Animal Performance and Productivity of a New Cultivar of *Brachiaria brizantha*

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Animal performance and productivity of a new cultivar of *Brachiaria brizantha*

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Introduction

Brazil has the competitive advantage of a very dynamic and cost-effective animal production system on pastures over other countries. The pursuit of more productive forages that will result in higher quality beef at a lower cost is justified. As *Brachiaria* is the most important forage genus utilised in Brazil, an intense search for new cultivars amongst collected and introduced ecotypes from Africa is underway. Following agronomic evaluation of this material in plots, 8 *Brachiaria* ecotypes were pre-selected. As part of Embrapa`s process of cultivar development, *B. brizantha* cv. Xaraés, characterised by high productivity (liveweight gain/area), was released in 2003, followed in 2007 by cv. Piatã, characterised by high nutritive value and consequently high animal performance (Euclides *et al.* 2009). From the 8 ecotypes pre-selected, one presented good traits for surviving dry periods (Euclides *et al*. 2001), which is the main constraint to herbage production under tropical and subtropical conditions. This study aimed to evaluate this ecotype under grazing conditions.

Methods

The experiment was carried out at Embrapa Beef Cattle, Campo Grande, MS, Brazil, from June 2009 to May 2012. The *B. brizantha* selected ecotype was "Paiaguás" and the commercial cv. Piatã was used as control. The experimental design was a randomized complete block with 2 treatments and 6 replicates. Twelve paddocks measuring 0.7 ha were subjected to continuous stocking. All treatments received lime (2.25 t/ha) and 400 kg/ha of 0-20-20 NPK fertiliser at establishment. Maintenance fertiliser was 80, 40 and 40 kg/ha/year of N, P_20_5 and K_20, respectively. Three steers (testers) were kept in each paddock for a whole year, with additional steers (grazers) added or removed as determined by the sward height of 30 cm imposed in each treatment.

All steers were weighed after fasting for 16 h, and forage samples were taken to determine herbage mass and percentages of leaf lamina, stems and dead material at 28-day intervals. At the same time, 2 hand-plucked samples were taken in each paddock and analysed to obtain estimates of crude protein and *in vitro* organic matter digestibility via NIRS. Exclusion cages were utilised to estimate herbage accumulation rate, which was calculated as the difference between the current herbage mass in the cage and preceding herbage mass outside the cage, considering only the green portion (leaves and stems), divided by the number of days between samplings. The stocking rate was calculated as the product of the average live weights of the tester and grazer steers and the number of days that they remained in each paddock.

The data were grouped according to period as follows: rainy (October-April); and dry (May-September); and subjected to an analysis of variance using the mixed procedure in SAS (SAS Institute, Cary, NC, USA). The applied model included the random effect of blocks, and the fixed effects of cultivar, period and the interaction between them. Where appropriate, the means were compared by the Tukey test at a 5% significance level.

Results

The sward heights remained within the planned range throughout the experiment (averages of 29.1 and 26.7 cm for rainy and dry seasons, respectively). Herbage mass (HM) was similar for both cultivars (P = 0.1501), but was greater (P = 0.0010) in the rainy season than in the dry season (means of 3070 and 2680 kg/ha, respectively).

Cultivar x period interactions were detected for herbage accumulation rate (HAR; P =0.0144), leaf percentage (LP; P = 0.0498), stocking rate (SR; P = 0.0011), crude protein (CP; P = 0.0459), *in vitro* organic matter digestibility

Table1. Means for herbage accumulation rate (HAR), leaf percentage and stocking rate (SR) for 2 *Brachiaria brizantha* cultivars, over a period of 3 years

	HAR (kg/ha/d)		Leaf (%)		SR (steers/ha)	
Cultivars	Rainy	Dry	Rainy	Dry	Rainy	Dry
Paiaguás	57.6aA	16.8bA	31.5aA	26.2bA	3.4aA	1.5bA
Piatã	62.2aA	9.5bB	32.1aA	22.3bB	3.6aA	1.1bB
Standard error	3.7	3.3	0.9	1.2	0.1	0.11

Within parameters, means followed by the same lower-case letters within rows, or the same upper-case letters within columns do not differ (P>0.05).

Table 2. Mean crude protein (CP), *in vitro* organic matter digestibility (IVOMD) and average daily gain (ADG), over a period of 3 years for 2 *Brachiaria brizantha* cultivars

	CP (%)		IVOMD (%)		ADG (g/steer)	
Cultivars	Rainy	Dry	Rainy	Dry	Rainy	Dry
Paiaguás	10.5 aA	9.0 bA	59.8 aA	57.3 bA	650aA	280bA
Piatã	9.7 aA	7.3 bB	58.9 aA	53.0 bB	610aA	160bB
Standard error	0.2	0.2	0.6	0.8	20	16

Within parameters, means followed by the same lower-case letters within rows, and the same upper-case letters within columns do not differ (P>0.05).

(IVOMD; P = 0.0241) and average daily gain (ADG; P = 0.0257). During the rainy period, HAR, LP and SR did not differ between cultivars; however, during the dry period, HAR and LP were greater for Paiaguás than Piatã pastures, and Paiaguás pastures sustained higher SR during this period (Table 1).

Stem percentage was greater (P = 0.0005) for Piatã than Paiaguás pastures, while both cultivars presented similar (P = 0.2366) dead matter percentage. For both cultivars, the percentages of stem and dead material were higher (P = 0.0001) during the dry than the rainy period, with means of 17.1 and 22.8% for stem, and 45.4 and 58.8% for dead material, during rainy and dry periods, respectively.

During the dry season, CP and IVOMD percentages of Paiaguás pasture were higher than for Piatã pasture (Table 2). During the dry season, steers grazing Paiaguás performed better than those grazing Piatã. This result may be explained by the higher percentages of leaf, CP and IVOMD observed for Paiaguás pasture during the dry season.

The differences in ADG and SR during the dry period resulted in greater (P = 0.0475) liveweight gain per unit area for Paiaguás pasture (685 kg/ha/yr) than for Piatã pasture (640 kg/ha/yr).

Conclusion

Brachiaria brizantha cv. Paiaguás has distinct advantages over cv. Piatã, especially in relation to its better growth during the dry season and better forage quality at that time, resulting in better animal performance. These traits suggest that this ecotype might be a new alternative to be used under different production systems, mainly during the dry period, which represents the main constraint as far as feed availability and quality is concerned.

References

Euclides VPB, Valle CB, Macedo MCM, Oliveira MP (2001) Evaluation of *Brachiaria brizantha* ecotypes under grazing in small plots. Proceedings of the XIX International Grassland Congress, São Pedro, São Paulo, Brazil, 11-21 February 2001. pp. 535-536.

Euclides VPB, Macedo MCM, Valle CB, Difante GS, Barbosa RA, Cacere ER (2009) Valor nutritivo da forragem e produção animal em pastagens de *Brachiaria brizantha*. *Pesquisa Agropecuária Brasileira* **44,** 98-106.