II WORLD CONGRESS ON INTEGRATED CROP-LIVESTOCK-FORESTRY SYSTEMS
May 4th and 5th, 2021 - 100% Digital

HEIGHT AND COVERAGE OF THE PIATÃ GRASS PASTURE IN A SYSTEM IN INTEGRATION AFTER GRINDING EUCALYPTUS

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ABSTRACT
This work aimed to evaluate the green cover and soil percentages; grass height; litter presence in Piatã grass pasture in integrated crop-livestock-forest system. The experiment was carried out at Embrapa Beef Cattle, agricultural year 2018/2019. The experimental design was a randomized block with the treatments packaged in subdivided plots, with 3 treatments (ICLF28, ICLF22 and ICL) and 4 repetitions. The evaluation months were from January to May 2019. In each one of them, with a sample area of 1.0 m x 1.0 m, the canopy height was measured with a graduated ruler starting from the ground level to the leaf tip; visual assessment of soil cover, litter and uncovered soil, by dividing the area into gradients, where each gradient corresponded to 25% of the point. The litter percentage was higher in the ICLF22 and ICLF28 systems, compared to ICLF in all months obtained. As well as higher plant height was also obtained in the Integrated Crop-Livestock system, in the same way as greater green coverage was observed.
Key words: Vgetation cover; soil uncovered; plant height

INTRODUCTION

The ICLF system is the intentional combination of agricultural, 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 forestry: ICF; livestock and forestry: ILF; of the three activities: ICLF (BALBINO et al., 2011a).

The addition of the forest component to the system, evolving to ICLF, increases the possibilities of use and activities combinations, as well as the environmental benefits, such as covering and enriching the soil, through the deposition of a dense organic material layer, established continuously by the leaves and branches fall, called litter. The litter is important for reactivating nutrient cycling, as it improves conditions for the vegetation establishment and microclimate conditions, such as, for example, relative humidity, thermal amplitude and wind intensity (BALBINO et al., 2011b).

Thus, the aim was to evaluate Piatã grass structural characteristics in an integrated crop-livestock-forest system.

MATERIAL AND METHODS

The experiment was carried out at the Technological Reference Unit (TRU) in Agrosilvopastoral systems, from Embrapa Beef Cattle, in Campo Grande-MS, Brazil. The region is found in the Cerrado biome, with an average annual rainfall of 1,560 mm, with defined seasons of rain from September to April and drought from May to August.

The experimental area used was composed of three systems: Integrated Crop-Livestock-Forest system with 28 m of eucalyptus rows (ICLF28); Integrated Crop-Livestock-Forest system with 22 m of eucalyptus rows (ICLF22); Integrated Crop-Livestock system (ICL).

The experimental design was a randomized block with the treatments arranged in subdivided plots, with 3 treatments in the plots (ICLF28; ICLF22; ICL) and 4 repetitions. The harvest months in January, February, March, April and May 2019 and the sampling points A, B, C, D and E made up the subplots.

The forage assessments were carried out for five months, between January and May 2019, in perpendicular transect to the tree rows in each plot. In each transect, 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 samples per plot.

In each of the samples, with a sample area of 1.0 m x 1.0 m, the canopy height was measured using a graduated ruler from the ground level to the leaf tip; visual assessment of soil cover, litter and uncovered soil.

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 package (FERREIRA, 2008).

RESULTS AND DISCUSSIONS

For the variables green cover and uncovered soil percentages (Table 1) there was interaction among systems and sampling points.

The ICL obtained the highest vegetation coverage, followed by the ICLF28 system at points B and C. The system that showed the lowest vegetation coverage was the ICLF22 system, where only point C was statistically similar to the other systems.

The vegetation cover variable, in the sample points, shows that in the ICL system all points had a higher behavior in relation to the other systems. The ICLF28 system shows the best results compared to ICLF22. The lowest values found were obtained at the points of the ends of the transects (A and E). These values are expected, as they refer to the competition suffered by eucalyptus trees.

For the uncovered soil variable there was also interaction by the Piatã grass with the sampling systems and points. The ICL presented the lowest values, that is, the lowest uncovered soil percentages at all sampling points. In the ICLF28 system, the points with the highest uncovered soil percentages were at the ends (A and E). In the ICLF22 system, the highest uncovered soil values were obtained, and within the system, the points that presented the highest values were also at the transect ends (A and E), within the system, the best result was obtained at the central point C.

The forage species growth is determined by their daily photosynthetic activity, accumulated in view of the available environmental resources. When exposed to shading, the growth rate of these species is quickly restricted due to the energy limitation required for photosynthetic processes (VARELLA, 2008).

Table 1. Vegetation cover and soil uncovered percentages in the sampling systems and location.

Site	ICL	ICLF28	ICLF22	CV (%)	P value
		Vegetation Cover (%)			
A	75.25 Aa	53.66 Bb	54.50 Bc		
B	76.00 Aa	72.30 Aa	65.08 Bb		
C	73.75 Aa	71.50 Aa	71.40 Aa	27.80	0.012
D	73.00 Aa	68.00 Ba	63.75 Bb		
E	77.00 Aa	58.20 Bb	54.17 Bc		
		Uncovered Soil (%)			
A	8.75 Ba	19.10 Aa	22.35 Aa		
B	8.00 Ba	9.50 Bb	13.75 Ab		
C	9.18 Aa	8.25 Ab	9.25 Ac	26.54	0.013
D	8.67 Aa	9.55 Ab	13.50 Ab		
E	6.12 Ba	18.25 Aa	20.75 Aa		

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

The variables plantheightand litter percentage (Table 2), there was a difference among the production systems used.

The plants height statistically higher in the Integrated Crop-Livestock system in relation to the Integrated Crop-Livestock-Forest systems was expected, as it does not suffer any competition for resources.

The system with the highest plant height was the ICL. For the litter variable, the ICLF28 and ICLF22 systems obtained higher percentages, being statistically equal to ICLF28 and ICLF22.

One aspect taken into account in relation to the canopy is related to the forage plants growth, under the shade projection in silvopastoral systems, since the response of any plant to the lower light availability is the stretching, as identified in silvopastoral systems with intense shading (Sousa et al., 2007).

Table 2. Grass plant height (cm) e litter presence (%) in the systems.

Variable	ICL	ICLF28	ICLF22	CV (%)	P value
Height (cm)	53.64 A	47.22 B	44.07 B	16.73	<0.01
Litter (%)	15.18 B	24.70 A	22.30 A	21.01	<0.01

Means followed by the same uppercase letter on the row, do not differ by the Tukey test (P> 0.05).

CONCLUSIONS

The litter percentage was higher in the ICLF22 and ICLF28 systems. Higher plant height was obtained in the Integrated Crop-Livestock-Forest system, as well as greater green coverage.

ACKNOWLEDGMENTS

CAPES for granting the scholarship.

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