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Development of Cultivars *Brachiaria brizantha* in Ecotone Cerrado-pantanal under Different Periods

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Abstract: In Pantanal South Matogrossense croplands pasture are around four million hectares, subject to flooding in the period of the waters. However, water deficit can lead to dehydration in the plant, reducing its growth and acceleration of senescence of tissues by decreasing the rate of leaf expansion and consequently showing less height and photosynthesis by reducing the leaf area. The objective of this research was to study the development of different cultivars of *Brachiaria brizantha*, which best thrives under two types of environments (conventional pasture and vereda-type of Cerrado vegetation formation) in periods of drought and rain. The experimental design was of randomized blocks with four repetitions in each environment in the two periods. Every 15 DAE (days after emergence) was rated the height of tiller, stem diameter and width of the leaf blade. Was employed Kruskal Wallis statistical method = {P (x>X2); (α = 0.05)} and for comparisons between the means obtained from the variables was carried out the Mann-Whitney test the probability 0.05. To cultivate larger values presented to Xaraés height of plant, stem diameter and width of the leaf blade in relation to the cultivars Marandu, Piatã and MG-4. Cultivating MG-4 presented the lower plant height, stem diameter, width of the leaf blade and a smaller thatched elongation in respect of other cultivars. Cultivating Xaraés was which adapted better to the region of the Cerrado-Pantanal ecotone, showing superior results to the other cultivars.

Key words: *Brachiaria*, farming, conventional pasture, plant size, environments

INTRODUCTION

One of the sectors that have greater responsibility for Brazil's economic growth is agriculture, where there is greater international competition, which requires increasingly cultivars that cover a greater productivity of forages, in which one of them stands out the *B. brizantha* (Marcelino *et al*., 2006).

For that increasingly occur in agricultural growth, at the same time the improvement of pastures is critical. Nantes (2009) pointed out that since the beginning of the exploitation of agriculture the aim is to seek improvements in pastureland that adapt the edaphoclimatic conditions in which they will be deployed.

In the region of the Cerrado (Brazilian Savanna) the seasonality in the distribution of rainfall associated with the occurrence of the mid-summer (long periods of drought) and low soil fertility, reduces the development of roots in such a way that requires a high degree of adaptability. In this sense, the genus *Brachiaria* spp. is the fodder that is grown in this region, where they have brought favorable feature (Valle *et al*., 2001), these areas may be an alternative to the cultivation of pastures during the period of drought, which are well drained (Penteado *et al*., 1996, 2000).

In Pantanal Sul Matogrossense (Brazilian Swamp) pasture cultivation areas are around four million hectares, subject to flooding in the period of water (Maltby, 1990; Haddad *et al*., 2000). Today there are few studies on grass in dry to moist soil with respect to different grass species (Penteado *et al*., 1996).

The water deficit can lead to dehydration in the plant, reducing its growth and acceleration of senescence of tissues by decreasing the rate of leaf expansion and consequently showing less height and photosynthesis by decreasing leaf area (Van Loo, 1992).

For the excess water in the soil, reduction in gas exchange occurs between the grass and the environment,

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resulting in anoxia or hypoxia, which is caused by the reduction of respiration of the roots (Liao and Lin, 2001). For such a relationship, are recommendations for the varieties of *B. brizantha*, how to cultivate Marandu, which features high resistance to drought, however there is a low adaptability in soggy soil, with good tolerance to shading, heat and cold, with development in temperatures between 15-35°C (Skerman and Riveros, 1990; Soares Filho, 1994). So, being recommended for the region of the Cerrado with medium soils and good fertility.

The growth and the development of fodder plants constitute important tool in productive potential and importance to know what the ecosystem productivity to deploy and taking as presupposition treated seeds and germination percentage (Brites *et al*., 2011). With this, one can see that the development of grazing does not depend only on the choice of the plant variety but also understanding their interaction in the environment, thus being a key point for both growth and maintenance of the productive capacity of the pasture (Nascimento *et al*., 2002).

On the other hand, Buxton and Fales (2004) stated that the development, growth and quality of production of a grass, are reflected in accordance with environmental conditions, however when your essential supplement with water, nutrients, light and temperature, can achieve productive efficiency.

