



Grassroots

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INSIDE THIS ISSUE:

**Range 101 Con-
tinued** 2-3

**2016 Brood
Survey** 4, 6

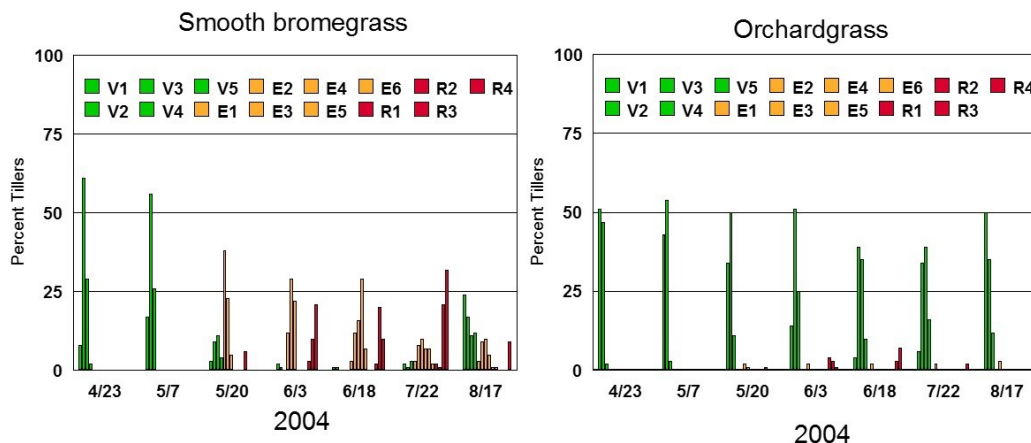
**The Green Side
Up** 5-6

**Greg Judy
Workshops** 7

Range 101: Timing of Grazing by Sandy Smart

Three important concepts that grassland managers can use to control grazing animals to manipulate the plant community are **timing, intensity, and frequency** of grazing. In this article I will discuss the importance of the **timing of grazing** in relation to plant development and its impact on future plant health. Hopefully, you will recognize the interrelationship between these concepts and previously discussed concepts such as succession, grazing resistance, and livestock distribution.

As a grass plant grows, from the time it breaks dormancy in the spring until it sets seed in the summer, it can be characterized into distinct morphological (growth form) stages. When I was a graduate student in the 1990s at the University of Nebraska-Lincoln, grassland researchers developed a numerical staging system to quantify the different stages that grasses went through. As a grass tiller (shoot) grows, it starts out by growing leaves only (called the vegetative stage). Later on, the stem starts to appear, and the grass elongates (called the elongation stage). As the stem elongates it continues to produce leaves until the reproductive part (inflorescence) emerges (we call this the reproductive stage). A grass plant, whether a bunchgrass or a rhizomatous plant, produces a population of tillers that vary in their development. Each species varies in their population demographics as to the percentage that stays vegetative, elongates, and produces a seed head. A great example of this can be seen in the following graphic. The V's represent vegetative shoots with 1 or 5 leaves (V1-V5; green



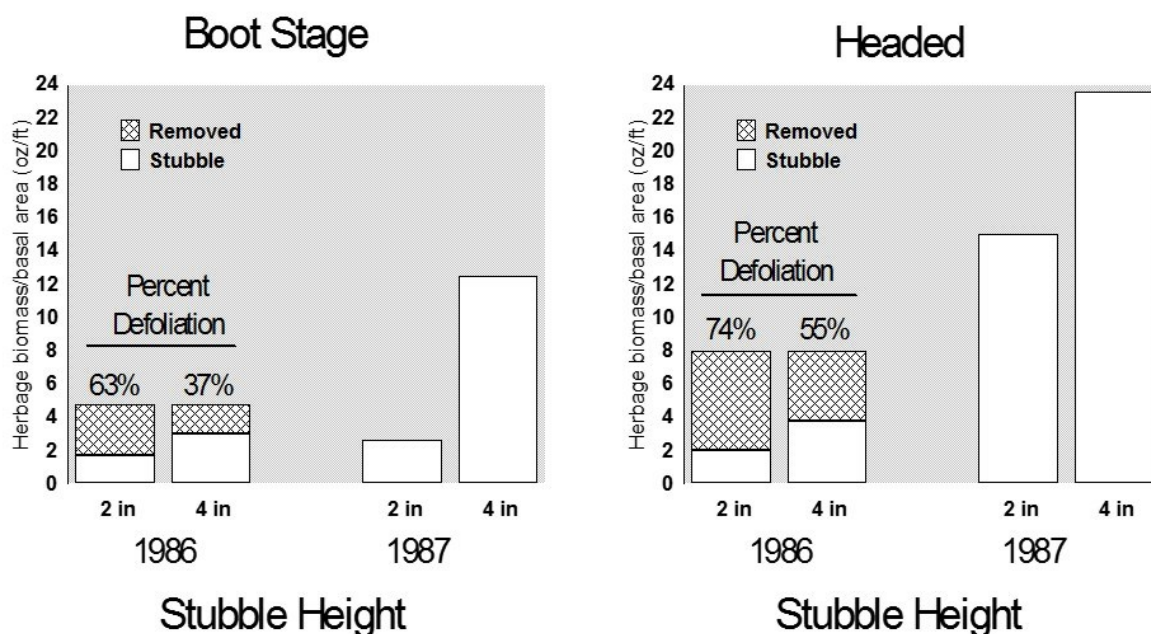
Population dynamics of smooth brome grass and orchardgrass tillers from a grazed pasture in 2004 (Smart unpublished).

