Mississippi State University Scholars Junction

MAFES Information Bulletins

Agricultural Economics Publications

8-1-1980

Beef Forage Research Progress Report

Robert E. Coats

Roscoe Ivy Jr.

Vance H. Watson

Werner Essig

Fred Tyner

Follow this and additional works at: https://scholarsjunction.msstate.edu/mafes-info-bulletins

Recommended Citation

Coats, Robert E.; Ivy, Roscoe Jr.; Watson, Vance H.; Essig, Werner; and Tyner, Fred, "Beef Forage Research Progress Report" (1980). *MAFES Information Bulletins*. 4. https://scholarsjunction.msstate.edu/mafes-info-bulletins/4

This Article is brought to you for free and open access by the Agricultural Economics Publications at Scholars Junction. It has been accepted for inclusion in MAFES Information Bulletins by an authorized administrator of Scholars Junction. For more information, please contact scholcomm@msstate.libanswers.com.

Information Bulletin 13

August 1980 DEPT. AGR. ECONOMICS REFERENCE ROOM

BEEF FORAGE RESEARCH PROGRESS REPORT



PROJECT MIS-1902 Forage Systems for Beef Cow-Calf Production (Report of Progress at the Black Belt Branch)

MAPES MISSISSIPPI AGRICULTURAL & FORESTRY EXPERIMENT STATION R. RODNEY FOIL, DIRECTOR MISSISSIPPI STATE, MS 39762

Mississippi State University



James D. McComas, President

Louis N. Wise, Vice President

PROJECT MIS-1902 Forage Systems for Beef Cow-Calf Production

Mississippi's beef cattle industry historically has centered around cow-calf production. Most calves traditionally have been sold at weaning, with producers depending on the revenue from sale of the weaned calves to cover the cost of maintaining the brood cow unit.

The availability of land and climate suitable for forage production in Mississippi and the high costs of grain, concentrates and stored forages dictate the use of grazed forages as the most practical means of producing weaned calves. The practicality of producing calves on forage has been recognized widely for many years; but the information required for increasing returns from calves produced on grazed forages has been inadequate. Therefore, Project MIS-1902 was initiated in 1975.

The objective of MIS-1902 is to determine the most profitable yearround forage system for cow-calf production in the major land resource areas of Mississippi.

MIS-1902 research also is being conducted at the MAFES Brown Loam Branch and the Mississippi State University Agricultural Research and Extension Centers at Poplarville and Pontotoc. The research at the Black Belt Branch is in cooperation with departments and scientists at Mississippi State University as follow:

Animal Science: H. W. Essig

Agricultural Economics: Fred Tyner Agronomy: Vance H. Watson

Experimental Statistics: Walter Drapala College of Veterinary Medicine: Tom Randolph

Agricultural and Biological Engineering: E. A. Kimbrough Jr.

Beef Forage Research Progress Report

PROJECT MIS-1902 Forage Systems for Beef Cow-Calf Production (Report of Progress at the Black Belt Branch)

> Black Belt Branch Experiment Station Robert E. Coats, superintendent

> With acknowledgment of support staff:

Roscoe Ivy, assistant superintendent Wade Stewart, former research assistant Frankie Boykin, herdsman Mary Ann Gray, bookkeeper and secretary

Beef Forage Research Progress Report

PROJECT MIS-1902 Forage Systems for Beef Cow-Calf Production (Report of Progress at the Black Belt Branch)

Robert E. Coats, superintendent, Black Belt Branch
Roscoe Ivy, assistant superintendent, Black Belt Branch
Vance H. Watson, professor and agronomist, Mississippi
State University Department of Agronomy
Werner Essig, professor and animal scientist, Mississippi
State University Department of Animal Science
Fred Tyner, professor and agricultural economist, Mississippi State University Department of Agricultural Economics

CONTENT

	PAGE
Project Design	2
Forage Yield and Quality	2
Results	2
Beef Cow-calf Production	2
Results	3
Cost and Returns	3
Pasture Establishment and Maintenance Costs	3
Cattle Costs	3
Cost and Returns by Forage Systems	3

PROJECT DESIGN

A 90-acre pasture at the Black Belt Branch was cross-fenced for comparing three forage systems-Coastal bermudagrass, Alicia bermudagrass and common ber-

Forage was harvested from each caged area at 28-day intervals in 1977, 1978 and 1979. Dry matter yields were determined, and quality of forage was estimated (using

Results

Total dry matter production each year was higher for Coastal and Alicia bermudagrass than for common bermudagrass plus tall fescue (Table 1). Major differences in production of the three forage systems were in the months that normally are hotter and drier.

Crude protein content of the common bermudagrass plus tall fescue was higher than that of either of the other bermudagrasses

The paddocks were stocked with angus cows and calves on April 19, 1977, by random assignment of one cow-calf unit per acre. The calves had been born in the previous fall and were weaned on June 14. Stocking rates until the cows were moved to fescue pasture on October 30 were-common bermudagrass, one cow per acre; Coastal and Alicia bermudagrass, one cow per acre until August 23 and 1.5 cows per acre thereafter.

The cows were bred to calve in the spring of 1978 and 1979 because of the lower maintenance (TDN) requirements of non-lactating cows in winter (see Management calendar, Table 15). All paddocks were stocked on March 31, 1978, with one cow-calf unit per acre. Seven of the cow-calf units were removed from each common bermudagrass

mudagrass interseeded with tall fescue. The pasture was divided into six 15-acre paddocks to provide two replicates of each forage system. Cages were placed in each

paddock to permit harvesting for determination of yield and quality of forage while the paddocks were being grazed.

FORAGE YIELD AND QUALITY

results of analysis for crude pro- phosphorus (P), calcium (Ca), tein, acid detergent fiber, neutral sodium (Na), iron (Fe), aluminum detergent fiber and lignin to es- (Al), manganese (Mn), boron (B), timate digestibility). Potassium copper (Cu) and zinc (Zn) content (K), magnesium (Mg), sulfur (S), also were determined.

(Table 2). Forages from each system contained enough crude protein to meet the minimum requirements of ruminants.

Estimates of quality of forage from the three systems differed only slightly (Tables 3, 4, 5, 6, 7 and 8). However, that part of the plant that is most highly digestible (about 98% digestible) generally was higher for the common bermudagrass plus tall fescue than for

either Coastal or Alicia bermudagrass (Table 6), and total digestibility also tended to be higher for common bermudagrass plus tall fescue than for the other forages (Table 8).

The mineral content (K, Mg, S, P, Ca, Na, Fe, Al, Mn, B, Cu and Zn) of forage from each system was within limits considered normal for forage grasses (Tables 9, 10, 11, 12, 13 and 14).

BEEF COW-CALF PRODUCTION

paddock on July 20 because of insufficient forage. Calves left on the common bermudagrass were weaned when the cows were moved to winter pasture on October 9.

Each paddock was stocked with one cow-calf unit per acre on March 21, 1979. The cows were moved to winter pasture when the calves were weaned on October 3.

Salt was supplied free choice at all times. Trace mineralized salt was supplied to help prevent grass tetany on the lush growth of the tall fescue in early spring.

Cows from all forage systems were grouped and placed on tall fescue pasture at the end of each grazing season. The winter pasture was supplemented with hay, silage and protein (Table 16).

Four angus bulls were placed in the winter pasture when the cows were bred for fall calving. The bulls were left with the cows for 90 days, and the cows were palpated 60 days after the bulls were removed.

One bull was placed in each 15acre paddock when the cows were bred for spring calving. Each bull was moved to a different forage system each 28th day over an 84day breeding season.

Cows and calves were weighed at 28-day intervals, and the animals on each forage system were rotated between paddocks at each weighing.

Each forage system was fertilized each year with 120 lbs of N and 40 lbs each of P. O. and K. O. with 60 lbs of the N applied in April and 60 lbs in June.

Weeds were controlled by mowing twice each summer.

Results

Conception rates in 1977 and 1979 were higher for the cows on Coastal bermudagrass than for those on the other forage systems (Table 17). Only one half of the cows on Coastal conceived in 1978, compared with 56 and 60% for common and Alicia, respectively.

Calves that were dropped in fall

Evaluation of the alternative forage systems requires construction of detailed forage budgets, of 1976 were weaned after only 56 days on each forage system (Table 18). Total gain of calves per acre averaged 74, 100 and 111 lbs for Alicia, Coastal and common, respectively.

Calves that were dropped in the spring were weaned after 192 days on each forage system in 1978, 196

COST AND RETURNS

determination of the costs directly

days in 1979. Total gain of calves per acre in 1978 averaged 265, 267 and 270 lbs for Alicia, Coastal and common, respectively. Alicia provided the most total gain (321 lbs/acre) in 1979, followed by common (310 lbs/acre) and Coastal (292 lbs/acre).

related to maintenance of a cowcalf herd and relating these costs to animal performance data.

