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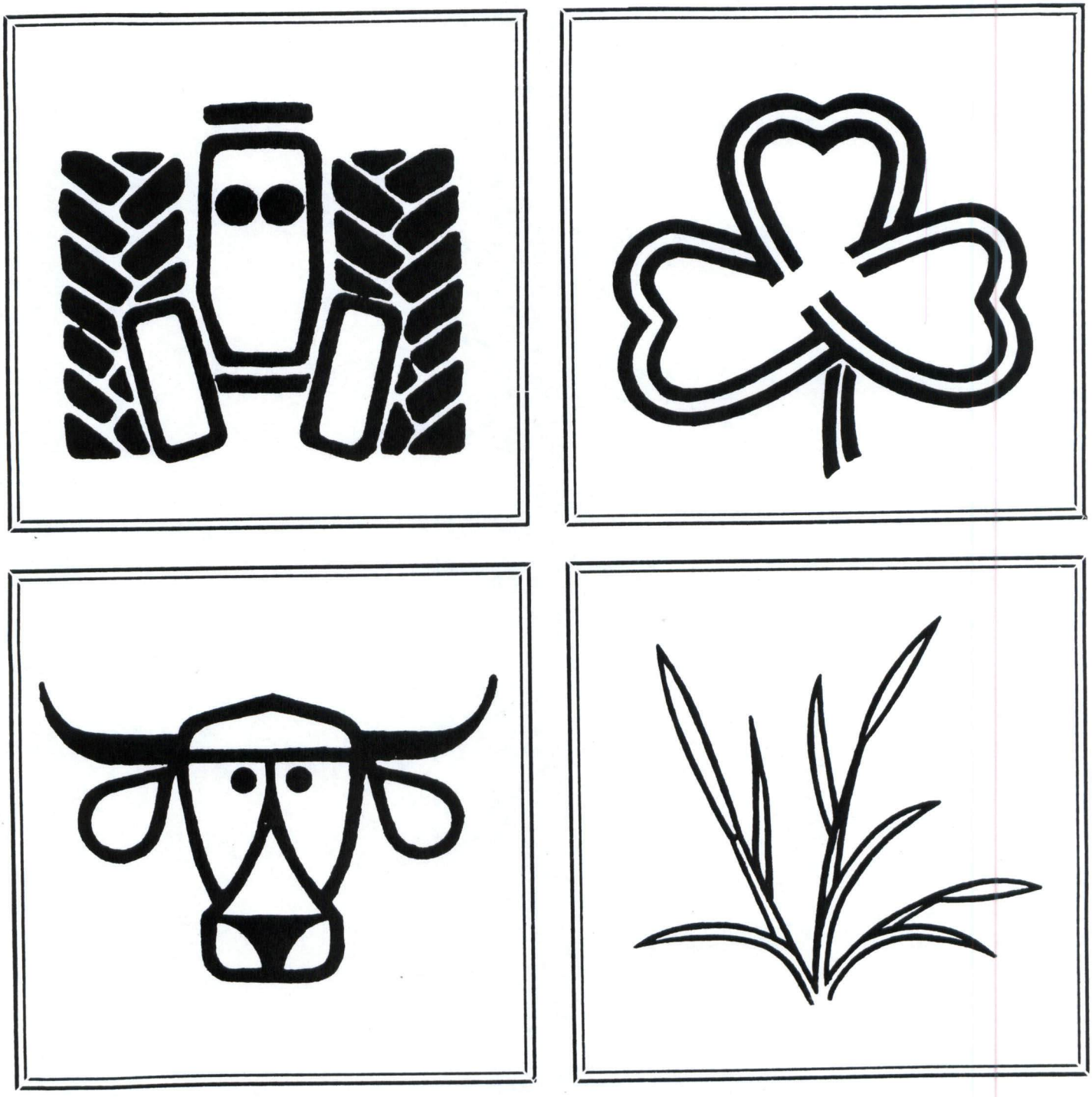

Forage Research in Texas

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Availability of Common Bermudagrass-Clover-Ryegrass Forage on Performance of Cows and Calves