Range 101 Continued on Page 2

Range 101 continued by Sandy Smart

bars), the E's represent tillers that have elongated and have 1 or 6 nodes on the stem (E1-E6; orange bars), and the R's represent the different stages of reproduction from emergence of inflorescence (R1) to seed ripening (R5) (red bars). A side note: some grasses may have more or less than 5 collared leaves before it starts the stem elongation phase and may have more or less than 6 nodes (E phase) before it starts the reproductive phase. In the previous graph on page 1, notice that almost all of the smooth brome grass tillers went through the elongation (orange bars) and reproductive phases (red bars) in June and July while orchardgrass remained mostly vegetative (green bars). This is one reason I recommend orchardgrass for grazing because it does not elevate its growing point much above the soil surface compared with smooth brome grass. The downside to orchardgrass is that it isn't very drought tolerant so I generally recommend it east of the James River valley. Understanding how different grasses grow and develop is important in knowing how they will respond to grazing at different times during the growing season.

The next figure demonstrates the importance of timing and intensity of defoliation on needleandthread and is useful to draw general principles about all grasses. Individual needleandthread plants were tagged and clipped at 2 inches or 4 inches in the boot stage (E4 or E5)



Needleandthread plants clipped at two heights at boot stage and headed out. (Adapted from Nebraska Cooperative Extension EC 91-123).

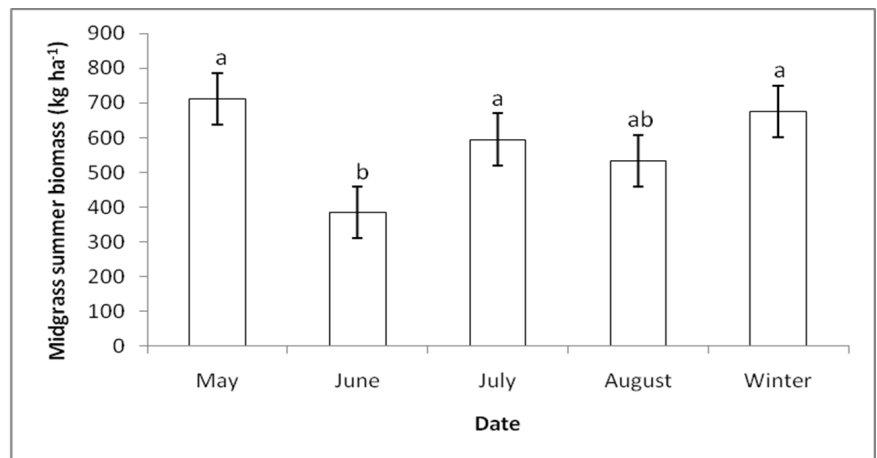
or headed out (R3 or R4) and tracked to see how the plants responded one year later. We typically recommend that it is safe to remove half of the plant biomass (take-half leave-half) without hurting the plant vigor the next year. Notice when plants are cut to 2 inches during the boot stage that they don't produce as much biomass the next year compared with clipping at 4 inch height. More importantly is waiting to clip the plants when they have headed out. Notice clipping at either height