Brought the importance of the environment for the cultivation of fodder, the objective of this research was to study the development of different cultivars of *B. brizantha*, which best thrives under two types of environments (conventional pasture and vereda-type of Cerrado vegetation formation) in periods of drought and rain.

MATERIALS AND METHODS

Experimental site: The experiment was conducted at the State University of Mato Grosso do Sul (UEMS), located in the municipality of Aquidauana, MS, Brazil. The region has an average elevation of 174 m, comprehended in the Lat. of 20°28'S and Long. 55°48'W, with the rainy season in the summer and dry in winter, showing an average of 1,400 mm annual rainfall. According to the Köppen-Geiger classification, the climate of the region is of type Aw (Tropical Savanna), set to hot tropical, subhumid, characterized by the irregular distribution of precipitation, with occurrence of well-defined dry season from July to the end of September and rainy period from October to April. The data regarding climatic conditions during the experiment were obtained from the meteorological station of Aquidauana, MS, Brazil (Fig. 1).

The soil was classified as a dystrophic Oxisol, deep, moderately drained physically and with sandy texture, according to EMBRAPA (2006) and according to Soil Taxonomy classification of USDA (2004) was classified as an Ultisol.

Experimental design: The experimental design used was randomized blocks with four replications. As for each environment (conventional pasture-CP and vereda-V) blocks of 64 m^2 with 16 beds of 4 m^2, totaling 32 experimental units. The cultivars were used Marandu, Xaraés, Piatã and MG-4, all of the genus *B. brizantha*, where were established in December 2009. For the tillage was used the micro tobata tractor to clean the site and soil breakdown. The chemical analysis of the soil at a depth of 0-0.20 m was performed and is presented in Table 1.

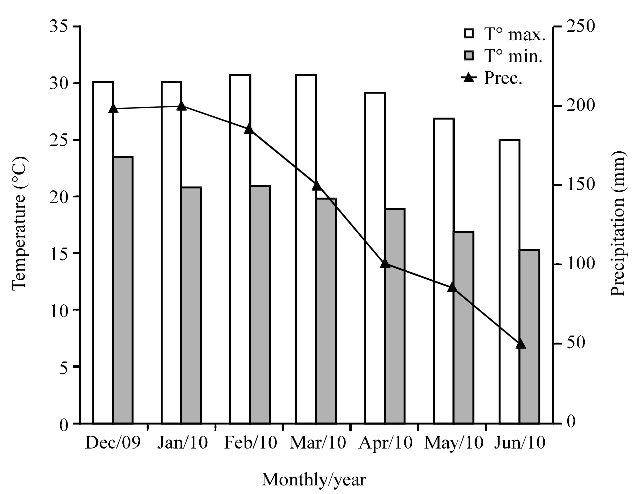

Fig. 1: Maximum and minimum temperatures (°C) and average precipitation (mm) during the experimental period

Table 1: Chemical variables of samples of topsoil (0-0.20 m) in the experimental areas

Chemical variables	Conventional pasture	Vereda
pH	4.90	4.40
Ca^{++} (cmol dm^{-3})	0.80	0.10
Mg^{++} (cmol dm^{-3})	0.60	0.10
K^{++} (cmol dm^{-3})	0.20	0.04
Al^{++} (cmol dm^{-3})	0.70	0.70
H+Al (cmol dm^{-3})	4.10	2.40
S (cmol dm^{-3})	1.60	0.24
V (%)	28.07	9.09
M (%)	30.04	74.50
Sum of Bases* (cmol$_c$ dm^{-3})	1.60	0.24
P (mg dm^{-3})	5.50	2.40
K (mg dm^{-3})	0.20	0.04

For sowing were used 16 kilograms of pure viable seeds per hectare, with cultural value for all the cultivars is equal to or greater than 50%. The seeding was performed uniformly at each construction site and haul later sifted a thin covering of soil.

To 35 days after germination (12/13/2009), the grasses of all environments were established, where it was held a close shave to the ground at a height of 15 cm, average all grasses were a homogeneous height and that could be evaluated which showed a further development of the two environments.

Collection and analysis of samples: For the collections were selected randomly to ten plants in the form of "zig zag", being respected the borders, with a blue aluminum wire which stands out among the grasses in each experimental unit.

