PERFORMANCE OF LACTATING DAIRY COWS GRAZED ON BERMUDAGRASS: A COOPERATIVE FIELD TRIAL[a]

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Story in Brief

A cooperative field trial was conducted on a dairy near Stilwell in Adair County. Forty-two lactating Holstein cows were grazed on 13.4 acres of intensively managed common bermudagrass for 71 days (June 12 to August 21), with no additional forage provided. During the same 71 day period, 11.7 tons of excess forage from this area were harvested for hay. Milk production averaged 43.9 lb during this grazing period. An unusually wet and cool May delayed the start of grazing, and drought conditions in August ended the grazing period sooner than expected.

Introduction

High quality forage at the lowest cost possible is essential if economical milk production is to be achieved. Many dairies in eastern Oklahoma depend on bermudagrass for summer pasture, but experience a drop in milk production as forage quality decreases throughout the season. Results from steer grazing trials on bermudagrass (McMurphy et. l., 1981) and cooperative field trials conducted in eastern Oklahoma with stockers show that intensively managed bermudagrass can yield higher gains than obtained under traditional management schemes. The objective of this field trial was to demonstrate the potential of common bermudagrass for supporting an economical level of milk production through the summer months.

Materials and Methods

A common bermudagrass pasture located on a dairy west of Stilwell in eastern Oklahoma was used in the study. An area 13.4 acres in size was fenced with electric wire and subdivided into three small pastures (paddocks) of approximately the same size. The trial was scheduled to begin by May 1, but full time bermudagrass grazing was delayed until mid-June due to an abnormally cool spring. During May and early June, when forage growth was slow, cows grazed two paddocks (9.2 acres) during the day only and had access to a separate ryegrass pasture at night. On June 9, the pastures had good growth of forage that had been spot grazed and were therefore clipped short to maintain an immature high-quality forage. On June 12 rotation between two paddocks was initiated. All cows were placed on one paddock until the grass was properly used (7-10 days) then rotated. The third paddock was maintained for emergency grazing, with excess forage harvested for hay (Table 1).

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Soils test indicated that phosphorus and potassium levels were both adequate. Nitrogen fertilizer was applied as shown in Table 1. The two paddocks in rotation received 50 lb of actual nitrogen per acre at approximately 25 day intervals. The third paddock received an initial application of 200 lb actual nitrogen per acre followed by one additional 50 lb application later in the trial.

Hand clipped samples of available forage were taken periodically and analyzed for crude protein content. Lactating cows from a herd of registered and grade Holsteins were used in the trial. A record of the number of cows milked daily was maintained and averaged 42 during the 71-day period with 9 fresh cows added to the milking herd and 18 cows turned dry. Cows were supplemented with 20-24 lb of a 16 percent commercial dairy pellet[b] fed daily in the barn. By utilizing two bulk milk tanks, milk production measurements could be recorded.

Rainfall data were collected throughout the summer months (Table 3).

Results and Discussion

Average daily milk production of the cows for the 71 day grazing period is shown by week in Table 2. Milk production decreased gradually through the first week of August and then increased the remainder of the trial. In past years, milk production after early July has been maintained by feeding supplemental hay. Cows were observed to spend less time grazing as temperatures increased, but grazed more during short periods of lower temperatures associated with showers or cloud cover. Crude protein content of hand clipped forage samples (Table 2) was high throughout the grazing period.

Table 1. Schedule of fertilizer application, hay production and pasture clipping dates.

	Pasture Management		
Date	Paddock 1 (4.2 acres)	Paddock 2 (5.0 acres)	Paddock 3 (4.2 acres)
May 3	50 lb/A N*	50 lb/A N	200 lb/A N
May 21	---	---	Cut 3.6 T hay
May 25	50 lb/A N	50 lb/A N	----
May 27	Mowed	---	----
June 9	Cut 7.0 T hay	Cut 3.7 T hay	----
June 18	---	---	Cut 8.8 T hay
June 23	50 lb/A N	50 lb/A N	50 lb/A N
July 18	---	---	Cut 2.9 T Hay
July 25	50 lb/A N	50 lb/A N	----
	Summary		
Total lb/A N	200	200	250
Total tons hay	7	3.7	15.3

*Nitrogen source was Ammonium Nitrate (34-0-0). A=acre.

Table 2. Weekly milk production of cows and crude protein content of available forage.

Date	Milk/Cow/Day, lb	Crude Protein*, %
June 13-19	46.64	22.0
June 20-26	47.17	18.2
June 27-July 3	46.63	20.8
July 4-10	46.44	23.1
July 11-17	44.24	16.9
July 18-24	42.63	22.1
July 25-31	40.97	16.3
August 1-7	40.29	18.3
August 8-14	41.74	20.1
August 15-21	42.40	19.0
10 week average	43.92	19.7

*Oven dry basis.

Table 3. Rainfall data.

Month	Potter, 1983	Stilwell, OK 30 Yr. Average
April	2.30	4.71
May	6.00	5.63
June	2.98	4.48
July	2.35	3.73
August	.80	3.35
September	.60	4.31
Total	15.03	26.21

Cattle grazed paddocks 1 and 2 exclusively until the end of July, at which time forage became limited and they were allowed access to paddock 3. Even though forage quantity in paddock 3 appeared adequate, milk production did not increase.

Although the stocking rate averaged 4.5 head/acre during most of the period, and 3.1 head/acre when paddock 3 was included, considerable forage accumulated in the fields when weather conditions favored growth. Twenty-six tons of high quality hay testing 15.7 to 23.4 percent crude protein were harvested from the 13.4 acres during the summer (Table 1).

This grazing trial was discontinued after August 21 because of insufficient forage due to drought conditions. As shown in Table 3, rainfall received for the summer months was 57 percent of the 30 year Stilwell average.

Milk production of dairy cows can be maintained while grazing limited acreages of bermudagrass under intense grazing schemes when fertility and moisture are not limited. Benefits to the dairy producer include additional acres available for hay production, less supplemental hay needed in late summer, and a higher protein bermudagrass forage than is possible with traditional management using low levels of fertility and low stocking rates.

Good dairy management practices of providing a balanced grain supplement, a good health program, clean water and shade must not be overlooked.

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[b] Contained 72 percent TDN on an as-fed basis.

Literature Cited

McMurphy, W.E., G.W. Horn and J.P. O'Connor. 1981. OSU MP-112:127.