NAME OF TEST: Grazing management studies on Dallisgrass-white clover pastures, Angleton, 1960.

OBJECTIVES: To determine (1) the effect of nitrogen fertilization during the summer on Dallisgrass-white clover pasture and (2) the effect of rotation grazing as measured by animal performance, forage availability and botanical composition.

EXPERIMENTAL PROCEDURE:

Location: Substation No. 3, Angleton, Texas

Soil type: Lake Charles clay

Cultural practices: Three pastures were allotted to each treatment. Three stocking rates (1, 1.5 and 2 steers per acre) were used with each treatment. Animal data was analyzed by covariance analysis.

Treatments: Continuously grazed pastures without supplemental N were compared with continuously grazed pastures fertilized with 60 pounds N. per acre (30 pounds in 2 applications) and with rotational grazed pastures without N (5 days on - 25 days off).

Fertilizer rate: 0-40-0 per acre was applied to all pastures, September 28, 1960. The nitrogen-fertilized pastures were fertilized with 30-0-0 per acre on June 27, 1961 and again with a like amount on August 21, 1961. Pastures receiving the no nitrogen and nitrogen treatments were switched from the 1960 schedule. Thus, 1961 nitrogen-fertilized pastures did not receive nitrogen in 1960.

Animal management: Crossbred Hereford-Brahman steer calves were purchased from Ed Henley, Lufkin, In November, 1960. Following wintering to maintain weight, the steers were placed on their respective pastures on March 21, 1960. The procedure for dividing the steers into their respective groups was to select two sets of 9 steers as uniform as possible. The steers within each set were randomized to the 9 pastures. Similar steers were added as necessary to affect the desired stocking rates.

RESULTS: The average initial weights and average gains for 1961 for the continuously grazed with and without nitrogen and the rotationally grazed pastures by 30-day weigh periods is given in Table 1. Regression equations, correlation and regression equations for the several treatments are given in Table 2.

Pounds per acre available forage (oven-dry) for alternate weigh periods are given in Table 3. Botanical composition of the available forage was determined by hand separation of randomly clipped forage on March 21, April 22 and September 20. These data are given in Tables 5, 6 and 7.

Following the grazing season, all steers (both testers and grazers) were divided into 3 lots on the basis of gain on pasture and placed in the feedlot. Pertinent feed lot data is given in Table 9. The concentrate ration fed was 85% ground ear corn and 15% cottonseed meal. Hay was locally produced prairie hay of fairly low quality. Bonemeal and salt were fed in a 50-50 mixture free choice. Consumption per pen was 8, 8 and 10 pounds for Pens 1, 2 and 3, respectively.

DISCUSSION: May and early June were dry. This is reflected in the low volume of forage available per acre (Table 3), and in the low steer gains (Table 1) during this period. The low steer gains during the period August 21 to September 20 may well be due to the very excessive rains and winds experienced during Harricane Carla. Steer gains during September 20 to October 20 were not high, but neither were the gains uncommonly low.

Nitrogen fertilizer did not affect steer gains in 1961. Heavy rains occurred after the application on June 27 and August 21. Forage growth (Table 4) did not indicate a response to the nitrogen. Neither did the color of the grass on nitrogen fertilized pastures suggest a nitrogen response. This is not presently understood.

For statistical analysis, the continuously grazed pastures were pooled, nitrogen fertilized and non-nitrogen pastures, and compared with rotational grazing. Within the range of stocking rates used, the mean gains on continuously grazed pastures were higher ($P<.01$) but there was also a significant stocking rate x grazing system interaction ($P<.05$).

The botanical analysis for continuously grazed pastures indicated to have received no nitrogen actually received nitrogen in 1960. The higher percent Dallisgrass on these pastures appeared to be the result of a nitrogen carryover from the 1960 nitrogen application. Dallisgrass grew more luxuriantly and was a darker green color on these pastures. Consequently, there was a lower percent clover. Steer gains were somewhat higher from March 21 to June 22 on these pastures (Table 1).

The effect of pasture gain on feedlot performance was small. Although an inverse relationship between pasture gain and feedlot performance might be expected, such a relationship has not been clearly defined in this or previous trials.

