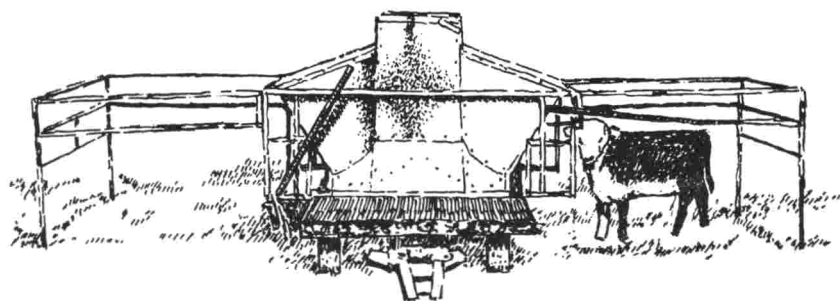
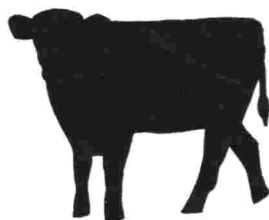
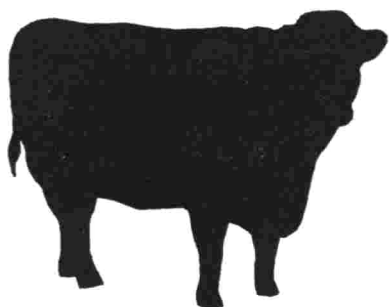




*Orchardgrass-Ladino Clover
and Fescue-Ladino Clover Pasture
for Beef Cows and Calves*
With and Without Creep Feeding

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1968

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SUMMARY

BEEF cow-calf production was compared during 1963 and 1964 on two different pasture combinations with and without creep feeding for the calves. The experiment was designed as a 2 x 2 factorial with two replications. Because of differences in the soil types and forage characteristics of the two replications, each was analyzed separately.

The results of comparing old-stand (seeded in 1953) fescue pastures with orchardgrass-Ladino clover pastures grown on cherty silty clay loam soils with steep slopes (5-20%) and relatively low moisture-holding capabilities were as follows:

1. Calves had an average adjusted daily gain of 1.95 pounds on orchardgrass-Ladino clover pastures and 1.63 pounds on the old-stand fescue pastures ($P < .01$).
2. Creep-fed and non-creep-fed calves had adjusted daily gains of 1.93 pounds and 1.66 pounds, respectively, with a much greater response (0.22 pound per day) to creep feeding observed during 1964.
3. Significant ($P < .05$) year differences were observed among both cow gains and calf gains. Rainfall amounts and distribution variations which influenced pasture growth and composition were apparently major factors contributing to these differences.

New stand (seeding in 1962) fescue-Ladino clover pastures compared with orchardgrass-Ladino clover pastures grown on rolling (2-12% slope) silt loam soils with relatively good moisture retention characteristics showed the following:

1. No significant ($P > .05$) difference in adjusted daily gains by calves was observed between newly seeded fescue-Ladino clover pastures (2.12 pounds) and orchardgrass-Ladino clover pastures (2.09 pounds).
2. The adjusted average daily gain for creep-fed calves was 2.32 pounds and 1.90 pounds for non-creep-fed calves. As in the other replication, a greater response (0.34 pound per day) to creep feeding was observed during 1964.
3. Highly significant ($P < .01$) yearly differences were observed between both cow gains and calf gains. The estimated proportion of Ladino clover making up the available forage dropped from 33.0% in 1963 to 9.5% in 1964.

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Orchardgrass-Ladino Clover and Fescue Ladino Clover Pasture For Beef Cows and Calves With and Without Creep Feeding

by

J. M. Anderson and L. M. Safley*

INTRODUCTION

SEVERAL pasture experiments utilizing beef steers as test animals have been conducted under Tennessee conditions (High *et al.*, 1965b; Hobbs *et al.*, 1965; and High *et al.*, 1965a). The primary comparisons were between fescue-Ladino clover and orchardgrass-Ladino clover pastures with various management practices used to expand these basic comparisons.

