

31  
E2  
No. 496

IN 496

OCTOBER 1977

*add*



OVERSEEDING WINTER ANNUAL FORAGES  
ON COASTAL BERMUDAGRASS SOD FOR  
BEEF COWS AND CALVES

## CONTENTS

	<i>Page</i>
EXPERIMENTAL PROCEDURE .....	3
Pasture Management .....	4
Management of Grazing Animals .....	4
RESULTS AND DISCUSSION .....	5
Pastures .....	5
Cattle Performance .....	6
SUMMARY .....	9
LITERATURE CITED .....	11

---

FIRST PRINTING 5M, OCTOBER 1977

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

# Overseeding Winter Annual Forages on Coastal Bermudagrass Sod for Beef Cows and Calves

C. S. HOVELAND, W. B. ANTHONY, J. A. McGUIRE, and J. G. STARLING<sup>1</sup>

**W**ARM SEASON PERENNIAL grasses, such as Coastal bermuda, are dormant or unproductive in southern Alabama for 5 to 6 months of the year (7). Overseeding winter annual clovers on such grass sods can extend the grazing season by 4 to 8 weeks (5) and improve beef calf gains (1, 3, 4). Close clipping or grazing to remove old grass residue in autumn is necessary to obtain good clover establishment and early production (6, 9).

Overseeding rye and clover on Coastal bermuda sod can extend the grazing season, but forage yield of the winter annuals is less when sod-seeded than when planted on prepared land (8). Rye provides earlier grazing than clover alone on sod. Steer gains have averaged 1.5 to 2.0 pounds per day with rye overseeded on Coastal bermuda (2, 10). However, no beef cow-calf grazing data are available comparing overseeding of various winter annuals on Coastal bermuda with grass sod alone in southern Alabama.

## EXPERIMENTAL PROCEDURE

This report summarizes the results of beef cow-calf performance over 3 years at the Wiregrass Substation, Headland, Alabama, on four pasture swards: (1) Wrens Abruzzi rye (*Secale cereale*), Yuchi arrowleaf (*Trifolium vesiculosum*) clover, and Autauga crimson (*Trifolium incarnatum*) clover overseeded on Coastal bermuda (*Cynodon dactylon*) sod; (2) Yuchi arrowleaf and Autauga crimson clovers overseeded on Coastal bermuda sod; (3) Gulf ryegrass (*Lolium*

---

<sup>1</sup>Professor, Department of Agronomy and Soils; Professor, Department of Animal and Dairy Sciences; Associate Professor, Department of Research Data Analysis, and Superintendent, Wiregrass Substation.

*multiflorum*) overseeded on Coastal bermuda sod; and (4) Coastal bermuda sod alone.

### **Pasture Management**

An established sod of Coastal bermuda on Norfolk fine sandy loam soil was used as the basic sward. The 1.75-acre paddocks had been used in earlier grazing trials. The grazing paddocks were randomly assigned treatments for this experiment as follows:

Three paddocks overseeded with rye and clover

Three paddocks overseeded with clover only

Two paddocks overseeded with ryegrass

Two paddocks not overseeded (control)

The grass sod was grazed closely each year in early October. Paddocks to be seeded were scarified with a disk. Rye-clover paddocks were planted with a grain drill in mid-October. Clover-only and ryegrass paddocks were seeded on undisturbed sod in November. Seeding rates per acre were 1 bushel rye, 8 pounds Yuchi arrowleaf clover, 10 pounds Autauga crimson clover, and 20 pounds Gulf ryegrass.

Nitrogen at 50 pounds per acre was applied to the Coastal bermuda control plots (non-overseeded) in early April and July to total 100 pounds N annually. The ryegrass treatment received 50 pounds N per acre in January, April, and July, to total 150 pounds annually. Rye-clover received 50 pounds per acre N in November and January, to total 100 pounds annually. The overseeded clover treatment did not receive any nitrogen fertilizer. Lime and mineral fertilizer were applied to all forage species according to soil test recommendations.

### **Management of Grazing Animals**

Grade Hereford and Hereford-Charolais cows bred to crossbred Charolais bulls were used. Calves, born from November through December, remained with the cows until weaned in September.

Whenever grazing was available, each 1 3/4-acre paddock was stocked with a cow-calf unit. Additional cow-calf units were added during peak periods of pasture growth. These animals were maintained on Coastal bermuda pastures when not on the experimental pastures. After calves were weaned, cows remained on pastures until there was insufficient forage or until seeding time. Animal weighing was done at 28-day intervals.