Pasture Establishment & Maintenance Costs

Input costs and forage yields vary from one situation to another, and producers should recognize that the budgets presented here are generalized and represent "recommended" practices for Mississippi. Input costs were developed from surveys of input suppliers in the Black Belt area in the spring of 1980. Adjustments for

Cattle Costs

Annual maintenance costs (excluding forages and supplemental feed) for a brood herd composed of one bull, 25 cows, their calves and replacement heifers are developed in this section (Table 25). Three cows are assumed to be replaced annually (one death and two culls). Four replacement heifers are kept and one is culled before replacement. The bull is replaced each fourth year. Assuming an 84% calf crop with one calf death before soil fertility, size and condition of owned equipment, different cultural practices and changing input prices are necessary to adapt these budgets to reflect a particular situation.

Representative budgets incorporating the practices described earlier in this report have been developed for initial establishment and annual maintenance of each forage system (Tables 19A-24B). A machinery and equipment budget accompanies each forage budget and specifies each machine operation, equipment size used, month operation is performed and the direct and fixed costs associated with each operation.

weaning results in a brood herd (at weaning time) of 30 animal units (one bull + 25 cows and 20 calves + four replacements).

Direct expenses included in the brood herd budget are veterinary and medicine, salt and minerals, labor and interest on operating capital. Veterinary and medicine was charged at \$.58 per month per cow-calf unit and at \$.42 per month for other animals. Each animal was charged \$.10 per month for salt and minerals. The monthly labor requirement was estimated at .28 hours or \$.87 per animal (charged at \$3.10/hr) for inspection, veterinary care and miscellaneous. Interest on operating capital was charged on all direct expenses at an annual 10% rate. The fixed costs included 10% interest on investment in the cows and the bull. No fixed charge was calculated for calves or replacements.

Costs & Returns by Forage Systems

The premise underlying comparisons among different forages was that each forage system/animal combination would result in a different set of cost and performance data. Thus, substrac-

ting the sum of forage system cost and animal costs from returns is a measure of economic returns (Table 26).

Direct expenses and fixed expenses were lower for common than for the other two systems. Costs exceeded returns for each system due primarily to the low average conception rate over the three-year period.

			Dry N	latter	Produc	tion		
Forage			BJ	y Month	s-Lbs/	A		
Coastal Bermuda Alicia Bermuda Common Bermuda*	5/16 1569 1079 1079	6/14 1171 767 382	7/12 423 417 150	$ \frac{1977}{8/9} 2986 3173 1690 $	9/13 1385 1001 923	10/4 1825 1214 1112	-	<u>Total</u> 9386 7651 5336
Coastal Bermuda Alicia Bermuda Common Bermuda*	$\frac{4/28}{1821}$ 2108 2147	5/25 1844 1928 2316	6/3 1843 1287 1125	$ \begin{array}{r} 1978 \\ \overline{7/21} \\ 1023 \\ 1141 \\ 651 \end{array} $	8/21 1108 1081 462	9/15 142 207 58	-	<u>Tota1</u> 7781 7752 6759
	$\frac{4/19}{946}$	5/16 1508	6/13 1024	$\frac{1979}{7/18}$ 2693	8/8 1525	9/5 1706	10/3 486 592	<u>Tota1</u> 9888
Loastal Bermuda Alicia Bermuda Common Bermuda*	1960 1782	954 1899	1120 1021	2210 1587	1385	1070	579	9831 9323
Coastal Bermuda Alicia Bermuda Common Bermuda* *Interseeded wit Table 2. Crude	1960 1782 th tall prote	954 1899 fescu in and	1120 1021 ne.	1587 1587 ite con	1494 1385 tent o	1070 f fora	ge, by	9831 9323 7 fora
Alicia Bermuda Common Bermuda* Interseeded wit Table 2. Crude Syste Branc	1960 1782 th tall prote m, yea th, 197	954 1899 fescu in and r and 7, 197	1120 1021 ne. d nitra date c 78 and	2210 1587 ite con of harv 1979.	1494 1385 tent o est, M	1070 f fora AFES B	ge, by lack F	9831 9323 7 fora 3elt
Alicia Bermuda Common Bermuda* Interseeded wit Table 2. Crude Syste Branc Forage	1960 1782 ch tall e prote em, yea ch, 197 Cru	954 1899 fescu in and r and 7, 197 de Pro	1120 1021 ne. d nitra date c 78 and otein (2210 1587 ate con of harv 1979. %)	1494 1385 tent o est, M	f fora AFES B	579 ge, by lack F	9831 9323 7 fora 3elt
Coastal Bermuda Alicia Bermuda Interseeded wit Table 2. Crude Syste Branc Forage Coastal Bermuda Alicia Bermuda Common Bermuda	$ \begin{array}{r} 1960 \\ 1782 \\ \hline 1782 \\ ch tall \\ e prote \\ m, yea \\ ch, 197 \\ \hline Cru \\ \hline Cru \\ \hline 6/1 \\ 10. \\ 13. \\ \end{array} $	954 1899 fescu in and 7, 197 de Pro 4 8/ 0 13 7 13 0 18	1120 1021 1021 1e. 1 nitra date c 78 and 0 tein (79 1 3.3 3.4 1 3.7 1	$ \begin{array}{r} 2210 \\ 1587 \\ 1587 \\ 1587 \\ 1587 \\ 1979. \\ 1979. \\ 1979. \\ 1979. \\ 1979. \\ 1979. \\ 1979. \\ 107$	$ \begin{array}{r} 1494 \\ 1385 \\ tent o \\ est, M \\ \hline \hline \\ \underline{7} \\ \underline{6/14} \\ \underline{.105} \\ .120 \\ \end{array} $	1501 1070 f fora AFES B Nitrat 8/9 .10 .20 .45	579 579 lack F <u>e (%)</u> <u>1(</u> 0 .(0 .(0 .(0 .(9831 9323 7 fora 3elt 0/4 062 078 082
Coastal Bermuda Alicia Bermuda Interseeded with Table 2. Crude Syste Brand Forage Coastal Bermuda Alicia Bermuda Common Bermuda	1960 1782 th tall prote m, yea th, 197 <u>Cru</u> <u>6/1</u> 10. 10. 13.	954 1899 fescu in and 7, 197 de Pro 4 8/ 0 13 7 13 0 18	1120 1021 1e. 1 nitra date c 78 and 0 tein (79 1 3.3 3.4 1 3.7 1	$ \begin{array}{r} 2210 \\ 1587 \\ \hline 1587 \\ \hline 1587 \\ \hline 1587 \\ \hline 1979. \\ \hline 1979. \\ \hline 1979. \\ \hline 197 \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ 197 \\ \hline 197 \\ 197 \\ \hline 1$	$ \begin{array}{r} 1494 \\ 1385 \\ tent o \\ est, M \\ \hline \hline \\ \underline{7} \\ \underline{6/14} \\ \underline{.056} \\ .105 \\ .120 \\ \\ 8 \end{array} $	1501 1070 f fora AFES B Nitrat 8/9 .10 .20 .45	579 ge, by lack F e (%) <u>1(</u> 0 .(0 .(0 .(9831 9323 7 fora 3e1t 0/4 062 078 082
Coastal Bermuda Alicia Bermuda Interseeded wit Table 2. Crude Syste Brance Forage Coastal Bermuda Alicia Bermuda Common Bermuda Alicia Bermuda	$ \begin{array}{r} 1960 \\ 1782 \\ \hline 1782 \\ th tall \\ prote \\ m, yea \\ th, 197 \\ \hline Cru \\ \hline Cru \\ \hline \frac{6/1}{10.} \\ 10. \\ 13. \\ \frac{5/2}{13.} \\ 14. \\ 15. \\ \end{array} $	954 1899 fescu in and 7, 197 de Pro 4 8/ 0 13 7 13 0 18 5 6/ 0 16 3 14 3 19	1120 1021 1021 1e. 1 nitra date co 78 and 0 tein (79 1 3.3 3.4 1 3.7 1 723 8 5.3 1 1.3 1 9.0 1	$ \begin{array}{r} 2210 \\ 1587 \\ \hline 1587 \\ \hline 1587 \\ \hline 1587 \\ \hline 1979. \\ \hline 1979. \\ \hline 1979. \\ \hline 1979. \\ \hline 197 \\ \hline 197 \\ \hline 197 \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ \hline 197 \\ \hline 6.4 \\ \hline \end{array} $	$ \frac{1494}{1385} $ tent o est, M $ \frac{7}{6/14} $.056 .105 .120 $ \frac{8}{5/25} $	1501 1070 f fora AFES B Nitrat 8/9 .10 .20 .45 .45	579 ge, by lack F e (%) <u>1(</u> 0 .(0 .(0 .(0 .(0 .(0 .(0 .(0 .(9831 9323 7 fora 3e1t 0/4 062 078 082 (21)
Coastal Bermuda Alicia Bermuda Interseeded with Table 2. Crude Syste Brand Forage Coastal Bermuda Common Bermuda Alicia Bermuda Coastal Bermuda Common Bermuda	$ \begin{array}{r} 1960 \\ 1782 \\ \hline 1782 \\ th tall \\ prote \\ m, yea \\ th, 197 \\ \hline Cru \\ \hline Cru \\ \hline 6/1 \\ 10. \\ 10. \\ 13. \\ \hline 5/2 \\ 13. \\ 14. \\ 15. \\ \end{array} $	954 1899 fescu in and 7, 197 de Pro 4 8/ 0 13 7 13 0 18 5 6/ 0 16 3 14 3 19	1120 1021 1021 1e. 1 nitra date co 78 and 0 tein (79 1 3.3 3.4 1 3.7 1 723 8 5.3 1 4.3 1 9.0 1	$ \begin{array}{r} 2210 \\ 1587 \\ \hline 1979. \\ \hline 1979. \\ \hline 1979. \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ \hline 197 \\ \hline 1.7 \\ \hline 5.3 \\ \hline 197 \\ \hline 3/21 \\ \hline 2.8 \\ \hline 1.9 \\ \hline 6.4 \\ \hline 197 \\ \hline \end{array} $	$ \begin{array}{r} 1494 \\ 1385 \\ \end{array} $ tent o est, M $ \begin{array}{r} \hline 7 \\ \underline{6/14} \\ .056 \\ .105 \\ .120 \\ \hline 8 \\ \underline{5/25} \\ \\ \\ 9 \\ \end{array} $	1501 1070 f fora AFES B Nitrat 8/9 .10 .20 .45 6/2	579 ge, by lack F e (%) 10 0 .0 0 .0 3 8/	9831 9323 7 fora 3elt 0/4 062 078 082

