



## Evaluation of Grazing Methods with Bermudagrass Pastures for Stocker Production

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*S.M. DeRouen, Hill Farm Research Station and J. D. Ward,  
Southeast Research Station*

### Findings

- Similar weight gains for stockers were observed over three years among pastures grazed continuously or rotationally at two levels of stocking rate.
- Individual weight gain performance did not differ between the two levels of stocking rate (3 or 4 stockers per acre) regardless of grazing method used.
- There were differences in forage crude protein and digestibility measurements among grazing method and stocking rate treatments, but these differences apparently did not influence stocker performance.

### Introduction

A high percentage of calves produced in Louisiana are sold at weaning and stockered in other sections of the country. The southeastern U.S., including Louisiana has an advantage for stocker grazing production over other regions of the nation. Its potential for forage production is higher due to longer growing seasons, adequate rainfall, and soils that readily respond to fertilization. These environmental advantages provide livestock producers in Louisiana the opportunity to carry calves through the stocker phase in a profitable manner. Unfortunately, there are some limitations that have hindered stocker grazing such as the relatively low rates of gain on warm-season perennial forages. Investigation of various grazing methods for stocker production will provide valuable information that could possibly address this limitation.

Studies investigating grazing methods on bermudagrass pastures with stocker cattle are somewhat limited and results from these studies have been conflicting and are therefore inconclusive. The purpose of this study is to evaluate the effects of continuous and rotational grazing methods at two stocking rates for stocker cattle consuming bermudagrass forages.

### Experimental Procedures

A three year study was conducted in 2001, 2002, and 2003 to determine the effects of continuous and rotational grazing methods on stocker performance at two different stocking rates. Grazing method-stocking rate treatments were: 1) continuous grazing with a stocking rate of 3 stockers per acre (**C-L**); 2) continuous grazing with a stocking rate of 4 stockers per acre (**C-H**); 3) rotational grazing with a stocking rate of 3 stockers per acre (**R-L**); and 4) rotational grazing with a stocking rate of 4 stockers per acre (**R-H**). Duration of the trials was 104, 90, and 84 days in 2001, 2002, and 2003, respectively. The trails were initiated in early to mid-May and terminated early to mid-August. The rotational pastures were divided equally into 8 paddocks. Stockers allocated to the rotational pastures were rotated among paddocks every 2 to 4 days.

A total of 252 fall-born, spring-weaned, Angus-sired, crossbred calves were used over the three year period. At the beginning of each trial, calves were given a growth implant, dewormed, and insecticide-impregnated ear tags were applied for horn fly control. The calves were dewormed again on day 56 into the trial. Eight pastures (two pastures per treatment) were used. Identical pasture fertilization



was applied to all pastures with 275 pounds/acre of 17-4-21-4 (N-P<sub>2</sub>O<sub>5</sub>-K<sub>2</sub>O-S) applied in April followed by three monthly applications of 150 pounds of ammonia nitrate (51 pounds of N) in May, June, and July.

Pastures were monitored for excessive forage growth and all pastures were clipped when necessary to suppress production of low quality forage. Table 1 gives monthly rainfall amounts for the spring and summer months over the three years the study was conducted. In general, rainfall was adequate for forage growth over the three growing seasons.

Relative forage availability was estimated monthly throughout the trial periods with rising plate meter readings. Monthly forage clippings were collected to determine forage quality for each pasture over the grazing period. Forage readings and samples collected on the rotational pastures were measured on the paddock the animals were recently removed (rotated) from and on the "fresh" paddock the animals were rotated to and the average of these two measurements were used to provide an estimate of overall forage availability and quality. Forage samples were oven-dried, processed, and sent to the Forage Quality Laboratory at the Southeast Research Station for analyses.

## Results and Discussion

Year did not affect any of stocker weight gain performance. Table 2 presents weight gain performance of the stockers over the three-year period. Average daily gain ( $P = 0.34$ ) and total gain ( $P = 0.31$ ) was not affected by grazing method and stocking rate treatment. Individual weight gains and ending weights were numerically higher for calves stocked at 3 head per acre compared with those stocked at 4 head per acre, regardless of grazing method, but these differences were not significantly different.

With two stocking rates evaluated, it would be of interest to compare weight gain per acre among treatments. As expected, total gains per acre were numerically higher for those calves stocked at 4 head per acre than those stocked at 3 head per acre, again regardless of grazing method (Table 2), however, these differences were not significantly different ( $P = 0.35$ ). There were large variations observed for total gain per acre with an average standard error of 28 pounds for the treatment means resulting in differences that were not significant.

