

Litter deposition in integrated agricultural systems in the Brazilian Cerrado

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Introduction

In agro-ecosystems, litter is a major component, comprising material that is deposited in the soil by fauna and flora. Integrated crop-livestock systems (ICL) and crop-livestock-forest systems (ICLF) are expected to enhance the use of plant biological cycle. Therefore, this study aimed to characterize litter deposition in integrated systems at the Brazilian Savannah, the Cerrado in Mato Grosso do Sul State, Brazil.

Material and Methods

The trial was carried out in Campo Grande, MS, Brazil (20°27' S, 54°37' W, 530 m altitude). Weather pattern in the region, according to Koppen, lies in the transition zone between Cfa and humid tropical Aw. The ICL system consisted of pasture grass (*Brachiaria brizantha* cv. BRS Piatã) for three years after one season soybeans crop in the Summer 2012. The ICLF system was like the ICL but with eucalyptus trees arranged in 22m x 2m (227 trees ha⁻¹). Pastures were managed under the same forage allowance and a plot in the Cerrado (native Savannah) was used as control. In late Spring 2014 15 representative samples per system (ICL, ICLF and Cerrado) were collected. At each sampling point, litter was collected from a 0,25m x 0,25m square. Subsequently the material was dried to calculate litter dry matter per hectare.

Results and Conclusions

In late Spring samples had only grass residues (Litter 1) resulting in greater litter accumulation for the Cerrado compared to the ICL and ICLF systems which showed no significant difference between them. However, when samples included forestry component (Litter 2), as expected, litter accumulation was lower in the ICL system when compared to ICLF and Cerrado, which did not show statistical difference between them (Table 1). These results indicate that the contribution of litter volume from the forestry component of ICLF is similar to the Cerrado. Therefore, it can be a contribution to agro-ecosystems' biodiversity.

Table 1. Dry mass of litter during spring 2014 in two agro-ecosystems, only fodder (1) and plus forestry component (2) relative to the native vegetation (Cerrado).

System	Litter 1 (kg ha ⁻¹)	Litter 2 (kg ha ⁻¹)
ICL	4,607 b	4,607 b
ICLF	4,932 b	7,106 a
Cerrado	9,402 a	9,402 a

a>b, in the column, by Tukey test (p<.05).

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