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# Orchardgrass-Ladino Clover Pasture for Stocker Steers in North Alabama

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BULLETIN 563      DECEMBER 1984  
ALABAMA AGRICULTURAL EXPERIMENT STATION  
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**COVER PHOTO. Steers grazing orchardgrass-ladino clover at Tennessee Valley Substation, May 24, 1979.**

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FIRST PRINTING 5M, DECEMBER 1984

*Information contained herein is available to all persons  
without regard to race, color, sex, or national origin.*

# ORCHARDGRASS-LADINO CLOVER PASTURE FOR STOCKER STEERS IN NORTH ALABAMA

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## INTRODUCTION

ORCHARDGRASS (*Dactylis glomerata*) furnished higher steer average daily gains (ADG) than tall fescue (*Festuca arundinacea*) in a previous grazing trial at the Tennessee Valley Substation (3). Ladino clover (*Trifolium repens*), planted with orchardgrass, further increased the ADG of steers. Unfortunately, orchardgrass stands are short-lived and this may be related to excessive summer grazing (6). It has been suggested that summer resting of orchardgrass might improve stand persistence and autumn productivity (5). Therefore this experiment was designed to test the effect of year-round grazing versus summer resting on the persistence of orchardgrass.

Oats, wheat, or rye have been grown with ryegrass and clover for 25 years at the Tennessee Valley Substation. These crops have traditionally been grazed by stocker beef steers during the October-May period except when inclement weather prevented it. During the decade of the 1960's, these steers grazed for an average of 147 days and had an ADG on grazing of 1.49 pounds (2). In that same 10-year study, gain per acre from grazing averaged 416 pounds. Steers gained from 266 to 294 pounds each from October to May while assigned to small grain-clover pastures. During a subsequent 5-year experiment at the same location, ADG on wheat-ryegrass-clover

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grazing was 1.44 pounds and grazing gain per acre averaged 423 pounds (4). Thus, it has been well documented that small grain-clover grazing is an excellent way to produce beef at the Tennessee Valley Substation. If similar animal performance could be obtained through use of perennial crops, then the cost of production of beef could be lowered with a concomitant increase in profit potential.

## **EXPERIMENTAL PROCEDURE**

This report summarizes the results of a 3-year experiment at the Tennessee Valley Substation, Belle Mina, Alabama, on orchardgrass-ladino clover pastures under two management systems: (1) grazed throughout the year when forage was available, and (2) grazed through June only (summer rested).

### **Pasture Management**

Six 4-acre paddocks were established on Humphries silt loam soil underlaid by chert. In early September 1977, 15 pounds of Hallmark orchardgrass seed per acre were drilled in 7-inch rows and Regal ladino clover was cultipack-seeded in a broadcast manner at the rate of 3 pounds per acre. Nitrogen fertilizer at the rate of 30 pounds N per acre was applied at planting. No additional nitrogen fertilizer was applied in subsequent years. Phosphorus and potassium were applied according to soil test recommendations. Botanical estimates of percentage orchardgrass, ladino clover, and weeds in the forage available to be grazed were made at monthly intervals in each paddock. These estimates were an evaluation of the proportion of the available forage that would be contributed by each species.

### **Cattle Management**

Crossbred beef steers with an average weight of about 500 pounds were purchased each August. Typically these steers were put on experimental pastures during September and continuously grazed until December when forage supply was depleted. The basic stocking rate was one animal per acre but stocking rate was adjusted by the addition or removal of animals so that the available forage was utilized. During the winter when forage on test pastures was insufficient, steers

grazed tall fescue and were fed corn silage plus cottonseed meal as needed to keep them gaining at a rate of about 1 pound daily. Experimental pastures were restocked in late March or early April. Again, stocking rate was adjusted so that the available forage was utilized. Insofar as was practical, the steers that were removed from a test pasture in the fall were returned to the same pasture in the spring. For the pastures that were rested during the summer, cattle grazed continuously through June. For pastures that were grazed for the full season, cattle grazed continuously until the end of August or first of September when they were removed from this experiment. These cattle were subsequently used in other feedlot studies and another set of experimental animals was started for the grazing trials. Usually the transition period was 2 weeks or less. Steers were weighed at 28-day intervals throughout the grazing experiment. Poloxalene blocks were provided in each pasture for control of bloat.

## RESULTS AND DISCUSSION

### Pastures

Excellent stands of both orchardgrass and ladino clover were obtained, figure 1. Weeds were minimal throughout the 3 years of the study. Ladino clover was extremely vigorous and formed a dense ground cover throughout the 3-year period, even during a drought period the third year. Clover growth was good during the summer months, figure 2. Ladino clover constituted about a third of the available forage the first year and increased to 40 to 50 percent in succeeding years, table 1. Orchardgrass stands and vigor were weakened by the third year, regardless of summer resting of the paddocks.