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SUMMARY

Common bermudagrass pastures were oversown with 'Mt. Barker' subterranean clover and 'Gulf' ryegrass during 1980, and 'Yuchi' arrowleaf clover and 'Gulf' ryegrass during 1981 and 1982. Mature F-1 Brahman x Hereford cows and their Simmental-sired calves were used to graze these pastures to three levels of forage availability (stocking rates). Calf average daily gain (ADG) during the 3-year period was similar from the lightly- and medium-stocked pastures with 2.61 and 2.51 lbs, respectively. Cows on the lightly-stocked pastures gained nearly one-third pound/day more than those cows on medium-stocked pastures (1.07 vs .78). Weight gain from both cows and calves was substantially lower from the high stocked pastures as cows exhibited an ADG of -0.70 and calves had an ADG of 1.34 lbs. Steer calves gained 70 pounds more than heifer calves on the lightly-stocked pastures, and 20 and 27 pounds more on the medium- and high-stocked pastures, respectively. The three-year average stocking rates were .76, 1.32, and 2.42 cow-calf units per acre, respectively for lightly-, medium-, and high-stocked pastures.

Introduction

One of the most frequently occurring management decisions facing beef producers is the choice of the proper stocking rate for a particular pasture, and the consequences of having the pasture grazed too lightly or too severely. Because of the dynamic marketing system of beef cattle the economic optimum stocking rate for a given forage changes from year to year. In order to make the correct biological or economical choice of stocking rates, one must know the performance boundaries for both the pasture and the grazing animal. This trial was initiated to ascertain animal response to various levels of available forage.

Procedure

Common bermudagrass pastures were drilled with 'Mt. Barker' subterranean clover and 'Gulf' ryegrass in October 1979, and with 'Yuchi' arrowleaf clover and 'Gulf' ryegrass during October 1980 and 1981. Total annual fertilizer rates during each year were 200-100-100 lbs/ac of N-P_2O_5-K_2O. The entire P_2O_5 and K_2O were applied in November and the N was applied in four equal splits of 50 lbs each beginning in early February. Mature F-1 Brahman x Hereford cows and their fall-born Simmental-sired calves were used to graze these pastures to three different levels of available forage. Forage available for grazing was harvested to ground level via hand clippers at monthly intervals. Grazing was continuous and "grazer" or "regulator" animals were used on a put-and-take basis to achieve the desired level of forage

availability. Cows and calves were weighed at monthly intervals throughout the 135-day average grazing trials.

Discussion

Forage available for consumption during each of the three years is shown in Table 1. Pastures with approximately 500 lbs/ac available forage are grazed sufficiently heavy enough that spot grazing due to dung pats and urine spots is not noticeable. At approximately 1000-1200 lbs/ac available forage, the grazing pressure is light enough to allow substantial spot grazing to occur. And, at 2000+ lbs/ac available forage, the grazing pressure is low enough to allow for a substantial amount of selection by the grazing animal.

Table 2 shows the resultant stocking rates in cows and calves per acre and the body weight per acre of the grazing animals. At the high-stocked level of approximately 3700 lbs/ac body weight, suckling calves are most often the only class of beef animal that can exhibit a positive gain response. Both cow and calf performance from lightly-, medium- and high-stocked pastures are shown in Tables 3, 4, and 5, respectively, for each of the three years in the study period.

The three-year averages of cow-calf performance from all stocking rates are presented in Table 6. Pastures stocked at .76 cow-calf units per acre (1359 lbs body weight/acre) produced steers and heifers which gained at 2.61 lbs/hd/day and cows which gained at 1.07 lbs/hd/day. On these lightly-stocked pastures, steers outgained heifers by 70 lbs (.53 lbs/hd/day). Regardless of sex of calf, cows gained at nearly the same rate. By increasing the body weight/ac by nearly 1000 lbs, or the stocking rate from .76 to 1.32 cow-calf units per acre, calf performance from the medium-stocked pastures was similar to that from the lightly-stocked pastures. Cow performance, however, was about .3 lb/hd/day less on the medium-stocked pastures as compared to the lightly-stocked pastures. In addition, as the stocking rates were increased, there were less gain differences between steers and heifers. Pastures stocked at 2.42 cows and calves per acre (3767 lbs body wt/ac) produced calves which gained at the rate of 1.34 lbs/hd/day and cows which lost .70 lbs/hd/day. Although forage availability apparently restricted ad libitum intake of both cows and calves on the high stocked pastures, the F-1 Brahman x Hereford cows continued to lactate and thereby masking, to a certain degree, the full detrimental impact of the forage availability situation. Under the conditions of this trial, common bermudagrass-clover-ryegrass is optimumly stocked at approximately 1.32 ± cows and calves per acre. And, since the available forage was usually greater than 1000 lbs dry matter per acre, the producer could use the approximate body weight of 2000 lbs/acre, regardless of class of animal, and be at or near the "proper" stocking rate for optimum gain.