In all trials, steer performance during the grazing season from April 1 to September 1 favored pasture combinations containing orchardgrass over those with fescue. Fescue pastures were advantageous during the period from November 1 to April 1. Generally, fescue pastures supported more animal grazing days.

No results of pasture tests with adult beef cows and nursing calves have been reported under Tennessee conditions. Since it was possible that results obtained with steers could not be extrapolated to cows, an experiment was designed to compare the performance of beef cows and calves grazing orchardgrass-Ladino clover pastures with that of beef cows and calves grazing fescue-Ladino clover pastures, both with and without creep feeding for the calves.

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EXPERIMENTAL PROCEDURES

Pastures

A 2 x 2 factorial experiment with two replications was established at the Highland Rim Experiment Station to compare two pasture combinations for beef cow-calf production with or without creep feeding for the calves. The following design was used in the test over a period of 2 years (1963 and 1964) :

	<i>Pasture plot</i>	<i>Treatment</i>
Block I	1	Fescue-Ladino clover and creep feed
	2	Fescue-Ladino clover and no creep feed
	3	Orchardgrass-Ladino clover and creep feed
	4	Orchardgrass-Ladino clover and no creep feed
Block II	5	Orchardgrass-Ladino clover and no creep feed
	6	Fescue-Ladino clover and no creep feed
	7	Fescue-Ladino clover and creep feed
	8	Orchardgrass-Ladino clover and creep feed

Each pasture plot consisted of 10 acres with one electric cross-fence to permit rotational grazing. All pasture plots except 1 and 2 were new seedings in the fall of 1962. Plots 1 and 2 are referred to as "old stand pastures" because they were seeded in 1953. Some lespedeza was available both years in pasture plots 1 and 2 because of natural reseeding. Although these plots were designated by a particular grass-Ladino clover combination, some fescue did contaminate the orchardgrass plots. Therefore, the nomenclature applied to each treatment refers to the predominant grass species in that particular pasture plot.

Soils

The soils in each plot are given in Table 1. Plots 1 through 4 were considerably steeper and more cherty than plots 5 through 8. Within a block and between plots the soils were as uniform as could be obtained for the size necessary in this experiment.

Following the initial seeding, soils from each plot were sampled annually and additional fertilizer applied as indicated by the soil test results. No applications of nitrogen fertilizer were made after the initial seeding.

Rainfall

An official record of the rainfall in the Springfield area has been

maintained since 1938. Records were obtained in 1963 and 1964 from a location approximately $\frac{3}{4}$ -mile southwest of the experimental areas.

Animals

Five Hereford cow-calf units were grazed on each 10-acre plot. Cows with calves from the Highland Rim Experiment Station herd were allotted into 8 uniform groups of 5 cow-calf units each, based on prior performance of the cows. These groups were randomly assigned to each of the pasture groups. Replacement of these cow-calf units was made in the case of the death of either a test cow or calf. In the fall of the year, cows diagnosed open on a pregnancy check were replaced and cows without live calves were replaced the following spring.

Grazing

Grazing started in April of each year and cows and calves remained on the test pastures until mid-October. The calves were weaned and cows removed and kept in confinement for a short period following weaning. Then, the cows were replaced on the experimental pastures and kept there as long as each had enough forage to provide adequate nutrition. The cows were removed from

Table 1. Kinds of soil and percentage in each plot

Soil	Percent Slope	Block I				Block II			
		Plot				Plot			
		1	2	3	4	5	6	7	8
Percent									
Baxter cherty silty clay loam	5-20	94	84	92	94	8			10
Minvale silt loam	5-12	5	4	5					
Mountview silt loam	2-5	1	8						
Lobelville silt loam	2-5		3			2			20
Huntington silt loam	0-3		1	1					
Greendale silt loam	2-5			2	1				
Dickson silt loam	2-12				5	81	40	15	64
Sango silt loam	2-5					8	60	85	45
Bewleyville silt loam	2-12					1			1

the test lot and wintered on corn silage and hay at 100% of the National Research Council's recommended allowances for pregnant beef cows.

