

FORAGE YIELD AND QUALITY OF COASTAL AND TIFTON 85 BERMUDAGRASS.

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ABSTRACT

Three replicated small plots (5 m × 7 m plot area) of Tifton 85 (T85) and Coastal (C) bermudagrass (*Cynodon dactylon*, L.) were established to determine yield and quality. Four harvests were made at intervals of approximately 2 wk beginning September 10, 2004. The DM yields were determined at 2wk intervals and IVDMD were determined at 4 and 6wk. DM yield at 8wk harvest was higher ($P < 0.01$) for T85 than for C, and CP at 2wk harvest was higher ($P < 0.01$) for C than for T85. The DM yield increased with maturity ($P < 0.01$), but CP decreased with maturity ($P < 0.01$) for both C and T85 over time. Both T85 and C had lower IVDMD at 6wk compared with 4wk maturity. The T85 IVDMD was only slightly depressed at 6wk compared with 4wk samples, but C plots had 9.5% lower IVDMD for 6wk compared with 4wk samples. Even more dramatic was the 17% higher ($P < 0.05$) IVDMD of T85 compared with C at 6wk maturity. Despite high NDF concentrations in T85 forage samples, the relatively high IVDMD values indicate that fiber was highly digestible.

INTRODUCTION

Previous yield trials were conducted that compared T85 with other bermudagrass cultivars (Tifton 68, Tifton 44 and C). The first trial compared DM yield and IVDMD of T85 with other bermudagrass hybrids in small-plot trials (Hill et al., 1993). In trial two, T85, Tifton 78, Tifton 44 and C were compared to determine steer performance and forage quality. In both trials, T85 had higher yield and IVDMD than other cultivars. T85 produced an average of 11% more DM than C, and was generally higher in quality. In several reports (Hill et al., 1993; Mandebvu et al., 1999; Hill et al., 2001; Corriher et al., 2007) cattle gains and digestibility were consistently higher for T85 than C hays and pasture forages.

Tifton 85 and C were produced in adjacent plots and harvested forages after 3-wk or 6-wk regrowth (Mandebvu et al., 1999). All forages had relatively high CP, from 14 to 18% of DM. Tifton 85 had the highest NDF at 6-wk maturity even though NDF was high for both forages. Coastal bermudagrass had greater concentrations of acid insoluble lignin and of ether-linked ferulic acid. The following: IVDMD, in situ DM digestibility, the NDF digestion after 72 h and in vitro NDF digestion after 48 h, were all higher for T85 at either maturity compared with C (Mandebvu et al., 1999). Our objective was to compare yield and quality of C and T85 bermudagrass in ungrazed plots.

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MATERIALS AND METHODS

Small-plot Yield and Forage Quality Experiment

Three replicated small plots (5 m × 7 m plot area) of T85 and C bermudagrass (*Cynodon dactylon*, L.) were established on Tifton sandy loam soils in 2001, at the Coastal Plain Experiment Station in Tifton, GA. Plots were used in other yield studies prior to July 2004, when they were prepared for a yield trial. On August 26, 2004, plots were mowed to stubble heights of approximately 5 cm, to initiate a new yield and quality trial. Four harvests were made at intervals of approximately 2 wk beginning September 10, 2004. Fertilizer was applied on August 26, 2004 (224 kg/ha, 24-6-12 ratio of N: P₂O₅: K₂O). Four quadrats (0.1 m²) were clipped to ground level in each plot, and clipped samples were oven-dried at 60° C for 72 h. Pooled estimates were converted to a moisture-free basis using pooled DM values. Plot DM yields were determined, and IVDMD of the 4- and 6-wk samples were determined using the DAISY incubator procedure (Ankom Tech., Macedon, NY). All cattle were managed under procedures approved by the University of Georgia Animal Care and Use Committee Guidelines (IACUC AUP #A2005-10179-c1; University of Georgia Animal Welfare Assurance #A3437-01).

Statistical Analyses

The small-plot yield experiment was analyzed as a randomized complete block in which DM yield was the average of four clippings at different dates during the growing season, and IVDMD of the forages was the mean of the 4-wk and 6-wk clipping dates used in 2004. Mixed Model Procedures of SAS (2003), with least squares means was used to analyze data.

RESULTS AND DISCUSSION

Small-plot Yield and Forage Quality Experiment

A small-plot experiment was conducted to determine yield and nutritive value of C and T85 bermudagrass, to provide information on ungrazed forage production that could support the larger cow-calf continuous grazing study (Corriher et al., 2007). In the plot experiment, DM yield at 8-wk harvest was higher ($P < 0.01$) for T85 than for C (Figure 1), and CP at 2-wk harvest was higher ($P < 0.01$) for C than for T85. The DM yield increased with maturity ($P < 0.01$), but CP decreased with maturity ($P < 0.01$) for both C and T85 over time. There was a forage × sampling date interaction ($P < 0.05$) for NDF, increasing more for T85 than C after the 4-wk harvest. A forage × sampling date interaction ($P < 0.05$) occurred for IVDMD (Figure 1), and the IVDMD was higher ($P < 0.05$) for T85 than C samples at both the 4-wk and 6-wk maturity. Both T85 and C had lower IVDMD at 6-wk compared with 4-wk maturity. The T85 IVDMD was only slightly depressed at 6-wk compared with 4-wk samples, but C plots had 9.5% lower IVDMD at 6-wk compared with 4-wk samples. Even more dramatic was the 17% higher ($P < 0.05$) IVDMD of T85 compared with C at 6-wk maturity. Despite high NDF concentrations in T85 forage samples, the relatively high IVDMD values suggest that fiber was highly digestible, and these results agree with previous research (Hill et al., 1993; Mandebvu et al., 1999). Hill et al. (1993) reported higher IVDMD for T85 than C in two 3-yr small-plot yield and quality experiments. Mandebvu et al. (1999) found higher IVDMD and higher 72 and 96 h in situ DM digestion in T85 than in C samples from plots harvested from 2-wk to 7-wk maturity, and they reported lower IVDMD for July than September samples. Although silicon from sand

attached to samples may be a problem in our environment, Mandebvu et al. (1999) reported 91% to 93% organic matter in plot samples, and Hill et al. (1993) reported only 1.3 to 2.4% acid insoluble ash in esophageal samples from C and T85 pastures over a 3-yr period. The small-plot data verified earlier quality and yield characteristics of C and T85, and indicated potential for increased cow and calf performance on T85 pastures.

CONCLUSIONS

Tifton 85 bermudagrass continues to prove to be the premier bermudagrass for the southern United States, and for other tropical and subtropical regions of the world. Tifton 85 has produced substantially higher dry matter yields, higher digestibility, and higher average daily gains than C.

LITERATURE CITED

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Figure 1: Comparison of Tifton 85 with Coastal bermudagrass in small-plot experiment. (a) DM, kg/ha; SE = 220.9, LSD = 719.3, 8 degrees of freedom (df); (b) CP, %; SE = 1.5, LSD = 2.56, 8 df; (c) NDF, %; forage \times sampling date interaction, forages at each date, SE = 1.88, LSD = 6.48, 6 df; dates at each grass, SE = 0.90, LSD = 2.94, 8 df; (d) IVDMD, %; forage \times sampling date interaction, forages at each date, SE = 0.78, LSD = 3.05, 4 df; dates at each grass, SE = 0.46, LSD = 1.80, 4 df.