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WORKER: Marvin E. Riewe

Table 1. Average weight gains per steer for several grazing practices on Dallisgrass-white clover pastures, Angleton, Texas, 1961

Steers per acre	Initial weight	3/21-4/20	4/20-5/22	5/22-6/22	6/22-7/21	7/21-8/21	8/21-9/20	9/20-10/20	
				Continuous grazing, No N					
1.0	440.0	80.0	75.0	20.0	52.5	57.5	5.0	20.0	310.0
1.5	455.0	72.5	60.0	-2.5	55.0	40.0	2.5	25.0	252.5
2.0	435.0	60.0	57.5	-10.0	42.5	27.5	-7.5	22.5	192.5
				Continuous grazing, N					
1.0	440.0	70.0	57.5	15.0	62.5	47.5	17.5	15.0	285.0
1.5	442.5	90.0	40.0	-12.5	62.5	40.0	2.5	12.5	235.0
2.0	430.0	67.5	30.0	-25.0	37.5	37.5	-5.0	2.5	155.0
				Rotational grazing					
1.0	455.0	77.5	37.5	10.0	42.5	40.0	5.0	25.0	237.5
1.5	430.0	67.5	45.0	5.0	45.0	35.0	-5.0	5.0	197.5
2.0	435.0	55.0	20.0	5.0	42.5	27.5	-7.5	12.5	155.0

Table 2. Regression equation, correlation and regression coefficients for several grazing treatments on Dallisgrass-white clover pastures, Angleton, Texas, 1961

Pasture treatment	Period	y	Regr. equation	b	r
Cont. grazed 60 lbs. N/acre	6/22 - 10/20	114.2	Y=204.2-60X	-60.00	-.995
Cont. grazed No N	6/22 - 10/20	11.42	Y=189.2-50X	-50.00	-.961
Cont. grazed Pooled	3/21 - 10/20	238.3	Y=423.93-123.75X	-123.75	-.998
Rotation grazed	3/21 - 10/20	196.7	Y=320.45-82.50X	-82.50	-.999

Table 3. Pounds per acre oven-dry forage available per acre for several grazing practices on Dallisgrass-white clover pastures, Angleton, Texas, 1961

No. steers per acre	4/20 - 5/22		6/22 - 7/21		8/21 - 9/20		9/20 - 10/20		Average	
	Begin	End	Begin	End	Begin	End	Begin	End	Begin	End
					Continuous grazing - No N					
1.0	740	1010	740	2370	720	670	670	740	720	1200
1.5	770	380	280	920	690	670	670	480	600	610
2.0	380	670	350	860	790	470	470	580	500	650
					Continuous grazing - N					
1.0	1430	1410	660	1540	1420	1020	1020	1600	1130	1390
1.5	430	210	400	820	530	710	710	540	520	570
2.0	510	370	230	840	740	690	690	800	540	680
					Rotation grazing 1/					
1.0	1590	1260	1890	1730	1590	840	1050	860	1530	1170
1.5	830	470	900	880	1460	670	910	690	1030	680
2.0	940	530	830	550	760	630	880	400	850	530

1/ There were six 5-day grazing periods on the rotational grazed pastures during each 30-day weigh period.

Table 4. The effect of 60 pounds N per acre on the yield of Dallisgrass-white clover pastures, 6/27 - 10/20, Angleton, Texas, 1961

No. steers per acre	Pounds oven-dry forage per acre 8/21	10/20	Total
	No Nitrogen		
1.0	2600	2000	4600
1.5	2700	1500	4200
2.0	2700	2100	4800
	60 lbs. Nitrogen per acre		
1.0	2300	2900	5200
1.5	2800	2100	4900
2.0	2000	2200	4200

Table 5. Botanical composition of available forages on the several Dallisgrass-white clover pastures, as determined by hand separation, March 21, 1961.

No. steers per acre	Percent Dallis-grass	Common Bermuda	White clover	Bur clover	Weeds
		Continuous grazing - No N			
1.0	71	6	10	12	1
1.5	77	8	4	8	3
2.0	64		11	22	3
		Continuous grazing - N			
1.0	23	1	37	31	8
1.5	55	1	35	2	7
2.0	30	10	30	18	12
		Rotation grazing			
1.0	50	8	14	20	8
1.5	77	2	13	2	6
2.0	45	1	24	29	1

Table 6. Botanical composition of available forage on the several Dallisgrass-white clover pastures as determined by hand separation, April 22, 1961