Forage		N	eutral	Deterger	t Fibe	r (%)	
				1977			
	5/16	6/14	7/12	879~	9/13	10/4	
Coastal Bermuda	68.4	71.4	71.6	73.6	73.5	76.9	
Alicia Bermuda	67.2	73.4	72.2	72.7	74.6	76.8	
Common Bermuda*	63.2	64.1	65.3	65.5	68.5	73.8	
			-	1978			
	4/18	5/25	6/23	7/21	8/21	9/15	
Coastal Bermuda	56.2	69.0	69.3	71.1	73.2	72.6	
Alicia Bermuda	61.6	69.9	68.8	72.6	74.0	73.0	
common Bermuda*	59.9	62.0	65.2	66.8	68.0	69.6	
				1979			
	4/19	5/16	6/13	7/18	8/8	9/5	10/3
Coastal Bermuda	52.1	66.5	76.4	73.7	77.8	76.4	72.6
Alicia Bermuda	48.4	68.0	73.5	77.7	70.6	72.1	72.9
Common Bermuda*	52.9	62.0	58.6	69.3	73.7	67.1	61.6
*Interseeded wi Table 4. Acid d system	th tall letergen 1, year	fescue it fiber and dat	c conter te of ha	it of for	rage, b MAFES E	y forag lack Be	ge elt
*Interseeded wi Fable 4. Acid d system Branch	th tall letergen a, year a, 1977,	fescue nt fiber and dat 1978 a	c conter te of ha and 1979	nt of for arvest, 1).	rage, b MAFES B	oy forag lack Be	ge elt
*Interseeded wir Table 4. Acid d system Branch Forage	th tall letergen 1, year 1, 1977,	fescue nt fiber and dat 1978 a	c conter te of ha and 1979 Acid De	nt of for arvest, 1). etergent	rage, b MAFES B Fiber	y forag lack Be (%)	ge 91t
*Interseeded wir Table 4. Acid d system Branch Forage	th tall letergen 1, year 1, 1977,	fescue nt fiber and dat 1978 a	te of ha and 1979 Acid De	nt of for arvest, 1). etergent <u>1977</u>	rage, b MAFES B Fiber	y forag lack Be (%)	ge elt
*Interseeded wir Fable 4. Acid d system Branch Forage	th tall letergen 1, year 1, 1977, 5/16	fescue at fiber and dat 1978 a 6/14	c conter te of ha and 1979 Acid De 7/12	at of for arvest, 1 $\frac{1977}{8.9}$	rage, b MAFES B Fiber 9/13	by forag lack Be (%) 10/4	ge elt
*Interseeded wir Fable 4. Acid d system Branch Forage	th tall letergen 1, year 1, 1977, <u>5/16</u> <u>34.5</u>	fescue and fiber and dat 1978 a 6/14 35.2	c contente of ha and 1979 Acid De 7/12 35.4	at of for arvest, 1 $\frac{1977}{8.9}$	rage, b MAFES B Fiber 9/13 37.3	y forag lack Be (%) <u>10/4</u> 41.9	ge 91t
*Interseeded wi Fable 4. Acid d system Branch Forage Coastal Bermuda	th tall letergen 1, year 1, 1977, <u>5/16</u> 34.5 36.8 25 9	fescue and fiber and dat 1978 a 6/14 35.2 39.9 25 c	c contente of ha and 1979 Acid De 7/12 35.4 39.8 26.2	etergent $\frac{1977}{8.9}$	rage, b MAFES B Fiber 9/13 37.3 41.8	by forag lack Be (%) <u>10/4</u> 41.9 42.6	ge elt
Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	th tall letergen 1, year 1, 1977, <u>5/16</u> 34.5 36.8 35.8	fescue and fiber and dat 1978 a 6/14 35.2 39.9 35.6	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3	t of for arvest, 1). etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5	ge 91t
Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	th tall letergen 1, year 1, 1977, <u>5/16</u> 34.5 36.8 35.8	fescue and fiber and dat 1978 a 6/14 35.2 39.9 35.6	c conter te of ha and 1979 Acid De 7/12 35.4 39.8 36.3	t of for arvest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5	ge elt
Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	th tall letergen 1, year 1, 1977, 5/16 34.5 36.8 35.8 4/18 36.5	fescue at fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23	t of for arvest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 22.7	rage, b MAFES B 9/13 37.3 41.8 39.8 8/21 34.6	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 24.2	ge 91t
*Interseeded wi Fable 4. Acid d system Branch Forage Coastal Bermuda Common Bermuda Coastal Bermuda	th tall letergen 1, year 1, 1977, 5/16 34.5 36.8 35.8 4/18 36.5 36.8	fescue and fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44 4	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5	$\frac{1977}{8.9}$ $\frac{1977}{34.2}$ 34.2 37.9 36.1 $\frac{1978}{7/21}$ 33.7 37.7	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 34.3 38.0	ge elt
*Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Common Bermuda Coastal Bermuda Coastal Bermuda	th tall letergen 1, year 1, 1977, <u>5/16</u> 34.5 36.8 35.8 <u>4/18</u> 36.5 36.8 34.1	fescue ant fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44.4 42 1	c conterte of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5 34.8	t of for tryest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 33.7 37.7 36.8	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4 33.4	by forage lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 34.3 38.0 31.7	ge elt
Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	th tall 5/16 34.5 36.8 35.8 4/18 36.5 36.8 34.1	fescue and fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44.4 42.1	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5 34.8	t of for rvest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 33.7 37.7 36.8	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4 33.4	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 34.3 38.0 31.7	ge elt
Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	th tall letergen 1, year 1, 1977, $\frac{5/16}{34.5}$ 36.8 35.8 $\frac{4/18}{36.5}$ 36.8 34.1 4/19	fescue nt fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44.4 42.1 5/16	c conter te of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5 34.8 6/13	nt of for arvest, 1 2. <u>etergent</u> <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 33.7 37.7 36.8 <u>1979</u> 7/18	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4 33.4 8/8	y forag lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 34.3 38.0 31.7	ge elt
*Interseeded wir Fable 4. Acid d system Branch Forage Coastal Bermuda Common Bermuda Coastal Bermuda Coastal Bermuda Coastal Bermuda	th tall letergen 1, year 1, 1977, 5/16 34.5 36.8 35.8 4/18 36.5 36.8 34.1 4/19 27.3	fescue and fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44.4 42.1 5/16 34.7	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5 34.8 6/13 35.9	nt of for rvest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 33.7 37.7 36.8 <u>1979</u> 7/18 36.0	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4 33.4 8/8 38.0	by forage lack Be (%) 10/4 41.9 42.6 43.5 9/15 34.3 38.0 31.7 9/5 35.6	ge elt 10/3
*Interseeded wi Table 4. Acid d system Branch Forage Coastal Bermuda Coastal Bermuda Coastal Bermuda Coastal Bermuda Coastal Bermuda	th tall letergen a, year a, 1977, $\frac{5/16}{34.5}$ 36.8 35.8 $\frac{4/18}{36.5}$ 36.8 34.1 $\frac{4/19}{27.3}$ 27.6	fescue nt fiber and dat 1978 a 6/14 35.2 39.9 35.6 5/25 37.6 44.4 42.1 5/16 34.7 35.5	c contente of ha and 1979 Acid De 7/12 35.4 39.8 36.3 6/23 38.3 36.5 34.8 6/13 35.9 35.5	nt of for rvest, 1 etergent <u>1977</u> <u>8.9</u> 34.2 37.9 36.1 <u>1978</u> 7/21 33.7 37.7 36.8 <u>1979</u> 7/18 36.0 36.8	rage, b MAFES B Fiber 9/13 37.3 41.8 39.8 8/21 34.6 37.4 33.4 8/8 38.0 35.3	by forage lack Be (%) <u>10/4</u> 41.9 42.6 43.5 <u>9/15</u> 34.3 38.0 31.7 <u>9/5</u> 35.6 34.9	ge elt <u>10/3</u> 35.2 34.6

*Interseeded with tall fescue.

