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The Texas Agricultural Experiment Station,
J.E. Miller, Director,
Texas A&M University System
College Station, TX

Chapter 12

FORAGE AND ANIMAL PRODUCTION PROGRAMS FOR SOUTH TEXAS

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CHAPTER 12

FORAGE AND ANIMAL PRODUCTION PROGRAMS FOR SOUTH TEXAS

Billy E. Conrad*

South Texas, also described as the Rio Grande Plain, consists of approximately 22 million acres and covers some 32 counties, from U. S. Highway 90 South to the Rio Grande River. The annual precipitation varies from less than 20 inches in the southwest to more than 30 inches in the east. Summers in South Texas are generally hot and dry, with temperatures occasionally above 100° F. The winters, however, are mild with freezing temperatures normally of short duration. The average frost-free season varies from about 250 days in the north to approximately 330 days in the south.

Soil types in the area are variable but can be grouped roughly into the following classes: (1) dark calcareous to neutral clays and clay loams of which the main series are Victoria, Monteola, Clareville, and Orelia; (2) reddish-brown neutral to slightly acid sandy loams of which the main series are Duval and Webb; (3) Willacy, Hidalgo, Brennon, Miguel, Goliad, and Medio make up a group of grayish-brown neutral sandy loams; (4) the bottomlands are made up mainly of brown to dark gray, calcareous clay loams and clays of the Harlingen, Cameron, Frio, Guadalupe, and Leona series. There are some saline soils in the area and some sands. The sands are mainly of the Nueces series.

Forage programs in South Texas range from strictly unimproved native pastures to highly intensified irrigated projects. Although dryland agriculture predominates, some irrigation is available. There is a definite trend toward increasing the acreage of irrigated pastures, particularly in the lower Rio Grande Valley.

*Associate professor, The Texas Agricultural Experiment Station, Beeville.

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WARM-SEASON PERENNIALS

The mild winters and long growing season make the warm-season perennial grasses highly adapted to South Texas. However, forage production on drylands is dependent on the amount and the distribution of rainfall. The distribution of moisture also creates considerable variation in forage responses to fertilization and has a direct bearing on forage quality, particularly under grazing.

Few introduced grasses have gained as wide usage as Coastal bermudagrass (Figure 12-1). The wide adaptation of Coastal is shown by its satisfactory performance

Figure 12-1. Coastal bermudagrass

under both dryland and irrigation throughout South Texas.

Other sod-forming grasses of major importance in South Texas are Coastcross-1 bermudagrass and African stargrass. African stargrass is utilized primarily in the lower valley under intensified grazing. Coastcross-1 is relatively new, and its region of adaptation has not been fully established; however, neither Coastcross-1 nor African stargrass is as cold tolerant as Coastal. The productive potential of the three grasses under irrigation in the lower Rio Grande Valley is similar (Table 12-1). Coastal bermudagrass forage production is directly related to available moisture and fertility level (Table 12-2). Coastal responds to fertilization, expecially nitrogen, even with

Table 12-1. Yearly distribution of forage production of three sod forming grasses in the Lower Valley under irrigation.[1]

Clipping date	Pounds of dry forage per acre		
	Coastcross I	Coastal	African Star
1971			
6-10	1,989	2,253	1,269
7-02	2,203	1,928	2,036
7-23	1,243	1,563	1,199
8-17	1,479	1,666	1,447
10-11	2,141	2,941	1,664
10-28	790	768	204
12-06	1,548	1,807	1,536
1972			
2-14	1,973	1,194	1,265
3-20	3,043	2,932	2,499
4-19	2,319	2,731	2,111
5-26	3,287	3,976	3,875
Yearly total	22,015	23,759	19,105

[1]Date supplied by Dr. R. R. Hoverson, Area Forage Specialist, Texas Agricultural Extension Service, Weslaco, Texas.

Table 12-2. Dry-matter yields of Coastal bermudagrass (pounds/acre) by years at varying nitrogen levels, Beeville, Texas.

Treatments (lb/A)*			Year		
N	P_2O_5	K_2O	1964	1965	1969
0	30	0	3,230	3,250	3,720
45	30	0	3,560	5,286	
60	30	0			7,210
90	30	0	4,620	7,590	
120	30	0			8,970
135	30	0	5,990	8,840	
180	30	0	5,974	9,960	9,750
240	30	0			12,290
Rainfall, inches			22.08	34.92	31.48

*Nitrogen was applied in split applications in the spring and after each harvest. Phosphorus was applied in late winter.

limited rainfall (1964), but the responses to similar amounts of applied nitrogen are much greater with higher rainfall (1965). It is possible for Coastal to produce yields in excess of six tons of dry matter in South Texas without irrigation (1969).

