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# EVALUATION OF TEN TROPICAL GRASSES IN THE NORTHWEST REGION OF THE STATE OF SÃO PAULO-BRAZIL

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## Abstract

The experiment was carried out in the northwest region of the State of São Paulo-Brazil to evaluate ten grasses recently introduced in the region. The grasses studied were*:* *Cynodon nlemfuensis* cv. Tifton 68, *C. dactylon* cv. Tifton 78, *Cynodon* spp. cv. Tifton 85, *C. dactylon* cv. Florakirk, *C. nlemfuensis* cv. Florico, *C. nlemfuensis* cv. Florona, *C. dactylon* cv. Coastcross, *Paspalum notatum* cv. Tifton 9, *Brachiaria brizantha* cv. Marandu, *Panicum maximum* cv. Tanzânia 1. The following variables were determined: DM production, growth rate, IVDMD, CP, ADF and NDF.

The GRs varied from 81 to 102 and from 14 to 26 Kg DM $ha^{-1}$ $day^{-1}$ during the rainy and dry seasons, respectively. The average contents of CP, NDF and ADF were different ($P<0.05$) among grasses. Higher values of CP (124 to 143 $g.kg^{-1}$) and NDF (717 to 749 $g.kg^{-1}$) were observed in the *Cynodon* cultivars while lower values of CP (102 and 107 $g.kg^{-1}$) and NDF (697 and 705 $g.kg^{-1}$) were registered in the cvs. Marandu and Tanzânia 1. The contents of ADF were higher in the the cvs. Tanzânia 1 and Tifton 9. The average values of IVDMD differed ($P\leq0.05$) among grasses and were all above 564 $g.kg^{-1}$, except for cv. Tifton-9 (499 $g.kg^{-1}$). The results obtained in this work allowed to conclude that the cvs. Tifton 78, Tifton

85, Coastcross, Florona, and Tanzânia 1 are interesting options for pastures establishment in the northwest region of the State of São Paulo-Brazil.

**Keywords:** *Brachiaria*, chemical composition, *Cynodon*, growth rate, *Panicum*, *Paspalum*

## Introduction

Pastures are an important component of the beef cattle industry in the northwest region of the State of São Paulo-Brazil. Grasses of the genus *Brachiaria*, and *Panicum*, are the main species used for grazing in this area.

In the last decade pastures have been established with new cultivars introduced in the region. It is well known that the adaptation and productivity of one species or cultivar depend especially of soil fertility, climatic conditions, and of the cutting or grazing management used. Thus, this work was conducted to determine the dry-matter (DM) production, the growth rate (GR), the "in vitro" dry-matter digestibility (IVDMD), and the contents of crude protein (CP), acid detergent fiber (ADF), and neutral detergent fiber (NDF) of ten grasses, some of which were recently introduced in this region.

## Materials and Methods

The experiment was carried out in a red-yellow Podzol in the northwest region of the state of São Paulo-Brazil (21$^{o}$ 31' SL and 50$^{o}$ 37' WL) from November 1995 to October 1997, and 410 m above sea level. The climate of the region is Aw-type (Köeppen). Plots were 3 x 3 m (9 m$^{2}$) in size and 2 m spaced. An area of 1 m$^{2}$ was used for sampling within each plot. The grasses tested were: *Cynodon nlemfuensis* Vanderyst cv. Tifton 68, *Cynodon dactylon* (L.) Pers. cv. Tifton 78, *Cynodon* spp. cv. Tifton 85, *Cynodon dactylon* (L.) Pers. cv. Florakirk, *Cynodon nlemfuensis* Vanderyst var. nlemfuensis cv. Florico, *Cynodon nlemfuensis* Vanderyst