No supplement other than salt was fed to animals while on pasture. Water and shade were provided in the paddocks. During late autumn and winter when no grazing was available, animals were removed from

the paddocks and fed Coastal bermuda hay and a protein-mineral-vitamin supplement. Once cows were allotted to a particular pasture treatment, they remained in that respective treatment until reassigned the following autumn.

## RESULTS AND DISCUSSION

### Pastures

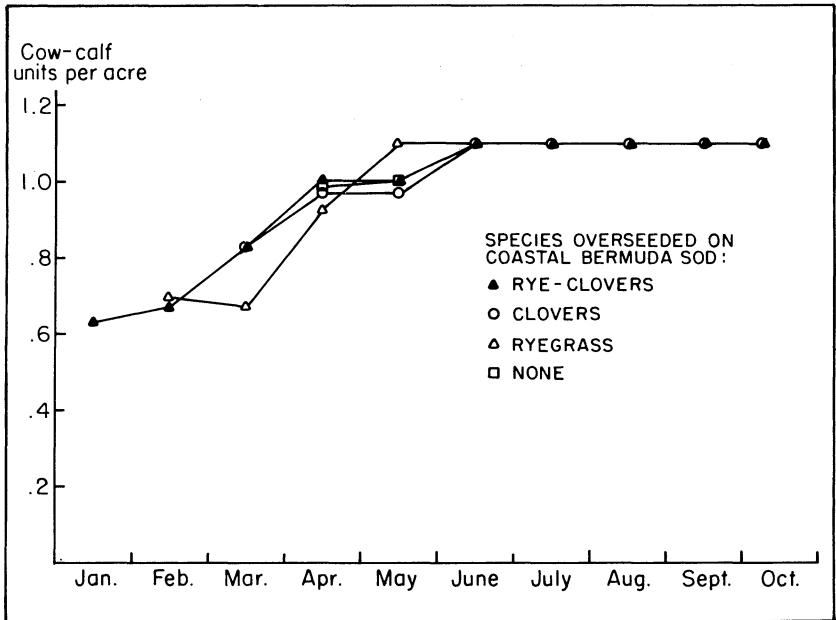
Overseeding rye on Coastal bermuda sod furnished the earliest grazing, with the stocking date ranging from January 2 to 14 for the 3-year period. This pasture provided a 9-month grazing season. Rye furnished most of the forage until early April when clover dominated the sward. Crimson clover was available in limited amounts in late February and continued until late April. Some arrowleaf clover was available in early March, but most of its production occurred during April, May, and June. Coastal bermuda growth was delayed 4 to 6 weeks by overseeding.

Coastal bermuda sod overseeded with crimson and arrowleaf clovers was stocked from March 4 to 17 over the 3-year period. Crimson clover dominated the sward until late April, while arrowleaf clover continued to furnish grazing through June. Overseeded Coastal bermuda furnished little grazing until late May except in the third year when a *Fusarium* disease reduced much of the clover stand and some grass was available in late April.

Ryegrass overseeded on the grass sod was stocked from February 7 to March 4 over the 3-year period. Ryegrass grazing was available until mid-May, followed by Coastal bermuda.

TABLE 1. RAINFALL AND MONTHLY TEMPERATURES DURING WINTER, SPRING, AND SUMMER, WIREGRASS SUBSTATION, 1974-76

Month	Rainfall, inches			Mean temperatures, degrees F					
	1973-74	1974-75	1975-76	Maximum			Minimum		
				1973-74	1974-75	1975-76	1973-74	1974-75	1975-76
November	3.6	2.8	3.0	73	70	69	48	43	47
December	9.0	3.5	3.6	61	64	62	37	39	37
January	12.6	7.7	—	71	64	—	53	41	—
February	9.8	4.8	2.0	64	66	69	39	44	42
March	3.7	6.1	3.6	75	69	73	49	45	50
April	5.2	11.8	2.9	78	76	80	52	52	54
May	3.3	6.6	10.0	86	86	80	64	65	60
June	3.6	8.1	3.4	89	89	87	65	68	66
July	8.2	10.7	6.6	92	89	91	69	70	69
August	7.1	6.7	2.4	90	90	90	69	70	68
September	4.3	3.4	5.8	86	84	86	65	64	65



**FIG. 1. Stocking rate of cows and calves on overseeded Coastal bermudagrass sod, 3-year average.**

Coastal bermuda not overseeded with winter annuals was stocked from March 27 to April 9 over the 3-year period. Most of the grazing during the first 2 to 3 weeks each year consisted of volunteer weeds, such as chickweed (*Stellaria media*), henbit (*Lamium amplexicaule*), and little barley (*Hordeum pusillum*). Coastal bermuda made little growth until mid- to late April because of low night temperatures. Coastal bermuda makes little growth when night temperatures are below 60 F, and night temperatures at the test location averaged 52 to 54 F in April, table 1. Soil moisture in each of the 3 years was generally adequate except during June 1974 and April, June, and August 1976.