Forage production of several warm-season perennial grasses grown in the lower Rio Grande Valley under irrigation and with adequate fertilization is shown (Table 12-3)

Table 12-3. Dry forage yields (pounds per acre) of nine warm-season grasses under irrigation at San Benito, 1956-57.[1]

Species	1956	1957	Average
Pretoria-90 bluestem	27,240	29,370	28,305
Blue buffelgrass	25,710	30,300	28,005
Common buffelgrass	20,760	23,510	22,135
Coastal bermudagrass	21,240	19,990	20,615
Angletongrass	18,020	18,650	18,335
Kleingrass	15,170	17,010	16,090
Medio bluestem	15,400	12,770	14,085

[1]Date taken from TAES PR-2107, 1959.

and under dryland at Beeville (Table 12-4). Several varieties and species have a

Table 12-4. Dry-matter yields (pounds per acre) of nine warm-season grasses, Beeville, 1965.

Species	Harvest dates			Total
	5-3-65	6-22-65	11-22-65	
Kleingrass	1,360	1,430	510	3,300
Rhodesgrass	510	1,010	520	2,040
Pretoria-90 bluestem	2,040	3,320	2,570	7,930
Gordo bluestem	350	1,700	1,390	3,440
Blue buffelgrass	790	1,090	1,010	2,890
Medio bluestem	730	550	1,250	2,530
Blue panic grass	620	470	530	1,620
Angletongrass	410	1,470	1,370	3,250
Coastal bermudagrass	1,450	1,300	500	3,250

high yield potential when grown under a long growing season and with adequate moisture and fertility (Table 12-3). On the other hand yields are limited and do not differ widely, except for certain bluestems, when grown with limited moisture (Table 12-4).

Buffelgrass, a native of Africa and the Southern Mediterranean area, has been grown largely in the southern half of South Texas. Although many strains have been

introduced, T-4464, usually referred to as Common buffel, has been the one most widely used. In 1968 Higgins buffelgrass was released. Higgins, having short rhizomes and slightly more cold tolerance, extended the northern boundary of adaptation. Currently a comprehensive breeding program is being conducted on buffelgrass which should markedly increase its region of adaptation (See Chapter 1).

Kleingrass is a fine-stemmed, leafy bunch grass adapted to essentially all the soils of South Texas. It produces dry-matter yields approximately equal to those of the other grasses (Table 12-4) except Pretoria-90, and has good forage quality. Kleingrass-75 (Figure 12-2) was released in 1968. Although forage production is no higher than with Coastal, animal production may be greater.

Pretoria-90, the highest yielding of those species tested, is adapted to all of South Texas. Pretoria-90 is an introduced bluestem which begins growth early in the spring and remains green late in the fall. The grass is leafy and has good drouth resistance. Poor seed production has prevented Pretoria-90 from becoming extensively used. It produces two seed crops per year which vary from 10 to 20 percent in pure live seed.

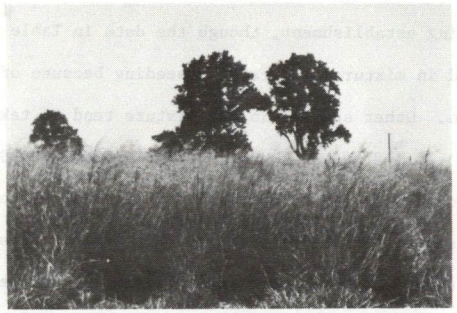

Figure 12-2. Kleingrass 75

Medio bluestem is a fine-stemmed, leafy, dark green plant which spreads rapidly by prostrate stems, forming a dense, solid ground cover. Medio is adapted to clay soils or sandy soils with a shallow clay layer. The grass has been used mostly in low areas along creeks.

Angletongrass, like Medio, produces long runners which root at the nodes, thus producing a solid cover. The stems are coarser, purplish-green in color with bearded nodes. The grass has a fairly high moisture requirement for good growth. It has good

salt tolerance. Angleton, like Medio, does best on the heavier soils in the lower areas.

Rhodesgrass is a leafy plant with fine stems. The grass spreads by stolons, developing a solid stand. Common rhodesgrass is susceptible to rhodesgrass scale, and many stands have been lost from scale infestation. Bell was released in 1966 by The Texas Agricultural Experiment Station as a scale tolerant rhodesgrass. Plantings have been primarily in the lower half of the South Texas area.

Blue panic is a bluish-green bunch grass that grows to a height of 5 to 6 feet under good growing conditions. Stems become coarse and woody as plants reach maturity. Because of its dense growth, Blue panic has been used for wind breaks in the lower valley. Blue panicgrass starts rapidly from seed and usually has good vigor the first years following establishment, though the data in Table 12-4 do not follow this pattern. It is used in mixtures for range reseeding because of the initial ground cover and production. Other species in the mixture tend to take over after the first few years.