var. nlemfuensis cv. Florona, *Cynodon dactylon* (L.) Pers. cv. Coastcross, *Paspalum notatum* cv. Tifton 9, *Brachiaria brizantha* (A. Rich) Stapf. cv. Marandu, *Panicum maximum* Jacq. cv. Tanzânia 1. Treatments were arranged in a randomized complete block design with four replications, with split-plot at time. Plots were fertilized at the beginning of the experiment with 550 $kg.ha^{-1}$ of single superphosphate. In November 1995, and November 1996, the plots were mowed. All grasses received a maintenance fertilization with 200, 50, and 100 $kg.ha^{-1}.year^{-1}$ of N, $P_2O_5$, and $K_2O$, splited in three times during the growing season. Plants were harvested at 35-day intervals during the rainy-season and 49-day intervals during the dry-season. Samples were taken to determine the DM production and the growth rate. The growth rate was estimated by dividing the dry-matter production by the number of days of each season. The IVDMD and the contents of CP, NDF and ADF were determined according to the methods described by Silva (1998). The data were statistically analysed and the means compared by the test of Tukey at the 5% level.

## Results and Discussion

The total DM production did not differ ($P \geq 0.05$) among the grasses evaluated. In the rainy-season the DM production was not different among the grasses, except the cv. Tifton-85 which produced more DM than the cv. Florico (Table 1). From the data of Table 1 it can be calculated that during the dry-season a better seazonal-distribution was obtained with the cvs. Tifton 78, Florico, Coastcross, Tifton 9, and Tanzânia 1, producing 15.32; 17.03; 18.54; 15.06; and 15.10%, of the total forage produced, respectively. These values of seazonal distribution of DM production for tropical forages in Brazil are in agreement with the results reported by Pedreira and Mattos (1981). The forage DM productions obtained in this work are similar to the productions reported in the literature for *Cynodon* cultivars (Sollenberger et al., 1995; Alvim et al., 1996; Gomide et al., 1997).

The growth rates varied from 81 to 102 kg DM.ha$^{-1}$.day$^{-1}$ during the rainy season and did not differ (P≥0.05) among the grasses studied (Table 1). In the dry-season the growth rates varied from 14 to 26 kg DM.ha$^{-1}$.day$^{-1}$ and did not differ among the grasses, except for the cv. Coastcross which presented a higher (P≤0.05) growth rate than the cvs. Tifton 68, Tifton 85, Florakirk, and Marandu (Table 1).

The average contents of CP, NDF, and ADF were different (P≤0.05) among grasses. Higher values of CP (124 to 143 g.kg$^{-1}$) and NDF (717 to 749 g.kg$^{-1}$) were observed in the *Cynodon* cultivars, while lower values of CP (102 and 107 g.kg$^{-1}$) and NDF (697 and 705 g.kg$^{-1}$) were registered for cvs. Marandu and Tanzânia-1, respectively (Table 2). The contents of ADF were higher in the cvs. Tanzânia 1 and Tifton 9 (439 and 443 g.kg$^{-1}$, respectively).

The average values of IVDMD differed (P<0.05) among grasses and were all above 564 g.kg$^{-1}$, except for cv. Tifton-9 (499 g.kg$^{-1}$).

Similar contents of CP, NDF, and ADF, and values of IVDMD of tropical grasses were reported by several authors (Gomide et al., 1979; Pedreira and Mattos, 1981; Jank et al., 1994; Sollerberger et al., 1995; Gomide et al., 1997).

The results obtained in this work allowed to conclude that the cvs. Tifton 78, Tifton 85, Coastcross, Florona, and Tanzânia 1 are interesting options for pastures establishment in the northwest region of the State of São Paulo-Brazil.

## References

**Alvim M.J., Resende H., and Botrel M.A**. (1996). Efeito da frequência de cortes e do nível de nitrogênio sobre a produção e qualidade da matéria seca do "Coast-Cross". In: WORKSHOP SOBRE O POTENCIAL FORRAGEIRO DO GÊNERO CYNODON, 1996, Juíz de Fora. Anais... Juíz de Fora: EMBRAPA-CNPGL, 45-55.

**Gomide C.C.C., Rodrigues L.R. de A., Rodrigues T. de J.D., Reis R.A. and Banzatto D.A**. (1997). Physiologial and chemical characteristics of five cultivars of *Cynodon*. Proc. 18th. International Grassland Congress, Winnipeg, Canadá. (CD-R, v.1, Session **1**, 97-98).

