

**PERFORMANCE OF STEERS IN *Brachiaria decumbens* PASTURES, PERMANENT
AND IN ROTATION WITH SOYBEAN**

L.A.Z. Machado, A.C. Fabrício, J.C. Salton

EMBRAPA- CPAO, CP 661, Dourados, MS, Brasil, 79824-970 zago@cpao.embrapa.br

Abstract

The integration agriculture/pasture is an alternative that allows countless benefits to the rural producer. At Embrapa Agricultural West four production systems were studied and two of them involved animal production. The systems Soybean/Pasture Rotation and Permanent Pasture were compared from september/98 to may/99. The availability and residue of dry matter of green leaves blades (DMGLB), stems (SDM) and senescent material, the gain/animal and gain/area was evaluated. The availability was monthly assessed. Herbage residue was higher in the Soybean/Pasture Rotation system. This system allowed gain/animal and gain/ha of 0.814 kg/day and 582 kg/ha, respectively, whereas the Permanent Pasture system the gain was 0.749kg/day and 515 kg/ha.

Keywords: rotation soybean/pasture, gain/animal, gain/ha, availability, forage residue

Introduction

The integration of the agricultural and livestock activities is an important alternative because it guarantees the production stability, and income for the producer. In the Southeast and Center-west of Brazil this integration was very much used when opening new agricultural areas, the pasture grass being sowed close to cultures such as corn and rice. Now,

integration is used in order to reform degraded pastures, mainly through the so-called “Barreirão” system (Kichel et al., 1996).

The no till system (soybean – *Glycine max*) on the signalgrass (*Brachiaria decumbens*), is a recent practice that allowed the rotation agriculture/pasture. Besides the economic aspect, there is also an environmental gain, as the pasture residues keep the soil covered during the agricultural cycle. On the other hand, the pasture benefits from the fertilizer residues left in the soil, by the annual crops. This system allows a great increment in the soybean and beef revenue (Broch et al., 1997).

Embrapa Agricultural West has been working on the development of agricultural production systems since 1996. In the research project "Environmental Impact of Intensive and Integrated Systems of Production of Grains and Beef, in the West of Brazil", among other experiments, pastures is being used in the following systems: a) Soybean/Pasture Rotation; and, b) Permanent Pasture.

Material and Methods

This research was carried out on a Red Dusky Latosol (Haplorthox), at an experimental area of Embrapa Agricultural West, Dourados, Brazil. In the treatment Soybean/Pasture Rotation, the pasture area is replaced for soybean and soybean for pasture, every two years. The stripe of land evaluated with pasture was established in november/97 with *Brachiaria decumbens*. The Permanent Pasture treatment was sowed in november/95 with *Brachiaria decumbens*, in a cultivated area of 3.1 ha, where farming grains had been sown for several years. Each area was subdivided in 9 plots, in order to allow the handling of pasture and animals. Fertilizers were applied only in the crops prior to the grass sowing and fertilizers were not used neither in the implantation nor the maintenance of the pasture.

Castrated $\frac{1}{2}$ nelore x $\frac{1}{2}$ hereford steers were used, aging from 12 to 19 months, at the beginning and at the end of the evaluation, respectively. The rotational grazing observed a 27 days grazing cycle of 24 days of rest and 3 days of grazing period. The forage availabilities before each grazing and the residue after the grazing were determined in one of the plots. The methodology of variable stock was used: during the whole assessment period eight testers animals were placed at the Permanent Pasture and ten at the Soybean/Pasture Rotation. Put-and-take animals were used to adjust the grazing pressure. The stock was adjusted, when necessary, to maintain an offer of dry matter of sheets of green leaves from 6 to 8%.

Results and Discussion

For both systems, the herbage availability was higher at the beginning of the experimental period. The medium availability of dry matter of green leaves blades (DMGLB), at the beginning of each grazing period was higher at the Soybean/Pasture Rotation system than at the Permanent Pasture. This could be attributed to the residues of fertilizers used in the soybean crop, in the system Soybean/Pasture Rotation (Figure 1).

The forage availability and residue in the Permanent Pasture system can be considered high for the species *Brachiaria decumbens*, when compared to the reality of the region. This high availability was due to the handling of the pasture, with the periodic adjustment of the stocking rate to maintain constant herbage availability. Thus, the animals were allowed to consume great amount of forage, with average monthly disappearance rate of approximately 450 kg/ha of available DMGLB, regardless system, and the daily disappearance rate varied from 1.74 to 1.81%, at the Soybean/Pasture Rotation and Permanent Pasture systems, respectively (Table 1).