The carrying capacity during January through March of pastures overseeded with rye-clover or ryegrass was about 60 to 70 percent of Coastal bermuda in summer, figure 1. Using higher rates of nitrogen fertilizer and a stocking rate adjusted to forage available in winter and spring on overseeded rye and clover would likely result in a substantial surplus of Coastal bermuda for summer hay production.

### Cattle Performance

Overseeding Coastal bermuda with rye and clover increased the grazing period about 3 months over Coastal bermuda alone, table 2.

TABLE 2. PERFORMANCE OF BEEF COWS AND CALVES ON COASTAL BERMUDA PASTURES OVERSEEDED WITH WINTER ANNUALS, WIREGRASS SUBSTATION, 1974-76 AVERAGE

Species overseeded on Coastal bermuda sod	Nitrogen applied per acre annually	Dates on pasture	Grazing days	Cow gain		Calf gain	
				Per acre	Av. per day	Per acre	Av. per day
	<i>Lb.</i>		<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>	<i>Lb.</i>
Rye-arrowleaf and crimson clovers	100	Jan. 8- Oct. 5	268 a*	240 ab	0.90 b	511 a	1.91 a
Arrowleaf and crimson clovers	0	Mar. 11- Oct. 5	211 c	290 a	1.37 a	410 b	1.94 a
Ryegrass	150	Feb. 14- Oct. 5	240 b	194 bc	.81 b	422 ab	1.76 b
None	100	Apr. 6- Oct. 5	187 d	163 c	.49 c	293 c	1.57 c
<i>C. V., percent</i>			4	29	28	13	11

\* Any two values within a column marked with the same letter are not significantly different at the 5 percent level.

Ryegrass extended the season by nearly 2 months and arrowleaf-crimson clover by nearly a month. It was noted that most of the first 3 weeks of spring grazing on non-overseeded Coastal bermuda consisted of volunteer weeds rather than the perennial grass.

Calf gain per acre was increased 74 percent when the Coastal bermuda sod was overseeded with rye and clover. The increase was 44 percent with ryegrass and 40 percent with clovers overseeded on the grass sod.

Average calf daily gain on pasture for the season was increased 12 percent with ryegrass, 22 percent with rye-clover, and 24 percent with clovers, as compared with Coastal bermuda alone, table 2. The slower gain on Coastal bermuda was mainly a result of poor performance in late summer, figure 2. Calves on overseeded pastures maintained a higher rate of gain throughout the grazing season.

Cow gain per acre was also increased by overseeding rye-clover or clovers on the grass sod, table 2. Cow daily gain was highest with clovers overseeded. Much of this increase in weight occurred during March and April when daily gains exceeded 2 pounds per day.

Total cow and calf gains per acre were high on overseeded Coastal bermuda sod: 751 pounds for rye-clovers, 700 pounds for clovers, and 616 pounds for ryegrass, as compared with only 466 pounds for Coastal bermuda sod alone.

An important aspect of the study was individual animal performance, table 3. Seasonal calf gain averaged 519 pounds by calves on Coastal bermuda overseeded with rye, 414 pounds by those on

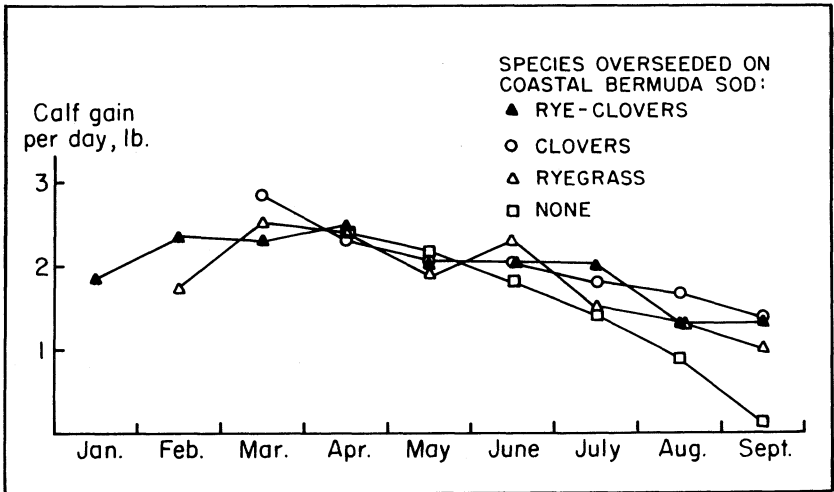


FIG. 2. Nursing calf gain per day over the season on overseeded Coastal bermudagrass sod, 3-year average.