Creep feeding

Creep feeding began on May 4 in 1963 and on April 2 in 1964. This supplemental feeding continued from these dates to weaning time each year. Initially, a commercial feed mixture containing molasses was added to aid in starting the calves on feed. After the calves were accustomed to eating the creep feed, a ration of 67% cracked shelled corn and 33% crimped oats was fed in 1963. In 1964 this mixture was altered slightly to 75% cracked shelled corn and 25% crimped oats. These mixtures were self-fed in portable steel feeders.¹

Observations

The pastures were visually evaluated at 2-week intervals during the grazing season and at 4-week intervals during the winter. These observations included estimates of the percent and average height of the various species in each pasture, and the stage of growth, condition, and color of each pasture (Figure 1).

The test cows and calves were weighed at scheduled intervals throughout the year. Calves were graded for type and condition in June and October.

Statistical Analysis

Data were analyzed by analysis of variance as outlined by Snedecor (1956).

RESULTS AND DISCUSSION

Calf Performance

Performance of the calves was the primary criterion for measuring treatment differences. Results for 1963 and 1964 are shown in Tables 2 and 3.

In 1963 adjusted calf gains during the grazing season on old stand fescue pastures averaged 1.73 and 1.54 pounds per day for creep and non-creep-fed calves, respectively. Creep fed calves on orchardgrass-Ladino clover pastures averaged gaining 2.23 pounds per day and non-creep-fed calves gained 2.09 pounds per day. New stand fescue pastures supported daily gains of 2.36 pounds with creep feed and 2.15 pounds without creep feeding. The improve-

¹ Feeders furnished through courtesy of National Pressed Steel Company, Memphis, Tennessee.

UNIVERSITY OF TENNESSEE
AGRICULTURAL EXPERIMENT STATION
ANIMAL HUSBANDRY — VETERINARY SCIENCE DEPARTMENT

Pasture Report

Station _____ Project _____ Date of Period _____

Lot No. _____	Sub Period 1		Sub Period 2	
	Date	No. Days	Date	No. Days
	No.	Animal Days on Pasture	No.	Animal Days on Pasture
Regular Animals _____				
Extra Animals _____				

SPECIES IN PASTURE

Common Name	σ Stand	Height		Stage of Growth
		Range	Av.	
		to		Young - Pre-bloom - Bloom - Seed - Dormant
		to		Young - Prebloom - Bloom - Seed - Dormant
		to		Young - Pre-bloom - Bloom - Seed - Dormant
		to		Young - Pre-bloom - Bloom - Seed - Dormant
		to		Young - Pre-bloom - Bloom - Seed - Dormant
		to		Young - Pre-bloom - Bloom - Seed - Dormant

GENERAL CONSIDERATIONS

1. Condition of Pasture: Washy - Succulent - Dry - Tough - Dead
2. Color: Very Green - Green Drab - Brown
3. Carrying Capacity: Excess - Sufficient - Short - Insufficient
4. Thickness of Sod: Very Dense - Dense - Moderate - Thin
5. Footing: Firm - Soft - Very Soft
6. Grade: Excellent - Very Good - Good - Fair - Poor - Very Poor

WEATHER AND MOISTURE CONDITIONS

Date	Temperature		Snow Inches	Rain Inches	Soil Moisture	Water Added
	Max.	Min.				

Figure 1. Pasture scoring form.

Table 2. Performance of beef calves on different pastures with and without creep feed (1963)

Pasture no. →	Block I				Block II			
	Old stand fescue		Orchardgrass		New stand fescue		Orchardgrass	
	Creep 1	No creep 2	Creep 3	No Creep 4	Creep 7	No Creep 6	Creep 8	No Creep 5
Number of calves	5	4 ¹	5	5	5	4 ¹	5	5
Days (4-17-63 to 10-17-63)	183	183	183	183	183	183	183	183
Av. wt. and gain/head, lb.								
Initial weight	144	148	117	138	160	179	145	122
Weaning weight	450	405	487	498	562	560	545	274
Total gain	306	257	370	360	402	381	400	352
Daily gain	1.67	1.41	2.03	1.97	2.20	2.08	2.19	1.92
Adjusted daily gain ²	1.73	1.54	2.23	2.09	2.36	2.15	2.38	2.10
Weaning grades ³								
Type	12.0	12.5	13.0	13.6	11.8	12.8	13.4	11.6
Condition	8.2	8.0	9.6	8.2	9.6	8.8	10.0	7.4

¹ One calf in each of these groups was chronically ill during the grazing season and both were eliminated from the results.

