Steer Weight Gains on Midland and Hardie Bermudagrass Pastures

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Story in Brief

A grazing trial with steers on four bermudagrass varieties (Midland, Hardie, Oklan and SS-16) began in 1977. Winter death loss of Oklan and SS-16 was so severe in 1979 that these two varieties were deemed unsuitable, and tests on them were discontinued. Average daily gain was 1.83 lb for Midland and 1.99 lb for Hardie with a 147-day season starting May 7, 1979. Stocking rate was adjusted to utilize available forage and totaled 381 and 405 steer days per acre for Midland and Hardie bermudagrass, respectively. This was an average of 2.6 and 2.8 steers per acre for Midland and Hardie, respectively. Total beef production per acre was 658 lb for Midland and 861 lb for Hardie.

These results emphasize the importance of pasture management in maintaining an immature growing forage, with steer selection, implanting and parasite control for maximum gain.

Introduction

Bermudagrass has not been promoted as a pasture for stockers. The selection and release of two new bermudagrass varieties, Hardie and Oklan, was based upon laboratory tests for forage quality. The purpose of this study was to evaluate these grasses with animal performance. We report herein results of steer grazing trials conducted in 1979, plus a summary of results from 1977 and 1978.

Experimental Procedure

The trials were conducted at the Agronomy Research Station, Perkins, Oklahoma. Two blocks of pastures, each containing one pasture of the hybrid bermudagrass varieties Midland, Hardie, Oklan and SS-16 (an unreleased experimental strain), were used in a randomized complete block design. The soils are the Dougherty, Konowa and Teller fine sandy loams (Arenic Haplustalfs, Ultic Haplustalfs and Udic Argiustolls). Soil tests revealed that the pH was 5.7 to 6.5, and soil phosphorous and potassium were very high.

The pastures were sprigged in 1975, and grazing trials began in 1977. Each of the pastures was about three acres and was subdivided with electric fences into three paddocks to facilitate rotational grazing during the grazing trials. The rotational grazing objective was 1-week grazing of the paddocks followed by a 2-week deferment. Thus, throughout most of the bermudagrass growing season, the forage was 2 and never over 3 weeks of age.

In early June of each year, each paddock was mowed to remove cool season annuals when steers were rotated. The pastures were fertilized with 150 lb of actual nitrogen per acre each year of the grazing trials. Nitrogen was applied as ammonium nitrate in three equal applications in early April, late June and early August.

Steers of two sources were used in the 1977 grazing trial. Forty-five were raised on the research station. They had grazed small grain pasture for 2 months prior to the trial and were in fleshly condition at the beginning of the trial. Fifteen steers were purchased at a livestock auction on May 2; they were in thin condition and were placed directly on bermudagrass. The steers, Hereford and Hereford x Angus, were assigned to treatment groups on the basis of source, breed and weight.

All steers (Hereford and Hereford x Angus) for the 1978 and 1979 trials were purchased at a livestock auction in March. The steers were grazed on small grain pasture with limited forage until the trial began, and were in thin condition at the beginning of the trial.

Daily gains were calculated from weight gains of steers that remained in the pastures throughout each grazing trial (tester steers). Average initial weight (mean ± SEM) of all tester steers in 1977 was 518 ± 8.4 lb, in 1978 was 520 ± 6.3 lb and in 1979 was 486 ± 10.9 lb. Stocking rates on the pastures were adjusted according to the amount of available forage throughout the grazing trials by use of put-and-take steers. For calculation of total steer gains, put-and-take steers were assigned daily gains of tester steers during each period. Steer weights were measured after about a 16-hour overnight shrink without feed or water.

All steers were implanted with 15 mg of diethylstilbestrol at the beginning of each trial. Injectable Tramisol (levamisole phosphate) was given for internal parasite control on July 1, 1977, twice in 1978 (March 1 and July 1) and on May 7, 1979. Excellent fly control was achieved during each trial by spraying the steers on each weigh date and keeping dust bags in the pastures. Steers in all pastures had access to trees or constructed shades. A commercial mineral supplement that contained 12 percent calcium and 12 percent phosphorus was fed free-choice during the trials.

The data were analyzed by analysis of variance. Where F values were significant ($P<.05$), these differences between Midland and Hardie bermudagrasses were marked by the * in Table 2.

Results and Discussion

Rainfall recorded on the station during the first 9 months of each year is compared with the long term average in Table 1. This 9-month total has varied from 73 to 85 percent of the long term average, with 1978 having the most severe drought.

Table 1. Seasonal precipitation (inches) for Agronomy Research Station, Perkins.