Forage				Lignin	(%)					
	5/16	6/14	7/19	1977 879a	0/13	10/4				
Coastal Bermuda	5.3	5.4	6.1	4 5	5 9	8.8				
Alicia Bermuda	6.1	8.4	6.9	5.3	6.7	8.4				
Common Bermuda*	4.6	5.1	6.1	5.8	6.7	7.6				
		1978								
	4/18	5/25	6/23	7/21	8/21	9/15				
Coastal Bermuda	7.0	7.3	4.4	5.1	5.3	5.7				
Alicia Bermuda	5.7	8.9	5.4	5.3	5.7	5.6				
Common Bermuda*	5.0	5.1	5.5	7.2	5.9	5.6				
				1979						
	4/19	5/16	6/13	7/18	8/8	9/5	10/3			
Coastal Bermuda	3.9	5.8	5.2	4.5	4.9	4.2	5.6			
Alicia Bermuda	4.7	6.0	5.3	5.6	4.6	5.1	5.3			
Common Bermuda*	2.6	4.2	4.6	5.2	4.0	4.9	4.5			

Table 5. Lignin content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

*Interseeded with tall fescue.

Table 6. Soluble cell content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

Forage		Se	oluble	Cell Con	ntent (%)	
				1977			
	5/16	6/14	7/12	~ 8/9	9/13	10/4	
Coastal Bermuda	31.6	28.6	28.4	26.4	25.5	23.1	
Alicia Bermuda	32.8	26.6	27.8	27.3	25.4	23.2	
Common Bermuda*	36.8	35.9	34.7	34.5	31.5	26.2	
				1978			
	4/18	5/25	6/23	7/21	8/21	9/15	
Coastal Bermuda	43.8	31.0	30.7	28.9	26.8	27.4	
Alicia Bermuda	38.4	30.1	31.2	27.4	26.0	27.0	
Common Bermuda*	40.1	38.0	34.8	33.2	32.0	30.4	
				1979			
	4/19	5/16	6/13	7/18	8/8	9/5	10/3
Coastal Bermuda	47.9	33.5	23.6	26.3	22.2	23.6	27.4
Alicia Bermuda	51.6	32.0	26.5	22.3	29.4	27.9	27.1
Common Bermuda*	47.1	38.0	41.4	30.7	26.3	32.9	38.4

*Interseeded with tall fescue.

Forage			Hemicellulose (%)									
				1977								
	5/16	6/14	7/12	8/9	9/13	10/4						
Coastal Bermuda	39.7	36.1	36.2	39.4	36.2	35.1						
Alicia Bermuda	30.3	35.5	32.4	34.8	34.2	36.5						
common bernuda*	21.4	40.0	29.0	49.0	49.0	50.4						
	4/10	E /04	C 100	1978	0/01	0/15						
Constal Rommuda	$\frac{4/18}{10.7}$	5/24	6/23	27 1	8/21	9/15						
Alicia Bermuda	24 8	25 4	32 3	31.4	36.6	35.0						
Common Bermuda*	25.9	19.9	30.4	29.9	34.6	37.8						
				1070								
	1/10	5/16	6/12	7/10	8/9	0/5	10/2					
Coastal Bermuda	$\frac{4/19}{24.8}$	31 8	40 5	37 7	39 7	40.8	37 4					
Alicia Bermuda	20.7	32.4	38.0	40.8	35.3	37.3	38.4					
Common Bermuda*	24.4	24.4	24.3	33.4	34.0	33.2	28.5					
*Interseeded wit Fable 8. Digest: system Branch	h tall ible dry , year a	fescue. 7 matter and date 1978 ar	c conter e of ha: nd 1979	nt of fo	orage, t MAFES BI	by forag lack Bel	ge Lt					
*Interseeded wit Fable 8. Digest: system Branch	h tall ible dry , year a , 1977,	fescue. y matter and date 1978 ar	r conter e of ha nd 1979	nt of fo rvest, M	orage, t MAFES BI	oy forag lack Bel	ge Lt					
*Interseeded wit Fable 8. Digest: system Branch Forage	h tall ible dry , year a , 1977,	fescue. y matter and date 1978 ar Dig	c conter e of ha nd 1979 gestible	nt of fo rvest, M e Dry Ma	orage, k MAFES BJ atter (9	oy forag lack Bel 6)	ge Lt					
*Interseeded wit Fable 8. Digest: system Branch Forage	h tall ible dry , year a , 1977,	fescue. y matter and date 1978 ar Dig	c conter e of has nd 1979 gestible	nt of fo rvest, M e Dry Ma <u>1977</u>	orage, h MAFES BI atter (9	by forag lack Bel	;e Lt					
*Interseeded wit Table 8. Digest: system Branch Forage	h tall ible dry , year a , 1977, <u>5/16</u>	fescue. y matter and date 1978 ar Dig 6/14	c conter e of ha: nd 1979 gestible 7/12	nt of fo rvest, M e Dry Ma <u>1977</u> <u>8/9</u>	orage, k MAFES BJ atter (9 9/13	by forag lack Bel 6)	;e !t					
*Interseeded wit Table 8. Digest: system Branch Forage	h tall ible dry , year a , 1977, <u>5/16</u> 54.8	fescue. y matter and date 1978 ar Dig 6/14 53.9 45 3	c contend of haming gestible 7/12 49.1 50 7	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7	orage, t MAFES BI atter (9 9/13 51.3 50.4	by forag lack Bel 6) 10/4 44.9 43.9	ge Lt					
*Interseeded wit Fable 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda *	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2	c conter e of has nd 1979 gestible 7/12 49.1 50.7 54.4	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5	orage, h MAFES BI atter (9 9/13 51.3 50.4 52 5	by forag lack Bel 6) <u>10/4</u> 44.9 43.9 49.0	ge Lt					
Interseeded wit Table 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, <u>5/16</u> 54.8 53.5 61.0	fescue. 7 matter and date 1978 ar Dig 6/14 53.9 45.3 58.2	c contend of hamily for the second se	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5	orage, b MAFES BI atter (9 9/13 51.3 50.4 52.5	by forag lack Bel 6) <u>10/4</u> 44.9 43.9 49.0	ge Lt					
Interseeded wit Table 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2	c conter e of has nd 1979 gestible 7/12 49.1 50.7 54.4	nt of for rvest, Ma <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/01	9/13 51.3 50.4 52.5	by forag lack Bel 6) <u>10/4</u> 44.9 43.9 49.0	;e Lt					
Interseeded wit Fable 8. Digest: system Branch Forage Coastal Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56 1	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25	c contend of hamily for the contend of hamily for the contend of hamily for the contend gestible 7/12 49.1 50.7 54.4 6/23 61 1	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/21	orage, b MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6	by forag lack Bel () 10/4 44.9 43.9 49.0 9/15 51 2	ge Lt					
*Interseeded wit Fable 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda *	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56.1 57.5	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25 49.0 47.9	c contend of hamily for the contend of hamil	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> <u>7/21</u> 54.1 55.2	orage, h MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6 52.5	by forag lack Bel () () () () () () () () () () () () ()	ge Lt					
Interseeded wit Fable 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56.1 57.5 59.3	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25 49.0 47.9 62.6	c conter e of ha: nd 1979 gestible 7/12 49.1 50.7 54.4 6/23 61.1 55.7 55.7	nt of for rvest, Ma <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/21 54.1 55.2 49.8	9/13 51.3 50.4 52.5 8/21 52.6 52.5 51.8	by forag lack Bel 6) <u>10/4</u> 44.9 43.9 49.0 <u>9/15</u> 51.2 53.7 51.0	t t					
Interseeded wit Table 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda Coastal Bermuda Alicia Bermuda Alicia Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 57.5 59.3	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25 49.0 47.9 62.6	c contend of hamily for the contend of hamil	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/21 54.1 55.2 49.8	orage, h MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6 52.5 51.8	by forag lack Bel 0) 10/4 44.9 43.9 49.0 9/15 51.2 53.7 51.0	ge Lt					
*Interseeded wit Fable 8. Digest system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda * Coastal Bermuda Alicia Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56.1 57.5 59.3	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25 49.0 47.9 62.6	c conter e of ha: nd 1979 gestible 7/12 49.1 50.7 54.4 6/23 61.1 55.7 55.7	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/21 54.1 55.2 49.8 <u>1979</u> 7/19	orage, h MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6 52.5 51.8 8/8	by forag lack Bel <u>10/4</u> 44.9 43.9 49.0 <u>9/15</u> 51.2 53.7 51.0 0/5	;e .t					
Interseeded wit Table 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda Coastal Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56.1 57.5 59.3 4/19 63.3	fescue. y matter and date 1978 ar Dig 6/14 53.9 45.3 58.2 5/25 49.0 47.9 62.6 5/16 53.7	c contend of hamily for the formation of	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> 7/21 54.1 55.2 49.8 <u>1979</u> 7/18 57 5	orage, h MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6 52.5 51.8 8/8 55.1	by forag lack Bel 0) 10/4 44.9 43.9 49.0 9/15 51.2 53.7 51.0 9/5 58.0	10/3					
*Interseeded wit Table 8. Digest: system Branch Forage Coastal Bermuda Alicia Bermuda Common Bermuda * Coastal Bermuda Alicia Bermuda Common Bermuda	h tall ible dry , year a , 1977, 5/16 54.8 53.5 61.0 4/18 56.1 57.5 59.3 4/19 63.3 62.1	fescue. y matter and date 1978 ar <u>Dig</u> 6/14 53.9 45.3 58.2 5/25 49.0 47.9 62.6 5/16 53.7 52.7	c conter e of ha: nd 1979 gestible 7/12 49.1 50.7 54.4 6/23 61.1 55.7 55.7 55.7 6/13 52.6 53.3	nt of for rvest, M <u>e Dry Ma</u> <u>1977</u> <u>8/9</u> 56.7 55.3 49.5 <u>1978</u> <u>7/21</u> 54.1 55.2 49.8 <u>1979</u> <u>7/18</u> 57.5 51.2	orage, k MAFES BI atter (9 9/13 51.3 50.4 52.5 8/21 52.6 52.5 51.8 8/8 55.1 57.9	by forag lack Bel	t 10/3 52.3 52.7					