The collections included in the period of 1/31/2010 the 3/16/2010, which is the period of the waters. Each experimental unit was evaluated between the two environments, in the height of the plant (HP), which has been monitored for 15, 30, 45 and 60 Days after Emergence (DAE), measured from the ground distance to maximum height of apex of the tiller by the main sheet, being determined with the use of a graduated ruler; in addition to the stem elongation and diameter (ED) and Width of Foliar Blade (WFB), in ten plants per experimental unit, with the help of a caliper for the respective measures. All variables were measured in centimeters.

In the period from 4/23/2010 to 6/7/2010, defined as a period of drought, were performed in both environments the same procedures carried out during the period of the waters.

Data analysis: Was employed Kruskal Wallis statistical method = {P (x>X2); (α = 0.05)} in place of the analysis of variance, because of not having met the test assumption F. To comparisons between the means obtained from the variables, the Mann-Whitney test the 0.05 probability, as proposed by Maroco (2007), with the aid of computational statistical program (SAS, 1999).

Table 2: Mean values of plant height (HP), diameter of stem (ED) and leaf blade width for the periods (WFB), cultivars and seasons

	X^2±SD; CV (%)		
Variables	HP	ED	WFB
Seasons			
Rainfall	33.38±11.31;34^A	3.15±0.82;26^A	12.03±4.05;33^B
Dry period	27.84±90.12;32^B	2.99±0.70;23^B	13.85±2.41;17^A
Cultivars			
Xaraés	32.79±11.51;35^A	3.20±0.80;25^A	13.58±3.57;26^A
MG-4	28.96±10.82; 37^C	2.87±0.72;25^C	12.15±3.38;27^C
Marandu	29.70±90.71;32^B	3.16±0.74;23^A	13.08±3.28;25^B
Piatã	30.66±90.91;32^B	3.04±0.75;24^B	12.96±3.39;26^B
Periods			
15 DAE[1]	22.16±60.11;27^D	2.86±0.72;25^C	10.55±3.31;31^D
30 DAE	28.22±70.69;27^C	2.88±0.63;22^C	11.84±2.74;23^C
45 DAE	33.39±80.70;26^B	3.17±0.77;24^B	14.17±2.39;17^B
60 DAE	38.87±11.29;29^A	3.37±0.81;24^A	15.58±2.78;18^A

[1]DAE: Days after emergence, [2]Capital letters in the same column do not differ significantly by Mann-Whitney test at 0.05 probability; SD: Standard deviation; CV: Coefficient of variation

RESULTS AND DISCUSSION

During periods of rain and drought have occurred significant differences for plant height, stem diameter and width of the leaf blade (Table 2). The rain period showed the highest value at the time of the plant and stem diameter and width of the leaf blade dry period presented value greater than the period of rain.

To cultivate larger values presented to Xaraés height of plant, stem diameter and width of the leaf blade in relation to the cultivars Marandu, Piatã and MG-4. Studies conducted by Euclides *et al.* (2008), observed that the forage production and canopy structure characteristic of cultivating Xaraés, were higher when compared with the Marandu and Piatã cultivar. In relation to stem diameter to cultivate Xaraés obtained larger values when compared with Marandu cultivar, however was not observed (Table 2).

The MG-4 cultivar presented the lower plant height, stem diameter, width of the leaf blade and a smaller thatched elongation in respect of other cultivars. Evaluation periods (15, 30, 45 and 60 DAE), significant differences were observed between plant height, diameter, stem and leaf blade width (Table 2). Thus, all cultivars during these periods showed morphological development and growing with 15 and 30 DAE the stem diameter did not differ significantly.

To Xaraés cultivar at 15 DAE, showed greater height compared to other cultivars in vereda environments and conventional pasture, which the results demonstrate the potential of productivity, according to Table 2. However, there was no significant difference between the conventional pasture and vereda for cultivars Marandu and Piatã (Table 3), corroborating Trevisanuto *et al.* (2009), where results obtained of larger size to Xaraés when related to Marandu and Piatã.