Table 1. Monthly available forage at three grazing pressures of sod-seeded common bermudagrass.

Date	High Stocked	Medium Stocked	Lightly Stocked
	----------lbs/ac----------		
1-27-80	1320	2904	2736
3-19-80	576	1056	1392
4-29-80	960	672	1824
5-27-80	504	1584	2784
6-27-80	408	1656	2856
AVG	754	1574	2318
2-25-81	1391	1415	1727
3-24-81	96	1247	2135
4-22-81	528	1031	3406
5-11-81	264	672	1919
6-24-81	888	1943	3238
AVG	633	1262	2485
3-11-82	1992	1416	1608
4-6-82	120	144	1225
5-4-82	216	432	1944
6-1-82	406	984	1812
6-29-82	720	1272	1728
AVG	691	850	1663

Table 2. Average stocking rates used to maintain forage availability on common bermudagrass-clover-ryegrass.

ITEM	Lightly Stocked	Medium Stocked	High Stocked
1980			
Stocking Rate (AU/ac)[1]	.75	1.43	2.39
Body Wt/ac (lbs)[2]	1313	2404	3738
1981			
Stocking Rate (Au/ac)	.75	1.25	2.52
Body Wt/ac (lbs)	1343	2254	3732
1982			
Stocking Rate (Au/ac)	.77	1.27	2.34
Body Wt/ac (lbs)	1421	2176	3831
3-Year Avg			
Stocking Rate (AU/ac)	.76	1.32	2.42
Body Wt/ac (lbs)	1359	2278	3767

[1] One animal unit (AU) = one cow + one calf.

[2] Body weight is combined weight of cow and calf.

Table 3. Cow-calf performance from lightly-stocked common bermudagrass-clover-ryegrass pastures.

ITEM	1980		1981		1982		3-Year Average	
	Cow	Calf	Cow	Calf	Cow	Calf	Cow	Calf
Starting Date	2-26		2-24		3-10		3-1	
Final Date	7-8		7-8		7-27		7-14	
No. Days on Test	133		134		139		135	
STEERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1126	412	1045	375	1133	401	1101	396
Final Wt. (lbs)	1243	780	1165	775	1319	800	1242	785
Wt. Gain (lbs)	117	368	120	400	186	399	141	389
ADG (lbs)	.88	2.77	.90	2.99	1.34	2.87	1.04	2.88
HEIFERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1156	380	1278	370	1218	372	1217	374
Final Wt. (lbs)	1254	648	1438	708	1412	722	1368	693
Wt. Gain (lbs)	98	268	160	338	194	350	151	319
ADG (lbs)	.74	2.02	1.19	2.52	1.40	2.52	1.11	2.35
ALL CALVES								
No. Animals	4	4	4	4	4	4	12	12
Initial Wt. (lbs)	1141	396	1162	373	1176	387	1160	385
Final Wt. (lbs)	1249	714	1302	742	1366	761	1306	739
Wt. Gain (lbs)	108	318	140	369	190	374	146	354
ADG (lbs)	.81	2.39	1.04	2.75	1.37	2.69	1.07	2.61

Table 4. Cow-calf performance from medium-stocked common bermudagrass-clover-ryegrass pastures.

