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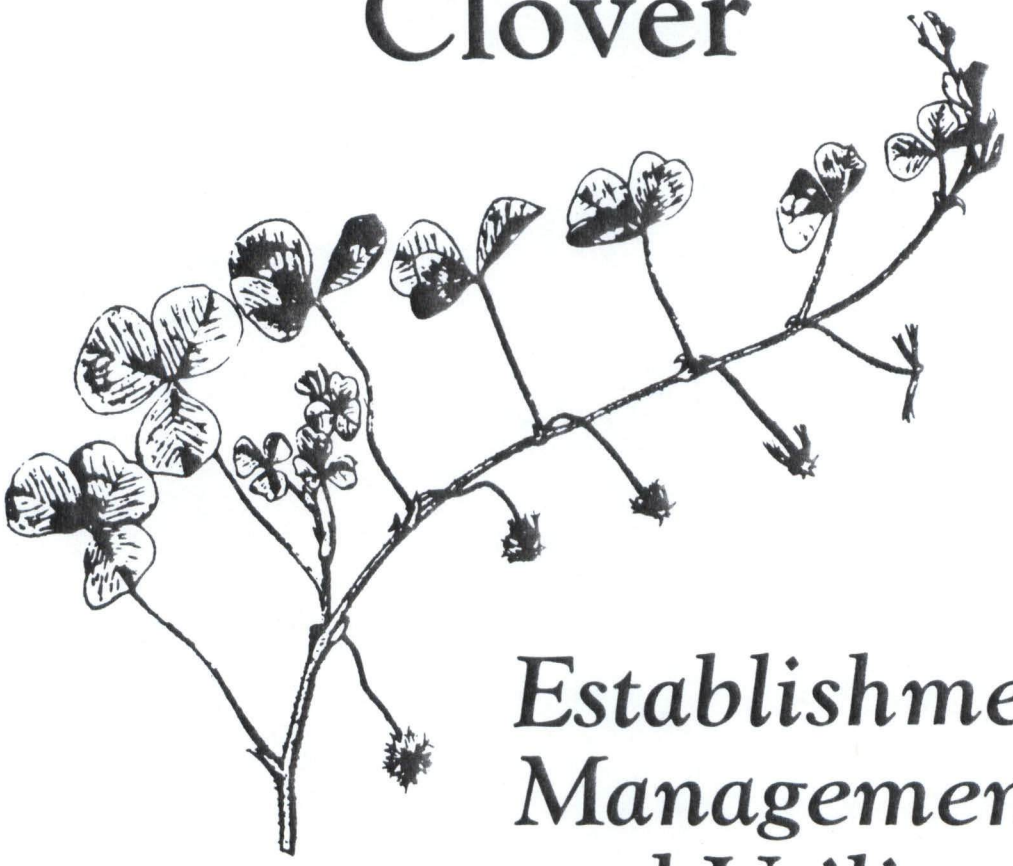
Subterranean Clover



Establishment, Management, and Utilization in Texas

THE TEXAS AGRICULTURAL EXPERIMENT STATION/Neville P. Clarke, Director/The Texas A&M University System/College Station, Texas

CHAPTER 6

Management and Grazing of Subterranean Clovergrass Mixtures in South Texas

W. R. OCUMPAUGH

Introduction

Subterranean clover is, and will continue to be, used in grass mixtures, particularly warm season perennial grasses like bermudagrass, kleingrass, bahiagrass, and dallisgrass. These grasses provide over half of the forage production in subclover mixtures and are most productive during the time when subclover is not present. During the periods when both clover and grass are growing, the pasture must be managed to favor the clover. Subclover has been considered a nearly ideal pasture legume because of its prostrate growth and flowering habit. Hence, it has been promoted as a legume that can withstand more misuse than most other forage legumes. Subclover matures about the time that summer grasses initiate active growth; therefore, it is not as competitive as arrowleaf clover (1).