Forage	Por	tassium	(%)	Magnesium (%)			
				1977			
	6/14	8/9	10/4	6/14	8/9	10/4	
Coastal Bermuda	.92	1.11	.80	.10	.10	.11	
Alicia Bermuda	.89	1.49	.82	.12	.14	.12	
Common Bermuda*	1.32	2.14	1.61	.17	.18	.18	
				1978			
	5/25	6/23	8/21	5/25	6/23	8/23	
Coastal Bermuda	2.20	1.96	1.54	.14	.13	.10	
Alicia Bermuda	2.23	1.61	1.36	.11	.15	.12	
Common Bermuda*	3.00	2.20	1.84	.24	.20	.13	
				1979			
	5/16	6/13	8/8	5/16	6/13	8/8	
Coastal Bermuda	1.61	1.69	1.55	.16	.14	.13	
Alicia Bermuda	1.64	1.55	1.38	.12	.13	.13	
Common Bermuda*	2.29	2.17	1.65	.22	.20	.17	

Table 9. Potassium and magnesium content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

*Interseeded with tall fescue.

Table 10. Sulfur and phosphorus content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

Forage	St	ulfur (9	%)	Phos	Phosphorus (%)		
	0.17.4	0.40	10/19	77			
Constal Roymuda	$\frac{6/14}{20}$	8/9	10/4	$\frac{6/14}{10}$	8/9	10/4	
Alicia Bormuda	. 39	. 30	. 39	.10	. 20	10	
Common Bermuda*	.27	.28	.32	.19	.24	.26	
			19	78			
	5/25	6/23	8/21	5/25	6/23	8/21	
Coastal Bermuda	.39	.56	.38	.36	.35	.27	
Alicia Bermuda	.34	.41	.39	.35	.36	.29	
Common Bermuda*	.32	.41	.24	.43	.42	.30	
			19	79			
	5/16	6/13	8/8	5/16	6/13	8/8	
Coastal Bermuda	.41	.60	.51	.33	.40	.34	
Alicia Bermuda	.39	.52	.47	.28	.38	.32	
Common Bermuda*	.35	.45	.40	.36	.39	.29	

*Interseeded with tall fescue.

Forage	Ca	alcium	(%)	Se	Sodium (%)			
	6/14	8/9	10/4	6/14	8/9	10/4		
Coastal Bermuda	.89	.71	.81	.05	.08	.07		
Alicia Bermuda	.80	.69	.70	.07	.10	.08		
Common Bermuda*	.88	.69	.73	.04	.08	.06		
	1978							
	5/25	6/23	8/21	5/25	6/23	8/21		
Coastal Bermuda	.80	.80	.61	.12	.17	.20		
Alicia Bermuda	.98	1.08	.86	.15	.14	.12		
Common Bermuda*	.92	.90	.70	.13	.15	.09		
	1979							
	5/16	6/13	8/8	5/16	6/13	8/8		
Coastal Bermuda	.90	.82	.70	.23	.25	.20		
Alicia Bermuda	.90	1.01	.96	.11	.10	.10		
Common Bermuda*	.73	.78	.72	.29	.20.	.16		

Table 11. Calcium and sodium content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

*Interseeded with tall fescue.

Table 12. Iron and aluminum content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

/14	ppm	197	77	ppm	
/14		197	77		
/14		201	1		
	8/9	10/4	6/14	8/9	10/4
126	283	1520	262	176	2060
740	1300	1770	690	1900	2420
438	352	182	440	164	85
		197	78		
/25	6/23	8/21	5/25	6/23	8/21
830	1190	1090	6900	2180	1540
250	6360	4290	1620	8610	2710
650	890	1140	3270	1310	1640
		197	79		
/16	6/13	8/8	5/16	6/13	8/8
620	1280	1810	3500	2500	3100
660	2580	4460	4200	4200	6100
710	2100	5700	4400	3400	9200
	740 438 /25 830 250 650 /16 620 660 710	$\begin{array}{rrrr} 740 & 1300 \\ 438 & 352 \\ \hline \\ /25 & 6/23 \\ 830 & 1190 \\ 250 & 6360 \\ 650 & 890 \\ \hline \\ /16 & 6/13 \\ 620 & 1280 \\ 660 & 2580 \\ 710 & 2100 \\ \end{array}$	$\begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

Forage	1	langanes	se		Boron			
		ppm			ppm			
				1977				
	6/14	8/9	10/4	6/14	8/9	10/4		
Coastal Bermuda	45	36	153	14	13	6		
Alicia Bermuda	49	78	151	15	11	8		
Common Bermuda*	56	53	83	20	11	5		
			1978					
	5/25	6/23	8/21	5/25	6/23	8/21		
Coastal Bermuda	144	52	44	15	9	10		
Alicia Bermuda	76	410	77	13	10	9		
Common Bermuda*	150	74	61	11	12	14		
		1979						
	5/16	6/13	8/8	5/16	6/13	8/8		
Coastal Bermuda	135	79	123	15	12	8		
Alicia Bermuda	116	111	195	13	10	8		
Common Bermuda*	148	98	181	10	17	8		

Table 13. Manganese and boron content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

*Interseeded with tall fescue.

Table 14. Copper and zinc content of forage, by forage system, year and date of harvest, MAFES Black Belt Branch, 1977, 1978 and 1979.

Forage		Copper			Zinc	
		ppm			ppm	
			1	977		
	6/14	8/9	10/4 -	6/14	8/9	10/4
Coastal Bermuda	2	7	19	35	34	94
Alicia Bermuda	2	15	19	32	39	109
Common Bermuda*	2	29	14	39	48	70
			978			
	5/25	6/23	8/21 -	5/25	6/23	8/21
Coastal Bermuda	30	36	26	170	150	170
Alicia Bermuda	24	100	24	160	180	180
Common Bermuda*	17	35	21	160	170	170
			1	979		
	5/16	6/13	8/8 -	5/16	6/13	8/8
Coastal Bermuda	28	32	47	410	210	180
Alicia Bermuda	25	37	55	320	200	190
Common Bermuda*	190	29	48	270	190	200

*Interseeded with tall fescue.

Table 15. Mai Bli	nagement calender for forage systems at the MAFES ack Belt Branch, 1977, 1978 and 1979 (fall calving) $\frac{a}{-}$.
January:	Feeding cows and calves (fall calves) hay, silage, and protein on Fescue - Bulls with Cows
February:	Continue feeding cows and calves hay, silage, and protein - Bulls with Cows
March-April:	Continue feeding until cows placed on pasture. Bulls removed from pasture. Application of fertilizer to pastures 120-40-40. Nitrogen applied in split application. Remove bulls March 15.
May-June:	Cows on pastures. Control flies, spray for weeds. Wean calves in June. Vaccinate calves (blackleg- malignant edema-lepto. Worm calves. Vaccinate heifers for brucellosis. Worm cows, pregnancy check cows, cull open and aged.
July-August:	Make hay of surplus grass. Continue control flies. Control weeds in pasture. Cows calving end of August. Eartag calves, castrate bull calves, record birthweight, birthdate, cow number, etc. Watch for scours and screw worms.
September:	Continue calving. Make hay from surplus forage.
October:	Continue calving. Move cows and calves to fescue pasture. Fertilize fescue. Control lice.
November- December	Feeding silage, hay and protein. Put bulls with cows December 15.

\$

ØL

<u>a</u>/Spring calving management calendar--Bulls placed with cows May 15 and removed August 10. Calving period February 15 to May 10.

Item	Alicia	Common	Coastal
	Bermudagrass	Bermudagrass	Bermudagrass
		1bs/A	
Hay	1,115	1,115	1,115
Silage	3,670	3,670	3,670
Protein	180	180	180

4

D

Table 16. Supplemental feed $\frac{1}{r}$ required for cow-calf production on forage, by forage system, MAFES Black Belt Branch, 1977= 1979 averages.

Table 17. Conception rates of Angus cows on forage by forage systems, MAFES Black Belt Branch, 1977, 1978 and 1979.