Coastal overseeded with ryegrass, and 406 pounds per calf grazing the sward overseeded with clover. In contrast, calves grazed on Coastal bermuda without benefit of overseeding made an average gain of only 260 pounds. Thus, by overseeding the Coastal bermuda sod, a nursed calf gained almost twice as much as comparable calves on the same sward without overseeding.

Cow weight gain also was favorably increased by overseeding Coastal bermuda. The cow gain on Coastal bermuda alone amounted to only 137 pounds. This amount of gain could frequently be insufficient to offset weight loss during the long dormant period when Coastal bermuda constituted the sole ration for the beef cow herd. Thus, the extra weight gain for cows on the overseeded Coastal bermuda was an important benefit.

Overseeding ryegrass on Coastal bermuda was relatively simple since it did not entail tillage, and it greatly increased calf and cow

TABLE 3. TOTAL GAIN PER TESTER ANIMAL ON PASTURE OVER THE GRAZING SEASON, 3-YEAR AVERAGE

Species overseeded on Coastal bermuda sod	Total gain per animal	
	Cows	Calves
	<i>Lb.</i>	<i>Lb.</i>
Rye-arrowleaf and crimson clover . . . . .	184	519
Arrowleaf and crimson clover . . . . .	243	406
Ryegrass . . . . .	183	414
None . . . . .	137	260



performance. Although rye and clover in combination produced greater calf gain than the overseeded ryegrass, this combination required more land preparation and thus greater cost.

Although ryegrass extended the grazing season and increased gain per acre, applying the same amount of nitrogen to overseeded rye and clover would provide more grazing over a longer season. Overseeding clovers alone on the sod, although furnishing a shorter grazing season, sharply increased calf daily gain and gain per acre at relatively low cost over that of Coastal bermuda alone. The value of clover in supplying nitrogen to the pasture and improving calf performance is apparent from these results.

Using the National Research Council published feeding standards, calculations were made of the nutrients used by the beef cows and calves in this study. This calculation revealed that the largest portion of the pasture nutrients were used by the beef cows. Improving the Coastal bermuda pasture by overseeding did not increase the portion of the pasture nutrients that was used by the beef cows. In this experiment, the portion of the total pasture nutrients used by the calves amounted to an average of 44 percent.

### SUMMARY

A grazing study with beef cows and calves was conducted over a 3-year period at the Wiregrass Substation on (1) Coastal bermuda sod fertilized with 100 pounds per acre N; (2) sod overseeded with Wrens Abruzzi rye-Yuchi arrowleaf and Autauga crimson clover with 100 pounds per acre N; (3) sod overseeded with arrowleaf and crimson clovers; and (4) sod overseeded with Gulf ryegrass with 150 pounds per acre N. Results are summarized as follows:

1. Overseeding Coastal bermuda with rye and clover increased the grazing period about 3 months; the increase was nearly 2 months with ryegrass overseeded and nearly 1 month when arrowleaf-crimson clovers were overseeded. Coastal bermuda pasture overseeded with rye-clover furnished a 9-month grazing season.

2. Calf gain per acre was 511 pounds for rye-clover, 422 pounds for ryegrass, and 410 pounds for arrowleaf-crimson clovers, as compared with 293 pounds for Coastal bermuda alone.

3. Calf daily gain was increased annually from 1.57 pounds on Coastal bermuda to 1.76 pounds with overseeded ryegrass and 1.90 pounds with rye-clover or clovers.

4. Total cow-calf gain per acre from overseeding Coastal bermuda sod was 751 pounds for rye-clover, 700 pounds for clovers, and 616

pounds for ryegrass, as compared with 466 pounds for Coastal bermuda alone.

5. Stocking rate varied from 0.6 to 0.7 cow-calf unit per acre on rye-clover or ryegrass during January through March to 1.1 units on Coastal bermuda in summer.

6. Overseeding of Coastal bermuda sod with rye-Yuchi arrowleaf and Autauga crimson clovers or clovers alone can be expected to increase beef production per acre and to improve calf performance.