Range 101 Continued on Page 3

Range 101 Continued by Sandy Smart

produces more plant biomass the next year compared with clipping at boot stage. These data show that timing and intensity of defoliation are important in determining how plants will respond in plant vigor the following year. My interpretation of why plants cut at heading, either moderate or high intensity (55% or 74% removal), is less harmful than compared with cutting at the boot stage is related to what the plant is trying to do with its products of photosynthesis. When we wait to cut plants after they have headed out, they have essentially completed their growth cycle and thus have produced adequate above ground and below ground biomass (roots). Plants in the boot stage are rapidly elongating and more of the products of photosynthesis are being used to grow shoot compared with growing roots. Thus it is likely that defoliation of the plant interferes with root growth in the rapid stem elongation phase. I liken this to cutting hay. If we wait to cut hay each year when the grasses have headed out we are likely to promote stand health year after year. Likewise if we cut too early (say rapid stem elongation phase) each year we are likely to cause a decrease in stand health.

To support this concept, I published a study where I clipped native prairie in western South Dakota once a month in the summer for 4 years in a row and then followed up in the 5th year to see the accumulated effects. The figure shows that clipping in June reduced the biomass of the midgrasses compared with clipping in May, July, August or waiting until winter. The midgrass species were western wheatgrass, green needlegrass, and prairie junegrass. These species are in rapid stem elongation phase in the middle of June. I believe that root growth was likely being interfered with by cutting in June. If we wait to cut later these grasses have essentially finished their growth cycle. If we clip early, i.e. May, it has plenty of time to regrow.



Yield of midgrasses in mixedgrass prairie of western South Dakota after 4 years of clipping in the middle of each month in the summer or clipping in the winter (Smart et al., 2012). Bars with similar letters are not statistically different from one another.

The practical aspect of knowing this is that grazing, fire, or any tool to defoliate plants at the right or wrong time can have a drastic change on the plant community. It is impractical to avoid grazing in the middle of the growing season to reduce the damage we might cause to our desirable forages. Thus it is important to change your season of use around to different pastures such that you do not graze the same pasture year after year at the same time. If you want to get rid of a particular species, knowing when it is actively elongating its stem is the perfect time to apply a defoliation tool like grazing, fire, or mowing. I have used this technique to successively reduce invasive cool-season grasses like Kentucky bluegrass and smooth brome grass from native warm-season tallgrass prairie.

Sandy Smart is an Extension Rangeland Management Specialist and Professor in the Department of Natural Resource Management at SDSU.

2016 Brood Survey Reflects a New Normal by Garnet Perman

Disappointing news about the state's pheasant population made the headlines just before Labor Day. If you haven't heard, the annual brood survey showed an average 20% reduction statewide from last year. The James River Valley showed the biggest decline. The Aberdeen area index is down 43%. Huron is down 23%, the Mitchell area is down 17% and Yankton area is down 33% from last year. The northern part of the 1-29 corridor and the north central area around Mobridge showed the smallest change. The mantra regarding pheasant numbers is weather is a factor from year to year, but habitat is king over the long haul.

Increased snow cover in the southern part of the state certainly played a role in that area. In the central part of the state pockets of drought started developing earlier in the summer. They show a dip in pheasant numbers as well. Weather events in 2016 weren't that extreme, so SD GF&P biologists initially expected numbers similar to last year. This year's lower count comes after a two year rebound following the devastating effects of severe drought in 2012, a cold wet spring in 2013 followed by winter storm Atlas that fall.

The most significant trend shown by the annual SD GF&P survey is the ongoing long term decline in pheasant numbers in areas that were once South Dakota's premier pheasant hunting areas. In the past 10 years CRP contracts statewide have expired faster than new contracts have been enrolled. Many of those expired CRP acres are in those areas that have seen the largest reduction in pheasant numbers compared to a 10 year average. When the 10 year average is considered, the Aberdeen area is down a whopping 63%. Watertown, Huron and Brookings have seen about a 50% decrease. According to the SD GF&P website, the quantity of premier pheasant habitat could be half the 2007 acreage by 2020. Areas of the state where large fields of small grains such as wheat provide good nesting cover haven't seen as dramatic a reduction in pheasant numbers even though CRP acres are down there as well. The pheasant brood survey warns that "future pheasant population expectations should be tempered by the reality of declining habitat quantity"-- a new normal.