In relation to Xaraés cultivar to 30 DAE in Conventional Pasture (CP) and Vereda (V), was presented

Table 3: Interaction between cultivars of *Brachiaria brizantha* in respect of periods for the variable plant height (HP)

Environment	DAE[1]	Cultivars (X^2±SD;CV (%)) Xaraés	MG-4	Marandu	Piatã
CP	15	22.64±6.100;14[Ba]	20.52±5,25;25[Ba]	16.59±5,03;30[Bb]	20.48±5,84;28[Ba]
V	15	25.62±5.600;21[Aa]	22.72±4.99;22[Ab]	24.04±5.40;22[Aab]	24.67±5.63;23[Aa]
CP	30	27.26±6.310;23[Ba]	22.00±5.21;26[Bc]	26.14±7.53;29[Bab]	25.11±6.16;24[Bb]
V	30	34.90±9.520;27[Aa]	29.57±5.92;20[Ab]	29.40±6.43;22[Ab]	30.91±6.27;20[Ab]
CP	45	32.64±8.730;27[Ba]	27.67±7.60;27[Bb]	31.17±8.35;27[Bab]	31.82±7.70;24[Ba]
V	45	38.29±9.700;25[Aa]	35.50±6.76;19[Aa]	33.24±7.33;22[Ab]	35.90±9.12;25[Aab]
CP	60	35.97±10.84;30[Ba]	35.32±8.30;23[Bab]	36.50±11.00;30[Ba]	37.81±7.90;21[Aa]
V	60	45.77±13.60;30[Aa]	42.80±11.50;27[Aa]	37.09±10.99;30[Ab]	38.99±11.02;28[Ab]

[1]DAE: Days after emergence; CP: Conventional pasture; V: Vereda. [2]Letters uppercase and lowercase vertically and horizontally equal, respectively, do not differ significantly by Mann-Whitney test at 0.05 probability; SD: Standard deviation; CV: Coefficient of variation

Table 4: Interaction of *Brachiaria brizantha* cultivars for the periods for the variable diameter of the stem of the plant

Environment	DAE[1]	Cultivars (X^2±SD;CV (%)) Xaraés	MG-4	Marandu	Piatã
CP	15	2.89±0.68;23[Aa]	2.49±0.70;28[Bb]	2.78±0.66;24[Ba]	2.68±0.63;23[Bab]
V	15	3.05±0.65;21[Aab]	2.82±0.68;24[Ab]	3.22±0.76;24[Aa]	2.95±0.73;25[Ab]
CP	30	3.05±0.68;22[Aa]	2.80±0.59;21[Ab]	2.93±0.60;20[Aab]	2.85±0.63;22[Aab]
V	30	2.92±0.64;21[Aa]	2.59±0.57;22[Bb]	2.93±0.60;20[Aa]	2.94±0.60;20[Aa]
CP	45	3.41±0.90;26[Aa]	3.09±0.66;21[Ab]	3.12±0.55;18[Ab]	3.165±0.72;23[Ab]
V	45	3.23±0.79;24[Aa]	2.77±0.65;23[Bb]	3.33±0.84;25[Aa]	3.20±0.87;27[Aa]
CP	60	3.62±0.86;24[Aa]	3.30±0.74;22[Ab]	3.49±0.77;22[Aab]	3.56±0.75;21[Aab]
V	60	3.50±0.90;26[Aa]	3.10±0.78;25[Ab]	3.46±0.74;21[Aa]	3.06±0.80;26[Bb]

[1]DAE: Days after emergence; CP: Conventional pasture; V: Vereda. [2]Letters uppercase and lowercase vertically and horizontally equal, respectively, do not differ significantly by Mann-Whitney test at 0.05 probability; SD: Standard deviation; CV: Coefficient of variation

to greater plant height and showing significance with the cultivars MG-4 and Piatã. In the same 30 DAE differences were significant between environments, in which the vereda presented superiority in all analyzed variables (Table 3).

In the period of 45 DAE, Piatã cultivar stood out among the others. However, in the same cultivar, in conventional pasture did not have significance in relation to the Marandu and Xaraés and of environment vereda, obtained no significant difference to MG-4 and Piatã. In the same period the Marandu cultivar showed lower height when compared to the other cultivars, however did not differ from Piatã cultivar (Table 3).

At 60 DAE all environmental conventional pasture cultivars did not differ significantly from each other (Table 3). Already cultivar MG-4 in relation to other environmental conventional pasture had lower values towards the environment vereda. In the way 60 DAE Xaraés and MG-4 cultivars were what had greater height but showing no significance. Cultivars Piatã and Marandu the environment vereda, in the same period, there were significant, however showed lower production compared with Xaraés and MG-4 (Table 3).