² These values were obtained by adjusting actual average daily gain for sex of calf and age of dam.

³ Low Good = 9; average Good = 10; high Good = 11; low Choice = 12; average Choice = 13.

Table 3. Performance of beef calves on different pastures with and without creep feed (1964)

Pasture no. →	Block I				Block II			
	Old stand fescue		Orchardgrass		New stand fescue		Orchardgrass	
	Creep 1	No Creep 2	Creep 3	No creep 4	Creep 7	No creep 6	Creep 8	No creep 5
Number of calves	5	5	5	5 ¹	5	5	5	5
Days (4-2-64 to 10-14-64)	195 ²	195 ²	195 ²	195 ²	195	195	195	195
Av. wt. and gain/head, lb.								
Initial weight	126	143	137	173	124	148	170	154
Weaning weight	463	414	488	400	534	445	574	447
Total gain	337	271	351	227	410	297	404	293
Daily gain	1.73	1.39	1.82	1.38	2.10	1.49	2.07	1.50
Adjusted daily gain ³	1.79	1.46	1.96	1.53	2.30	1.68	2.23	1.66
Weaning grades ⁴								
Type	12.4	10.4	12.6	10.4	14.2	11.8	14.0	11.8
Condition	9.0	8.0	9.2	6.8	10.6	8.2	10.2	8.2

¹ Two calves in this group were replaced during the grazing season due to accidental death of either the calf or dam. Gains were recorded on these calves and their replacements for the period of time they were actually grazing the pasture.

² Calves in these groups were fed in drylot from August 11 to August 24 (13 days) because of insufficient pasture.

³ These values were obtained by adjusting actual average daily gain for sex of calf and age of dam.

⁴ Low Good = 9; average Good = 10; high Good = 11; low Choice = 12; average Choice = 13.

ment in calf gains due to creep feeding in 1963 was about the same for all comparisons regardless of the basic calf gains supported by a particular kind of pasture.

During the grazing season of 1964, there was a noticeable decrease in both quality and quantity of forage in all pastures, except old stand fescue. Within each block, adjusted calf gains for non-creep-fed calves were about the same and supplemental feed supported similar increases in adjusted gain (Block I, 0.33 pound and 0.43 pound; Block II, 0.62 pound and 0.57 pound).

Differences in calf gains between the fescue and orchardgrass-Ladino clover pastures of Block I were much smaller in 1964 than in 1963. The simplest way to explain the disadvantage of the old stand fescue pastures is the low percent of legumes in the pasture mixture and the difference in soil type between the two blocks. Because of the obvious soil and forage differences between blocks, the results were analyzed as two separate experiments. The comparison in Block I was old stand fescue vs. orchardgrass with and without creep feeding. In Block II new stand fescue was compared to orchardgrass-Ladino clover with and without creep feeding.



Figure 2. Evaluation of the pastures included an estimation of the average height of each component of the pasture mixture.

Variance analyses of adjusted calf gains are shown in Table 4. In Block I, where the old stand fescue pastures were compared with the orchardgrass-Ladino clover pastures, a significant ($P < .01$) advantage of 0.32 pound per head per day was observed for the orchardgrass pastures for the 2 years combined. The fescue pastures in Block I were thin-sodded, practically devoid of legumes, short in height, and appeared to be tough during the entire grazing season.

The creep-fed calves gained 0.27 pound per head per day more ($P < .01$) than those calves on similar pastures that were not creep fed. The average gain for all calves in Block I was 1.90 pounds per head per day in 1963 and 1.68 pounds per head per day in 1964. This difference was significant ($P < .05$). Generally speaking, response to the treatments was consistent since no significant ($P < .05$) interactions were observed.

