



***Brachiaria brizantha* cv. Marandu consorciada com *Stylozanthes Spp.* sob adubação convencional e orgânica em Planaltina-DF¹**

João Paulo Horta Vieira de Miranda², João Paulo Guimarães Soares³, Francisco Duarte Fernandes³, Allan Kardec Braga Ramos³, Breno Rodrigues dos Reis⁴, Laís Ribeiro de Souza⁴, Gustavo Oliveira e Silva⁴

¹Trabalho financiado pelo projeto Leite Agroecológico. Edital Repensa/CNPQ 2010

²Zootecnista, Mestrando do Programa de Pós-Graduação em Ciências Animais – Universidade de Brasília/UnB, Brasil, Bolsista da CAPES. e-mail: joaopaulohorta@zootecnista.com.br

³Pesquisador, EMBRAPA Cerrados, Brasília, Brasil.

⁴Estagiário, EMBRAPA Cerrados, Brasília, Brasil.

Resumo: Objetivou-se neste trabalho avaliar a produtividade de matéria seca (PMS) durante dois anos da pastagem consorciada de *Brachiaria brizantha* cv. Marandu *Stylozanthes spp.* com adubação orgânica e convencional. O delineamento experimental foi em blocos casualizados generalizados, com três blocos, três tratamentos e duas repetições em dois experimentos no período chuvoso e seco, sendo os tratamentos: sem adubação, adubação convencional e orgânica. As adubações foram feitas somente no plantio da pastagem e a PMS foi avaliada de acordo com a metodologia de amostragem aleatória utilizando-se o quadrado de 1 m². Não houve diferença estatística para PMS somente no período chuvoso do segundo ano. A PMS foi superior para pastagem com adubação convencional em relação a orgânica e sem adubação no primeiro ano, do período seco (3.000,0 kg.ha⁻¹; 1.170,7 kg.ha⁻¹ e 1.929,80 kg.ha⁻¹) e do período chuvoso (9.542,4 kg.ha⁻¹ e 6.073,1 kg.ha⁻¹; 4.229,1 kg.ha⁻¹), respectivamente. No período seco do segundo ano a PMS foi semelhante para os tratamentos convencional e orgânico (5.347,1 kg.ha⁻¹; 5.894,6 kg.ha⁻¹) em relação ao sem adubação (3.999,7 kg.ha⁻¹) respectivamente. A pastagem com adubação orgânica apresentou menores produtividades, porém constantes em relação a convencional que diminuiu ao longo do período. Isto ocorreu provavelmente em função da liberação lenta dos nutrientes dos adubos orgânicos em relação aos convencionais, que são prontamente disponíveis.

Palavras-chave: cerrado, consórcio, leguminosa, resiliência

***Brachiaria brizantha* cv. Marandu mixed *Stylozanthes Spp.* under conventional and organic fertilization in Planaltina-DF**

Abstract: The aim of this work was the dry matter productivity (DMP) evaluation of *Brachiaria brizantha* cv. Marandu intercropped to *Stylozanthes spp.* exposed to organic and conventional fertilization during two years. It was evaluated two experiments. The first one in the rainy season and second one in the dry season. The experimental design for both experiments was in randomized blocks, with three blocks, three treatments and two repetitions. The treatments were: Crops without fertilization (Control), Crops with conventional fertilization and Crops with organic fertilization. The fertilizations were applied only in the planting season and DMP was evaluated according to the randomized sample methodology using a square of 1 m². There was no statistical difference for DMP only rainy season during the second year. The DMP was higher in the first year to the conventionally fertilized pasture in comparison to the organic and without fertilization in dry season (3000 kg.ha⁻¹; 1170.7 kg.ha⁻¹; 1650.20 kg.ha⁻¹) and the rainy one (9542.4 kg.ha⁻¹ e 6073.1 kg.ha⁻¹; 4229.1 kg.ha⁻¹) respectively. In the dry period of the second year the PMS was similar to conventional and organic treatments (5347.1 kg.ha⁻¹ and 5894.6 kg.ha⁻¹) in relation to the without fertilization (3999.7 kg.ha⁻¹) respectively. The pasture with organic fertilization showed in general, lower productivities, but equal in relation of the conventional during all period. But, the experiment with conventional fertilizers decreased over the period. The significance is probably due to the slower release of nutrients from organic fertilizers in comparison to the conventional which is usually readily available.