The cultivars analyzed in the environment of conventional pasture and vereda were significant in all periods, except in the Piatã to 60 DAE (Table 3). The environment vereda got more time for all cultivars in relation to conventional pasture; possibly rainy season occurs too late hence the soil appeared drier over the vereda thus having prolonged moisture since they are sandy areas and slopes of swamps (wet location or Brazilian Pantanal).

According to Dias-Filho (2005), forage *B. brizantha* demonstrates the existence of wide variability even within the same species, with tolerance to wet soils. Cultivars Xaraés, MG-4, Piatã and Marandu at 15, 30, 45 and 60 DAE, differed significantly between the environments where the vereda had higher yields compared to conventional pasture (Table 3).

The vereda has not submitted soils with excess water, because in periods of sampling, there not was high rainfall, with a climate with high temperatures and moist soil, which was favorable for the development of cultivars, linking up with the conventional pasture, which contained dry soil and high temperature.

The Xaraés cultivar in period 15 DAE in conventional pasture, presented its stem diameter greater when compared with the cultivar MG-4, wherein occurred significant differences, however with cultivars Marandu and Piatã there was no such difference (Table 4). In the period from 15 DAE, the vereda with the Xaraés and Marandu did not differ significantly from each other while being superior to MG-4 and Piatã, according to Table 4.

In period 30 DAE in conventional pasture environment for stem diameter, the Marandu, Piata and Xaraés, were not statistically significant, however, the

Xaraés was superior to cultivar MG-4, differing among them. In the same period but in vereda, the Marandu, Piata and Xaraés not different when compared with the MG-4 (Table 4).

In the period from 45 DAE in conventional pasture, Xaraés cultivar was higher than the other, occurring significance. However, in the same period, the environment vereda, the Xaraés, Marandu and Piatã showed no significance, being just above the MG-4, which showed the lowest stem diameter (Table 4).

In period 60 DAE in the environment of conventional pasture, cultivate Xaraés not different cultivars Marandu and Piata but significant difference in relation to MG-4; environmental vereda in the same period (Table 4), did not differ from the Xaraés of Marandu cultivar, however were superior to MG-4 and Piatã.

To cultivate Xaraés in period 15, 30, 45 and 60 DAE, when compared to conventional pasture and vereda environments, showed no significant differences for almost none of respective environments, being homogeneous in diameter stem almost all periods (Table 4). In cultivar MG-4 for periods of 15, 30, 45 and 60 DAE, comparing the environments, conventional pasture and vereda, only significant difference between 15 DAE. It can be seen in Table 4 showed that the vereda environment stem diameter greater than conventional pasture, however the same cultivar and the periods of 30 and 45 DAE, there were differences between the environments in which the conventional pasture had greater stem diameter compared with the vereda.

The environment conventional pasture and vereda, in periods 45 and 60 DAE, cultivating Xaraés differ significantly. Also seen that in Marandu 60 DAE, there was difference among cultivars and other periods and showed no significance for the variable width of the leaf blade, shown in Table 5. According to Lemaire (1997) and Lemaire and Chapman (1996), the length and width of the leaf vegetable is a feature plastic responsive to the intensity of grazing regarded as a strategy morphological exhaust capable of imparting to the plant varying degrees of resistance to grazing.

During 15 DAE in the environment conventional pasture and vereda, no significant differences occurred, where yields were similar for all cultivars during this period. In period 30 DAE in conventional pasture environment, cultivating MG-4 got the smallest width of the leaf lamina in the other cultivars (Table 5). In the same period and environment, cultivars Marandu, Piata and Xaraés had similar yields and therefore not presented significance. Already in the environment vereda, cultivating Xaraés had the highest productivity in the other cultivars but did not differ significantly between the Marandu and Piata, with the lowest yield the MG-4.

At 45 DAE to cultivate Xaraés in the environment conventional pasture, which had been highlighted as the width of the leaf blade thereby obtaining a higher productivity compared with other cultivars (Table 5). However the environment vereda 45 DAE, cultivars Marandu and Xaraés, showed greater productivity, showing no significance between both cultivars differing only with MG-4 and Piatã.

