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Forage mass ,carrying capacity and daily weight gain of crossbred heifers in silvopastoral system or exclusive signalgrass pasture

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Key words : *Brachiaria decumbens* ,dairy cattle ,season of the year ,shading ,legume trees

Introduction Pasture degradation characterized by soil erosion ,weed invasion ,low forage yield and nutritive value and animal performance and productivity often is the result from mistaken pasture management .Silvopastoral systems are an option to overcome pasture degradation by promoting soil and water conservation ,improved thermal animal comfort and forage nutritive value as well (Paciullo et al 2007) .Nonetheless ,the adoption of such system is hampered due to limited research data on the effect of factors influencing their efficiency .This study aimed at the comparison of a silvopastoral system with a monoculture of signal grass pasture (*Brachiaria decumbens* cv Basilisk) .

Material and methods The trial was run from April 2005 to March 2006 .The experimental area comprised a 16 ha of a hilly Red-Yellow Latosol .Mean rainy fall and temperature figures were respectively ,60mm and 17°C from April to September and 230mm and 24°C m from October to March .Two experimental treatments were compared : exclusive signalgrass pasture and a silvopastoral system ; the latter consisting of signalgrass pasture established in 30m wide strips ,alternating with 10m wide strips of four lines of tree legumes species : *Acacia mangium* ,*A .augustissima* e *Mimosa arthemisia* ,besides *Eucalyptus grandis* .The experimental design was completely randomized ,with two replications .The experimental animals were dairy crossbred Holland-Zebu heifers ,with initial live-weight of 250 kg ,there being three heifers per experimental unit .The grazing system was intermittent one with grazing cycles of 42 and 56 d ,in the rainy summer season and the dry winter season , respectively ,observing a seven days grazing period .The put and take method was used to adjust the same grazing pressure on the experimental units .Green forage mass ,pasture carrying capacity and live weight gain per heifer and ha were the assessed response variables .The ANOVA of the data considered the repeated measure in time option of the GLM (General Linear Model) from the SAS .

Results Experimental treatments and their interaction with months did not affect ($P > 0.05$) green forage mass nor pasture carrying capacity ; still these attributes varied over the months of the year .Forage mass reached highest value in January (2,295 kg/ha) progressively decreasing from March (1,728 kg/ha) to September with the lowest figure (797kg/ha) .From October on ,the figures increased in response to the improved climatic conditions of rainfall and temperature ,reaching the highest figure of 2,117 kg/ha .Pasture carrying capacity varied from 0.85 to 2.40 heifer/ha (0.66 and 1.60 AU/ha) ,showing a response standard similar to that of the forage mass .The live weight gains did not respond to the experimental treatments during the dry season but in the rainy season these figures were 14.9 and 21.3% higher for the silvopastoral treatment relative to the exclusive signalgrass pasture (Table 1) .This superior animal performance and productivity of the heifers under the silvopastoral system is attributed to the favorable shadow effect on the forage nutritive value (Paciullo et al .,2007) as well as the on thermal heifer comfort ,mainly during the hot summer season (Paes Leme et al 2005) .

Table 1 Heifer average daily gain (ADG) (g/head/day) and live weight gain (LWG) (kg/ha) ,in silvopastoral system (SPS) and *B.decumbens* pasture (BDP) .

Treatment	Dry season		Rainy season	
	ADG	LWG	ADG	LWG
SPS	276 a	62 a	647 a	221 a
BDP	252 a	59 a	563 b	182 b

Means followed by same letter do not differ ($P > 0.05$) by the Tukey test .

Conclusion The silvopastoral system is a viable pasture management strategy for growing dairy heifers under the tested environmental conditions .

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