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“Solidarity in a competing world —
fair use of resources”

***Brachiaria brizantha* cv. BRS Piatã Forage Yield under Integrated Crop-Livestock-Forestry Systems in Brazil**

MARIANA PEREIRA¹, SARAH GLATZLE², VALÉRIA ANA CORVALÃ DOS SANTOS³, MARIA DA GRAÇA MORAIS¹, JULIANA MARA DE FREITAS SANTOS², ROBERTO G. ALMEIDA⁴

¹Federal University of Mato Grosso do Sul, Animal Science, Brazil

²University of Hohenheim, Inst. of Agricultural Sciences in the Tropics (Hans-Ruthenberg-Institute), Germany

³São Paulo State University (UNESP), Animal Science, Brazil

⁴EMBRAPA Beef Cattle, Integrated Production Systems, Brazil

Abstract

Integrated crop-livestock-forestry (ICLF) systems are increasingly considered for a diversified agricultural production in Brazil. In this study we analysed the forage yield [kg DM ha⁻¹], of *Brachiaria brizantha* BRS cv. Piatã for ICLF demonstration plots at the Brazilian Agricultural Research Corporation - EMBRAPA, located in Campo Grande-MS, Brazil. The analysed plots with four replicates corresponded to three production systems: Two integrated crop-livestock-forestry systems (ICLF1 and ICLF2) and an integrated crop-livestock system (ICL). The trees (*Eucalyptus urograndis*) in the ICLF systems were planted in single rows with 2 m between trees and 14 or 22 m between rows, resulting in 357 trees ha⁻¹ (ICLF1) and 277 trees ha⁻¹ (ICLF2), respectively. The crop component is soy-bean, planted every 4 years. Grass biomass was sampled monthly in a line of five sampling points at equal distance from each other between tree rows to represent the understory shading gradient. Animal feed intake was considered using the moving cages method. During the dry season (June - October) the forage yields between the different treatments didn't differ significantly from each other (average 5.4 kg DM ha⁻¹). In the rainy season (November - January) the ICLF system had the highest forage yield (ICLF 17.7 > ICL 6.6 kg DM ha⁻¹). Most likely the main reason for these results is due to the management practice. In the dry season the ICLF systems had such a low stocking rate compared to the ICL system, that in the rainy season the ICLF systems were able to exceed the forage production of the ICL system. In the tree plots during the dry season the forage yields along the shading gradient didn't differ significantly (average 5.3 kg DM ha⁻¹). In the rainy season the points with higher shading (near the tree rows) had lower forage yields (9.9 and 11.8 kg DM ha⁻¹, respectively) than the central points (16.1 kg DM ha⁻¹). The microclimate within the tree plots has a great effect on the forage production. During the dry season the shading effect of the trees on the whole area is more evenly distributed resulting in similar forage yields along the shading gradient.

Keywords: Agroforestry, Brazilian savannah, shading, tropical grass