Keywords: savannah, consortium, legumes, resilience

Introduction

It is common sense that the Brazilian Savannah presents soils of low fertility. The use of alternative fertilizers is strategic to manage adequately pasture in organic systems (Figueiredo & Soares, 2012). For example, the use of practices such as phosphate rock, rock powder, lime and intercropped legumes to increase biological nitrogen fixation. By this way of crop management supplement naturally and with slow release of nutrients the soil mineral deficiencies. Moreover, it is the most important practice which to promote better absorption and utilization



of nutrients by the plants favoring nodulation and nitrogen (N) fixation in legumes, softening nutritional stresses, promoting balanced nutrition to the plants and enabling access to the little available nutrients (Siqueira & Saggin Jr., 2001).

Mixed pastures of forage grasses and legumes are a good low cost option with to attenuate the pastures degradation problem. The use of legumes with increased N fixation capacity through symbiosis with *Rhizobium* bacteria improve the litter pasture quality and can provide large N quantities to system soil-plant-animal. So as so, fixed N by legumes can improve diet quality for cattle production. Moreover, legumes have less seasonal variation in nutritional value in comparison to the forage (Soares et al., 2011).

The aim of this work was the dry matter production (DMP) evaluation of *Brachiaria brizantha* cv. Marandu intercropped with *Stylozanthes Spp.* pastures under organic and conventional fertilization in Brazilian Savannah soils.

Material e Methods

The experiment was conducted in the Embrapa Cerrados experimental field, based in Planaltina – DF with the renovation of grazing area using *Brachiaria brizantha* cv. Marandu intercropped with *Stylozanthes Spp.* The experimental design was in randomized blocks, with three blocks, three treatments and two repetitions in two experiments on rainy season and dry season. Fertilizers were applied exclusively in the planting season, in February 2011. The soil in the experimental area was classified as a Red Latosolic, with low natural fertility, having the following chemical characteristics: pH = 5.8; Al³⁺ = 0,04 cmol.dm³; Ca + Mg = 1.54 cmol.dm³; P = 3.51 mg.dm³ e K = 0.47 mg.dm³.

For the acid soil correction were applied 2 Ton ha⁻¹ of Dolomitic Limestone and 1 ton.ha⁻¹ of Gypsum. In the control (no fertilization treatment) was not applied fertilizers. The organic fertilization was obtained with a source of P and K such as thermopotassium (6% k₂O) and the thermophosphate (12% P₂O₅) in amounts of 2 Ton ha⁻¹ and 1 ton.ha⁻¹, respectively. Before fertilization the area was cropped with green manure using *Crotalaria juncea* ninety days before planting to guarantee the N source. For the conventional treatment was used as sources of K, the Potassium Chloride (60% k₂O); P, the Triple Superphosphate (46% P₂O₅) and, N, urea (46% N) in amounts of 200, 260 and 217.40 kg./ha, respectively. The dry matter production rates were evaluated for two years during four periods of time (August/2011; January/2012; August/2012 e January/2013). To the dry matter production analysis, the evaluation was made by random sampling method using the square of 1 m². The samples were weighed using a scale in the field and subjected to oven drying at 65°C for 72 hours according to AOAC (1995).

The statistical analysis were obtained using LSD test (SAS version 9.1.2.package), at 5% probability.

Results and Discussion

It was observed statistical differences (P<0.05) in dry matter productivity (kg.ha⁻¹) among the studied systems but there was no statistical difference (P>0.05) for DMP only in the rainy season during the second year (Table 1). In the first year, the average observed of dry matter productivities values in the consortium were 3000 kg.ha⁻¹ and 1629.80 kg.ha⁻¹ in the dry season, 9542.40 kg.ha⁻¹ and 6073.10 kg.ha⁻¹ in the rainy season for conventional and organic systems respectively. In the second year, the observed yield was 5547.1 kg.ha⁻¹ and 5894.6 kg.ha⁻¹ in the dry season, 6031.3 kg.ha⁻¹ and 5551.2 kg.ha⁻¹ in the rainy season for conventional and organic systems respectively. Costa et al., (2012) studying also *Brachiaria* and *Stylozanthes* consortium in Alta Floresta - MT, obtained DMP of 5191 kg.ha⁻¹, in the dry season an 8143 kg.ha⁻¹ in the rainy season, both superior to that obtained in this study.

