Tifton 85, Coastal Bermudagrass, and Supplement for Backgrounding Fall Born Calves During the Summer

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Summary

Fall-born, early summer weaned calves gained as much or more during the summer months grazing Tifton 85 bermudagrass than did companion calves grazing Coastal bermudagrass and receiving 2 lbs/hd/da of a 28% protein supplement in both year one and year two. In the second year, combined steer and heifer ADG exceeded 1.5 lbs/da grazing Tifton 85 bermudagrass and about 2 lbs/da with Tifton 85 and a protein supplement. The F-1 (Hereford x Brahman) steers exceeded 2 lbs/da ADG in both years when grazing Tifton 85, and with supplementation in year two, approached 3 lbs/da during July-September. The increased nutritive value of Tifton 85 bermudagrass offers new and exciting opportunities to background stockers during the summer. Protein supplementation of 2lbs/hd/da increased ADG by about 0.3 lbs/da for stockers grazing either Coastal or Tifton 85 bermudagrass. The supplement to extra gain ratio for stockers was 6.1 for Tifton 85 and 6.9 for Coastal bermudagrass. Thus, for a $ 200/ton ration, the supplement costs for extra gain was $ 0.61/lb for Tifton 85 and $0.69/lb for Coastal bermudagrass. As previously documented, supplementation strategies should always include assumptions of feed:extra gain conversions, costs of ration and supplementation, stocking rates, and expected animal performance levels for both the backgrounding phase as well as the post-backgrounding phases of feedlot and/or breeding.

Introduction

In general, the most challenging stocker performance goals are with fall-born calves weaned in June-July and immediately backgrounded on bermudagrass throughout the summer. Previous research with Tifton 85 bermudagrass in Georgia indicated about a 25% increase in animal performance over Coastal bermudagrass. Although nutritive assessments of NDF, ADF, and protein were similar for both grasses, digestibility of the cell wall, fiber components (NDF, ADF), is higher for Tifton 85 compared to Coastal bermudagrass. Two grazing experiments at the Overton Center were conducted to document the use of Tifton 85 vs Coastal bermudagrass for backgrounding fall-born, summer-weaned calves. The hypothesis of the first study (Trial 1) was that calves grazing Tifton 85 bermudagrass (TIF-85) without supplementation should produce equivalent weight gains as stocker calves grazing Coastal bermudagrass and receiving a protein supplement (CSUP). The primary objective of the Trial 1, VAC-45 backgrounding experiment, was to document weight change during the first six weeks post-weaning, and to compare TIF-85 to CSUP during summer grazing for calf gain. In the second experiment, Trial 2, an assessment of stocker performance from both bermudagrasses was made with and without supplement to document the potential of forage cultivar and supplementation for backgrounding fall-born calves. A secondary objective in both Trials was to assess performance of F-1 Hereford x Brahman steers compared with 25% Brahman steers and heifers during the summer months.

Experimental Procedures

Trial 1

A component of the Texas Value Added Calf (TEX-VAC) management program, VAC-45, was used with fall born (Sept 15-Nov 1) calves weaned in June. In this experiment (Trial 1), on June 9, steers and heifers (total n=50) from first-calf F-1 Angus x Brahman (AxB) dams and Hereford sires (HHAB), and 15 F-1 (HxB) steers were weaned. On June 9, calves received Bovashield 4, 7-way vaccine with somnus, Eprinex pour-on dewormer, Revelor-G ear implant, and a fly tag containing 20% Diazanon. From June 9 to June 16 all calves were in the weaning lot and received water via trough, *ad libitum* bermudagrass hay, and 3 lbs/hd/da of a 3:1 (corn:soybean meal) ration. The weaning lot was a 2-ac mesh wire fenced area which was adjacent to pasture which housed all the cows. On June 16, calves were weighed and stratified by previous treatment, sex, weight, and breed type and randomly allotted to two replicates of two pasture treatments. Each replicate pasture was grazed by 6 HHAB steers, 7 HAAB heifers, and 4 HxB steers. Pasture treatments were TIF-85 without supplementation, and Coastal bermudagrass with 2 lbs/hd/da of a 1:1 (corn:soybean meal) ration (28% protein) fed daily (CSUP). The corn:SBM ration also contained .05% Rumensin 80; 1.25% dicalcium phosphate; 6.25% magnesium oxide; and 2.5% salt. These additional ingredients were added to enhance performance and prevent ration gorging which allowed all animals an opportunity for ration intake. Stockers were weighed on June 30 and re-vaccinated with Bovashield 4. Additional weighings were made on July 20, August 10, and on August 31 at time of shipment to a commercial feedlot.

