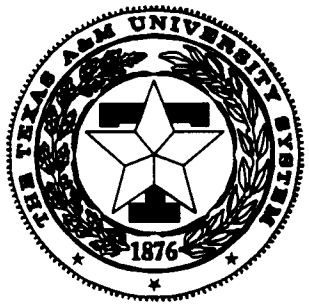
PUBLICATIONS

1998

FORAGE-LIVESTOCK FIELD DAY REPORT - 1998

TEXAS A&M UNIVERSITY AGRICULTURAL RESEARCH and EXTENSION CENTER at OVERTON

Texas Agricultural Experiment Station
Texas Agricultural Extension Service



April 16, 1998

Research Center Technical Report 98-1

PASTURE AND ANIMAL PERFORMANCE FROM BERMUDAGRASS PASTURES AT THREE STOCKING RATES WITH OR WITHOUT NITROGEN FERTILIZATION

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Background. Coastal and common bermudagrass pastures have been grazed at 3 stocking rates at TAMU-Overton since 1969 with cows and calves. From 1969 through 1984, annual fertilization was 200-100-100 lbs/ac of N-P_2O_5-K_2O and pastures were overseeded with annual ryegrass and various clovers (crimson, arrowleaf, subterranean, ball, red, white). From 1985 to 1997, each bermudagrass stocking rate pasture was divided into two overseeding x fertilizer treatments: (1) ryegrass + N only, and (2) clover + K only. From 1990-1997, N applications (250 lbs N/ac per year) were made only during the ryegrass growing period with no N applied to exclusive bermudagrass. Two cow-calf herds were used to assess animal performance at different stocking rates (fall calvers from Feb. to June; winter calvers from June to Sept.). The objective of this experiment was to quantify pasture-animal performance from various stocking rate x fertility regimens.

Research Findings. A summary of 7 years of pasture stocking rates, suckling calf gains, and calf gain per acre is shown in Table 1. Even though bermudagrass did not receive N during the summer months, stocking rates on exclusive bermudagrass ranged from about 0.70 to 3.4 cow-calf units (AU/ac) (approx. 1500 lbs) per acre, suckling calf ADG ranged from less than 1.0 lb/day on high stocked to nearly 2.5 lbs/day on low stocked pastures, and bermudagrass pasture productivity ranged from 100 to 360 lbs/ac calf weight from mid-June to September. Total seasonal gains per acre were generally higher on high or medium stocked pastures compared to low stocking rates. On both common and Coastal bermudagrass pastures, gain per acre was optimum-maximum on high (2.0 AU/ac) or medium (1.2 AU/ac) stocked pastures that had been overseeded with ryegrass and N fertilization. At lower stocking rates (.8 AU/ac), however, differences in gain per acre between N vs non-N fertilization were not as great. But, the residual forage that remained (risk factor) on low stocked Coastal bermudagrass pastures was 2 to 4-fold that on common bermudagrass pastures.

Application. Bermudagrasses on sandy soils are efficient in utilizing plant food nutrients from existing or previously applied sources. In humid environments, year-long bermudagrass pastures may be productive, sustainable, and vigorous during prolonged periods (years) of non-N fertilization. Table 2 shows fertilizer (only) costs per pound of calf gain using N and K rates from this experiment. Other costs (ryegrass and clover seed, lime, lease, animal, interest, etc.) are necessary before a complete costs analysis may be projected. Using these data, calf gains from medium stocked pastures would have fertilizer costs per pound of gain of about $.10 for N-fertilized pastures or $.03 for K-fertilized pastures.

Table 1. Cow-calf stocking rate and calf performance from bermudagrass pastures with different stocking rates and fertility regimens (1990-1996).

PASTURE	Winter-Spring			Summer			Total		
	SR[1]	ADG[2]	GAIN/AC	SR	ADG	GAIN/AC	SR	ADG	GAIN/AC
Common BG									
Clover + K	1.80	0.85	122	2.13	0.56	107	1.97	0.71	229
Ryegrass + N	1.96	1.79	339	2.39	1.02	224	2.18	1.41	563
Clover + K	1.18	2.39	245	1.28	1.68	201	1.23	2.04	446
Ryegrass + N	1.32	2.66	340	1.32	1.83	224	1.32	2.25	564
Clover + K	0.72	2.75	170	0.68	2.30	134	0.70	2.53	304
Ryegrass + N	0.81	2.94	231	0.79	2.18	159	0.80	2.56	390
Coastal BG									
Clover + K	1.91	1.73	283	2.78	0.89	231	2.35	1.31	514
Ryegrass + N	2.13	1.94	407	3.38	0.78	238	2.76	1.36	645
Clover + K	1.17	2.39	244	1.29	2.03	246	1.23	2.21	490
Ryegrass + N	1.31	2.75	357	1.90	2.02	359	1.61	2.39	716
Clover + K	0.75	3.01	197	0.83	2.46	193	0.79	2.74	390
Ryegrass + N	0.82	3.20	251	1.13	2.26	243	0.98	2.73	494

[1]Stocking rate expressed as cow + calf per acre (approx. 1500 lb)
[2]Average Daily Gain of calves (half steers and half heifers)

Table 2. Fertilizer costs[1] per pound of calf gain using 250 lbs/ac N or 100 lbs/ac K_2O.

Calf Gain	N cost/lb			K_2O cost/lb		
(lbs/ac)	$.20	$.25[2]	$.30	$.12	$.15	$.18
300	.167	.208	.250	.040	.050	.060
400	.125	.156	.188	.030	.038	.045
500	.100	.125	.150	.024	.030	.036
600	.083	.104	.125	.020	.025	.030
700	.071	.089	.107	.017	.021	.026
800	.063	.078	.094	.015	.019	.023

[1]Cost per pound of suckling calf gain is for fertilizer only and does not include any other pasture-animal-management expenses.
[2]Cost of N @ $.25 per pound would be equivalent to $170/ton for 34-0-0 (680 lbs N/ton of 34-0-0), for example.