**Gomide J.A., Obeid J.A., and Teixeira Neto J.F.** (1979). Produtividade e valor nutritivo do capim-colonião (*Panicum maximum*). Revista da Sociedade Brasileira de Zootecnia, **8:** 198-225.

**Jank L., Savidan Y.N., Souza M.T. de, and Costa J.C.G.** (1994). Avaliação do germoplasma de *Panicum maximum* introduzido da África. I. Produção forrageira. Revista da Sociedade Brasileira de Zootecnia, **23:** 433-440.

**Pedreira J.V.S., and Mattos H.B.** (1981). Crescimento estacional de vinte e cinco espécies ou variedades de capins. Boletim de Industria Animal., **38:**117-43.

**Sollenberger L., Pedreira C.G.S., Mislevy P., and Andrade I.F.** (1995). New *Cynodon* forages for the subtropics and tropics. In: CONRAD, J.H. et al. (eds.). Proceedings of the international conference on livestock in the tropics, Gainesville, University of Florida. 22-27.

**Silva, D. J.** (1991). *Análise de alimentos (métodos químicos e biológicos).* Viçosa: UFV, 2. ed., 1998. 165p.

**Table 1** - Dry matter production and growth rate of ten tropical grasses in the northwest region of the State of São Paulo-Brazil (average values of two rainy and two dry seasons, from 11/1995 to 10/1997)

| Grasses | Dry matter yield ($t.ha^{-1}$) | | Growth rate ($kg\ DM.ha^{-1}.day^{-1}$) | |
|---|---|---|---|---|
| | Rainy season | Dry season | Rainy season | Dry season |
| Tifton 68 | 10.28 ab | 1.47 b | 81 | 15 b |
| Tifton 78 | 11.88 ab | 2.15 ab | 93 | 22 ab |
| Tifton 85 | 13.35 a | 1.32 b | 102 | 14 b |
| Florakirk | 11.11 ab | 1.45 b | 86 | 15 b |
| Florico | 9.94 b | 2.04 ab | 75 | 21 ab |
| Florona | 11.58 ab | 1.64 ab | 85 | 17 ab |
| Coastcross | 10.94 ab | 2.49 a | 81 | 26 a |
| Tifton 9 | 10.94 ab | 1.94 ab | 82 | 21 ab |
| Marandu | 11.40 ab | 1.60 ab | 88 | 16 b |
| Tanzânia 1 | 11.75 ab | 2.09 ab | 86 | 22 ab |
| CV (%) | 10.34 | 20.38 | 10.82 | 20.43 |

Means within a column followed by the same letter are not different ($P \geq 0.05$) by the test of Tukey.

**Table 2** - Contents of crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF) and values of the in vitro dry matter digestibility (IVDMD) of ten grasses in the northwest region of the State of São Paulo-Brazil (average values of two rainy and two dry seasons, from 11/1995 to 10/1997)

| Grasses | **CP** | ADF | NDF | IVDMD |
|---|---|---|---|---|
| | | $g.kg^{-1}$ | | |
| Tifton 68 | 143 a | 394 c | 717 de | 641 a |
| Tifton 78 | 130 bc | 399 bc | 736 abc | 583 bc |
| Tifton 85 | 124 cd | 412 bc | 749 a | 573 bc |
| Florakirk | 126 bcd | 415 b | 739 ab | 558 c |
| Florico | 138 ab | 397 bc | 721 cde | 596 b |
| Florona | 130 bc | 397 bc | 722 bcde | 572 bc |
| Coastcross | 127 bcd | 408 bc | 729 bcd | 578 bc |
| Tifton 9 | 117 de | 443 a | 737 abc | 499 d |
| Marandu | 102 f | 407 bc | 697 f | 586 bc |
| Tanzânia 1 | 107 ef | 439 a | 705 ef | 564 bc |

Means within a column followed by the same letter are not different ($P \geq 0.05$) by the test of Tukey.