

## 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<sup>-1</sup> day<sup>-1</sup> 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<sup>-1</sup>) and NDF (717 to 749 g.kg<sup>-1</sup>) were observed in the *Cynodon* cultivars while lower values of CP (102 and 107 g.kg<sup>-1</sup>) and NDF (697 and 705 g.kg<sup>-1</sup>) 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≤0.05) among grasses and were all above 564 g.kg<sup>-1</sup>, except for cv. Tifton-9 (499 g.kg<sup>-1</sup>). 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° 31' SL and 50° 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<sup>2</sup>) in size and 2 m spaced. An area of 1 m<sup>2</sup> 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<sup>-1</sup> 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<sup>-1</sup>.year<sup>-1</sup> of N, P<sub>2</sub>O<sub>5</sub>, and K<sub>2</sub>O, 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 sezonal-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 sezonal 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<sup>-1</sup>.day<sup>-1</sup> 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<sup>-1</sup>.day<sup>-1</sup> 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<sup>-1</sup>) and NDF (717 to 749 g.kg<sup>-1</sup>) were observed in the *Cynodon* cultivars, while lower values of CP (102 and 107 g.kg<sup>-1</sup>) and NDF (697 and 705 g.kg<sup>-1</sup>) 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<sup>-1</sup>, respectively).

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

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.

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**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 <sup>-1</sup> )		Growth rate (kg DM.ha <sup>-1</sup> .day <sup>-1</sup> )	
	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 <sup>-1</sup>			
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.