Forage System	1977	1978	1979	Av.
Alicia bermuda	80	60	80	73
Coastal bermuda	90	50	90	76
Common bermuda*	80	56	80	72

*Interseeded with tall fescue.

			Forage System		
Item	Unit	Alicia	Coastal	Common1	
Calves dropped in Fall of 1976					
Cow-calf units	No.	15	15	15	
Calf data					
Date put on pasture Weaning date Grazing days Average age at weaning	No. Days	April 19 June 14 56 262	April 19 June 14 56 261	April 19 June 14 56 263	
Amount First				100	
Average birth weight Average weight when put on pasture Average weaning weight	Lbs. Lbs.	61 278	59 271	62 291	
Actual 205-day adjusted	Lbs. Lbs.	352 , 288	371 304	402 333	
Total gain per acre	Lbs.	74	100	111	
Calves dropped in Spring 1978					
Cow-calf units	No.	15	15	15*	
Calf data					
Date put on pasture Weaning date Grazing days Average age at weaning	No. Days	March 31 October 9 192 238	March 31 October 9 192 229	March 31 October 9 192 233	
Average birth weight Average weight when put on pasture	Lbs. Lbs.	61 99	58 94	66 98	
Actual 205-day adjusted	Lbs. Lbs.	364 322	361 321	420**	
Total gain per acre	Lbs.	265	267	270***	
Calves dropped in Spring 1979					
Cow-calf units	No.				
Calf data Date put on pasture		Manch 91	Newsh 01		
Weaning date Grazing days Average age at weaning	No. Davs	October 3 196 204	October 3 196 201	March 21 October 3 196	
Average hirth weight			201	150	
Average weight when put on pasture Average weaning weight	Lbs. Lbs.	59 59	60 60	65 65	
Actual 205-day adjusted	Lbs. Lbs.	280 382	352 375 356 390		
Total gain per acre	Lbs.	321	272	210	

Table 18. Preweaning performance of calves on 15-acre paddocks of three forage systems, MAFES Black Belt Branch, 1977, 1978 and 1979.

 1 Interseeded with tall fescue.

*Reduced to 8 cow-calf units on 7/20/78.

**Average of 8 calves

4

1

***Includes the average weight of the 7 calves when removed from pasture on 7/20/78.

TABLE 19A. ESTIMATED COST PER ACRE BY OPERATION, COASTAL (or ALICIA) BERMUDA PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI,1980.

OPERATION OR MATERIAL DESCRIPTION	UNIT	40	TR	TIMES OVER	TR D HOURS	ACTOR DIRECT COST	FIXED COST	EQU HOURS	IPMENT DIRECT COST	FIXED COST	LABC HOURS	COST	QUAN	MATERI PRICE	AL COST	TOTAL
LIME (SPREAD)	CWT	8	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00	1.20	4.80	4.80
CHISEL PLOW 12"	ACRE	4	2	1.00	.30	1.54	1.47	.30	.21	.52	.30	.93	.00	.00	.00	4.67
DISK HARROW 14"	ACRE	4	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
AMM. NITRATE	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.85	7.35	6.25	6.25
SUPERPHOSPHATE	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.30	10.25	13.32	13.32
POTASH	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	7.45	7.45	7.45
SPREADER	ACRE	5	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
DISK HARROW 14"	ACRE	5	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
CUSTOM SPRIGGING	ACRE	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	40.00	40.00	40.00
CULTIPACKER	ACRE	5	2	1.00	.24	1.23	1.18	.24	.24	.83	.24	.74	.00	.00	.00	4.23
2, 4-D AMINE	LB	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	2.00	2.55	5.10	5.10
SPRAYER 21'	LB	5	1	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.14	.00	.00
AMM. NITRATE	CWT	7	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.85	7.35	6.25	6.25
SPREADER	ACRE	7	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
TOTAL					1.40	6.05	5.73	1.40	1.63	3.63	1.40	4.34			83.17	104.55

.

ITEM	UNIT	PRICE DOLLARS	QUANTITY	AMOUNT
INCOME TOTAL INCOME				.00
DIRECT EXPENSES				
OPERATOR LABOR	HOUR	3.10	1.40	4.34
LIME (SPREAD)	CWT	1.20	4.00	4.80
AMM. NITRATE	CWT	7.35	1.70	12.50
SUPERPHOSPHATE	CWT	10.25	1.30	13.32
POTASH	CWT	7.45	1.00	7.45
CUSTOM SPRIGGING	ACRE	40.00	1.00	40.00
2, 4-D AMINE	LB	2.55	2.00	5.10
EQUIPMENT	ACRE	1.63	1.00	1.63
TRACTOR	ACRE	6.05	1.00	6.05
INT ON OP CAP	ACRE	2.64	1.00	2.64
TOTAL DIRECT EXPENSE				97.83
RETURNS ABOVE DIRECT	EXPENSES			-97.83
FIXED EXPENSES				
EQUIPMENT	ACRE	3.63	1.00	3.63
TRACTOR	ACRE	5.73	1.00	5.73
TOTAL FIXED EXPENSE				9.36
OTAL SPECIFIED EXPENSES	-			107.19
NET RETURN				-107.19

TABLE 19B. ESTIMATED COST AND NET RETURNS PER ACRE, COASTAL (or ALICIA) BERMUDA PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI,1980.

					TR	ACTOR		EQU	IPMENT		LA	BOR		MATER	IAL	
OPERATION OR MATERIAL DESCRIPTION	UNIT	МО	TR	TIMES OVER	HOURS	COST	FIXED COST	HOURS	DIRECT COST	FIXED COST	HOURS	COST	QUAN	PRICE	COST	TOTAL
LIME (SPREAD)	CWT	8	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00	1.20	4.80	4.80
CHISEL PLOW 12'	ACRE	4	2	1.00	.30	1.54	1.47	.30	.21	.52	.30	.93	.00	.00	.00	4.67
DISK HARROW 14"	ACRE	4	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
AMM. NITRATE	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.85	7.35	6.25	6.25
SUPERPHOSPHATE	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.30	10.25	13.32	13.32
POTASH	CWT	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	7.45	7.45	7.45
SPREADER	ACRE	5	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
DISK HARROW 14"	ACRE	5	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
SECTION HARROW 14"	ACRE	5	1	1.00	.14	.32	.29	.14	.04	.07	.14	.43	.00	.00	.00	1.15
COMMON BERMUDA SEED	LB	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	5.00	2.35	11.75	11.75
TAILGATE SEEDER	ACRE	5	1	1.00	.20	.45	.41	.20	.18	.26	.20	.62	.00	.00	.00	1.92
CULTIPACKER	ACRE	5	2	1.00	.24	1.23	1.18	.24	.24	.83	.24	.74	.00	.00	.00	4.23
2,4-D AMINE	LB	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	2.00	2.55	5.10	5.10
SPRAYER	ACRE	5	1	1.00	.18	.41	.37	.18	.15	.23	.18	.56	.00	.00	.00	1.72
AMM. NITRATE	CWT	7	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.85	7.35	6.25	6.25
SPREADER	ACRE	7	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
TOTAL					1.92	7.23	6.80	1.92	2.00	4.19	1.92	5.95			54.92	81.09

TABLE 20A. ESTIMATED COST PER ACRE BY OPERATION, COMMON BERMUDA PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI, 1980.

ITEM	UNIT	PRICE DOLLARS	QUANTITY	AMOUNT
INCOME				
DIRECT EXPENSES				.00
OPFRATOR LABOR	HOUD	2 10	1 00	
LIME (SPREAD)	CWT	1 20	1.92	5.95
AMM. NITRATE	CWT	7 35	4.00	4.80
SUPERPHOSPHATE	CWT	10.25	1.30	12.50
POTASH	CWT	7.45	1.00	7.45
COMMON BERMUDA SEED	LB	2.35	5.00	11.75
2,4-D AMINE	LB	2.55	2.00	5.10
EQUIPMENT	ACRE	2.00	1.00	2.00
TRACTOR	ACRE	7.23	1.00	7.23
INT ON OP CAP	ACRE	3.74	1.00	3.74
TOTAL DIRECT EXPENS	E			73.84
RETURNS ABOVE DIREC	T EXPENSES			-73.84
FIXED EXPENSES				
EQUIPMENT	ACRE	4.19	1.00	4.19
TRACTOR	ACRE	6.80	1.00	6.80
TOTAL FIXED EXPENSE				10.99
TAL SPECIFIED EXPENSES				84.83
NET RETURN				-84.83

TABLE 20B. ESTIMATED COST AND NET RETURNS PER ACRE, COMMON BERMUDA PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI,1980.