WARM-SEASON ANNUALS

Sudangrass and forage sorghums are adapted throughout Texas and have been the major summer annuals planted in South Texas. Sudangrasses have been used primarily for grazing and hay production, whereas the forage sorghums have been major sources of silage. Yields at Beeville of several varieties and hybrids are shown in Tables 12-5 and 12-6.

Table 12-5. Forage yields of sudan varieties and hybrids, Beeville.

Variety or hybrid	Pounds of dry forage/acre			
	1962	1963	1964	1965
Grazer (b)	10,330	3,780	7,970	7,540
Haygrazer (b)	10,090	3,900	7,510	7,220
Sorghum Alum (a)	8,730	4,460	7,200	
Sudax II (b)	9,290	3,460	7,440	7,570
Piper (a)	7,140	3,320	6,200	4,730
Greenleaf (a)	5,350		5,270	5,510
Sweet 372 (a)	3,760	3,140	5,290	4,210
Trudan II (b)			8,180	4,720
Annual rainfall	31.31	16.17	22.08	34.92

(a) - variety
(b) - hybrid

Table 12-6. Forage yield of sorghum varieties and hybrids grown for silage, Beeville, Texas.

Variety or hybrid	Tons per acre							
	1962		1963		1964		1965	
	Green	Dry	Green	Dry	Green	Dry	Green	Dry
Honey (a)	11.6	3.8	6.3	1.6	18.0	2.7	16.8	4.7
Beef Builder T (b)	11.8	3.9	7.9	2.3	10.2	3.4	13.3	4.4
Sart (a)	7.6	2.7	8.5	2.2	12.9	3.8	11.3	3.9
Yield Maker (b)	10.6	3.9	6.8	2.4				
Tracy (a)			7.8	2.0	11.5	3.7	12.0	3.5
FS 22 (b)	11.7	4.6	6.5	1.8	10.3	3.4	11.3	3.4
Milk Maker (b)	12.4	4.1	6.5	1.9	8.7	2.9	11.6	3.9
Silo King (b)	9.7	3.7	8.1	2.2				
Atlas (a)	9.6	3.6	8.0	2.1	9.6	3.2	10.7	3.5
Annual rainfall	31.31		16.17		22.08		34.92	

(a) - variety
(b) - hybrid

COOL-SEASON ANNUALS

Oats, wheat, and barley are the primary small grains used in South Texas for temporary winter pastures. Oats are the most popular species (as shown by number of acres). However, because of diseases of oats, other small grains are gaining in popularity. Average forage yields of several small grain species at three locations are shown in Table 12-7; there is considerable variation between years and locations. The yearly effects may be due to factors such as moisture, temperature, or disease severity.

Table 12-7. Average forage yields of small grains at three locations.

Species	Pounds of dry forage per acre				
	Beeville		Robstown		Karnes Co.
	1972	1973	1972	1973	1973
Oats	3,190	4,230	3,560	2,480	3,920
Barley	2,830	3,830	3,590	2,030	3,640
Wheat	3,240	3,580	4,430	2,180	3,426
Rye	2,820	3,300	3,700	2,470	3,500
Triticales	2,800	3,230	4,020	2,590	3,450

ANIMAL PERFORMANCE

Animal performance on Coastal and Kleingrass-75 pastures at The Texas Agricultural Experiment Station at Beeville is summarized in Table 12-8. The carrying capacity of the two grasses is approximately equal, but gain per animal is better on Kleingrass.

Table 12-8. Summary of steer grazing results, Beeville, 1966-69.

	Kleingrass	Coastal
Stocking rate, acres per animal	1.0	1.0
Animal grazing days, per acre	154	142
Gain, pounds per acre	228	121
Average daily gain, pounds per animal	1.48	0.85

Animal gains on Coastal have been erratic but, in general, are satisfactory during the early part of the growing season (Figure 12-3). As the season progresses performance