TABLE 1. PERCENTAGE CLOVER IN FORAGE AVAILABLE ON ORCHARDGRASS-LADINO CLOVER PASTURE

Management	Clover in forage, pct.		
	1978	1978-79	1979-80
Grazed all season .....	30	41	47
Not grazed in summer .....	36	49	50

TABLE 2. GRAZING PERIODS OF STEERS ON ORCHARDGRASS-LADINO CLOVER PASTURE

Grazing season	Grazed all year		Not grazed in summer	
	Dates	Days	Dates	Days
First year, 1978				
Spring-summer .....	April 10-Sept. 7	150	April 10-June 29	80
Second year, 1978-79				
Autumn .....	Sept. 26-Dec. 19	85	Sept. 26-Dec. 19	85
Spring-summer .....	March 20-Aug. 30	163	March 20-June 28	100
Total .....		248		185
Third year, 1979-80				
Autumn .....	Sept. 5-Dec. 5	92	Sept. 4-Dec. 5	92
Spring-summer .....	April 1-Aug. 27	136	April 1-June 20	120
Total .....		228		212
Two-year average, 1978-79 and 1979-80				
Autumn .....		88		88
Spring-summer .....		150		110
Total .....		238		198

The grazing season during spring and summer of the establishment year was 150 days, from April 10 to September 7, table 2. During the two succeeding years, orchardgrass-ladino clover provided an average of 238 calendar days of continuous grazing as compared to 198 days when summer rested.

### Cattle Performance

The stocking rate on orchardgrass-ladino clover that had been grazed throughout the year was lower during the fall grazing season than that of the orchardgrass-clover that was rested during the summer (1.50 versus 1.92 steers per acre). In contrast, there were no differences in stocking rate during the spring-summer pasture season (2.25 versus 2.17 steers per acre). Steer grazing days per acre, table 3, are a result of stocking rate and length of grazing period. When the orchardgrass-clover pastures were grazed throughout the year, steer grazing days during the spring-summer period were double those during the autumn (215 versus 107). This is primarily the result of a much longer grazing season because the stocking rates were comparable during the spring-summer season.

TABLE 3. STEER GRAZING DAYS ON ORCHARDGRASS-LADINO CLOVER PASTURE

Grazing season	Days per acre	
	Grazed all year	Not grazed in summer
	<i>No.</i>	<i>No.</i>
First year, 1978		
Spring-summer .....	164 a*	90 b
Second year, 1978-79		
Autumn .....	70 b	98 a
Spring-summer .....	197 a	169 b
Total .....	267 a	267 a
Third year, 1979-80		
Autumn .....	145 a	150 a
Spring-summer .....	232 a	146 b
Total .....	377 a	296 b
Two-year average, 1978-79 and 1979-80		
Autumn .....	107 b	124 a
Spring-summer .....	215 a	159 b
Total .....	322 a	283 a

\* Means within a line having the same letter are not significantly different at 5 percent level.

TABLE 4. AVERAGE DAILY GAIN OF STEERS ON ORCHARDGRASS-LADINO CLOVER PASTURE

Grazing season	Average daily gain	
	Grazed all year	Not grazed in summer
	<i>Lb.</i>	<i>Lb.</i>
First year, 1978		
Spring-summer .....	1.68 b*	2.26 a
Second year, 1978		
Autumn .....	1.34 a	1.61 a
Spring-summer .....	1.72 a	1.84 a
Third year, 1979-80		
Autumn .....	1.62 a	1.86 a
Spring-summer .....	1.68 a	1.79 a
Two-year average, 1978-79 and 1979-80		
Autumn .....	1.48 a	1.74 a
Spring-summer .....	1.70 a	1.81 a

\* Means within a line having the same letter are not significantly different at 5 percent level.

Steer average daily gains ranged from about 1.5 to 1.8 pounds, table 4, thus being equivalent to those produced by cool-season annual pastures at this same location. Rate of gain was higher on pastures that were not grazed during the summer period because rate of gain generally declined as the season progressed. Even so, the high proportion of clover in the available forage probably accounts for the excellent gains

made during summer. Steers on those pastures were in excellent condition, figure 3. In a previous study at this location (1), 150 pounds of N per acre was equivalent to clover in an orchardgrass pasture, however, all gains were good (1.76 versus 1.78 pounds, ADG). In that 6-year experiment, gain per acre averaged 337 pounds for orchardgrass with N and 350 pounds for orchardgrass-white clover.

As expected, highest beef gains per acre were obtained when steers were grazed throughout the summer, table 5. When grazing was terminated in June, beef gains per acre were reduced about 70 pounds (576 versus 505 pounds). Gains increased each of the 3 years, rising to 657 pounds per acre the third year. On pastures that were grazed throughout the year, gains during spring-summer were about double those obtained during autumn. Gains were highly acceptable, especially in view of the fact that no nitrogen fertilizer was used except during establishment.

Gains per steer averaged 374 pounds when grazed throughout the season, table 6. Somewhat lower gains (328 pounds per steer) were obtained when grazing was terminated in late June.