Table 4. Variance analysis of adjusted¹ calf gains 1963 and 1964

Source of variation	df	ms	F
<u>Block I</u>			
Kind of pasture	1	1.0360	13.92**
Creep	1	0.7728	10.39**
Year	1	0.4494	6.04*
Interactions (pooled)	4	0.1371	1.84
Error	32	0.0744	
<u>Block II</u>			
Kind of pasture	1	0.0089	0.18
Creep	1	1.5555	31.24**
Year	1	0.7839	15.74**
Interactions (pooled)	4	0.1272	2.55
Error	32	0.0498	

¹ Adjusted for age of dam and sex of calf.

* $P < .05$.

** $P < .01$.

In Block II the pasture mixtures performed equally well. The adjusted average daily gain for calves on orchardgrass-Ladino clover pastures was 2.09 pounds per day; calves on the fescue-Ladino clover pastures gained 2.12 pounds per day. This is a distinct contrast to the comparison between pasture mixtures in Block I. The fescue pastures in Block II were more tender, had a denser

stand, had a greater total amount of available forage, and had a higher percent of legumes than fescue pastures in Block I. Also, cows and calves were removed from the pasture in Block I for 13 days during an extremely dry period in 1964 because enough forage was not available.

Creep-fed calves in Block II gained 0.42 pound per day more ($P < .01$) than non-creep fed calves. Calves in this block ate more total creep feed than those in Block I. The grazing and behavioral habits of the cows apparently had a marked influence on creep feed consumption by the calves.

There was a highly significant difference ($P < .01$) in calf gains between years in Block II. Creep-fed calves gained 0.10 pound per day less in 1964 than in 1963. In 1963 the advantage in gain for the creep-fed calves was very small; in 1964 the creep-fed calves gained at a much greater rate than non-creep-fed calves.

The significant difference between calf gains in 1963 and 1964 can be explained in part by the severe deficiency in rainfall (Figure 3) for two extended periods (September-December 1963 and May-July 1964) which resulted in a sharp drop in both the total forage available on each pasture and the percent legumes in all pastures except the old stand fescue. These extended periods of dry weather were apparently an equalizer of calf performance when no supplemental feeds were available and resulted in inferior calf performance on all pastures. Based on these results, a critical evaluation of each pasture should be made following periods of extended dry weather to determine if the legumes need to be re-established. Usually when legumes in a pasture are less than 15% of the total forage available over an entire grazing season, the pasture should be renovated and legumes re-established.

Creep-fed calves graded highest in type and condition at weaning. The cost per pound of extra gain by creep-fed calves (assuming all gain above non-creep-fed calves was a result of the creep feed alone) ranged from 30 to 104 cents in 1963 and from 10 to 16 cents in 1964 (Table 5). Creep feeding on the old stand fescue pastures did not result in gains equal to those obtained on the new stand fescue-Ladino clover pasture. The deficiencies in basic pasture quality were not compensated by supplemental feed for the calves.