In environmental vereda within 60 DAE, to cultivate Xaraés and Marandu no significant differences between them, this showed higher yield than the others. In the same period, the environment vereda, cultivating Marandu and Piatã not differ significantly, as shown in Table 5.

According Vilela (2007), the cultivar has Xaraés higher productivity compared to other cultivars of *B. brizantha*, which can be explained by the morphology of the species which presents leaf wider and longer. Flores *et al.* (2008) reported that cultivar Xaraés has advantages over other cultivars *B. brizantha* as faster regrowth and increased forage production, which ensures higher bearing capacity and higher productivity per area.

The productivity of mass Piatã, both in conventional pasture and in the vereda to the water and dry periods, showed superiority over the other cultivars (Table 6). Studies by Trevisanuto *et al.* (2009), showed that the cultivar Xaraés resulted in higher productivity mass compared cultivars Piatã and Marandu.

Table 5: Interaction of *Brachiaria brizantha* cultivars for the periods for the variable width of the leaf blade

		Cultivars (X^2±SD;CV (%)			
Environment	DAE[1]	Xaraés	MG-4	Marandu	Piatã
CP	15	10.86±2.77;25^{Aa}	9.90±3.27;33^{Aa}	10.20±3.19;31^{Aa}	10.54±2.49;24^{Aa}
V	15	11.16±3.17;28^{Aa}	10.04±3.43;34^{Aa}	10.57±2.79;26^{Aa}	11.07±4.79;43^{Aa}
CP	30	12.19±2.50;20^{Aa}	11.01±3.23;29^{Ab}	12.17±3.04;25^{Aa}	12.31±2.31;19^{Aa}
V	30	12.28±2.79;23^{Aa}	11.12±2.71;24^{Ac}	11.97±2.29;19^{Aab}	11.69±2.68;24^{Aab}
CP	45	15.48±2.55;16^{Aa}	13.67±2.63;19^{Ac}	14.54±2.22;15^{Ab}	14.42±2.36;17^{Abc}
V	45	14.47±2.52;17^{Ba}	13.00±2.05;16^{Ac}	14.15±1.73;12^{Aab}	13.66±2.23;16^{Abc}
CP	60	17.15±2.92;17^{Aa}	15.02±2.83;19^{Ac}	16.29±2.42;15^{Aab}	15.72±2.82;18^{Abc}
V	60	15.83±3.40;21^{Ba}	14.39±2.26;16^{Ac}	15.41±2.04;13^{Bab}	14.91±2.58;17^{Abc}

[1]DAE: Days after emergence; CP: Conventional pasture; V: Vereda. [2]Letters uppercase and lowercase vertically and horizontally equal, respectively, do not differ significantly by Mann-Whitney test at 0.05 probability; SD: Standard deviation; CV: Coefficient of variation

Table 6: Interaction of *Brachiaria brizantha* cultivars in relation to rainfall and dry period for the variable height of the plant in the conventional pasture and vereda

	Cultivars			
Environment	Xaraés	MG-4	Marandu	Piatã
Rainfall (X^1±SD;CV (%))				
CP[2]	35.17±10.14;29[a]	28.26±10.43;37[b]	33.60±11.05;33[a]	33.22±10.22;30[a]
V	36.10±12.80;35[a]	34.24±11.97;34[ab]	32.51±10.27;31[b]	33.58±11.67;34[ab]
Dry period				
CP	24.16±9.90;41[a]	22.12±7.60;34[b]	23.77±6.31;26[a]	24.60±6.80;28[a]
V	35.99±11.78;33[a]	31.05±8.94;29[bc]	29.36±7.63;26[c]	31.58±7.58;24[b]

[1]Lower case letters in the same row do not differ significantly by Mann-Whitney test at 0.05 probability. [2]CP: conventional pasture; V: vereda

Table 7: Interaction of *Brachiaria brizantha* cultivars in relation to rainfall and dry period for the variable stem diameter from conventional pasture and vereda

	Cultivars			
Environment	Xaraés	MG-4	Marandu	Piatã
Rainfall (X^1±SD;CV (%))				
CP[2]	3.59±0.90;25[a]	2.92±0.84;28[c]	3.20±0.68;21[b]	3.21±0.78;24[b]
V	3.25±0.81;25[a]	2.69±0.64;23[c]	3.36±0.78;23[a]	2.96±0.73;24[b]
Dry period				
CP	2.90±0.59;20[a]	2.89±0.64;22[a]	2.96±0.70;24[a]	2.87±0.67;23[a]
V	3.09±0.74;24[a]	2.95±0.73;25[a]	3.12±0.72;23[a]	3.11±0.79;25[a]