No. steers per acre	Percent						
	Dallis-grass	Common Bermuda	White clover	Bur clover	Persian clover	Yel.Hop. clover	Weeds
			Continuous grazing - No N				
1.0	58	5	2	1	24	8	2
1.5	Sample lost						
2.0	37	16	10			21	16
			Continuous grazing - N				
1.0	34	11	11	33	10		1
1.5	48	34	15			1	2
2.0	16	31	31			1	21

Table 7. Botanical composition of available forage on the several Dallisgrass-white clover pastures as determined by hand separation, September 20, 1961

No. steers per acre	Percent		
	Dallis-grass	Common Bermuda	Weeds
	Continuous grazing - No N		
1.0	77	23	
1.5	77	23	
2.0	37	60	3
	Continuous grazing - N		
1.0	46	52	2
1.5	41	58	1
2.0	16	84	1
	Rotation grazing		
1.0	84	15	1
1.5	91	7	1
2.0	79	20	1

Table 8. Grade score* for steers at end of grazing period on Dallisgrass-white clover pastures, Angleton, 10/20/61.

No. steers per acre	Grade	Flesh
	Continuous grazing - No N	
1.0	20	14
1.5	17	16
2.0	18	17
	Continuous grazing - N	
1.0	18	15
1.5	17	15
2.0	22	19
	Rotation grazing	
1.0	20	15
1.5	18	17
2.0	21	20

* 14-16-18: High to low good
20-22-24: High to low medium
Scored by John H. Jones

Table 9. The effect of gain on pasture on steer performance in feedlot, Angleton, Texas, 1961-62

Pen number:	1	2	3
Number of steers per pen	12	12	12
Avg. in pounds per steer:			
Gain on pasture	253	200	152
Initial weight, 10/20	683	637	583
Sale weight	857	866	841
Gain in feedlot	174	229	258
ADG	2.22	2.39	2.32
Feed consumed per day:			
Concentrate	19.06	19.37	18.92
Clover pellets	.75	.72	.70
Hay	4.76	3.88	3.55
Total	24.57	23.97	23.17
Feed consumed/cwt. gain:			
Concentrate	860	815	812
Clover pellets	34	30	38
Hay	215	163	152
Total	1109	1008	1002
Number of days on feed	78	96	111

NAME OF TEST: Grazing winter pastures, Angleton, 1960-61

OBJECTIVES: To determine (1) the effect of stocking rate on gain per animal and gain per acre on Gulf ryegrass and Kentucky 31 fescue pasture, (2) changes in moisture and protein content of the available forage.

EXPERIMENTAL PROCEDURE:

Location: Substation No. 3, Angleton, Texas

Soil type: Lake Charles clay

Experimental design: Three pastures each of Gulf ryegrass and Ky. 31 fescue completely randomized. Three pastures of a given species were each grazed at different stocking rate. Animal data was analyzed by covariance analysis. The pasture was three acres. The fescue was seeded October 8, 1959 (second year fescue). The Gulf ryegrass was seeded September 20, 1960 on the same pastures that had been seed to ryegrass in 1959. All pastures were fertilized with 24-30-0 per acre on September 20, 1960 and topdressed with 30-0-0 per acre on January 23, 1961.

Weaned crossbred Hereford x Brahman steer calves were used as experimental animals. The procedure was to select two sets of 6 steers as uniform as possible based on age, weight and grade. The steers within each set were randomized to the 6 pastures. Similar steer calves were added as necessary to affect desired stocking rates. The average gain per steer per pasture was based on the gains of the 2 tester steers within each pasture. Average initial weight per steer was 500 pounds. Tall fescue was grazed from November 15, 1960 to May 26, 1961--192 days. Ryegrass was grazed from November 29, 1960 to May 19, 1961--171 days.

RESULTS: The total season gain per animal and per acre by stocking rates for the 1960-61 season is shown in Table 1. The highest gain per animal was obtained on ryegrass pasture. At the point of maximum gain per acre, gain per acre was approximately 13% higher on ryegrass pasture (Table 2). However, the carrying capacity was almost 61% greater on tall fescue pasture (1.45 vs. .9 steer per acre). The average total season gain per steer did not differ significantly between ryegrass and tall fescue pastures within the range of stocking rates used during the 1960-61 season. There was, however, a significant stocking rate x pasture interaction. The decrease in gain per animal, as the stocking rate was increased (Table 3,b), was significantly greater on ryegrass pasture.