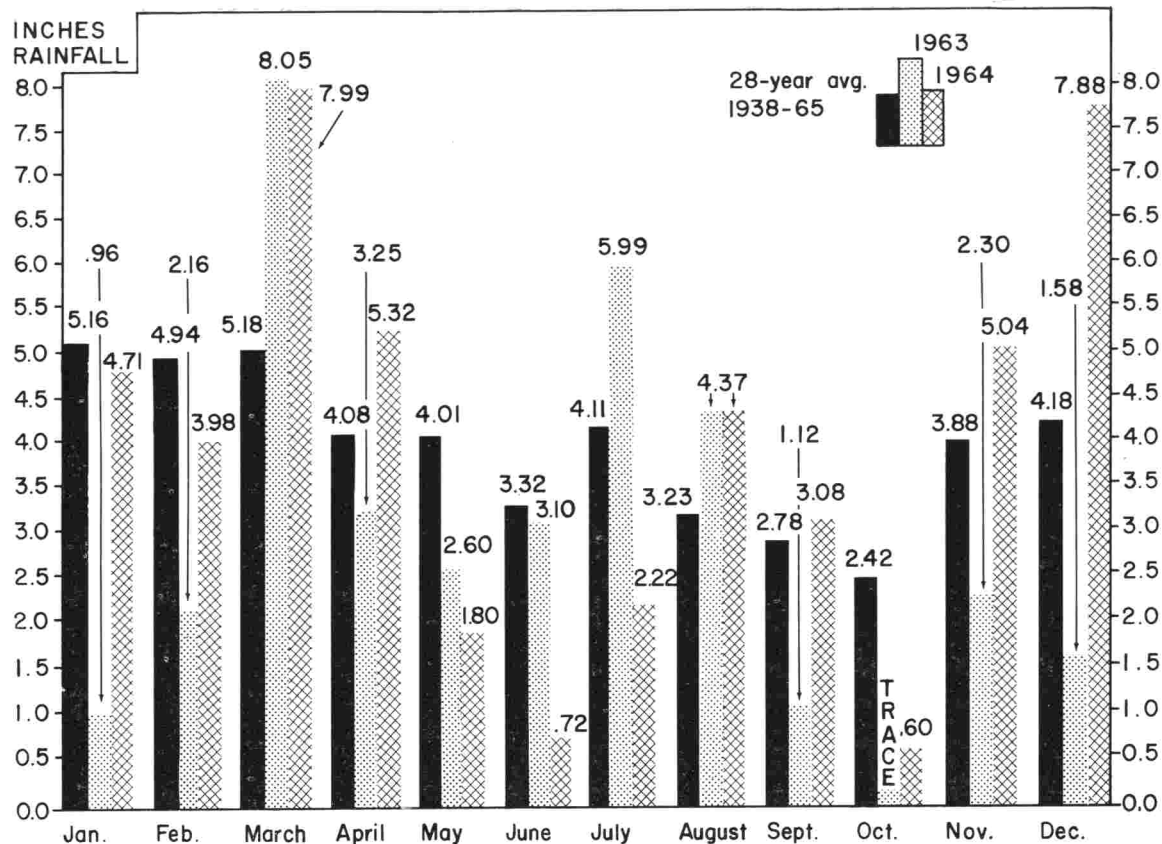


Figure 3. Cows and calves on orchardgrass—Ladino clover pasture with creep feed available for the calves.

Table 5. Creep feed consumption and costs (1963 and 1964)

Pasture no. →	Block I		Block II	
	Old stand fescue 1	Orchardgrass 3	New stand fescue 7	Orchardgrass 8
<u>1963</u>				
Total creep feed consumed, lb./hd. (167 days)				
Corn	403.3	276.5	365.7	558.8
Oats	220.7	156.0	201.8	328.4
Commercial mixture	7.2	7.2	7.2	—
Cost of creep feed, \$/hd. ¹	14.79	10.36	13.49	20.70
Cost/pound of gain, ¢ ²	30.2	103.6	64.2	43.1
<u>1964</u>				
Total creep feed consumed, lb./hd. (195 days)				
Corn	296.6	407.7	564.5	526.3
Oats	101.1	135.9	198.7	186.4
Commercial mixture	16.7	14.0	25.9	27.0
Cost of creep feed, \$/hd. ¹	9.71	12.89	18.41	17.30
Cost/pound of gain, ¢ ²	14.7	10.4	16.3	15.6

¹ These cost figures are based on the following feed prices: corn, \$1.20/bushel; oats, \$0.85/bushel; and commercial mixture, \$80/ton.

Cost/head for creep feed

² Calculated as follows:

Gain/head creep-fed calves — Gain/head non-creep-fed calves

Cow Performance

Weight changes by mature cows during the grazing season were quite variable (Tables 6 and 7). However, the variance analysis as shown in Table 8 indicated significant differences associated with the same factor as calf gains, except that creep feeding of the calves exerted no apparent effect on the gain of the cows.

In Block I, the cows on the fescue pastures averaged 0.58 pound per head per day less gain ($P < .01$) during the grazing seasons of 1963 and 1964 combined than cows on orchardgrass-Ladino clover pastures. During the 1964 grazing season, cows on Block I gained 0.59 pound less than in 1963.

