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Can Modified Intensive Early Stocking Be Used in Cow/Calf Production?

K. R. Harmoney
Kansas State University, kharmone@ksu.edu

J. R. Jaeger
Kansas State University, jrjaeger@ksu.edu

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Abstract

Intensive early stocking (IES) was introduced nearly a half century ago in eastern Kansas and has since been adopted as a major management tool to increase animal production, efficiency of production, and economic return on tallgrass rangelands. These increases have come almost exclusively by using IES with young stocker animals. Intensive early stocking and its gains have been proven effective repeatedly in published research. A similar modified IES (MIES) system has increased production efficiency of stocker animals on western Kansas rangelands. Perennial grassland acres for cattle production, as well as cattle numbers, are declining. Using management practices that mimic a MIES system to increase beef cattle stocking density for breeding herds may allow producers to maintain or increase cow numbers for beef production on fewer perennial grassland resources. The objective of this project is to compare cow and calf growth and performance in traditional continuous season-long stocking (SLS) and MIES beef production systems.

Keywords

body condition score, conception rate, continuous stocking, early weaning, litter cover, species composition

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Keith Harmoney and John Jaeger

Introduction

Intensive early stocking (IES) was introduced nearly a half century ago in eastern Kansas and has since been adopted as a major management tool to increase animal production, efficiency of production, and economic return on tallgrass rangelands. These increases have come almost exclusively by using IES with young stocker animals. Intensive early stocking and its gains have been proven effective repeatedly in published research. A similar modified IES (MIES) system has increased production efficiency of stocker animals on western Kansas rangelands. Perennial grassland acres for cattle production, as well as cattle numbers, are declining. Using management practices that mimic a MIES system to increase beef cattle stocking density for breeding herds may allow producers to maintain or increase cow numbers for beef production on fewer perennial grassland resources. The objective of this project is to compare cow and calf growth and performance in traditional continuous season-long stocking (SLS) and MIES beef production systems.

Experimental Procedures

On native mixed-grass rangelands, 211-225 total cow/calf pairs at two locations were stocked at either 1.45× the typical stocking density May through November, or at a typical 1× density during the growing seasons of 2015-2017. The grazing study occurred at the Saline Experimental Range in northeast Ellis County, and the HB Ranch in southern Trego County. Both stocking treatments were implemented at both locations. Calves from 1.45× cows were weaned mid-growing season in late July and were backgrounded in a feedlot, thus reducing pasture stocking rate and density for the last portion of the grazing season. Calves from 1× cows were weaned in October. Cow body weights and body condition scores (BCS) were measured at the start of grazing in May, at the grazing mid-point in late July, and at the end of the grazing season in October. Calf weights were also recorded at these times. Additional calf weights were measured at approximately 4 and 8 weeks after weaning time periods. Cows were synchronized for artificial insemination (AI) and pregnancy was determined 30-35 days following AI and at the end of the grazing season by using transrectal ultrasonography. All pastures were monitored for plant species composition, ground cover, and biomass along transects at representative ecological sites to compare rangeland health between MIES and continuous stocking systems. Available herbage dry matter (DM) was measured through a double sampling protocol of clipped sample plots calibrated to readings from a falling

plate meter, while ground cover and species composition were estimated with a modified step-point technique along the same transects. Cows were intermingled during the winter, managed together, and had access to the same stockpiled winter rangeland and short-term feed resources until being sorted into their respective stocking treatments at grazing turnout in May.

Results and Discussion

Cow body weight (Table 1) was similar between grazing treatments at the start of each grazing season. Cow BCS (Table 2) was also similar for both grazing treatments at the start of the 2015 grazing season. Cow body weight and BCS were similar for both grazing treatments each year at the midpoint of the grazing season at the end of July (Table 1). Cow body weight and BCS were always greatest in October for cows from the MIES group. Even though MIES cows were stocked at a greater density, early-weaning calves in late July still allowed the MIES cows to gain condition each fall. The MIES cows retained some of this greater body condition through the winter and subsequently started with a greater body condition in both the 2016 and 2017 grazing seasons (Table 2). Cow grazing treatment did not affect cow first service conception rate (FSCR), but final conception rate was greater for the MIES grazing treatment (Table 1). Greater average cow BCS to start the grazing season in the MIES cow group may have benefitted final pregnancy rate. Averaged over all three years, calf body weight was not different for the two grazing treatments at any time during the growing season.

Total available herbage dry matter was similar between grazing treatments in the year prior to the study and was also similar between grazing treatments at the midpoint in late July and the end of grazing in October for each of the three study years (Table 3). Average total available herbage between the two stocking treatments was consistently within 150 lb/acre at all sampling dates. In three years, vegetative species composition had not changed significantly between the two grazing treatments for any of the species monitored (data not shown).

Implications

The use of an MIES system appears to be a suitable stocking strategy to increase cow/calf units while maintaining rangeland productivity. Cows in the MIES system with early weaning had similar or improved values for most production characteristics, including beginning and end of season BCS and final pregnancy rate. Returns from both systems, at present, are similar. At the current animal production level, the current variable cost pricing level, and current livestock pricing levels, a cost and returns budget showed that the MIES system provided an estimated return of $25.60/acre (including all costs of carrying more cows), while the continuous SLS system provided an estimated return of $24.87/acre.

Table 1. Cow body weights and BCS, and calf body weights at the start of the grazing season, at the end of July at mid-grazing season, and at the end of the grazing season

	Stocking treatment	
	Continuous SLS	Modified IES
Cow May weight, lb	1131	1169
Cow May BCS	5.09*	5.32*
Calf May weight, lb	188	189
Cow July weight, lb	1256	1270
Cow July BCS	5.31	5.40
Calf July weight, lb	377	376
Cow October weight, lb	1267*	1365*
Cow October BCS	5.22*	5.74*
Calf October weight, lb	555	568
Cow FSCR, %	45.5	54.9
Cow Final Conception Rate, %	86.0*	91.0*

*Indicates statistically different values between treatments at the $P \leq 0.05$ level.
Cow FSCR to timed AI and final conception rate is also included.

Table 2. Cow BCS at the start of grazing each year for 2015-2017, and the average over all three years

	Year			
Stocking treatment	2015	2016	2017	Average
Continuous SLS	5.17	5.26*	4.84*	5.09*
Modified IES	5.27	5.56*	5.13*	5.32*

*Indicates statistically different values between treatments at the $P \leq 0.05$ level.

Table 3. Pasture available herbage DM yield determined by falling plate meter readings calibrated with clipped frame samples in the fall of 2014 prior to grazing treatments, and in 2015 to 2017 at mid-season in July and after the growing season in October

	Cow stocking treatment			
	July		October	
	Continuous SLS	Modified IES	Continuous SLS	Modified IES
	Available DM (lb/acre)			
2014			1831	1861
2015	2298	2260	1997	1980
2016	2655	2526	2365	2279
2017	1970	2026	1579	1584
Average 2015-17	2308	2271	1980	1948