazing or corn stalk grazing, additional feed will be needed. One option is to change to feeding a higher quality hay source, if available. Free choice high quality hay (58 to 60% TDN) can work down to temperatures of 34°F below the LCT of the cow (-15°F for cows in good condition with dry hair or 19°F with wet hair). If cows are grazing, then supplementation with a high energy feed may be desirable. While corn can be used to provide more energy, it comes with risk. Feeding more than 2 to 3 lbs/hd/d can decrease forage digestion, especially if the forage is lower in protein. This means that one could make up the difference of about 15°F between the LCT of the cow and the wind chill index temperature. For a cow in BCS of 5 with a dry coat, corn supplementation would cover the increased energy requirement down to 5°F, or for a cow with a wet hair coat only to about 38°F.



Taking steps to improve body condition score before cold weather hits can help reduce the impacts of cold weather on the cows. Photo credit Karla Wilkie.

(Continued on Page 7)

GRLS Internship: Intern and Provider Perspectives

Caden Billings is a junior at the University of Nebraska-Lincoln studying Grazing Livestock Systems, a program requiring students to participate in an internship as part of their coursework. This summer, Caden completed an internship at Daybreak Ranch located near Highmore, South Dakota. Daybreak Ranch is operated by **Jim and Carol Faulstich**, along with their daughter and son-in-law. The main focus of the ranch is a red angus cow/calf operation, which is supplemented by the custom grazing of yearlings, farming and two hunting enterprises.

When asked why he agreed to host an intern Jim said, "First, because Caden asked if we would host him. Secondly, I see the importance in connecting future ag leaders and providers with successful businesses to learn from their experiences and expertise." Jim feels every degree program should require at least one year of interning with providers willing to share. "Even though an intern requires some of my time, I think there is value in working and teaching side-by-side to help young people help future generations," added Faulstich.

While at Daybreak Ranch, Caden was responsible for checking cattle health, monitoring water and forage resources, making recommendations for rotational grazing moves, watching fence conditions, as well as the general day-to-day operation and management of the ranch. Through these activities, Jim hoped Caden would benefit by gaining new ideas and an appreciation for taking a holistic approach to management and decision-making and the importance of the environment through practices such as regenerating soil health and grazing management.

From Caden's perspective, he benefited from the internship by gaining a better understanding of the importance of grassland evaluation and conservation. He learned how multi-species grazing can be beneficial for grasslands, how a no-till farming operation can harmonize with a cow/calf operation and the importance of HRM principles. Increased knowledge of native grasses, forbs and shrubs of South Dakota and Nebraska was a benefit, as were ideas on dealing with seasonal weather challenges from a cow/calf and farming standpoint. Faulstich even provided Caden with information on how to outfit deer and pheasant hunts in the Prairie Pothole Region of South Dakota.

Enhanced communication is a benefit any student will gain in completing an internship, according to Caden. "Internships force students to be clear about what they want in an internship and makes them responsible for communicating those ideas to several possible providers to obtain an experience that meets their needs," offered Caden. Jumping into an operation and working with new people provides growing pains related to communication. However, this was a positive for Caden, who went on to say, "In my opinion, the more a young person can put themselves into uncomfortable situations, the more personal growth they will have, which will prepare them for a broader unforeseeable future of challenges."

Besides attending to daily ranch activities, Jim encouraged Caden to participate in educational events to make him more knowledgeable as an intern and as a future rancher. For Jim, knowledge and involvement are important. "I hope an intern leaving Daybreak Ranch would appreciate the value in being involved and a leader in the community, state and nation."



Caden Billings with Jim Faulstich of Daybreak Ranch

Caden commented that exposure to the South Dakota Grassland Coalition (SDGC) events was the cherry on top of his internship. Through the SDGC he was able to participate in bird tours, pasture walks, a low stress stockmanship class and an introductory HRM class. Caden hopes to stay connected to the SDGC, and to become involved in the Nebraska Grazinglands Coalition.

As Caden reflects on his internship experience, he appreciates how doors were opened for him as a person and how he was exposed to new ideas. "Jumping into a foreign operation and seeing tasks accomplished in a different fashion can provide answers and ideas that may be applicable to my own ranch problems in the future," commented Caden.

As for Jim, "We enjoyed Caden's interest in our operation and his intense desire to learn. His many questions challenged me to think about our operation, and I think both of us ended the internship period with new ideas and enthusiasm. It was a pleasure."

