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Forage Quality Under Grazing for Bigbee Berseem and Meteora Subterranean Clovers

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Summary

The forage quality of a Bigbee berseem clover pasture declined earlier in the spring than the quality of a Meteora subterranean clover pasture. The quality of the diets selected by cows from these pastures remained high, however, and of almost equal value. The level of indigestible fiber in diet samples suggested that forage quality was not limiting digestible organic matter intake. Cattle grazing these clovers should perform very well throughout the clover growing season so long as grazing pressure is not excessive.

Introduction

Bigbee berseem clover was released jointly by the Mississippi Agricultural and Forestry Experiment Station and the Agricultural Research Service, USDA in March 1984. Forage clipped from small plots at Angleton in 1984 indicated that the nutritive quality of Bigbee declined more rapidly than for subterranean clover during the spring period. A study was conducted in 1985 to test the significance of these quality differences in the diets of grazing cattle.

Procedure

Bigbee berseem and Meteora subterranean clovers were each established in one four-acre pasture in fall 1983. The berseem clover pasture was grazed for the first time from mid-December 1984 through May 1985. It was stocked with six yearling heifers through mid-February when four heifers were moved to the subterranean clover, initiating the grazing of that pasture. Supplemental hay was fed on the berseem pasture during much of January and until the stocking rate was reduced in mid-February. Two cow-calf pairs also grazed the Meteora pasture until early April when they were replaced by an equal number of test cattle. All heifers were removed from both pastures on May 7, 1985 to reduce grazing pressure.

On April 12, 1985, one lactating Brahman crossbred cow, fitted with ruminal and esophageal cannulas, was added to each pasture. One other cannulated dry cow had been added to the Meteora pasture one week earlier. Esophageal samples were collected from each of the three cows three times daily for four days beginning on April 16. Forage samples were clipped at ground level from 40 randomly located sites in each pasture during these four days to provide estimates of forage availability and sward quality. The cannulated cows and their calves were switched between pastures on April 19 and again on May 7. Four-day sampling sequences from cows and pastures were repeated beginning on April 30 and May 14.

All samples were chilled in the field immediately after collection, transported to a freezer in the laboratory, and subsequently freeze-dried before being weighed, ground, and analyzed. They were examined microscopically to estimate percentage grass and clover and chemically to measure total and indigestible fiber. Total fiber was determined by extraction with neutral detergent solution. The residue remaining after six days of in vitro fermentation and neutral detergent extraction was termed indigestible fiber. Both fiber fractions are expressed on an organic matter basis.

Results and Discussion

During the April 16 and April 30 sample collection periods, sward samples from the Bigbee berseem clover pasture were substantially higher in both total and indigestible fiber and lower in clover content than samples from the Meteora subterranean clover pasture (Table 1). The fiber levels followed the pattern with time that we found in samples clipped from small plots of Bigbee berseem and Mt. Barker subterranean clovers in 1984. Fiber levels in diet samples, particularly for indigestible fiber, were relatively the same from the two pastures throughout the experiment. The contrast between indigestible fiber levels of sward and diet samples from the same pasture became especially striking late in the season. At the May 14 sampling period indigestible fiber of the sward in both pastures was well above the level (15 percent) where it begins to reduce intake of digestible organic matter. However, diets selected by the cows were below that level, indicating that indigestible fiber was not limiting intake.

With the possible exception of the Bigbee pasture on the April 30, forage availabilities were high enough to allow unlimited intake. The Bigbee clover stand sustained considerable damage from trampling during wet weather in January. Even though forage available per acre was always less than for the Meteora pasture, the Bigbee

KEYWORDS: Bigbee berseem clover/Meteora subterranean clover/ nutritive quality.

TABLE 1. FORAGE AVAILABILITY AND PERCENTAGE TOTAL FIBER, INDIGESTIBLE FIBER AND CLOVER IN SWARD, AND DIET SAMPLES FROM BIGBEE BERSEEM AND METEORA SUBTERRANEAN CLOVER PASTURES

Date/Pasture	Forage available lb/A	Total fiber in		Indigestible fiber in		Clover in	
		Sward	Diet	Sward	Diet	Sward	Diet
		Percent					
April 16							
Bigbee	1,950	46.2	44.4	17.2	9.3	68.6	57.5
Meteora	2,330	41.3	44.9	13.6	11.6	79.7	59.5
April 30							
Bigbee	1,560	52.4	45.8	22.5	11.4	65.1	61.8
Meteora	2,580	46.0	49.2	18.8	12.7	74.0	56.4
May 14							
Bigbee	2,060	54.4	50.3	25.5	12.4	62.8	60.7
Meteora	2,440	51.3	49.6	25.6	12.7	63.3	52.1

pasture presented a much taller sward profile throughout the experiment because Bigbee berseem is an upright species.

Cattle grazing Bigbee berseem clover were able to maintain a high quality diet for the duration of the spring season despite the much lower quality of the total sward. The upright growth of Bigbee is undoubtedly an aid to selectivity by cattle. Its growth habit and other subjective observations indicate that Bigbee may need to be grazed rotationally in order to approach its production potential.