Put in economic terms, the loss of habitat impacts local pocket books. The number of hunters has steadily declined over the past decade. Last year, 150,036 hunting licenses were sold, just over 85,000 to out of state hunters. Each hunter spent an estimated average of \$1,134, boosting the state's economy by \$170.1 million. In 2015, Tripp and Brule counties saw the largest influx of hunting revenue. Tripp County, which is currently about half grassland and half cropland, took in \$10.1 million last year, nearly 90% of which came from out of state hunters. The brood survey showed 6.0 pheasants per mile in the Winner area last year, 4.9 for this year. In Brown County, which the county seat of Aberdeen has historically promoted as the Pheasant Capitol of the World, hunters spent \$12 million in 2012. In 2015 the Brown County hunters spent an estimated \$9.5 million. The annual brood surveys showed 3.2 pheasants per mile last year and only 1.8 this year.

2016 Brood Survey Continued on Page 6

The Green Side Up: Endangered Species by Pete Bauman

It's no secret to the membership of the Coalition that private land managers have significant influence on our state's natural resources, especially grasslands, water and the species that inhabit these areas. What may surprise our members is how important the Coalition can be in relation to representing our collective conservation interest. An example can be found in the conversation surrounding endangered species.

In 2014, the US Fish and Wildlife Service (USFWS) listed two small prairie butterflies under the Endangered Species Act (ESA). The Poweshiek Skipperling was listed as endangered and the Dakota Skipper as threatened. Both species rely on diverse native prairie/pastures in eastern South Dakota and other states.

Listing decisions were made after years of data gathering and conversations with affected parties - including input from South Dakota's ranching community through groups like the South Dakota Grassland Coalition. In 2012, the Coalition provided comments to the USFWS as that agency was gathering information on the status of the previously mentioned butterflies. The Coalition stressed that if those species were listed, it would be important to not penalize the ranchers that have retained butterfly habitat through either a heavy ESA regulatory burden or critical habitat designation. Those conversations resulted in an approach to listing the species that recognized sound grassland management practices on private lands were vitality important to the long term conservation of these species. Accordingly, the Dakota Skipper used a section 4(d) rule at the time of listing to maximize regulatory flexibility which exempted "take" of this species for all normal ranching activities. Further, the USFWS minimized unwanted critical habitat designations on private landowners. So while these species were ultimately listed, the Service recognized that the habitat remaining was not in *spite* of ranchers....but *because* of them!!

The loss of native grassland habitats is a reality that will eventually effect all South Dakotans, not only because of the actual loss of this valuable natural resource for our state but also because of national-level issues such as endangered species. These two small prairie butterflies should not be viewed as the exception, but rather as a cautionary prelude to what is likely to come with continued grassland loss.

The USFWS relies heavily on input from the Coalition when assessing its private lands programs in South Dakota. Scott Larson with USFWS's endangered species program in Pierre attended the July board meeting for the Coalition as a simple courtesy to provide a 'heads up' on what might be coming in the next few years related to endangered species issues. This type of outreach sets the stage for the Service to seek future council from the board, similar to the process that was followed in 2014.

The USFWS intends to evaluate several South Dakota species over the next seven years. Birds on the list include the black-backed woodpecker (Black Hills region) and the golden winged warbler (eastern SD).



Naturalist and Day County Conservation District Project Manager, Dennis Skadsen teaching children at the 2015 Bird Tour about riparian ecosystems and importance of biodiversity.

2016 Brood Survey Continued by Garnet Perman

On the bright side, SD GF&P biologist Travis Runia said that weather hampered this year's survey. He is hopeful that more birds are out there than the count indicated. An early corn harvest in some parts of the state will also help hunters find their limits.

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

The Green Side Up Continued by Pete Bauman

Mammals include the prairie gray fox, northwestern moose, plains spotted skunk, and little brown bat. Also on the evaluation list is Blanding's turtle and several insects including the western bumble bee, yellow banded bumble bee, monarch butterfly, and regal fritillary butterfly. While the black-backed woodpecker and northwestern moose are not necessarily reliant on healthy and diverse grasslands and wetlands in South Dakota, many of the others are. If we fail to retain diversity of native vegetation in our farming and ranching operations, including native flowering pollinators, we can only assume we will be faced with a growing list of species concerns in the future. Diversity can be profitable, and species diversity on the farm or ranch can be a great indicator of ecological balance and healthy, profitable systems.

Pete Bauman is an Extension Range Field Specialist in Watertown, SD.



