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MASS YIELD OF PIATÃ GRASS IN SYSTEMS IN INTEGRATION

Eduardo André FERREIRA [1]; Daniel Paulo FERREIRA [2]; Joadil Gonçalves de ABREU [3]; Roberto Giolo de ALMEIDA [4]; Virginia Helena de AZEVEDO [3]; Kyron Cabral SALES [1]; Lucas Matheus Barros ASSIS [5]; Vinicius Trindade SANDRI [6]

[1] Tropical Agriculture. PhD student. Federal University of Mato Grosso - UFMT; [2] Tropical Agriculture. MSc. UFMT; [3] PhD. Professors. UFMT; [4] Agronomy. Researcher. Embrapa Beef Cattle; [5] Animal Science. PhD Student. UFMT; [6] Agronomy. Student. UFMT

ABSTRACT

This study aimed to evaluate the mass yield of Piatã grass (*Urochloa brizantha* cv. Piatã) in a crop-livestock-forest integration system. The experiment was carried out in the area of Embrapa Beef Cattle, in Campo Grande – MS, Brazil, in the 2018/2019 agricultural year. The experimental design was in randomized blocks with the treatments arranged in subdivided plots, with 3 treatments in the plots (ICLF28; ICLF22; ICL) and 4 repetitions. The harvest months were January, February, March, April and May 2019, the following distances from the eucalyptus rows: ICLF28 (7m, 10m, 11m, 9m, 4m); ICLF22 (3m, 7m, 10m, 7m, 3m). The sampling locations were identified by letters A, B, C, D, E. The harvest made at ground level, the material was taken to the laboratory, weight to obtain mass yield and divided into subsamples. The ICL system showed a higher mass yield accumulated in all sampling points. In the ICLF28 system, the highest yields were at central points B, C and D. In the ICLF22 system the highest yields were at points C and D. In the ICLF systems, the end points obtained lower results than the others.

Key words: leaf; stem; senescence

INTRODUCTION

The ICLF system is an intentional combination of crop, livestock and forestry activities, carried out in the same area, in intercropped crop, in succession or rotation. However, there are options for cultivating crops and livestock: ICL; crop and forest: ICF; livestock and forestry: ILF; of the three activities: ICLF. This components combination brings several benefits to the deployment environment, especially for the productive capacity recovery in degraded soils and the intensification of the use of the area without prejudice to any resource (BALBINO et al., 2011).

The maximum yield of these systems is obtained when the animal peak production is observed without a decrease in the tree production and vice versa. Thus, to avoid reductions in forage production due to shading it is necessary that the choice of forage species that best adapt to this system, demonstrating a good tolerance level to shading, as is the Piatã Grass case (OLIVEIRA et al., 2014).

Studies carried out in several regions and ecosystems in Brazil demonstrate that this brachiaria has wide adaptation and high yield, compared to other cultivars already studied, thus representing a good option and alternative in integration systems because it has productive and favorable management characteristics, of plant, tolerance to the shading factor, quality and high leaf production (OLIVEIRA et al., 2014).

However, studies with this forage under shading conditions are scarce, and further research is needed to optimize the Piatã Grass yield in crop-livestock-forest integration systems. Thus, the aim was to evaluate the yield of Piatã grass accumulated dry mass in crop-livestock-forest integration systems.

MATERIAL AND METHODS

The experiment was carried out at the Technological Reference Unit in Agrosilvipastoral systems of Embrapa Beef Cattle in Campo Grande-MS, Brazil. The soil in the area has a flat relief, being classified as a Dystrophic Red Latosol with a clay texture. The experiment area has been used with succession cycles since 2008. The experimental design was a randomized block with 4 repetitions, with the treatments arranged in subdivided plots, with 3 treatments in the plots (ICLF28; ICLF22; ICL). In the subplots, the harvest months (January, February, March, April and May 2019) and the sample points (A, B, C, D and E) were allocated. In perpendicular transect to the tree rows in each plot, five equidistant points were defined (A, B, C, D and E), where A and E were 1 m from the tree trunks; and C corresponded to the intermediate position; totaling 5 sample points per plot. The 28 m Crop-Livestock-Forest Integration system and the 22 m Crop-Livestock-Forest Integration system have distances between different sampling points, due to the eucalyptus rows distance of each system. In order to evaluate the Piatã grass accumulated dry mass yield, it was harvested at ground level by means of a gasoline side harvester. Harvested material samples were taken to the laboratory to determine the dry mass content according to AOAC (1990). Then the dry mass yield accumulated in the season was calculated. The data were subjected to analysis of variance and the means were compared using the Tukey test at 5% probability. The analyzes were performed using the SISVAR statistical software (FERREIRA, 2008).

RESULTS AND DISCUSSIONS

For the variable accumulated dry mass yield (ADMY) (Table 1) there was interaction between systems and sampling points.

Table 1. Accumulated dry mass yield (5 harvests) (t DM ha^{-1}).

Site	ICL	ICLF28	ICLF22	CV %	P value
A	15.28 Aa	4.89 Bb	6.37 Bb		
B	14.83 Aa	7.72 Ba	5.93 Ca	15.44	<0.01
C	15.56 Aa	7.67 Ba	7.29 Ba		
D	15.03 Aa	7.00 Ba	6.02 Ba		
E	14.84 Aa	4.20 Bb	4.63 Bb		

Means followed by the same letter, lower case in the column and upper case in the row, do not differ by the Tukey test (P> 0.05).

The ICL system showed the highest ADMY results at all sample points, with no difference between the points. With regard to the ICLF28 system, it presented higher ADMY at central points B, C and D, being very similar to ICLF22 which obtained the highest values at points C and D. At ICLF, the luminous interception promoted by the treetops was greater, reducing the amount of light energy that reaches the forage component, and consequently limiting the photosynthetic process. Similarly, Souza et al. (2019) evaluating the Marandu Grass yield in crop-livestock-forest integration systems, observed that the highest yield forage yield was verified in the treatment in crop-livestock integration, justifying this fact by the lower shading level occurred in this treatment. In the ICLF systems, the end points (A and E) obtained the smallest ADMY, as they are closer to the eucalyptus rows, in line with the fact that the Piatã grass suffers competition for water, light and nutrients with the eucalyptus. Oliveira et al. (2014), working with the Livestock-Forest Integration system and Piatã grass in the second grazing cycle found a reduction in the dry mass yield of Piatã Grass forage by around 34% to 53% in relation to the Piatã grass. This effect attributed to the greater tree component growth, intercepting a greater amount of light, resulting in a reduction in the Piatã Grass yield, natural over time. According to Balbino et al. (2011), the greater the spacing between the tree rows, the greater the radiation penetration in the forage substrate, favoring the biomass accumulation. However, the spacing between rows cannot be so great as to compromise the quantity and quality of the forest product per area and the desired tree cover for the animal protection. Thus, the results demonstrate that the tree component used in the evaluated systems must be used in a way that it is not too dense, impairing the Piatã grass accumulated dry mass yield.

CONCLUSIONS

The ICL system showed the highest accumulated dry mass yield in all sampling points. In ICLF28 and ICLF22 system, the highest accumulated dry mass yields were at central points C and D.

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