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Extending Native Winter Pasture Use with Spring Grazing Practices

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Introduction

Improving profitability will help sustain the economic viability of ranch operations. Feed costs typically represent well over half of annual cow-calf production costs. Two things, 1) grazing strategies aimed at increasing the proportion of feed supplied through grazing and 2) decreasing reliance on high-cost harvested forages, have the potential to improve profit.

Many South Dakota ranchers graze throughout the year and provide supplements of harvested or purchased feed during the last trimester of pregnancy, during the first trimester of lactation, and on occasion when winter weather conditions are adverse. Separate pastures are typically designated for winter use only, often based on availability of winter shelter, water, and access to stored feeds. In addition, many operations depend on leased pasture, particularly during the summer months, making home-based pastures more suitable to graze in the winter.

In practice, winter pastures are deferred from grazing during the growing season (spring green-up until killing frost) so that forage is stockpiled prior to winter use. Conventional wisdom and rancher experience suggest that this method maximizes stockpiled forage biomass. However, defoliation during the growing season may stimulate plant production. A rapidly growing plant may compensate for the tissue removed. In some instances there is only partial regrowth (only a portion of what was removed regrows). Full regrowth or more regrowth than what was removed are less probable.

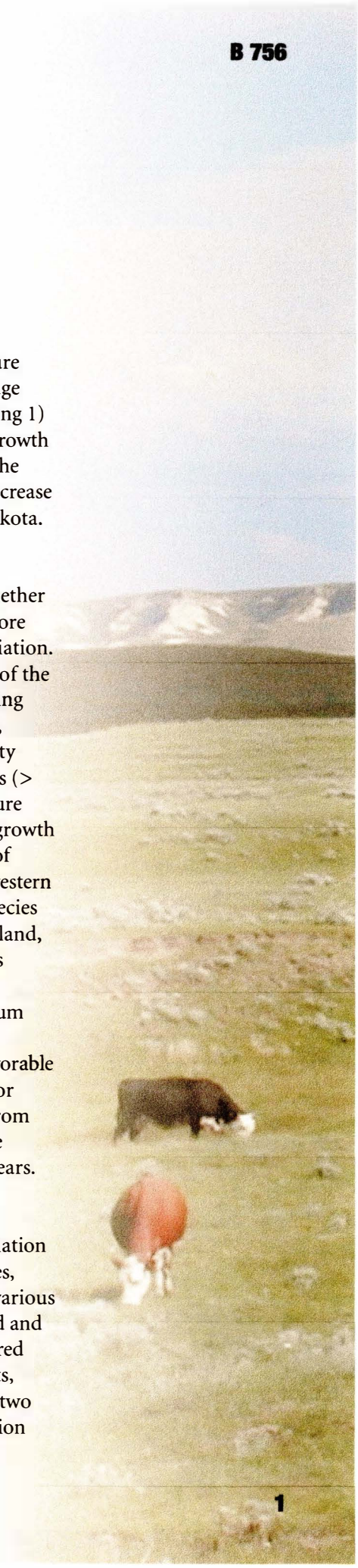
Designing a grazing strategy that capitalizes on rapid spring growth through appropriate timing of grazing events could increase the utilization of winter pasture without sacrificing the amount of forage stockpiled for winter use. Understanding 1) the underlying mechanisms of plant growth and 2) response to defoliation allows the design of grazing strategies that can increase the use of winter pastures in South Dakota.

Understanding our environment

Growing conditions determine whether plants will regrow partially, fully, or more than what was removed through defoliation. In South Dakota, as in many portions of the northern Great Plains, favorable growing conditions are usually limited to April, May, and June because the vast majority of forage plants are cool-season species (> 60% by composition) and peak moisture occurs in May and June. Therefore, regrowth will not extend beyond the early part of summer. Observing plant heights of western wheatgrass, a common cool-season species found on western South Dakota rangeland, throughout the summer illustrates this pattern (fig. 1). By the middle of July, western wheatgrass reaches its maximum plant height, suggesting that growing conditions after this period are not favorable for increasing plant height (or yield) for this species. Therefore, full regrowth from defoliated cool-season plants would be expected only before July 15 in most years.

Determining when to graze

To evaluate plant response to defoliation timing and intensity on winter pastures, winter standing forage biomass from various clipping treatments at the Cottonwood and Antelope research stations was compared for three years (2003-2005). Small plots, replicated three times, were clipped at two intensities based on 25 or 50% utilization



of the current standing biomass of western wheatgrass. Clipping dates were May 15, June 15, July 15, and August 15. An additional treatment was not clipped during the summer (winter pasture control plot). In December or January, to estimate how much regrowth occurred after plots were defoliated in the summer, plant height of western wheatgrass was measured. Winter standing biomass (midgrasses and shortgrasses) was also estimated for each treatment.