The results of the variance analysis in Block II indicated no significant differences ($P > .05$) between gain by cows on orchardgrass-Ladino clover and fescue-Ladino clover pastures (0.84 pound vs. 0.63 pound per head per day, respectively). As in Block I, cows in Block II gained considerably less per head per day in 1964 (0.49 pound) than in 1963 (0.98 pound). This year difference was highly significant ($P < .01$).

These cow performance data supplement the results obtained with calves in that either fescue-Ladino clover or orchardgrass-Ladino clover pastures supported similar amounts of beef production when they had comparable stands of legumes and comparable amounts of total available forage.

Table 8. Variance analysis of beef cow gains from spring to weaning 1963-64

Source of variation	df	ms	F
<u>Block I</u>			
Kind of pasture	1	3.2891	23.34**
Creep	1	0.0189	0.13
Year	1	3.4398	24.41**
Interactions (pooled)	4	0.0284	0.20
Error	32	0.1409	
<u>Block II</u>			
Kind of pasture	1	0.3960	2.22
Creep	1	0.0194	0.11
Year	1	2.2753	12.73**
Interactions (pooled)	4	0.2299	1.29
Error	32	0.1787	

** $P < .01$.

Table 6. Performance of beef cows on different pastures with and without creep-fed calves (1963)

Pasture no. →	Block I				Block II			
	Old stand fescue		Orchardgrass		New stand fescue		Orchardgrass	
	Creep 1	No creep 2	Creep 3	No creep 4	Creep 7	No creep 6	Creep 8	No creep 5
Grazing season (4-17-63 to 10-17-63)								
Number of cows	5	5	5	5	4 ¹	5	5	5
Days	183	183	183	183	183	183	183	183
Av. wt. and gain/head, lb.								
Initial weight	1032	1012	1036	1129	1022	1076	1153	1060
Final weight	1091	1045	1255	1297	1262	1259	1313	1196
Total gain	59	33	219	168	240	183	160	136
Daily gain	0.32	0.18	1.20	0.92	1.31	1.00	0.87	0.74
Grazing season (10-17-63 to 12-4, 18, and 23-63)								
Number of cows	5	5	5	5	5	5	5	5
Days	57	60	46	57	65	62	67	65
Av. wt. and gain/head, lb.								
Initial weight	1121	1068	1207	1218	1225	1303	1313	1170
Final weight	1147	1077	1197	1260	1228	1286	1300	1157
Total gain	26	9	—10	42	3	—17	—13	—13
Daily gain	0.45	0.14	—0.21	0.74	0.04	—0.27	—0.19	—0.20

¹ One cow died in this group. She was replaced with a similar cow to maintain grazing pressure on each pasture.

Table 7. Performance of beef cows on different pastures with and without creep-fed calves (1964)

Pasture no. →	Block I				Block II			
	Old stand fescue		Orchardgrass		New stand fescue		Orchardgrass	
	Creep 1	No creep 2	Creep 3	No creep 4	Creep 7	No creep 6	Creep 8	No creep 5
Grazing season (4-2-64 to 10-14-64)								
Number of cows	5	5	5	5 ¹	5	5	5	5
Days	195	195	195	195	195	195	195	195
Av. wt. and gain/head, lb.								
Initial weight	1066	1059	1202	1047	1100	1060	1116	938
Final weight	1058	1024	1213	1176	1163	1205	1190	1044
Total gain	—8	—35	11	82	63	145	74	106
Daily gain	—0.04	—0.18	0.16	0.42	0.32	0.74	0.38	0.53
Grazing season (10-14-64 to 11-20 and 30-64)								
Number of cows	5	5	None	None	5	5	5	None
Days	37	37	—	—	47	47	47	—
Av. wt. and gain/head, lb.								
Initial weight	1058	1024	—	—	1163	1205	1190	—
Final weight	1057	1037	—	—	1176	1218	1210	—
Total gain	—1	13	—	—	13	13	20	—
Daily gain	—0.03	0.35	—	—	0.28	0.28	0.43	—

¹ Two cows had to be replaced in this group. One was replaced because of a chronic prolapse of the uterus and the other was due to accidental death of the calf.