Management of Subclover-Warm Season Perennial Grasses

The following is a brief guide of management requirements for growing subclover with warm season perennial grasses in the Texas Gulf Coast Region:

- Apply P (and K if required) fertilizer in the fall just before expected clover germination. With good clover stands, there is no advantage to applying supplemental N-fertilizer (1). Avoid N- fertilizer in fall when attempting to establish or re-establish clover. Limiting summer N fertilization for the grass will also improve clover production the following fall and winter.
- Graze pastures short by the time clover seedlings are expected to establish. Continue grazing until cool temperatures limit grass growth.
- Continuous or periodic grazing can be initiated after subclover seedlings have 4 to 6 trifoliolate leaves.
- Always feed cattle hay before turning them on clover pasture for the first time. Feeding hay, bloatguard blocks, or growing ryegrass with the clover reduce the incidence of bloat where clover stands are lush. Bloat has not been a serious problem as long as the cattle were accustomed to grazing clover and other forage is available. However, the incidence of bloat does increase following frost damage.
- Clover is an extremely high quality forage and it is important to match the cows' greatest nutrient needs to the period of maximum clover production. Therefore, calving should occur in January and February so the breeding season occurs during the maximum clover growth period.
- Avoid herbicides toxic to clover and do not use "brush control" herbicides such as picloram unless they are applied as a spot treatment or with a carpet roller. Even herbicides like Grazon P+D (which contains picloram) have enough residual effect to prevent clover seedling establishment for a year or more. Subclover will tolerate low rates of 2,4-D, but weeds will not be controlled unless the herbicide is applied when the weeds are small.
- If reseeding is desirable, do not overgraze during April and early May when seed is developing, especially if rainfall is below normal.

Subclover-Coastal Bermudagrass Mixtures

The grazing research reported below on subclover was initiated in 1983 at the Texas A&M University Agricultural Research Station at Beeville. The grazing research to date has been with the variety Woogenellup, which is reported to have superior hard seededness compared to Mt. Barker. However, more recent findings indicate that neither variety is well adapted to the high pH (calcareous) soils that are so prevalent in large areas of Central and South Texas. We would expect improved clover performance as we gain more experience with the "new" high pH tolerant Clare and Koala varieties of subclover. The soils at the Beeville station are calcareous, and the pH for this experiment ranged from 7.6 to 7.8.

Pastures were set stocked for all grazing periods except for spring 1985. In spring 1984 and summer 1985 and 1986, pastures were stocked with one heifer (average weight about 700 lbs) to the acre. During spring 1985, a variable number of animals were utilized in an effort to maintain uniform available forage among pastures. In winter/spring 1985-86, pastures were stocked at one heifer per 1.7 acres on October 30, 1985, and those animals remained on the pastures (with no adjustments or supplemental feed) until June 11, 1986 when more heifers were added to increase the stocking rate to one heifer per acre. Due to limited rainfall, no grazing data was collected in summer 1984. At the conclusion of each summer grazing period, large numbers of cattle were moved onto these pastures to utilize all excess forage to prepare them for subclover seedling establishment.

In 1984, there was little legume present due to poor establishment caused by inadequate planting equipment and unfavorable weather conditions in fall and winter 1983-84. In fall 1984, a "Tye" no-till drill was used and excellent stands were obtained. The clover reseeded in fall 1985 but not in fall 1986. Other pastures on the station and around the area did re-establish naturally in 1986. The author hypothesizes that the clover was grazed too short during April and May when it was trying to set seed (Table

1). Low rainfall in March and April limited growth; and forage available dropped below 500 lbs/A in late April and May, suggesting that when subclover is grazed too short during the seed development stage, number or quality of seed set was jeopardized. During spring 1985, when seed set was good and rainfall was plentiful, 2,000 lbs/A of forage was available. Recent research from Oregon (3) substantiates this hypothesis.

Table 1. Rainfall and Forage Available for Consumption on N-fertilized Coastal Bermudagrass and Coastal Bermudagrass Overseeded With Woogenellup Subclover