Trial 2

Fall-born, Simmental-sired (SimX) steers (n=38) and heifers (n=40) with AxB dams were weaned on June 12, 2002 and received a 7-way vaccine with somnus, Eprinex pour-on dewormer, Revelor-G ear implant, and fly tag. Fall-born F-1 Hereford x Brahman (HxB) steers (n=20) received identical weaning treatments. All cattle were re-weighed on June 25, 2002 and allocated to treatment groups based on sex, breed type, previous stocking rate, and weight. Three replicate pastures of each of four treatments were: (1) Coastal bermudagrass pasture (COS); (2) COS plus supplement (CSUP); (3) Tifton-85 bermudagrass pastures (TIF-85); and (4) TIF-85 plus supplement (T85SUP). Supplement for this trial was identical to the 1:1 (corn:SBM), 28% protein ration used in Trial 1. Unlike Trial 1, however, this supplement was fed daily for the first two weeks and then the weekly ration was divided equally into a 3-time per week feeding (Mon, Wed, Fri). Cattle were allowed an adjustment period to treatment assignments from June 25 to July 3 at which time 28-day gains were taken thereafter. Stocking rate was 3 stockers per acre and stocking was continuous until Sep. 25 when the experiment was terminated and all cattle were transported to a commercial feedlot.

Results & Discussion

Trial 1

Steers and heifers from previous cow-calf stocking rate studies were partitioned to illustrate weight change during the first week of weaning (Table 1). During the first week post-weaning, the average for HHAB steer and heifer weight changes was -5.15, -1.58, and -0.91 lbs/da, respectively, for calves previously stocked at low, medium, and high rates (Table 1). The HxB F-1 steers showed a -2.57 lb/da response during the first week of weaning. Fill losses or shrink due to weaning during the first week (6-9 to 6-16) were deemed to be moderate to low weight losses due to the restraints of weaning whereby cows had close contact with their calves. From time of weaning, June 9, to July 20 (41 days) calf gain was about 1.65 lbs/da regardless of pasture treatment (Table 2). Thus, within the recommendations of the VAC 45 program, and the nutritional regimens of the weaning-grazing components, moderate weight gains were achieved. During the grazing phase, June 16 to August 31, stocker gains were essentially identical at nearly 1.9 lbs/da from either CSUP or TIF-85. During the 76-da grazing phase, it was evident in this study that ADG of stockers grazing TIF-85 was equal to

ADG of stockers grazing Coastal bermudagrass plus a daily allotment of 2 lbs/hd of a 28% protein plus Rumensin supplement. There was no difference between ADG of HHAB steers and heifers during either the entire weaning-grazing period (1.4 lbs/da) or the grazing only period (1.6 lbs/da). And, there was no effect of pasture treatment on ADG of HHAB cattle. The F-1, HxB steers, however exhibited greater (P<.05) ADG than the HHAB, and HxB steers also had greater (P<.05) gains from grazing TIF-85 (2.30 lbs/da) vs CSUP (2.03 lbs/da). The 2.3 lb/da gains from the HxB steers grazing TIF-85 emphasized the opportunities to optimize stocker performance using adapted animal genotypes with increased nutritive value-based bermudagrass pastures. Further, these enhanced steer gains occurred during the traditional "summer slump" period of July-August. At relatively similar levels of forage availability in all pastures, the stocking rate on TIF-85 at 4.5 hd/ac compared to 2 hd/ac on CSUP resulted in a two-fold advantage in liveweight gain per acre for TIF-85 (551 vs 225 lbs/ac). Results from this one year experiment showed enhanced stocker gains, stocking rate, and genotype attributes for cattle grazing TIF-85 pastures.

Table 1. Stocker performance during first week post-weaning from three stocking rates (SR) in Trial 1.

Previous SR[1]	Breed Type[2]	Calf Sex	Number	Weaning Wt June 9	Weight June 16	1-week ADG
				(lbs)	(lbs)	(lbs/da)
LO	HHAB	M	4	840	798	-6.00
LO	HHAB	F	4	743	713	-4.29
ME	HHAB	M	19	709	699	-1.72
ME	HHAB	F	15	708	696	-1.44
HI	HHAB	M	4	684	669	-2.11
HI	HHAB	F	4	642	644	0.29
ME	HxB	M	15	562	544	-2.57

[1]Previous stocking rates (SR) during cow-calf phase was low (LO), medium (ME), and high (HI).
[2]Breed types included Hereford x (AxB) [HHAB] and F-1 (Hereford x Brahman) [HxB].