Grazing Season

In earlier experiments with beef steers at the Tennessee Station (Hobbs *et al.*, 1965), fescue pastures were found to support more animals per acre during both the summer and winter months than orchardgrass pastures. The length of the grazing season is important in determining the amount of winter feed required. In 1963, fescue-Ladino clover pastures furnished an average of 10 cow grazing days per pasture more than did orchardgrass-Ladino clover pastures. In 1964, the advantage in favor of fescue pastures was 150 cow grazing days per pasture. This longer grazing season in 1964 resulted in the winter feed costs being reduced by about \$6 per head for cows grazing fescue pastures compared to cows grazing orchardgrass pastures.

Persistence of Stand

As has been observed in steer grazing trials, the tendency in this trial was for Ladino clover to be crowded out faster in the fescue pastures than in the orchardgrass pastures (Table 9). A comparison of species composition in 1963 with similar observations in 1964 will provide a vivid display of the rapidity with which Ladino clover was depleted from the pasture mixture. A problem of seed impurity was encountered in this experiment. The contamination of orchardgrass seed with fescue seed was clearly seen in all four orchardgrass pastures in 1963 and fescue became quite dominant in 1964. Almost 30% of pasture 4 was considered to be fescue during the 1964 grazing season.

In observing the pastures where the fescue seed had been drilled with the orchardgrass seed, it was easy to see that in a short time the pasture would be predominantly fescue. Within the same pasture where there were differences in the degree of contamination, areas composed primarily of orchardgrass would be grazed close to the ground while those areas where fescue was prevalent would be growing lush. These observations agree with those made by High *et al.* (1965a) when a pasture combination of orchardgrass, fescue, and Ladino clover was seeded for beef steers.

Rainfall

A critical factor necessary for good pasture production is ample and fairly uniform rainfall. In Figure 3, the average monthly rainfall for 1963 and 1964 is contrasted with the 28-year average for the Springfield area. There were two periods during these 2

Table 9. Species composition, percent¹ (1963 and 1964)

Pasture no. →	Block I				Block II			
	Old stand fescue		Orchardgrass		New stand fescue		Orchardgrass	
	Creep 1	No creep 2	Creep 3	No creep 4	Creep 7	No creep 6	Creep 8	No creep 5
1963								
Fescue	83	80	6	15	62	64	12	12
Orchardgrass	—	—	38	49	—	—	59	57
ladino clover	7	10	50	34	37	36	29	30
lespedeza	8	8	—	—	—	—	—	—
Miscellaneous	2	2	6	2	1	—	—	1
1964								
Fescue	88	90	12	29	89	87	20	15
Orchardgrass	—	—	68	59	—	—	70	74
ladino clover	3	3	18	6	9	12	8	9
lespedeza	4	3	—	—	—	—	—	—
Miscellaneous	5	4	2	6	2	1	2	2

¹ These values were derived by averaging all of the estimated percentages taken at 2-week intervals (4-17-63 to 10-16-63 and 4-2-64 to 10-14-64).

years in which rainfall apparently had a significant effect on pasture forage production. The total rainfall for the last 4 months of 1963 was 5.00 inches compared to the 28-year average of 13.26 inches. Also, the total rainfall for May and June, 1964, was 2.52 inches with a 28-year average of 7.33 inches. The last 4 months of 1963 were the driest on record and the May and June, 1964, rainfall was the next to driest on record.

These extended periods of dry weather severely affected all the pastures. The stand of Ladino clover was reduced more than one-half in 1964 compared to 1963. The average height of the pastures during the grazing was 3 to 4 inches less in 1964. For example, the average height for the fescue in Pasture 6 was 8.1 inches in 1963 and 4.9 inches in 1964. The height of the orchardgrass in Pasture 8 decreased from 6.8 inches to 4.1 inches between similar periods. This reduction in overall height resulted in a drastic drop in total available forage. Although some dormancy was observed during both years, the percent of plants considered to be dormant was much greater in 1964 than in 1963. Pastures that were rated very good to excellent during 1963 were rated only fair to good in 1964.

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