SDSU's Cow-Calf Unit Grand Opening by Sandy Smart

On Friday September 16, South Dakota State University held their Cow-Calf Education and Research Facility Dedication. This day was a long-in-coming celebration of efforts dating back more than 5 years ago. Animal Science faculty, administrators, industry partners, and cow-calf producers participated in making this dream come true. Fundraising came from a variety of sources ranging from industry sponsors to individual cow-calf producers. SDSU is grateful to all sponsors, but were amazed by the generosity of more than 35 cow-calf producers that gave more than \$10,000 each. In addition, many producers participated in the "send a cow to college" program where the proceeds of cull cow sales were donated to this project. This new facility will strengthen our ability to educate the next generation of cow-calf managers and provide a premiere research facility for our professors.



From left: Interim Provost and Executive Vice President for Academic Affairs Dr. Dennis Hedge, SDSU Cow-Calf Education and Research Facility Assistant Manager Alejandro Casella, SDSU Cow-Calf Education and Research Facility Manager Kevin Vander Wal, Animal Science Professor Dr. Cody Wright, South Dakota Governor Dennis Daugaard, SDSU President Dr. Barry Dunn, South Dakota Governor's Office Director of Policy & Operations Dr. Nathan Sanderson, SDSU Animal Science Department Head Dr. Joe Cassady. (Photo by L. Berg, 2016).

Greg Judy Grazing Workshops by Pete Bauman

In late August nearly 100 producers and agency staff converged on Bart and Janet Carmichael's Wedge Tent Ranch north of Faith, SD to participate in a grazing and land management workshop featuring Missouri cattlemen and grazing practitioner Greg Judy. Two days later another 30 producers gathered on the far eastern edge of the state on Jessica Kruse's K Creek Ranch near Gary, SD for the second leg of the workshop series. The workshops were hosted by the SD Grassland Coalition and its partners. As typical of the Coalition's expanded partnerships these workshops were co-funded by the American Bird Conservancy and the World Wildlife Fund with technical and logistical support by staff from NRCS, SDSU Extension, and The Nature Conservancy.

Greg Judy is the owner and operator of Green Pastures Farm near Columbia, Missouri who's operation focuses on grassfed/grassfinishing naturally raised livestock including beef, sheep, and hogs (visit greenpasturesfarm.net for more information). Greg shared his unique perspectives on grassland management in Missouri, and provided the audience a reminder on key concepts of land management, regardless of whether your ranch is comprised of tame pasture in Missouri, native range in western SD, or a mix of native and tame tallgrass prairie in eastern SD. While not afraid to share what is working for his operation, Judy was very intentional in how he related his management philosophies to practical application on the host ranches. Concepts of soil health, grassland species diversity and recovery, animal management, and animal performance were key themes throughout the workshops, challenging producers to think critically about managing input costs and maximizing profit potential while recognizing the grass resource is their key asset.



Greg Judy workshop near Faith, SD on the Bart and Janet Carmichael Ranch (Photo Pete Bauman, 2016)

Pete Bauman is an Extension Range Field Specialist in Watertown, SD.



Grazing School to Conduct Alumni Survey by Sandy Smart

The Grassland Coalition just wrapped up their 14th Annual SD Grazing School held near Chamberlain. In a few weeks the Coalition, in participation with SDSU, is going to be sending out an alumni survey to get feedback on how effective their curriculum has been on helping students learn and apply the basics of grazing management on their operations. We believe that this survey will be a tremendous asset to help the Coalition determine their impact of the Grazing School mission. We look forward to sharing what we learn in the next few months.



2015 SD Grazing School (Photo T. Herrmann)



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Brookings, SD 57007

Calendar of Events

Event	Date	Location	Contact Person	Phone
Gettysburg Cover Crop/Soil Health Tour	Oct 5	Gettysburg	Josh Lefers	605-770-2989
SD SRM Excellence in Range Management Tour—Doug Sieck	Oct 11	Selby	Josh Lefers	605-770-2989
SD SRM Meeting	Nov 9-10	Deadwood	Tanse Herrmann	605-347-4952 ext. 3
NRCS State Tech Meeting	Nov 10	Pierre	Kathy Irving	605-352-1205
SD Cattlemen's Convention/ Leopold Presentation	Nov 30-Dec 1	Pierre, SD	Judge Jessop	605-280-0127
Winter Road Show	Dec 12-16	TBD	Judge Jessop	605-280-0127

Please remit any comments, suggestions, or topics deemed necessary for further review to: Sandy Smart, SDSU Box 2170, Brookings, SD 57007, alexander.smart@sdsu.edu, (605) 688-4017