					TR	ACTOR		EQU	IPMENT		LABO	R		MATERI	AL	
OPERATION OR MATERIAL DESCRIPTION	UNIT	мо	TR	OVER	HOURS	COST	FIXED	HOURS	DIRECT	FIXED COST	HOURS	COST	QUAN	PRICE	COST	TOTAL
LIME (SPREAD)	CWT	8	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00	1.20	4.80	4.80
CHISEL PLOW	ACRE	8	2	1.00	.30	1.54	1.47	.30	.21	.52	.30	.93	.00	.00	.00	4.67
DISK HARROW	ACRE	9	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
DISK HARROW	ACRE	9	2	1.00	.23	1.18	1.13	.23	.45	.88	.23	.71	.00	.00	.00	4.35
SECTION HARROW	ACRE	10	1	1.00	.14	.32	.29	.14	.04	.07	.14	.43	.00	.00	.00	1.15
FESCUE SEED	LB	10	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	15.00	.36	5.40	5.40
GRAINDRILL	ACRE	10	2	1.00	.24	1.23	1.18	.24	.72	1.65	.24	.74	.00	.00	.00	5.71
CULTIPACKER	ACRE	10	1	1.00	.24	.54	.49	.24	.24	.83	.30	.93	.00	.00	.00	2.85
AMM. NITRATE	CWT	10	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.28	7.35	9.41	9.41
SUPERPHOSPHATE	CWT	10	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.30	10.25	13.32	13.32
POTASH	CWT	10	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.00	7.45	7.45	7.45
SPREADER	ACRE	10	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
AMM. NITRATE	CWT	3	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.28	7.35	9.41	9.41
SPREADER	ACRE	3	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
TOTAL					1.78	6.91	6.51	1.78	2.39	5.35	1.84	5.70			49.79	76.65

TABLE 21A. ESTIMATED COST PER ACRE BY OPERATION, FESCUE PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI, 1980.

ITEM	UNIT	PRICE DOLLARS	QUANTITY	AMOUNT DOLLARS
INCOME				
TOTAL INCOME				.00
DIRECT EXPENSES				
OPERATOR LABOR	HOUR	3.10	1.84	5.71
LIME (SPREAD)	CWT	1.20	4.00	4.80
FESCUE SEED	LB	.36	15.00	5.40
AMM. NITRATE	CWT	7.35	2.56	18.82
SUPERPHOSPHATE	CWT	10.25	1.30	13.32
POTASH	CWT	7.45	1.00	7.45
EQUIPMENT	ACRE	2.39	1.00	2.39
TRACTOR	ACRE	6.91	1.00	6.91
INT ON OP CAP	ACRE	6.15	1.00	6.15
TOTAL DIRECT EXPE	NSE			70.94
RETURNS ABOVE DIR	ECT EXPENSES			-70.94
FIXED EXPENSES				
EQUIPMENT	ACRE	5.35	1.00	5.35
TRACTOR	ACRE	6.51	1.00	6.51
TOTAL FIXED EXPEN	SE			11.86
OTAL SPECIFIED EXPENSES				82.80
NET RETURN				02.00

TABLE 21B. ESTIMATED COST AND NET RETURNS PER ACRE, FESCUE PASTURE ESTABLISHMENT, BLACK BELT AREA OF MISSISSIPPI,1980.

TRACTOR EQUIPMENT LABOR MATERIAL OPERATION OR MATERIAL TIMES DIRECT FIXED DIRECT FIXED HOURS QUAN PRICE COST COST TOTAL DESCRIPTION UNIT MO TR OVER HOURS COST COST HOURS COST COST LIME (SPREAD) ACRE 8 0 1.00 .00 .00 .00 .00 .00 .00 .00 .00 4.00 1.20 4.80 4.80 AMM. NITRATE 0 CWT 4 1.00 .00 .00 .00 .00 .00 .00 .00 .00 1.90 7.35 13.97 13.97 SUPERPHOSPHATE .00 CWT 0 1.00 .00 4 .00 .00 .00 .00 .00 .00 1.10 10.25 11.27 11.27 POTASH CWT 4 0 .00 1.00 .00 .00 .00 .00 .00 .00 .00 .85 7.45 6.33 6.33 SPREADER ACRE 4 1 1.00 .20 .45 .41 .20 .14 .26 .00 .20 .62 .00 .00 1.88 WEEDMASTER PT 4 0 1.00 .00 .00 .00 .00 .00 .00 .00 2.49 3.74 .00 1.50 3.74 SPRAYER ACRE 4 1 1.00 .18 .41 .37 .18 .15 .23 .18 .56 .00 .00 .00 1.72 MOWER ACRE 6 2 1.00 .20 1.03 .98 .20 .27 1.08 .20 .62 .00 .00 .00 3.98 AMM. NITRATE CWT 6 0 1.00 .00 .00 .00 .00 .00 .00 .00 .00 7.35 13.97 1.90 13.97 SPREADER ACRE 6 1 1.00 .20 .45 .41 .20 .14 .26 .20 .62 .00 .00 .00 1.88 AMM. NITRATE CWT 7 0 1.00 .00 .00 .00 .00 .00 .00 .00 .00 1.90 7.35 13.97 13.97 SPREADER ACRE 7 1 1.00 .20 .45 .41 .20 .14 .26 .20 .62 .00 .00 .00 1.88 PRORATED EST. COST ACRE 0 0 1.00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 .00 10.72 TOTAL .98 2.80 2.58 .98 .84 2.09 .98 3.04 68.04 90.11

TABLE 22A. ESTIMATED COST PER ACRE BY OPERATION, COASTAL (or ALICIA) BERMUDA PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI, 1980.

		.00
3.10	.98	3.04
1.20	4.00	4.80
• 7.35	5.70	41.89
10.25	1.10	11.27
7.45	.85	6.33
2.49	1.50	3.74
.84	1.00	.84
2.80	1.00	2.80
3.12	1.00	3.12
		77.84
		-77.84
10.72	1.00	10.72
2.09	1.00	2.09
2.58	1.00	2.58
		15.39
		93.23
		-93.23
	3.12 10.72 2.09 2.58	3.12 1.00 10.72 1.00 2.09 1.00 2.58 1.00

TABLE 22B. ESTIMATED COST AND NET RETURNS PER ACRE, COASTAL (or ALICIA) BERMUDA PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI,1980.

OPERATION OR MATERIAL			-	TIMES		ACTOR	FIXED	EQU	JIPMENT DIRECT	FIXED	LABO HOURS	R COST	QUAN	MATER PRICE	IAL COST	TOTAL
DESCRIPTION	UNII	MO	IR	OVER	HOURS	COST	COST	HOURS	COST	COST						
LIME (SPREAD)	CWT	8	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00	1.20	4.80	4.80
AMM. NITRATE	CWT	4	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	2.28	7.35	16.76	16.76
SUPERPHOSPHATE	CWT	4	0	1.00	• .00	.00	.00	.00	.00	.00	.00	.00	.85	10.25	8.71	8.71
POTASH	CWT	4	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.65	7.45	4.84	4.84
SPREADER	ACRE	4	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
2,4-D	LB	5	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	2.00	2.55	5.10	5.10
SPRAYER	ACRE	5	1	1.00	.18	.41	.37	.18	.15	.23	.18	.56	.00	.00	.00	1.72
MOWER	ACRE	6	2	1.00	.20	1.03	.98	.20	.27	1.08	.20	.62	.00	.00	.00	3.98
AMM. NITRATE	CWT	6	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	2.28	7.35	16.76	16.76
SPREADER	ACRE	6	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
MOWER	ACRE	8	2	1.00	.20	1.03	.98	.20	.27	1.08	.20	.62	.00	.00	.00	3.98
PRORATED EST. COST	ACRE	0	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	8.48
TOTAL					.98	3.37	3.15	.98	.97	2.91	.98	3.04			56.97	78.89

TABLE 23A. ESTIMATED COST PER ACRE BY OPERATION, COMMON BERMUDA PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI, 1980.

ITEM	UNIT	PRICE DOLLARS	QUANTITY	AMOUNT DOLLARS
INCOME TOTAL INCOME				-00
DIRECT EXPENSES				
OPERATOR LABOR	HOUR	3.10	.98	3.04
LIME (SPREAD)	CWT	1.20	4.00	4.80
AMM. NITRATE	CWT	7.35	4.56	33.52
SUPERPHOSPHATE	CWT	10.25	.85	8.71
POTASH	CWT	7.45	.65	4.84
2,4-D	LB	2.55	2.00	5.10
EQUIPMENT	ACRE	.97	1.00	.97
TRACTOR	ACRE	3.37	1.00	3.37
INT ON OP CAP	ACRE	2.42	1.00	2.42
TOTAL DIRECT EXPENS	E			66.77
RETURNS ABOVE DIREC	T EXPENSES			-66.77
FIXED EXPENSES				
PRORATED EST. COST	ACRE	8.48	1.00	8.48
EQUIPMENT	ACRE	2.91	1.00	2.91
TRACTOR	ACRE	3.15	1.00	3.15
TOTAL FIXED EXPENSE				14.54
TAL SPECIFIED EXPENSES				81.32
NET RETURN				-81.32

TABLE 23B. ESTIMATED COST AND NET RETURNS PER ACRE, COMMON BERMUDA PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI,1980.