Month	1977	1978	1979	Long term average
January	0.22	0.92	2.11	1.53
February	1.16	2.63	0.25	1.46
March	2.50	1.46	3.80	2.20
April	2.23	1.85	3.42	3.16
May	8.46	7.28	6.83	5.09
June	1.90	4.59	3.01	4.58
July	3.15	0.90	0.42	3.45
August	2.88	0.53	1.62	3.19
September	1.77	0.49	1.94	3.81
Total	24.27	20.65	23.40	28.47

Table 2. Average daily gains (ADG) of steers, total steer grazing days per acre, and total gain per acre for intervals in 1979 with 3 years of seasonal averages.

Grazing interval	Number of days	ADG, lb		Total steer days/acre		Total gain/acre, lb	
		Midland	Hardie	Midland	Hardie	Midland	Hardie
5-7 to 6-1	25	4.05	3.35	45*	85	182	286
6-1 to 6-29	28	1.43	1.88	86*	78	124	147
6-29 to 7-31	32	2.01	2.32	109	114	220	264
7-31 to 8-31	31	0.60	1.11	83*	71	50*	77
8-31 to 10-1	31	1.43	1.51	58	58	82	86
1979 season	147	1.83	1.99	381	406	658*	861
1978 season	114	1.82	1.84	242*	259	419	487
1977 season	153	1.45	1.73	281	313	416*	552

* Indicates a significant difference (P = 0.05) between Midland and Hardie.

Details of the results for 1977 and 1978 seasons were published by Horn and McMurphy (1979). The winter of 1978-79 was severe enough that Oklan bermudagrass suffered over 90 percent winterkilling. Oklan bermudagrass was dropped from the test. The SS-16 had about 40 percent winterkilling, and it was dropped from the test by mid-1979. Production from it was so low that it should not be considered for northern Oklahoma. The test is now an evaluation of Midland and Hardie bermudagrass, both varieties being quite winterhardy.

Average daily gains (Table 2) were highest in May and lowest in July. The differences between Hardie and Midland have not been statistically significant. The 1979 season average daily gains were 1.83 lb for Midland and 1.99 lb for Hardie. Such high average daily gains deserve explanation, and presently we can only say that it is the product of total good animal and pasture management practices. These include selection of good steers, implanting with growth hormones, excellent internal and external parasite control, shade and mineral supplement. Pasture practices of nitrogen fertilization, proper stocking rates and rotation to provide young forage between 2 and 3 weeks of age are also factors favorable to high steer gains.

Stocking rates are expressed in steer days per acre. If you divide steer days per acre by the number of days in that interval, the quotient is steers/acre for that interval. Thus, Midland bermudagrass for the entire 1979 season had an average stocking rate of 2.6 steers per acre (381/147). Producers do not have the option to adjust stocking rates as freely as in our research. The only way most producers can use this program and keep the available forage young will be with rotation grazing and hay removal at peak growth periods. Therefore, the lowest stocking rate at any grazing interval becomes an important value to a producer. A producer must not run out of forage. For Midland bermudagrass, the lowest stocking rate was in May with 1.8 steers per acre (45 steer days per acre). The lowest stocking rate for Hardie was 1.9 steers/acre (58 steer days per acre) in September.

The Hardie bermudagrass has been consistent for 3 years in providing almost twice as much forage (measured in steer days per acre) each May. Precipitation for 1979 was below normal each month after June 1. A possible trend that appeared in the first 2 years (Horn and McMurphy, 1979) was that average or higher precipitation in the summer months favored greater production in midsummer from Midland than from Hardie. The two bermudagrass varieties offer a good combination potential, with Hardie being more productive in May and June and Midland having more production and potential for later if moisture is favorable.

Total gain per acre was 861 lb of beef for Hardie and 658 lb of beef for Midland. The gain per acre and stocking rates for 1979 are markedly higher than in previous years. While the nitrogen fertilization rate was the same (150 lb of actual nitrogen per acre for each year), we recognize that in the previous year the summer drought was so severe that only 1.92 inches of rain (July-September) fell on the last 100 lb of actual nitrogen applied. Therefore, the 1979 season results may well reflect residual soil nitrogen from the previous year.

These results reveal excellent average daily gains and emphasize the importance of a complete program for both steer and pasture management to provide and maintain high quality young forage to steers capable of producing.

Literature Cited

Horn, G.W., and W.E. McMurphy. 1979. Steer weight gains on Midland, Hardie, Oklan and SS-16 bermudagrass pastures. Okla. Agr. Exp. Sta. MP-104. p. 104-107.