Cost for installation of electrical fencing for the rotational grazing method was recorded for this study. Fencing costs per stocker (not including labor) was \$58 and \$43 for R-L and R-H, respectively. Because the same fencing was needed for the pastures stocked at either 3 or 4 head per acre, fencing costs was lower on a per stocker basis for the R-H treatment. If these costs were prorated over the duration of the study (3 years), this would amount to \$19.33 and \$14.33 per stocker for R-L and R-H, respectively, on an annual basis. Nonetheless, with no improved animal performance resulting from the rotational grazing method, the cost of this additional fencing would not be justified.

Forage availability, based on rising plate meter readings, was similar ( $P < 0.62$ ) among the grazing method and stocking rate treatments (Table 3). There was a tendency, however, for forage to be numerically less available for the pastures stocked at 4 head per acre (C-H and R-H) compared with those pastures stocked at 3 head per acre (C-L and R-L). There were differences in forage crude protein ( $P < 0.05$ ), acid detergent fiber ( $P < 0.05$ ), and *in vitro* true digestibility ( $P < 0.01$ ) among the treatments (Table 3). Crude protein was higher for the C-H and R-H indicating that higher stocking rates resulted in higher crude protein levels. Acid detergent fiber was lower (favorable) for the R-H treatment compared with the other treatments and *in vitro* true digestibility was greater (favorable) for both rotationally grazed treatments compared with continuously grazed treatments. These differences in crude protein, fiber, and digestibility, however, did not result in improved animal performance.

In conclusion, under the conditions of this study, results revealed that similar weight gains of stockers were obtained between the two grazing methods evaluated. Furthermore, animal performance was similar among continuous and rotationally grazed pastures stocked at either 3 or 4 stockers per acre indicating that continuous grazing at the higher stocking rate would be recommended. There were some



differences in forage quality parameters, but these differences did not appear to affect stocker performance.

Table 1. Spring and summer monthly rainfall amounts (inches) at Hill Farm Research Station.

Month	Year 2001	Year 2002	Year 2003	53-year average (1950-2003)
April	2.41	2.67	3.61	5.10
May	2.52	3.75	10.11	5.18
June	5.38	1.15	3.09	4.28
July	2.00	4.11	3.09	4.15
August	3.69	3.03	1.73	2.96
Total	16.00	14.71	21.63	21.67

Table 2. Weight gain performance of stockers by grazing method and stocking rate treatment.

Treatment <sup>1</sup>	No.	Initial weight <sup>2</sup> , lb	Average daily gain, lb	Total gain, lb	Ending weight <sup>2</sup> , lb	Total gain per acre, lb
C-L	54	547	1.38	128	675	381
C-H	72	548	1.17	109	657	436
R-L	54	547	1.39	128	675	384
R-H	72	547	1.20	112	659	445
P level <sup>3</sup>	--	0.84	0.34	0.31	0.29	0.35

<sup>1</sup>C-L - continuous grazing with a stocking rate of 3 stockers per acre; C-H - continuous grazing with a stocking rate of 4 stockers per acre; R-L - rotational grazing with a stocking rate of 3 stockers per acre; and R-H - rotational grazing with a stocking rate of 4 stockers per acre.

<sup>2</sup>Average of two weights collected over two consecutive days.

<sup>3</sup>Probability level – if level is less than 0.05 then treatment is a significant effect.



Table 3. Forage quality of bermudagrass pastures by grazing method and stocking rate treatment.

Treatment <sup>1</sup>	Rising plate meter reading	Crude protein, %	Neutral detergent fiber, %	Acid detergent fiber, %	<i>In vitro</i> true digestibility, %
C-L	10.2	13.5 <sup>a</sup>	66.7	30.9 <sup>a</sup>	56.9 <sup>a</sup>
C-H	8.7	14.9 <sup>b</sup>	66.3	30.3 <sup>b</sup>	57.4 <sup>b</sup>
R-L	11.9	14.0 <sup>a</sup>	67.1	30.8 <sup>a, b</sup>	58.1 <sup>c</sup>
R-H	9.7	15.4 <sup>b</sup>	65.6	29.1 <sup>c</sup>	60.4 <sup>d</sup>
P level <sup>2</sup>	0.62	0.04	0.19	0.05	0.01

<sup>1</sup>C-L - continuous grazing with a stocking rate of 3 stockers per acre; C-H - continuous grazing with a stocking rate of 4 stockers per acre; R-L - rotational grazing with a stocking rate of 3 stockers per acre; and R-H - rotational grazing with a stocking rate of 4 stockers per acre.

<sup>a, b, c, d</sup> Means within a column with different superscripts differ ( $P < 0.05$ ).

<sup>2</sup> Probability level – if level is less than 0.05 then treatment is a significant effect.