Regrowth of western wheatgrass, measured as plant height in the winter minus summer cutting height, was greater following clipping in May or June compared to July or August (fig. 2). However, no difference in regrowth height due to defoliation intensity was detected. These data demonstrate that opportunities for plant regrowth by cool-season grasses such as western wheatgrass are limited to periods with favorable growing conditions: from spring to early summer. Clipping at 25% relative utilization during the summer resulted in higher winter standing biomass than clipping at 50% utilization (fig. 3). The May clipping date, with 25% utilization, was the only defoliation treatment that had levels of standing forage biomass that were similar to those of the winter-only clipping treatment. Other treatments only regrew a portion of the biomass that was removed by clipping. These results suggest that grazing winter pasture in May at a 25% utilization would permit sufficient regrowth to maintain the quantity of stockpiled forage anticipated for winter use. Caution should be exercised if grazing in May at higher utilization rates (50%) or extending the grazing into June at low utilization rates (25%), because it could reduce winter standing biomass.

Flash grazing

In order to put into practice a dual use (late spring and normal winter grazing) of winter pastures, a high degree of management is required. Late spring grazing, as outlined, needs to occur in May at light utilization levels. Conceptually, grazing should be applied in such a way that livestock only graze the upper portion of the plant. Livestock are typically in a pasture for a short period (< 2 days) at a high stocking density and are moved through several pastures. This grazing strategy is often referred to as "flash grazing." The keys to successfully accomplish flash grazing are 1) the short grazing period per pasture and 2) the high stocking density. This allows for an even distribution of the grazing height across the pasture. Visually, the remaining grass height should look as if it were cut by a mower at a 3- to 4-inch cutting height. If uneven grazing occurs, then the grazing period needs to be reduced.

Achieving high stocking densities on pastures in South Dakota can be problematic if pasture size is too large (> 640 acres). In the past, ranchers often had very large pasture sizes (> 1000 acres), but with recent cost share programs funded by state and federal agencies for cross fencing and water development, the opportunity for practicing flash grazing is much more attainable. We know of several South Dakota ranchers that practice flash grazing. Their ranches range from 3,000 to 15,000 acres and the number of pastures range from 8 to 50, which results in the average pasture size of approximately 475 acres. Typical herd size ranges from 250 to 500 pairs, resulting in stock densities that range from 0.5 to 1.5 head per acre.

Economic payoff

The economic payoff occurs by not having to feed stored feeds during the time flash grazing is practiced. Many of the ranches that practice flash grazing typically can do this for 3 to 4 weeks in the spring. If a ranch can save three weeks of feeding hay to 500 head, that amounts to a savings of 375 Animal Unit Months or 146 tons of hay. For hay valued at $75 per ton, a ranch could potentially save $10,970 in feed costs per year.

Summary

It is possible to increase the use of winter pastures in South Dakota by applying a spring (May) flash grazing technique that does not decrease the amount of grass stockpiled for winter. The optimum time to apply the flash grazing is critical because regrowth is limited to May and June in South Dakota on cool-season dominated pastures. Generally, ranchers can flash graze for 3 to 4 weeks. The economic benefit comes from not having to feed stored feeds while flash grazing is practiced.

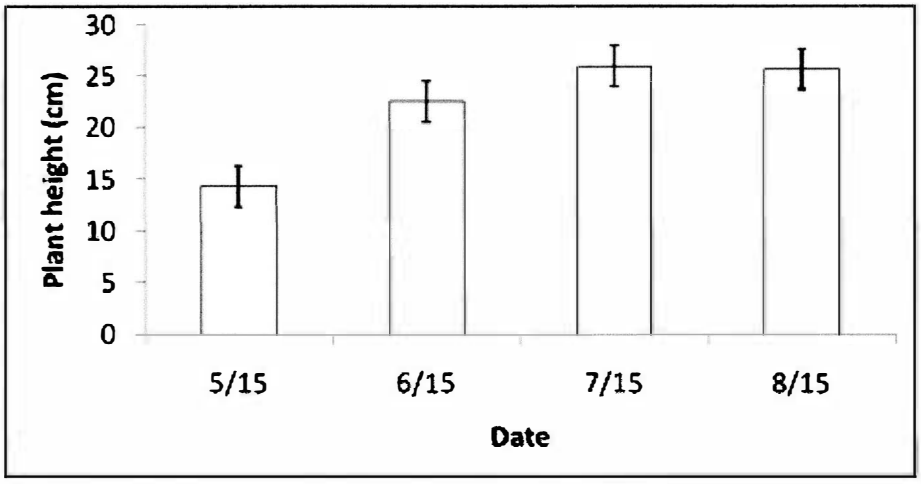


Figure 1. Plant height of western wheatgrass measured at Cottonwood and Antelope stations during the summers of 2002-2005.