Science with a Story (Continued from Page 4)

Forewarned is Forearmed: Seeking Early Warnings of Ecological Upheavals by Caleb Roberts



Caleb Roberts

As global environmental upheavals mount (e.g., climate change, agricultural land conversion, species invasions), regime shifts, or abrupt transitions from one ecological state (e.g., a productive grassland/pasture) to another, often less desirable state (e.g., an unproductive shrubland or desert), are increasing in frequency and magnitude. Science tells us that early detection and prevention of regime shifts is orders of magnitude more cost-effective for ensuring we keep getting what we need from ecosystems—like clean water, food production, and biodiversity. Thus, the search for methods to detect early warnings of regime shifts has become a “holy grail” in ecology.

Using the Great Plains as an example biome, Caleb, **Dirac Twidwell**, associate professor in UNL’s Agronomy and Horticulture Department, and others have developed a method for tracking regime shifts in space and time. Think of how meteorologists display storm tracking: the front moves along the television screen, and the direction and speed of the movement tell the forecasters and the television viewers where and when the storm

will strike next. This is (conceptually) their method for detecting early warnings of regime shifts. Only instead of days or hours of forewarning, the method provides decades of early warning of ecological upheavals.

The ability to foresee ecological change decades ahead of time is a powerful management tool for our environment. The method, dubbed spatial regime tracking, and the concepts behind it, is already being incorporated into grassland management in Nebraska and throughout the Great Plains. From Nebraska ranchers combatting tree invasion of their lands to wildlife biologists working to conserve Sage Grouse, spatial regimes tracking is helping prioritize and strategize more effective and cost-effective land management. Caleb is excited to continue honing this work on early warnings so everyone can be forewarned and forearmed against ecological changes.

Cow Cold Stress (Continued from Page 5)

Distillers grains are another option. Distillers is a good source of energy, it has more energy than corn, and because it is high in protein, it does not cause as much of a substitution effect (will not decrease intake of the forage much). In the example above where the cow needed an extra 1.2 lbs of TDN, feeding 1.2 lbs (as-fed) of dry distillers would provide the extra energy needed. In the case of distillers and gestating cows, the pounds of energy needed to account for energy used due to cold stress would be equal to the pounds of dry distillers that would need to be fed. Limitations on the amount of distillers that could be fed would be more based on budgetary concerns than digestive effects.

When wind chill temperatures are extremely cold or the cow has a wet hair coat, a lot of supplement would be needed to make up the greater energy needs and maintain body condition. For instance, if the wind chill was -10°F and the cows had a wet hair coat, 8.6 lbs of dry distillers would be needed to account for the increased energy requirement. However, feeding these levels is likely impractical. A better approach would be to provide a smaller amount of supplemental feed and to continue to feed the extra feed after the weather has moderated to allow cows to regain energy lost during the storm.

It is also important to remember that lactating cows have a much greater energy requirement than pregnant cows. Given this, the combination of cold stress and lactation can pull down BCS quickly. Thus, if lactating cows are also subjected to cold stress, increasing their energy intake prior to observing loss of condition is advisable.

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PGAM Students Head to China in 2020



While on Hainan, students will visit the golf courses on the Shenzhou Peninsula, Sanya and Mission Hills Haikou

The trip will start with a flight from Lincoln to Chicago and then the group will move on from Chicago to Beijing. After seeing the sights in Beijing such as the Great Wall, Tiananmen Square, and The Forbidden City, we will move on to Hainan Island. Hainan is China's version of Hawaii. A tropical island on the south side of the country is the epicenter of tourism in the country. While on Hainan, students will visit the golf courses on the Shenzhou Peninsula, Sanya and Mission Hills Haikou. Mission Hills is a multibillion-dollar (equiv) development that will ultimately become the largest golf facility in the world with 22 courses on property when complete.

Over Spring Break in 2020, students majoring in PGA Golf Management will join students majoring in Hospitality Restaurant and Tourism Management (HRTM) to study the emerging hospitality and golf industries in China. This program will nicely complement the existing education abroad offering in Scotland creating an opportunity to contrast the oldest golf industry with one of the youngest.

Students will also explore the hotel aspects of the tourism industry. China has ambitions to become a global tourism destination. They face significant challenges in achieving this ambition, and students will apply their knowledge and skills to synthesize ways in which China could eventually achieve their aspirations.