	Rainfall		Forage Available	
Date	Observed	76-year Mean	N-fert.	Subclover
	Inches		Pounds/Acre	
1985				
Jan.	2.38	1.77	746	1,058
Feb.	1.71	1.85	515	869
Mar.	3.04	1.77	1,408	1,264
Apr.	6.47	2.30	1,843	2,075
May	5.41	3.61	1,609	2,146
June	2.40	3.20	1,910	1,319
July	2.18	2.66	1,691	1,792
Aug.	.16	2.57	2,986	2,638
Sept. (3)	2.97	4.39	1,970	1,354
			All pastures grazed short	
Oct. (30)	1.88	2.68	1,305	1,062
Nov.	2.17	2.07	1,427	1,170
Dec.	.57	2.11	1,010	782
1986				
Jan.	1.08	1.77	834	1,048
Feb.	2.02	1.85	783	907
Mar.	1.13	1.77	643	907
Apr.	.66	2.30	753	612
May	6.36	3.61	717	383
June	4.71	3.20	2,094	1,535
July	.18	2.66	2,704	2,700
Aug.	5.94	2.57	2,955	2,630

Forage available was not recorded for 1984, but monthly rainfall was 0.54, 0.09, 1.94, and 1.55 inches for March, April, May, and June 1984, respectively.

Woogenellup subclover planted with Coastal bermudagrass produced cattle performance (Average Daily Gain, [ADG]) comparable to bermudagrass pastures receiving two 50-pound applications of nitrogen fertilizer (Table 2). In spring 1985, grazing on subclover began about 3 weeks earlier and carried nearly 50 percent more animals per acre than was possible on N-fertilized Coastal. This resulted in a corresponding 50 percent increase in beef per acre (Table 2).

No chemical weed control of any form has been practiced on these pastures, and all pastures have received 100 pounds per acre of 0-46-0 fertilizer each fall. The combination of these two management practices has resulted in a significant amount of spring growth of winter annual grasses and naturally occurring annual medics in the N-fertilized Coastal bermudagrass pastures. Had these annual "weeds" been controlled with a herbicide and/or not been encouraged by the addition of phosphorous fertilizer, the advantage of using subclover would likely have been more convincing. The results of the first 3 years indicate that superior carrying capacity can only be expected when spring rainfall is plentiful. However, a positive aspect is that subclover has substituted for 100 pounds of N-fertilizer each year. This is in agreement with earlier small plot research at Eagle Lake (1). If the subclover growing in association with Coastal bermudagrass is properly grazed, we have no evidence to date that subclover retards the potential summer performance of Coastal bermudagrass pastures. However, we have observed reduced Coastal stands if legumes are allowed to accumulate excessive forage in late spring.

Subclover-Kleingrass Mixtures

There is one year of grazing data from subclover with kleingrass at the Beeville station. In that experiment, sodseeded Mt. Barker and Clare subclover were compared to N-fertilized kleingrass. Clare subclover is one variety that has been identified as being well adapted to calcareous soils (2). The soils at this site range from pH 7.6 to 7.9. Like the bermudagrass experiment, phosphorous fertilizer was applied to all pastures. Fifty pounds of N-fertilizer were applied to the non-clover pastures in February, and again in August. The winter-spring of 1987 started off wet, followed by only occasional rainfall totaling about 2 inches during March, April, and most of May.

Table 2. Average Daily Gain and Gain Per Acre for Heifers Grazing Coastal Bermudagrass Fertilized With Nitrogen or Interseeded With Woogenellup Subterranean Clover

	Average Daily Gain				Gain/Acre			
	Winter/Spring[1]		Summer[2]		Winter/Spring		Summer	
Year	N-fert.[3]	Sub	N-fert.	Sub	N-fert.	Sub	N-fert.	Sub
	Pounds/Head/Day				Pounds/Acre			
1984	1.40	1.51	—[4]	—	127	133	—	—
1985	2.18	2.19	1.30	1.48	111	170	116	118
1985-86	1.03	1.00	1.08	0.89	175	182	89	73

[1]March 27 through June 26, 1984; February 21 through June 20, 1985; and October 30, 1985 through June 11, 1986.

[2]June 20 through September 12, 1985 and June 11 through September 3, 1986.

[3]Fifty pounds of N/A in February and August each year.

[4]No grazing due to low rainfall.

Through the spring growth period, Clare subclover provided more growth than the other two treatments, and carried five heifers per pasture (5-acre pastures) compared to three on Mt. Barker and N-fertilized kleingrass. Clare matured earlier than Mt. Barker and the gains fell off in that period for Clare subclover. Otherwise, all ADGs were similar. The summer grazing was still in progress as this chapter was being prepared.

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