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Lyle W. Lomas

Joseph L. Moyer

K.P. Coffey

See next page for additional authors

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Effects of grazing system on performance of cow-calf pairs grazing bermudagrass pastures interseeded with wheat and legumes

Abstract

A total of 96 fall-calving cows and 64 calves grazed bermudagrass interseeded with wheat and legumes during 1996, 1997, and 1998 in either a continuous or rotational system stocked at equal rates. Legume cover, available forage dry matter, residual hay production, gains of cows and calves grazing wheat interseeded into bermudagrass, and gains of cows grazing bermudagrass interseeded with legumes were measured. Grazing system had no effect on legume cover, available forage dry matter, gains of cows and calves (wheat phase), and gains of cows (legume phase); however, rotationally grazed pastures produced more residual hay than those grazed continuously.

Keywords

Cattlemen's Day, 2000; Kansas Agricultural Experiment Station contribution; no. 00-287-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 850; Beef; Interseeding; Wheat; Legumes; Grazing

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Authors

Lyle W. Lomas, Joseph L. Moyer, K.P. Coffey, and George A. Milliken

EFFECTS OF GRAZING SYSTEM ON PERFORMANCE OF COW-CALF PAIRS GRAZING BERMUDAGRASS PASTURES INTERSEEDED WITH WHEAT AND LEGUMES

*L. W. Lomas¹, J. L. Moyer¹,
G. A. Milliken², and K. P. Coffey³*

Summary

A total of 96 fall-calving cows and 64 calves grazed bermudagrass interseeded with wheat and legumes during 1996, 1997, and 1998 in either a continuous or rotational system stocked at equal rates. Legume cover, available forage dry matter, residual hay production, gains of cows and calves grazing wheat interseeded into bermudagrass, and gains of cows grazing bermudagrass interseeded with legumes were measured. Grazing system had no effect on legume cover, available forage dry matter, gains of cows and calves (wheat phase), and gains of cows (legume phase); however, rotationally grazed pastures produced more residual hay than those grazed continuously.

(Key Words: Interseeding, Wheat, Legumes, Grazing.)

Introduction

Short-duration rotational grazing at higher than normal stocking rates has been used to improve forage utilization of underutilized pastures. Most of the previous research has evaluated rotationally grazed pastures stocked at a higher rate than the continuously grazed pastures, resulting in higher gain per acre and lower individual grazing gains for the rotational system. Because stocking rates were different for each grazing system, it is difficult to determine whether the performance differences were due to grazing system or stocking rate. Rotational grazing also may be beneficial for establishment of legumes. This study was conducted to com-

pare legume establishment, available forage, and grazing performance of fall-calving cows and calves grazing bermudagrass pasture interseeded with wheat, red clover, ladino clover, and Korean lespedeza and managed by either continuous or rotational grazing. Cattle numbers and land area were equal for each grazing system.

Experimental Procedures

Four 10-acre 'Hardie' bermudagrass pastures were used in a completely randomized design with two replications per grazing system. 'Jagger' wheat was no-till interseeded into the bermuda at 90 lb/acre in the falls of 1995, 1996, and 1997. Pastures were interseeded in the springs of 1996 and 1997 with 'Kenland' red clover, 'Regal' ladino clover, and Korean lespedeza. All pastures were fertilized with N, P and K in mid-May of 1996, 1997, and 1998 followed by 50 lb of N per acre in late July. Eight fall-calving cows were allotted randomly to each pasture on May 21, 1996, and 8 fall-calving cow-calf pairs were assigned randomly to each pasture on March 21, 1997 and April 7, 1998. Rotationally grazed units were subdivided into eight paddocks that were grazed for 3.5-day (1996 and 1997) or 2-day intervals (1998). In 1997 and 1998, cows and calves initially grazed the interseeded wheat for 56 days. Then calves were removed, and cows grazed bermudagrass interseeded with legumes for the remainder of the summer.

¹Southeast Agricultural Research Center, Parsons.

²Department of Statistics.

³University of Arkansas, Fayetteville.

Wheat was not available for grazing in 1996 because of below normal precipitation, so grazing was initiated with cows at the beginning of the bermudagrass-legume phase. Cows grazed bermudagrass interseeded with legumes for 113 days in 1996, 88 days in 1997, and 91 days in 1998. Hay was harvested from all pastures in late July of each year to maintain the bermudagrass in a vegetative state. We measured legume cover, available forage dry matter, gains of cows and calves grazing interseeded wheat and gains of cows grazing bermudagrass interseeded with legumes.

Results and Discussion

Grazing performance is presented in Table 1. No significant ($P>.05$) year by treatment interactions were observed. Legume cover and available forage dry matter were similar ($P>.05$) between grazing systems during both the interseeded wheat and legume/bermudagrass phases. However,

residual hay production was higher ($P<.05$) from rotationally grazed pastures than from pastures grazed continuously. Available dry matter during the wheat phase was higher ($P<.05$) in 1998 than in 1997. Legume cover did not differ during the wheat phase in 1997 and 1998. Legume cover and hay production during the bermudagrass phase were higher ($P<.05$) in 1997 than in 1998. Grazing system had no effect ($P>.05$) on gains of cows and calves grazing interseeded wheat or gains of cows grazing bermudagrass interseeded with legumes. Because legume cover and available dry matter did not differ between grazing systems, differences in grazing performance would not be expected. On interseeded wheat, calves gained 2.78 lb/day and cows gained 1.29 lb/day. Cows grazing bermudagrass interseeded with legumes gained 1.63 lb per day. Although differences ($P<.05$) occurred in cattle weights between years, cow and calf gains were similar ($P>.05$) between years.

Table 1. Effects of Grazing System on Performance of Cow-Calf Pairs Grazing Bermudagrass Pastures Interseeded with Wheat and Legumes

Item	Grazing System		Year		
	Continuous	Rotation	1996	1997	1998
<u>Interseeded Wheat Phase</u>					
No. of cow-calf pairs	32	32	-	32	32
No. of days	56	56	-	56	56
Calf initial wt., lb	508	509	-	468 ^a	549
Calf final wt., lb	666	662	-	628 ^a	701 ^b
Calf gain, lb	158	153	-	160	152
Calf daily gain, lb	2.82	2.74	-	2.85	2.71
Cow initial wt., lb	1341	1343	-	1272 ^a	1412 ^b
Cow final wt., lb	1415	1414	-	1344 ^a	1485 ^b
Cow gain, lb	73	71	-	72	73
Cow daily gain, lb	1.31	1.27	-	1.28	1.30
Legume cover, %	19.9	18.8	-	23.2	15.5
Available dry matter, lb/acre	1630	1555	-	1392 ^a	1792 ^b
<u>Bermudagrass/Legume Phase</u>					
No. of cows	48	48	32	32	32
No. of days	97	97	113	88	91
Cow initial wt., lb	1307	1300	1081 ^a	1344 ^b	1485 ^c
Cow final wt., lb	1459	1468	1289 ^a	1516 ^b	1585 ^c
Cow gain, lb	153	168	208 ^a	172 ^{a,b}	100 ^b
Cow daily gain, lb	1.56	1.70	1.84	1.95	1.10
Legume cover, %	7.0	10.0	6.5 ^{a,b}	16.2 ^a	2.9 ^b
Available dry matter, lb/acre	3667	3868	3850	3830	3622
Hay production, lb of dry matter/acre	1727 ^a	3075 ^b	2200 ^{a,b}	3087 ^a	1917 ^b

^{a,b,c}Grazing system and year means within a row with the same letter are not significantly different ($P<.05$).