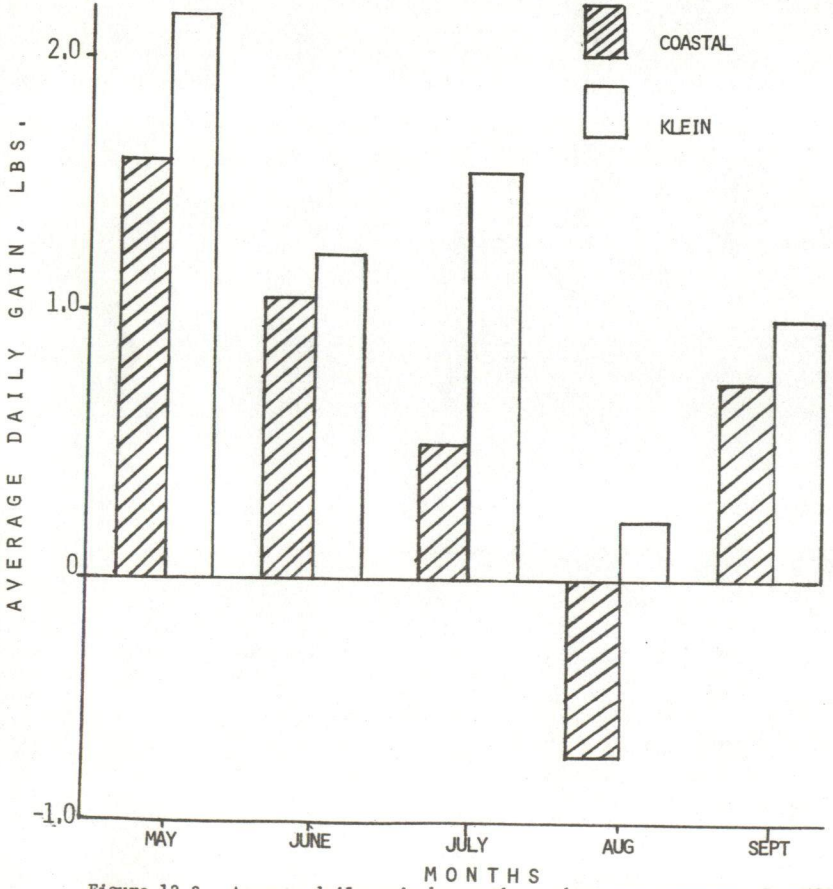

Figure 12-3. Average daily gain by months - three year summary, Beeville.

decreases. During August, weight losses may occur on young animals. During the July and August periods, the depression in animal performance has been prevented and the animals maintained in a gaining state by supplying energy in the form of ground grain sorghum at the daily rate of 1.0 percent of their body weight. Animal gains during the fall again are on the positive side, although not as high as spring gains. Satisfactory performance has been obtained in the fall as late as November and December, depending on moisture and temperature conditions. Animal performance on Kleingrass-75 pasture has been superior to Coastal throughout the growing season. As may be noted in Figure 12-1, the rate of gain on Kleingrass-75 also decreases as the summer season approaches; however, the animals continue to gain through the month of August.

The winter dormant season for perennial warm-season grasses in South Texas is usually of short duration. Due to the mild winters, annual cool season grasses and weeds usually volunteer in native pastures which have not been excessively overgrazed during the growing season. These pastures, properly stocked, have supported mature animals during the winter without supplements. Improved single species pastures under more intense production practices, however, have presented some wintering problems.

Results of several methods of wintering steer calves are shown in Table 12-9.

Table 12-9. Winter performance of steer calves in dry-lot and on dormant pastures, Beeville, 1967-68.

	Supplement, lbs/hd/da.-		
Roughage	Guar meal	Ground grain sorghum	Avg. daily wt. change lbs/day
Coastal hay	2	2	1.2
	2	4	1.4
Dormant Coastal pasture	2	2	1.0
	2	4	1.3
Sorghum silage	2	2	0.9
	2	4	1.1
Dormant Kleingrass-75 pasture	0	0	0

Previous studies have indicated that Coastal bermudagrass hay of good to fair quality when fed alone would not support young animals without supplements. Sorghum silage also has been demonstrated to be inadequate for maintinaing young animals during the

winter without additional protein and energy. However, when protein and energy are supplied, there are no significant differences in animal performance between Coastal hay and dormant Coastal pastures (Table 12-8). Fall growth of Coastal on the well-drained soils of South Texas will normally remain bright and upright after frost. Although the grass becomes tough and decreases in quality as the dormant season prograsses, animals apparently are able to utilize the forage, providing their protein requirement is met and some energy is supplied.

Animal performance on dormant Kleingrass-75 pastures without supplements is also shown in Table 12-8. Under South Texas conditions the fall growth of Kleingrass-75 has been allowed to accumulate and then to be utilized during the dormant season. Animals graze the grass readily throughout the winter and performance has been directly related to the severity and duration of the winter. In general mature animals can be expected to maintain their body weight during the winter on dormant Kleingrass-75 pasture.

SUMMARY

The diversity of climatic conditions in South Texas offers many possibilities for animal agriculture. Success or failure is dependent on providing economically the nutrient requirements on a year round basis. Therefore, forage and animal production programs for South Texas must be based on the objectives and managerial capability of the individual producer.

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