ITEM	1980		1981		1982		3-Year Average	
	Cow	Calf	Cow	Calf	Cow	Calf	Cow	Calf
Starting Date	2-26		2-24		3-10		3-1	
Final Date	7-8		7-8		7-27		7-14	
No. Days on Test	133		134		139		135	
STEERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1150	364	1228	378	1105	400	1161	381
Final Wt. (lbs)	1235	672	1335	748	1194	774	1255	731
Wt. Gain (lbs)	85	308	107	370	89	374	94	351
ADG (lbs)	.64	2.32	.80	2.76	.64	2.69	.69	2.59
HEIFERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1102	343	1153	383	1071	375	1109	367
Final Wt. (lbs)	1225	631	1278	703	1171	760	1225	698
Wt. Gain (lbs)	123	288	125	320	100	385	116	331
ADG (lbs)	.92	2.17	.93	2.39	.72	2.77	.86	2.44
ALL CALVES								
No. Animals	4	4	4	4	4	4	12	12
Initial Wt. (lbs)	1126	354	1191	381	1088	388	1135	374
Final Wt. (lbs)	1230	652	1307	726	1183	767	1240	715
Wt. Gain (lbs)	104	298	116	345	95	379	105	341
ADG (lbs)	.78	2.24	.87	2.57	.68	2.73	.78	2.51

Table 5. Cow-calf performance from high-stocked common bermudagrass-clover-ryegrass pastures.

ITEM	1980		1981		1982		3-Year Average	
	Cow	Calf	Cow	Calf	Cow	Calf	Cow	Calf
Starting Date	2-26		2-24		3-10		3-1	
Final Date	7-8		7-8		7-27		7-14	
No. Days on Test	133		134		139		135	
STEERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1018	411	1013	365	1214	398	1082	391
Final Wt. (lbs)	918	632	975	560	1116	565	1003	586
Weight Gain (lbs)	-100	221	-38	195	-98	167	-79	194
ADG (lbs)	-.75	1.66	-.28	1.46	-.71	1.20	-.58	1.44
HEIFERS								
No. Animals	2	2	2	2	2	2	6	6
Initial Wt. (lbs)	1209	355	1113	373	1221	411	1181	380
Final Wt. (lbs)	1121	588	1000	523	1092	529	1071	547
Wt. Gain (lbs)	-88	233	-113	150	-129	118	-110	167
ADG (lbs)	-.66	1.75	-.84	1.12	-.93	0.85	-.81	1.24
ALL CALVES								
No. Animals	4	4	4	4	4	4	12	12
Initial Wt. (lbs)	1114	383	1063	369	1218	405	1132	386
Final Wt. (lbs)	1020	610	988	542	1104	547	1037	566
Weight Gain (lbs)	-94	227	-75	173	-114	142	-94	181
ADG (lbs)	-.71	1.71	-.56	1.29	-.82	1.02	-.70	1.34

Table 6. Three-year averages of cow-calf performance from different stocking rates of common bermudagrass-clover-ryegrass pastures.

ITEM	Lightly Stocked		Medium Stocked		High Stocked	
	Cow	Calf	Cow	Calf	Cow	Calf
	(lbs)					
STEERS						
Initial Wt.	1101	396	1161	381	1082	391
Weaning Wt.	1242	785	1255	731	1003	586
Gain	141	389	94	351	-79	194
ADG	1.04	2.88	.69	2.59	-.58	1.44
HEIFERS						
Initial wt.	1217	374	1109	367	1181	380
Weaning Wt.	1368	693	1225	698	1071	547
Gain	151	319	116	331	-110	167
ADG	1.11	2.35	.86	2.44	-.81	1.24
STEER ADVANTAGE						
Gain	-10	70	-22	20	31	27
ADG	-.07	.53	-.17	.15	.23	.20
ALL CALVES						
Initial Wt.	1160	385	1135	374	1132	386
Weaning Wt.	1306	739	1240	715	1037	566
Gain	146	354	105	341	-94	181
ADG	1.07	2.61	.78	2.51	-.70	1.34
STOCKING RATE						
Animal-units/ac	.76		1.32		2.42	
Body weight/ac	1359		2278		3767	
Gain/ac	111	269	139	450	-227	438