Again, as in previous years, low steer gains were experienced early in the season. Protein and moisture analysis (Tables 3 and 4) alone do not seem to suggest a solution. The winter of 1960-61 was very wet. With cattle grazing continuously, grazing was often under rather boggy conditions.

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Table 1. Steer gains at three stocking rates on Gulf ryegrass and Ky 31 fescue, Angleton, 1960-61

Pasture	Gulf ryegrass			Ky. 31 fescue		
	1	2	3	4	5	6
Steers grazed/acre	.94	1.34	1.63	1.00	1.50	2.00
Initial wt/steer, lbs.	500.00	500.00	500.00	502.50	497.50	497.50
Grazing period	11/29 to 5/19 (171 days)			11/15 to 5/26 (192 days)		
Total gain/steer, lbs.	218.30	120.80	40.00	161.50	130.00	75.00
Grazing period, winter	11/29 to 2/16 (79 days)			11/15 to 2/16 (93 days)		
Avg. daily gain, lbs.	.27	-.53	-1.04	.50	.27	-.32
Grazing period, spring	2/16 to 5/19 (92 days)			2/16 to 5/26 (99 days)		
Avg. daily gain, lbs.	2.14	1.77	1.33	1.16	1.06	1.06

Table 2. Observed and estimated gain per animal and per acre for crossbred Hereford-Brahman weaned steer calves grazing Gulf ryegrass and Ky. 31 fescue pastures, Angleton, 1960-61.

Stocking rate: Number of steers/acre	Gain per steer		Gain per acre	
	Estimated	Observed	Estimated	Observed
		Gulf ryegrass		
.8	255.9		204.7	
.9*	230.1		207.1*	
.94	219.8	218.3	206.6	205.2
1.00	204.4		204.4	
1.25	140.0		175.0	
1.34	116.9	120.8	156.6	161.9
1.50	75.6		113.4	
1.63	42.2	40.0	68.8	65.2
1.75	11.2		19.6	
		Ky. 31 fescue		
.8	182.8		146.2	
1.0	165.5	161.5	165.5	161.5
1.25	143.8		179.8	
1.45*	126.5		183.4*	
1.50	122.2	130.0	183.3	195.0
1.75	100.5		175.9	
2.0	78.9	75.0	157.8	150.0

*Estimated stocking rate producing maximum gain per acre.

Table 3. Regression equations, regression and correlation coefficients for stocking rate on pounds gain per steer on Gulf ryegrass and Ky. 31 fescue pastures, Angleton, 1960-61.

Pasture	Regression equation 1/	b	r
Ryegrass	Y = 461.87 - 257.48X	257.48	-.999
Fescue	Y = 252.07 - 86.60X	86.60	-.998

1/ - X = No. steers per acre and Y = pounds gain per steer.

Table 4. Percent protein* in available forage on ryegrass and fescue pastures, Angleton, 1960-61.

Number steers/acre	Gulf ryegrass			Ky. 31 fescue		
	.94	1.34	1.63	1.00	1.50	2.00
Sampling date:						
11/15/60				11.7	11.3	11.5
11/29/60	15.5	16.7	17.0			
12/21/60	16.9	15.1	15.4	11.2	10.5	10.8
1/19/61	19.7	17.5	15.2	11.2	9.9	9.1
2/15/61	22.2	22.5	21.6	12.5	12.6	18.4
3/14/61	17.2	18.8	21.4	16.8	17.2	17.2
4/11/61	17.0	15.8	17.7	12.6	13.3	17.6
5/2/61	9.5	12.0	13.7	11.3	10.2	12.1
5/22/61	5.7	7.2	8.4	8.3	8.1	10.4

*Analysis of one composite sample from each pasture on each sampling date only.

Table 5. Percent moisture* in available forage on ryegrass and fescue pastures, Angleton, 1960-61

Number steers/acre	Gulf ryegrass .94	1.34	1.63	Ky. 31 fescue 1.00	1.50	2.00
Sampling date:						
11/15/60				76	77	75
11/29/60	88	86	86			
12/21/60	81	79	77	75	73	71
1/19/61	85	84	85	77	76	75
2/15/61	85	84	83	70	71	76
3/14/61	84	84	84	76	75	78
4/11/61	83	82	83	74	77	79
5/2/61	71	74	73	70	67	65
5/22/61	49	56	50	60	54	64

*Moisture determination on two drying samples per pasture per sampling date.