[1]Lowercase letters in the same row do not differ significantly by Mann-Whitney test at 0.05 probability. [2]CP: conventional pasture; V: vereda

Table 8: Interaction of *Brachiaria brizantha* cultivars for the rainfall and dry period, for the variable width of the leaf blade of conventional pasture and vereda

	Cultivars			
Environment	Xaraés	MG-4	Marandu	Piatã
Rainfall (X^1±SD;CV (%))				
CP[2]	13,27±4,59;34[a]	10,97±3,81;35[c]	11,91±3,98;33[bc]	12,48±3,86;31[ab]
V	12,68±4,16;33[a]	10,97±3,48;32[c]	12,26±3,39;28[ab]	11,76±4,51;38[bc]
Dry period				
CP	14,22±2,43;17[a]	13,40±2,98;22[b]	14,34±2,76;21[a]	13,73±2,26;16[ab]
V	14,11±2,44;17[a]	13,29±2,22;17[b]	13,77±2,09;15[ab]	13,86±1,68;12[a]

[1]Lowercase letters in the same row do not differ significantly by Mann-Whitney test at 0.05 probability. [2]CP: conventional pasture; V: vereda

In conventional pasture to Xaraés and Marandu did not differ from Piatã (Table 6), differing significantly from the MG-4, which had the lower height during the rainy season, possibly occurred by a greater density of seedlings, providing greater competitiveness of nutrients available in the soil. In the environment vereda in the same period of the waters, to cultivate Xaraés showed greater height but did not differ from Piatã. However the Marandu got shorter, showing no significance in relation to cultivars Piatã and MG-4 (Table 6).

During the dry season was observed that Xaraés cultivar was higher among the other cultivars, so there was no significance between the Marandu and Piatã, a result similar to that of Euclides *et al.* (2008), in which forage production was higher for the cultivar Xaraés when compared to Marandu.

Already Piatã showed similar productivity in environments conventional pasture and vereda. In the dry period in the environment vereda, cultivating Xaraés differed significantly among cultivars presented, showing larger, with 35.99 cm (Table 6). In the same period the Piatã and MG-4, showed no significance, where the only significant difference Piatã with Marandu.

In the rainy season in conventional pasture, cultivate Xaraés had the highest stem diameter compared with other cultivars. Second Pedreira (2006), the stem elongation in tropical forages, is due to two main reasons, summarized in a low frequency of defoliation and flowering. So it is remarkable that the cultivar Xaraés among other cultivars showed higher leaf blade width and consequently higher productivity and reduced frequency of defoliation (Table 6).

In setting the Xaraés in vereda again stands out when compared with other cultivars, not differing statistically from Marandu. Already cultivar MG-4 in the environment vereda, showed lower stem diameter (Table 7).

The interactions between the environment, conventional pasture and vereda, in the dry period, showed that among all the cultivars was not detected significance (Table 7). Flores *et al.* (2008) report that the Xaraés has advantages over the other cultivars of *Brachiaria* spp., As greater and greater speed of regrowth forage production, which ensures greater ability to leaf blades, ensuring greater productivity per area.

Miranda *et al.* (2005) presented four cultivars of *B. brizantha*, which found that the cultivars Xaraés and Capiporã had higher productivity, being associated with increased emission tiller, which ensures increasing leaf blades.

During the dry period in both environments (Table 8), it can be observed that the Xaraés had an elongation of leaf largest compared with the other, with no significance to cultivars Marandu and Piatã. It can be observed that in both environments, MG-4 cultivar had the lowest leaf width (Table 8). As Vilela (2007), to cultivate Xaraés has wider leaf blades (2.5 cm) and longer (60 cm) than other cultivars of *B. brizantha*.

CONCLUSION

The Xaraés cultivar (B. brizantha) which was adapted better to the ecotone region Cerrado-Pantanal, showing better results in plant size and environment conventional pasture and vereda in both periods. Regarding environments and periods studied, the MG-4 appeared lower than other cultivars.

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