Table 2. Average daily gains (ADG) for calves grazing Tifton 85 (TIF-85) bermudagrass without supplementation or Coastal bermudagrass plus supplementation (CSUP) from weaning to August 31 in Trial 1.

Pasture Treatment	Average Daily Gain		Stocking Rate	Overall Gain/ac	Average Daily Gain by Breed Type [2]			
	Initial 6-9 to 7-20 41-d	Pasture Phase 6-16 to 8-31 76-d			6-9 to 8-31		6-16 to 8-31	
	---------- lbs / da ----------		(hd/ac)	(lbs/ac)	HHAB	HxB	HHAB	HxB
TIF-85	1.64 a[1]	1.86 a	4.5	551 a	1.42 a	2.20 a	1.54 a	2.30 a
CSUP	1.69 a	1.87 a	2.0	225 b	1.38 a	1.83 b	1.61 a	2.03 b

[1]Means in a column followed by a different letter differ statistically (P<.02).
[2]Breed types included Hereford x (AxB) [HHAB] and F-1 (Hereford x Brahman) [HxB].

Trial 2

Weaning weights in mid-June of fall born calves ranged from about 570 lbs for Grazer calves (GRZR) which were stocked at high to medium high rates to 765 lbs for low stocked tester steers (Table 3). During the first 13 days of weaning, all pre-weaning groups had positive ADG which ranged from less than a pound per day to more than 3 lbs/day for the GRZR group (Table 3). This 13-day weaning period in Trial 2 provided a more appropriate time for weight gain adjustments post-weaning compared to the 7-day period reported in Trial 1 (Table 1).

Table 3. Performance of steers and heifers during the first 13 days post weaning from three pre-weaning stocking rates in Trial 2.

Previous SR Treatment Status	Breed[1] Type	Calf Sex	Number	June 12 Weaning Weight (lbs)	June 25 13-day Weight (lbs)	13-day ADG (lbs/da)
LO	SIM X	M	7	765	776	0.86
LO	SIM X	F	6	741	746	0.42
ME	SIM X	M	6	745	754	0.76
ME	SIM X	F	8	720	737	0.78
HI	SIM X	M	10	673	690	1.25
HI	SIM X	F	8	675	689	1.10
GRZR	SIM X	M	15	572	614	3.23
GRZR	SIM X	F	18	561	607	3.28

[1] Breed type was Simmental x (AxB) [SIMX].

The stocking rate for all pastures during the June through September period at 3 hd/ac was rated as a very low stocking rate during this particular year with respect to forage available for consumption. At this stocking rate, animals had *ad libitum* selection of bermudagrass leaves which enhanced the potential to achieve maximum individual gain. The treatment ADG for all calves during the 84-day grazing-backgrounding experiment was 1.01 and 1.30 lbs/da, respectively, for COS and CSUP; and was 1.69 and 2.02 lbs/da, respectively for TIF-85 and T85SUP (Table 4). There was about a 0.3 lb ADG difference between each of the four treatments. In this experiment, ADG was different ($P<.05$) between each of the four treatments. The ADG for the implanted steers and heifers was similar across treatments. However, ADG of the HxB steers was significantly higher than SIMX steers on each of the four treatments and ranged from 1.64 lbs/da on COS to 2.89 lbs/da on T85SUP. These fall born HxB steers were not managed pre-weaning for maximum weaning weights and therefore may have exhibited some compensating gains during backgrounding. However, when considering animal performance from Trial 1 and Trial 2, the ADG of HxB steers was almost identical at 2.04 lbs/da, from CSUP, 2.30 lbs/da, from TIF-85 (Table 5). From these two grazing experiments using HxB steers, the opportunity to obtain gains of 2.3 to nearly 3.0 lbs/da during the summertime appears to be attainable when grazing Tifton 85 bermudagrass with environmentally-adapted cattle types.

Table 4. Average daily gain of steers and heifers grazing Tifton 85 or Coastal bermudagrass each with or without supplementation in Trial 2.