In the second year during the dry dry period the DMP was similar for the conventional and organic treatments (4845.15 kg.DM/ha; 5614.30 kg.DM/ha) compared to the control (3999.70 kg.DM/ha). The average contribution of legumes in pasture was superior for organic in relation to conventional management respectively and superior too in the dry season compares to the rainy season.

Table 1. *Brachiaria brizantha* cv. Marandu intercropped with *Stylozanthes spp.* under conventional and organic fertilization dry matter production and and legume percentage during two years.

Fertilization	First Year		Second Year	
	Dry season	Rainy season	Dry season	Rainy season
Control	1170.7 (10,17%) b	4229.1 (21,83%) c	3999.7 (28,8%) b	5060.10 (10,8%) a
Conventional	3000.0 (4,90%) a	9542.4 (7,05%) a	5347.1 (12,6%) a	6031.30 (0,8%) a
Organic	1629.8 (10,48%) b	6073.1 (26,92%) b	5894.6 (28,8%) a	5551.20 (4,7%) a

Means followed by different small letters in columns, in each period, differ by LSD test (Least Square Difference) (P<0.05).



52ª Reunião Anual da Sociedade Brasileira de Zootecnia

Zootecnia: Otimizando Recursos e Potencialidades

Belo Horizonte – MG, 19 a 23 de Julho de 2015



The higher dry matter productivities yields observed in the conventional system during the first year was expected, since conventional fertilization provides nutrients faster and readily, especially in the first year of grazing use. The quick supplement of nutrients for the plant was also by the activity of microorganisms which favors chemical reactions in the soil (Siqueira & Saggin Jr., 2001).

On the other hand, when we look at the second year was lower dry matter productivities yield in the pasture with conventional fertilization, which did not occur with the organic treatment, where you use the fertilizer with natural sources of phosphorus and potassium, which have slower release. The plant response in this system becomes smaller, however, more resilient and constant, which possibly led to an increase the dry matter production in the second year, still assisting the organic matter provided by the decomposition of crotalaria incorporated into the planting of pasture in organic management.

However, in both managements the legumes introduced in can increase the N contribution in mixed supply systems, provided increased transfer of N and increased the dry matter production for grasses (Reis Júnior et al., 2002).

Conclusions

The slower release of nutrients from organic fertilizers for conventional, readily available, probably promoted lower productivity, but steady pasture with organic fertilization compared to conventional which decreased productivity over the period.

The study of the use of these alternative sources for fertilization of pastures is strategic for organic and conventional systems, they can reduce production costs.

References

- ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTRY - AOAC. **Official methods of analysis**. 16.ed. Arlington: AOAC International, 1995. 1025p.
- COSTA, R. N.N.; LANGE, A.; CAIONE, G.; SCHONINGER, E.L. Produção de forragem para ovinos utilizando o consórcio de gramíneas com leguminosas sob pastejo rotacionado. **Revista de Ciências Agro-Ambientais**, v.10, n.1, p.99 - 109, 2012.
- FIGUEIREDO, E. A. P.; SOARES, J. P. G. Sistemas orgânicos de produção animal: dimensões técnicas e econômicas. In: REUNIÃO ANUAL DA SOCIEDADE BRASILEIRA DE ZOOTECNIA, 49, 2012, Brasília. **Anais...** Brasília, DF: SBZ, 2012. 1 CD-ROM.
- SIQUEIRA, J.O. & SAGGIN-JUNIOR, O.J. **Dependency on arbuscular mycorrhizal fungi and responsiveness of Brazilian native wood species**. Mycorrhiza, 11:245-255, 2001.
- SOARES, J. P. G.; AROEIRA, L. J. M.; FONSECA, A. H. F.; FAGUNDES, G. M., SILVA, J. B. Produção orgânica de leite: Desafios e perspectivas. In: Marcondes, M.I. et al., (Org.). III SIMPÓSIO NACIONAL DE BOVINOCULTURA LEITEIRA E I SIMPÓSIO INTERNACIONAL DE BOVINOCULTURA LEITEIRA. Viçosa. **Anais...** Viçosa: Suprema Grafica e Editora, 2011, v.1, p. 13-43.