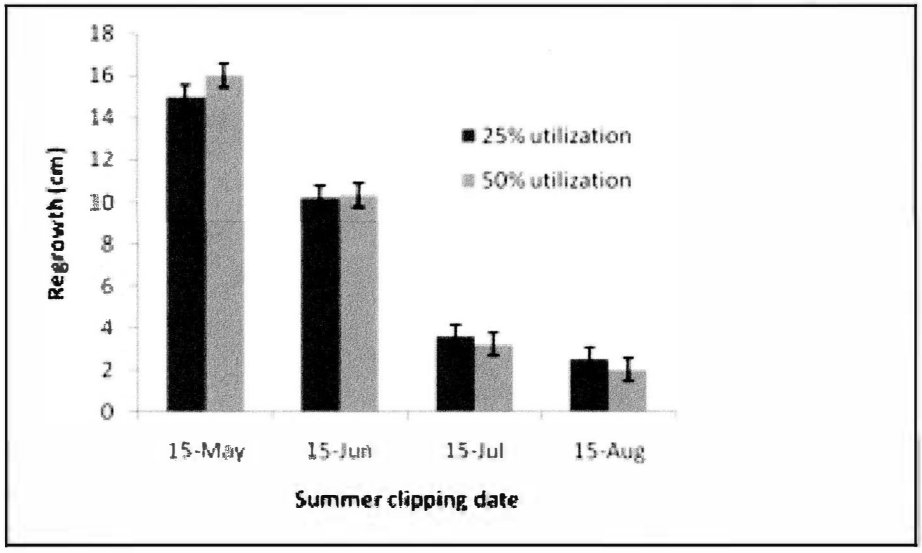


Figure 2. Regrowth of western wheatgrass plants measured in winter (December–January) averaged across years (2003-2005) and research stations (Cottonwood and Antelope) from plots clipped at 25% relative utilization (dark-colored bars) and 50% relative utilization (light-colored bars) during the summer. Standard error of the mean is 0.56 cm.

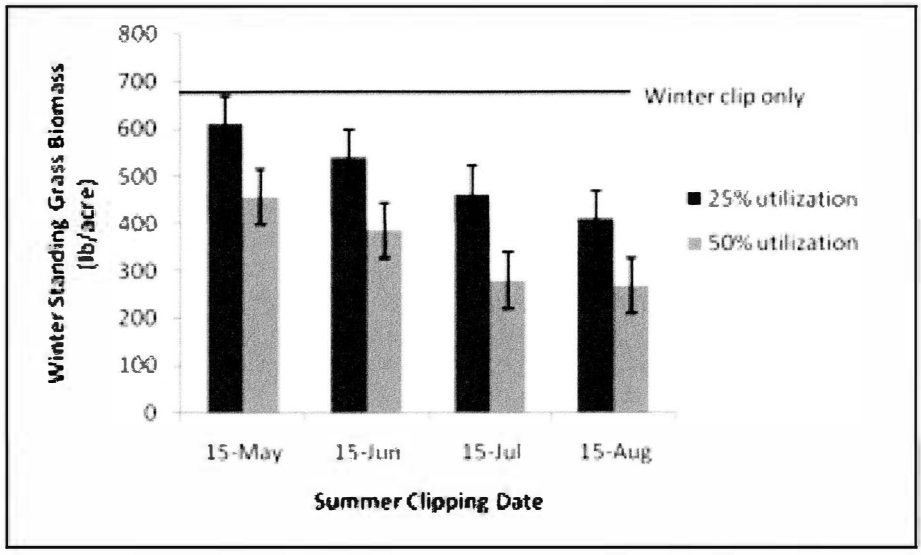


Figure 3. Winter (December- January) standing grass biomass averaged across years (2003-2005) and research stations (Cottonwood and Antelope) from plots clipped at 25% relative utilization (dark-colored bars) and 50% relative utilization (light-colored bars) during the summer. Winter clipping only treatment (solid horizontal line) was 673 lb/acre. Standard error of the mean is 58.6 lb/acre.

B756 may be accessed on the web at http://agbiopubs.sdstate.edu/articles/B756.pdf