TABLE 5. BEEF GAIN PER ACRE OF STEERS ON ORCHARDGRASS-LADINO CLOVER PASTURE

Grazing season	Beef gain per acre	
	Grazed all year	Not grazed in summer
	<i>Lb.</i>	<i>Lb.</i>
First year, 1978		
Spring-summer .....	295 a*	198 b
Second year, 1978-79		
Autumn .....	104 b	157 a
Spring-summer .....	390 a	330 b
Total .....	494 a	487 a
Third year, 1979-80		
Autumn .....	242 b	271 a
Spring-summer .....	415 a	248 b
Total .....	657 a	519 b
Two-year average, 1978-79 and 1979-80		
Autumn .....	173 b	216 a
Spring-summer .....	403 a	289 b
Total .....	576 a	505 b

\* Means within a line having the same letter are not significantly different at 5 percent level.





FIG. 1.

FIG. 1. Excellent ladino clover and orchardgrass stands were obtained and were available for grazing in March.

FIG. 2. Good ladino clover growth during June.

FIG. 3. Steers were in good condition on orchardgrass-ladino clover during June.



FIG. 2.



FIG. 3.

TABLE 6. GAIN PER TESTER STEER ON ORCHARDGRASS-LADINO CLOVER PASTURE

Grazing season	Gain per steer	
	Grazed all year	Not grazed in summer
	<i>Lb.</i>	<i>Lb.</i>
First year, 1978		
Spring-summer .....	269 a*	192 b
Second year, 1978-79		
Autumn .....	113 a	136 a
Spring-summer .....	235 a	200 b
Total .....	348 a	336 a
Third year, 1979-80		
Autumn .....	151 a	166 a
Spring-summer .....	248 a	155 b
Total .....	399 a	321 b
Two-year average, 1978-79 and 1979-80		
Autumn .....	132 a	151 a
Spring-summer .....	242 a	177 b
Total .....	374 a	328 b

\* Means within a line having the same letter are not significantly different at 5 percent level.

TABLE 7. COMPARISON OF ANIMAL PERFORMANCE ON COOL-SEASON ANNUALS<sup>1</sup> OR ORCHARDGRASS-CLOVER GRAZING AT THE TENNESSEE VALLEY SUBSTATION

Item	Cool-season annual grazing	Orchardgrass- ladino clover grazing
Date grazing began .....	Oct. 17	Sept. 15
Date grazing ended .....	Jun. 2	Jun. 29
No. days in grazing season .....	228	287
No. days grazed .....	170	183
No. days not grazed (winter) .....	58	104
Autumn grazing season:		
Dates grazed .....	10/17-12/23	9/15-12/12
No. days grazed .....	68	88
Spring-summer grazing season:		
Dates grazed .....	2/20-6/2	3/26-6/29
No. days grazed .....	102	95
Gain per acre, lb. ....	423	505

<sup>1</sup> Data on cool-season annuals obtained during a 5-year study (1971-75) and those on orchardgrass-clover are taken from the current report.

The number of days grazed on the orchardgrass-clover mixture, table 7, was slightly longer than for animals grown in a previous cool-season experiment at this same location, 183 versus 170 days. This small difference favoring the orchardgrass-clover mixture was a result of the longer fall grazing period (+ 20 days) but shorter spring-summer season (- 7 days).

These results indicate that weaned steers can be back-grounded on orchardgrass-ladino clover pasture and be in excellent condition for feedlot finishing by mid- to late sum-

mer. Orchardgrass-ladino clover pastures cost less than winter annuals because of less nitrogen fertilizer expense and stands persist at least 3 years. In this 3-year experiment, grazing of orchardgrass during the summer did not affect stand persistence.

The high production per acre and the spreading of establishment costs over a 3-year period make orchardgrass-ladino clover an attractive pasture mixture for northern Alabama.

### SUMMARY

A grazing study with yearling steers was conducted for 3 years at the Tennessee Valley Substation on orchardgrass-ladino clover pastures under two grazing systems: (1) grazed throughout the year, and (2) grazed only through June. The objective was to determine if summer rest would improve vigor and persistence of orchardgrass. No nitrogen fertilizer was used except 30 pounds per acre for establishment of the pastures.

Ladino clover made up 30 to 50 percent of the total forage produced. Orchardgrass stands and vigor were excellent initially but were weakened by the third year, regardless of summer resting the pasture. Initially the available forage consisted of about 70 percent orchardgrass; however, by the end of the third year only about 25 percent of the available forage was orchardgrass. On a practical basis, swards containing orchardgrass should be re-established about every fourth year.

Orchardgrass-ladino clover pasture provided 238 calendar days of grazing and 322 steer grazing days when continuously grazed, compared to 198 calendar days and 283 grazing days when given a summer rest.

Steer ADG averaged 1.5 to 1.7 pounds with beef gain per acre of 576 pounds and gain per steer of 374 pounds when grazed without summer rest. Summer resting of pastures during July and August reduced gain per acre by 70 pounds.

Orchardgrass-ladino clover is a desirable short-term pasture that can be highly productive for grazing steers, and in northern Alabama the mixture is equal to winter annuals. Resting the orchardgrass-clover pasture during July and August is not recommended.

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