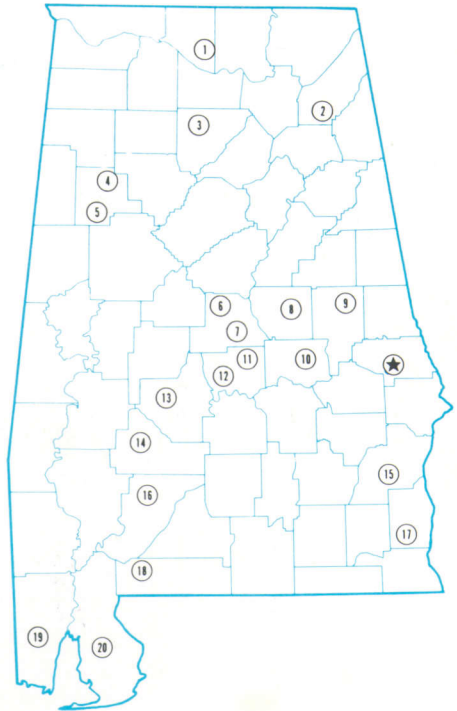
7. Only 44 percent of the pasture herbage production was utilized by the calves in this experiment. The beef cows were overfed. It seems appropriate to state that more efficient utilization of the pastures could have been obtained by grazing stocker cattle rather than beef cows with calves.

## LITERATURE CITED

- (1) COPE, J. T. JR., C. C. KING, T. B. PATTERSON, AND S. C. BELL. 1972. Forage and Feed Systems for Beef Brood Cow Herds. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 435.
- (2) HARRIS, R. R., E. M. EVANS, J. K. BOSECK, AND W. B. WEBSTER. 1972. Fescue, Orchardgrass, and Coastal Bermudagrass Grazing for Yearling Beef Steers. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 432.
- (3) HOVELAND, C. S., W. B. ANTHONY, AND E. L. MAYTON. 1960. Coastal-Vetch-Crimson Good for Cows and Calves. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 7, No. 3.
- (4) \_\_\_\_\_, AND H. E. BURGESS. 1972. Pastures for Beef Cattle in the Piedmont. Auburn Univ. (Ala.) Agr. Exp. Sta. Cir. 196.
- (5) \_\_\_\_\_, E. L. CARDEN, G. A. BUCHANAN, E. M. EVANS, W. B. ANTHONY, E. L. MAYTON, AND H. E. BURGESS. 1969. Yuchi Arrowleaf Clover. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 396.
- (6) \_\_\_\_\_, J. R. WILSON, AND P. A. MOTT. 1971. Summer Grass Residue Affects Growth of Winter Legumes under Sod. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 18, No. 3.
- (7) \_\_\_\_\_, C. C. KING, E. M. EVANS, R. R. HARRIS, AND W. B. ANTHONY. 1971. Bermudagrass for Forage in Alabama. Auburn Univ. (Ala.) Agr. Exp. Sta. Bull. 328.
- (8) \_\_\_\_\_, R. F. McCORMICK, JR., J. A. LITTLE, AND J. T. OWEN, III. 1976. Chemically Suppressing Grass Sod Helps Overseeded Winter Annuals. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 23, No. 4.
- (9) \_\_\_\_\_, AND E. L. MAYTON. 1972. Easy Establishment of Yuchi on Coastal Bermuda Sod. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 19, No. 3.
- (10) PATTERSON, R. M., W. B. ANTHONY, AND V. L. BROWN. 1959. Pasture Know-How from Winter Grazing Trials. Auburn Univ. (Ala.) Agr. Exp. Sta. Highlights of Agr. Res. Vol. 6, No. 3.

## Alabama's Agricultural Experiment Station System AUBURN UNIVERSITY

With an agricultural research unit in every major soil area, Auburn University serves the needs of field crop, livestock, forestry, and horticultural producers in each region in Alabama. Every citizen of the State has a stake in this research program, since any advantage from new and more economical ways of producing and handling farm products directly benefits the consuming public.



### Research Unit Identification

#### ★ Main Agricultural Experiment Station, Auburn.

1. Tennessee Valley Substation, Belle Mina.
2. Sand Mountain Substation, Crossville.
3. North Alabama Horticulture Substation, Cullman.
4. Upper Coastal Plain Substation, Winfield.
5. Forestry Unit, Fayette County.
6. Thorsby Foundation Seed Stocks Farm, Thorsby.
7. Chilton Area Horticulture Substation, Clanton.
8. Forestry Unit, Coosa County.
9. Piedmont Substation, Camp Hill.
10. Plant Breeding Unit, Tallassee.
11. Forestry Unit, Autauga County.
12. Prattville Experiment Field, Prattville.
13. Black Belt Substation, Marion Junction.
14. Lower Coastal Plain Substation, Camden.
15. Forestry Unit, Barbour County.
16. Monroeville Experiment Field, Monroeville.
17. Wiregrass Substation, Headland.
18. Brewton Experiment Field, Brewton.
19. Ornamental Horticulture Field Station, Spring Hill.
20. Gulf Coast Substation, Fairhope.