Pasture	Average Daily Gain		
	All Cattle	SIM X[2] Hfr & Str	HxB[2] Steers
	---------- (lbs / da) ----------		
Coastal PAS	1.01 d	.91 d	1.64 c
Coastal + SUPL	1.30 c	1.18 c	2.04 b
Tifton 85 PAS	1.69 b	1.58 b	2.33 b
Tifton 85 + SUPL	2.02 a	1.86 a	2.89 a

[1] Means in a column followed by a different letter differ (P<.05).
[2] Breed types included Simmental x (AxB) [SIM X] and F-1 (Hereford x Brahman) [HxB].

Table 5. Average daily gain comparisons for Trial 1 and Trial 2 during the grazing-backgrounding summer period.

Pasture	Average Daily Gain			
	Trial 1[1] HHAB	Trial 2[2] SIM X	Trial 1[1] HxB	Trial 2[2] HxB
	---------- (lbs / da) ----------			
Coastal PAS		.91 d		1.64 c
Coastal + SUPL	1.61 a[3]	1.18 c	2.03 b	2.04 b
Tifton 85 PAS	1.54 a	1.58 b	2.30 a	2.33 b
Tifton 85 + SUPL		1.86 a		2.89 a

[1]Trial 1 grazing from 6-16 to 8-31
[2]Trial 2 grazing from
[3]Means in a column followed by a different letter differ (P<.05).

Table 6. Stocking rate, gain per animal and per acre, extra gain from supplement, and feed:extra gain ratio.

Pasture	Stocking Rate	Gain / Animal	Gain / Acre	Extra Gain Suppl.	Feed: Extra Gain
	(hd / ac)	(lbs)	(lbs)	(lbs)	
Coastal PAS	3	93	279	--	--
Coastal + SUPL	3	120	360	.29	6.9
Tifton 85 PAS	3	155	465	--	--
Tifton 85 + SUPL	3	186	550	.33	6.1

Extra gain attributable to supplement and resultant feed:extra gain ratios are shown in Table 6. For both CSUP and T85SUP, the 2 lb/hd/da supplement produced about 0.3 lb/da extra gain over non-supplemental cattle which resulted in a feed:extra gain conversion of 6.9 to 6.1, respectively. Thus, at this conversion rate, supplement cost and value of cattle need to be carefully considered before implementing such a program. However, other factors that also need consideration are stocking rate, forage mass available for grazing, and post-grazing ownership.

Implications

Decisions to background calves post-weaning are usually based on either projected opportunities to merchandize pre-conditioned VAC-45 calves, or the desire to retain ownership through the backgrounding and feedlot phase. The success of any backgrounding program is inseparately linked to animal health and to nutritive value of the pasture-forage and/or supplemental feed. From these initial studies, the added nutritive value of Tifton 85 bermudagrass has created new potential opportunities for managers who wish to background-graze stockers during the summer and approach or exceed the 2 lbs/da ADG barrier. The use of protein supplementation provided an additional 0.3/lb daily gain; however, the feed to extra gain conversion of about 6:1 to 6:9 did not exceed that of a conventional feedlot program. Since all bermudagrass pastures were overseeded with a rye and/or ryegrass with winter-spring application of a complete fertilizer (N-P-K), only nitrogen fertilizer was used during the summer grazing of stocker cattle. About $ 55 to $ 60 per acre in fertilizer was used during each year (3 applications of 150 lbs/ac 34-0-0 at $ 240/ton).

Using only fertilizer costs, the fertilizer cost per pound of gain during Trial 1 was about $ 0.11/lb gain for Tifton 85 and $ 0.27/lb gain for Coastal bermudagrass + Supplementation. In Trial 2, fertilizer costs per pound of gain for the four treatments were: $ 0.12/lb gain for Tifton 85; $0.10/lb gain for Tifton 85 + Supplementation; $ 0.19 for Coastal; and $ 0.15 for Coastal + Supplementation. Supplementation costs of $ 0.61 to 0.69 per pound of extra gain in these studies are additional costs for consideration when choosing this management option. The total cost per pound of gain should include the other fixed costs for pasture as well as animal and interest costs. Estimates of total costs per pound of gain for these two experiments were anticipated to range from about $ 0.25 to $ 0.50/lb depending upon management strategy used. Supplementation decisions must be carefully considered to warrant implementation. The primary factors affecting the economy of supplementation are uniquely linked to forage nutritive value, forage availability, stocking rate, and ownership preferences for subsequent animal performance expectations (feedlot, puberty, etc.).