				TR	ACTOR		EOU	IPMENT		LABO	R		MATERIA	AL	
UNIT	MO	TR	TIMES	DHOURS	IRECT COST	FIXED COST	HOURS	DIRECT COST	FIXED COST	HOURS	COST	QUAN	PRICE	COST	TOTAL
ACRE	7	2	1.00	.20	1.03	.98	.20	.27	1.08	.20	.62	.00	.00	.00	3.98
CWT	8	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	4.00	1.20	4.80	4.80
CWT	9	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.73	7.35	12.72	12.72
CWT	9	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.10	10.25	11.27	11.27
CWT	9	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.85	7.45	6.33	6.33
ACRE	9	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
CWT	3	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	1.73	7.35	12.72	12.72
ACRE	3	1	1.00	.20	.45	.41	.20	.14	.26	.20	.62	.00	.00	.00	1.88
ACRE	0	0	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	8.28
				.60	1.94	1.80	.60	.55	1.60	.60	1.86			47.84	63.87
	UNIT ACRE CWT CWT CWT ACRE ACRE ACRE	UNIT MO ACRE 7 CWT 8 CWT 9 CWT 9 ACRE 9 CWT 3 ACRE 3 ACRE 0	UNIT MO TR ACRE 7 2 CWT 8 0 CWT 9 0 CWT 9 0 CWT 9 0 ACRE 9 1 CWT 3 0 ACRE 3 1 ACRE 0 0	UNIT MO TR TIMES ACRE 7 2 1.00 CWT 8 0 1.00 CWT 9 0 1.00 CWT 3 0 1.00 ACRE 9 1 1.00 ACRE 3 0 1.00 ACRE 3 1 1.00	TR TR UNIT MO TR OVER HOURS ACRE 7 2 1.00 .20 CWT 8 0 1.00 .00 CWT 9 0 1.00 .00 ACRE 9 1 1.00 .20 CWT 3 0 1.00 .00 ACRE 3 1 1.00 .20 ACRE 4 0 1.00 .00 ACRE 5 1 1.00 .20 ACRE 0 0 1.00 .00	TIMES DIRECT UNIT MO TR OVER HOURS COST ACRE 7 2 1.00 .20 1.03 CWT 8 0 1.00 .00 .00 CWT 9 0 1.00 .00 .00 ACRE 9 1 1.00 .20 .45 CWT 3 0 1.00 .00 .00 ACRE 3 1 1.00 .20 .45 .45 ACRE 0 0 1.00 .00 .00 .00	TIMES DIRECT FIXED JNIT MO TR OVER HOURS COST COST ACRE 7 2 1.00 .20 1.03 .98 CWT 8 0 1.00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 ACRE 9 1 1.00 .20 .45 .41 CWT 3 0 1.00 .00 .00 ACRE 3 1 1.00 .20 .45 .41 ACRE 0 0 1.00 .00	TIMES TRACTOR EQU DIRECT FIXED HOURS COST COST HOURS ACRE 7 2 1.00 .20 1.03 .98 .20 CWT 8 0 1.00 .00 .00 .00 .00 CWT 9 0 1.00 .20 .45 .41 .20 CWT 3 0 1.00 .00 .00 .00 .00 ACRE 3 1 1.00 .20 .45 .41 .20	TIMES TRACTOR EQUIPMENT DIRECT FIXED DIRECT FIXED DIRECT ACRE 7 2 1.00 .20 1.03 .98 .20 .27 CWT 8 0 1.00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00	TIMES TRACTOR EQUIPMENT JNIT MO TR OVER HOURS COST COST DIRECT FIXED ACRE 7 2 1.00 .20 1.03 .98 .20 .27 1.08 CWT 8 0 1.00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .00 .00 .00 .00 .00 .00 CWT 9 0 1.00 .20 .45 .41 .20 .14 .26 CWT 3 0 1.00 .00 .00 .00 .00 .00 ACRE 3 1	TRACTOR EQUIPMENT LABO JNIT MO TR OVER HOURS COST COST COST FIXED HOURS COST COST HOURS COST COST HOURS COST COST COST COST HOURS COST COST	TRACTOR EQUIPMENT LABOR JNIT MO TR OVER HOURS COST COST DIRECT FIXED HOURS COST COST	TIMES TRACTOR EQUIPMENT LABOR UNIT MO TR OVER HOURS COST COST DIRECT FIXED HOURS COST COST QUAN ACRE 7 2 1.00 .20 1.03 .98 .20 .27 1.08 .20 .62 .00 CWT 8 0 1.00 <	TRACTOR EQUIPMENT LABOR MATERIA UNIT MO TR OVER HOURS COST COST COST COST QUAN PRICE ACRE 7 2 1.00 .20 1.03 .98 .20 .27 1.08 .20 .62 .00 .00 CWT 8 0 1.00 .00	TRACTOR EQUIPMENT LABOR MATERIAL UNIT MO TR OVER HOURS COST COST COST COST COST COST GUAN PRICE COST COST COST GUAN PRICE COST COST GUAN PRICE COST COST GUAN PRICE COST GUAN AGRE GUAN PRICE COST GUAN GUAN GUAN AGRE GUAN AGRE GUAN AGRE GUAN GUAN GUAN AGRE GUAN AGRE GUAN AGRE GUAN GUAN GUAN AGRE

TABLE 24A. ESTIMATED COST PER ACRE BY OPERATION, FESCUE PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI, 1980.

ITEM	UNIT	PRICE DOLLARS	QUANTITY	AMOUNT DOLLARS
INCOME TOTAL INCOME				.00
DIRECT EXPENSES				
OPERATOR LABOR	HOUR	3.10	.60	1.86
LIME (SPREAD)	CWT	1.20	4.00	4.80
AMM. NITRATE	CWT	7.35	3.46	25.43
SUPERPHOSPHATE	CWT	10.25	1.10	11.27
POTASH	CWT	7.45	.85	6.33
EQUIPMENT	ACRE	.55	1.00	.55
TRACTOR	ACRE	1.94	1.00	1.94
INT ON OP CAP	ACRE	2.38	1.00	2.38
TOTAL DIRECT EXPENS	E			54.57
RETURNS ABOVE DIREC	T EXPENSES			-54.57
FIXED EXPENSES				
PRORATED EST. COST	ACRE	8.28	1.00	8.28
EQUIPMENT	ACRE	1.60	1.00	1.60
TRACTOR	ACRE	1.80	1.00	1.80
TOTAL FIXED EXPENSE				11.68
OTAL SPECIFIED EXPENSES				66.25
NET RETURN				-66.25

TABLE 24B. ESTIMATED COST AND NET RETURNS PER ACRE, FESCUE PASTURE MAINTENANCE, BLACK BELT AREA OF MISSISSIPPI, 1980.

Item	Unit	Quantity	Price/	Amount
Direct Expenses	01110	quantity	unre	Anounc
Veterinary and Medicine	head	30	6.32	189,60 ^a
Salt and Minerals	cwt	6.8	5.00	34.00
Labor	hrs	136	3.10	421.60
Interest on Operating				
Capital	herd	1	64.52	64.52
Total Direct Expenses				709.72
Fixed Expenses				
Interest on Investment	herd	1	1205.00	1205.00 ^b
Total Specified Expenses				1914.72

Table 25. Estimated annual maintenance costs (excluding forage and

 $\frac{a}{($.58 \times 20 + .42 \times 10) \times 12}$ months

 $\underline{b}/$ \$12,050 herd value based on 25 cows @ \$450 each and one bull @ \$800.

Table 26. Estimated cost and return per acre for fall- and spring-calving cow-calf operations on three forage, systems at the MAFES Black Belt Branch Experiment Station, 1976, 1977 and 1978, calculated at 1980 prices.

	Alicia	Coastal	Common ^{b/}
Direct expenses			
Herd maintenance (Table 25)	28.39	28.39	21.29
Supplemental feed ^{C/}	73.58	73.58	61.31
Pasture maintenance (Tables 22B, 23B, and 24B) $\frac{d}{}$	96.03	96.03	84.96
Fixed expenses			
Interest on herd investment (Table 25)	48.20	48.20	36.15
Pasture maintenance (Tables 22B, 23B, and 24B) <u>d</u> /	19.28	19.28	18.43
Total specified expenses	265.48	265.48	222.14
<u>Returns</u> (Value of weaned calves) ^{<u>e</u>/}	310.53	307.13	254.36
Returns above specified expenses @ 100% conception rate	45.05	41.65	58.79
Returns above specified expenses @ study conception rates	-38.79	-32.06	-39.00

a/ Stocked at 1 cow/acre except as noted.

b/ Stocked at 3/4 cow/acre.

C/ Prices used: hay @ \$60/ton, silage @ \$15/ton, CSM @ \$220/ton, and DPW @ \$60/ton.

 \underline{d} One acre base forage plus 1/3 acre fescue.

e/ Three-year average weaning weight/calf x \$85/cwt, adjusted for stocking rate. (Assumes 100% calf crop)

 \underline{f} Returns adjusted for calving percentage.

Mention of a trademark or proprietary product does not constitute a guarantee or warranty of the product by the Mississippi Agricultural and Forestry Experiment Station and does not imply its approval to the exclusion of other products that also may be suitable.

In conformity with Title IX of the Education Amendments of 1972 and Section 504 of the Rehabilitation Act of 1973, Dr. T. K. Martin, Vice President, 610 Allen Hall, P. O. Drawer J, Mississippi State, Mississippi 39762, office telephone number 325-3221, has been designated as the responsible employee to coordinate efforts to carry out responsibilities and make investigation of complaints relating to nondiscrimination.

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, age, or handicap.