The results on the rate of forage disappearance (DMCLB + SDM) obtained in this work were similar to those of Wendling et al. (1997), who observed a daily consumption of

2.48 and 2.42 of dry matter of forage/day/100kg of body weight of body weight by 500 kg live weight dairy cows on signalgrass pasture managed to offer 4 and 8%, respectively.

The daily average gain was slightly higher in the Soybean/Pasture Rotation system. Even though the Permanent Pasture system showed deficiency symptoms, especially of nitrogen, the average daily gain was relatively high due to the high herbage allowance. The gain/ha was higher in the Soybean/Pasture Rotation system. The difference between the systems was not greater because the Permanent Pasture was also established on farming area, where the fertility of the soil was reasonable. It is possible that this difference would increase as time goes by and the soil fertility returns to its original level.

The daily average gain, for both systems, was higher than those obtained by Leite & Euclides (1994) who report a gain of 20 to 700 g/animal/day in *Brachiaria decumbens*, on september and may, respectively. It was also higher than the gains/animal observed by Valle et al. (1996) that obtained 464 g/animal/day, on *B. decumbens* in the rainy season. Regardless of system gain per animal and per hectare, were higher than those obtained by Euclides et al. (1993) who report 460 g/animal/day and 343 kg gain/ha/year, during the rainy season, for signalgrass pasture. The soybean/pasture rotation is a system with potencial for improving animal production from pastures.

References

- Broch, D.L.; Pitol C. and Borges E.P.** (1997). Integração agricultura-pecuária: plantio direto da soja sobre pastagem na integração agropecuária. Maracaju: Fundação MS, 1997. 24p. (Fundação MS. Informativo Técnico, 1/97).
- Euclides, V.P.B.; Zimmer A.H.; Portela P.G.; Macedo M.C.M. and Oliveira M.P.** (1993) Evaluation of *Brachiaria decumbens* and *Brachiaria brizantha* under grazing. In: International Grassland Congress 17, 1993. Palmerston North, New Zealand.

Proceedings... Palmerston North: New Zealand Grassland Association, 1993. p. 1997-1998.

Kichel, A.N.; Miranda C.H.B. and Macedo M.M. (1996). Conventional and multiple cropping systems of upland rice for reclamation of degraded *Brachiaria decumbens* pastures. In: Simpósio sobre Cerrado 8, 1996, Brasília, DF. Biodiversidade e produção sustentável de alimentos e fibras nos cerrados: anais. Editado por Roberto Carvalho Pereira, Luiz Carlos Bhering Nasser. Planaltina: EMBRAPA-CPAC, 1996. p.443-445.

Wendling, I.J.; Gomide J.A.; Braz S.P. and Santos H.Q. (1997). Consumo de forragem e produção de leite em pastagem de *Brachiaria decumbens* STAPF adubada sob duas ofertas diárias de forragem. In Reunião Anual da Sociedade Brasileira de Zootecnia, 34, 199~7, Juíz de Fora, MG. Anais...Editado por Rosane Scatamburlo Lizieire, Margarida Mesquita Carvalho, Oriel Fajardo de Campos, Limírio de Almeida Carvalho e Carlos Eugênio Martins. Juíz de Fora, SBZ, 4: 258-60.

Leite, G.G. and Euclides V.P. (1994). Utilização de pastagem de *Brachiaria spp.* In: Simpósio sobre Manejo de Pastagem 11, 1994, Piracicaba, SP. Anais... Piracicaba: FEALQ, 1994. p.267-298. Editado por Aristeu Mendes Peixoto, José Carlos Moura, Vidal Pedroso de Faria.

Valle, L. da C.S.; Cardoso E.G.; Silva J.M. da; Miranda C.H.B. and Feijó G.L.D. (1996) Produção animal em *Brachiaria decumbens* pura e em sistema *B. decumbens* – *Pennisetum purpureum*. In: Reunião Anual da Sociedade Brasileira de Zootecnia, 33., 1996, Fortaleza, CE. Anais... Fortaleza: SBZ, 1996. 2: 84-86.

Table 1

	Soybean/Pasture Rotation		Permanent Pasture	
	DMSG ¹	DMS ²	DMSG ¹	DMS
Availability (kg/ha)	1,439	2,478	1,948	3,492
Residue (kg/ha)	982	2,300	1,483	3,251
Disappearance rate *	1.74	1.15	1.81	0.92
Stock (kg/ha)	1043.2		984.0	
Gain/animal (kg/an./day)	0.814		0.749	
Gain/ha (kg/ha)	582.0		515.6	

* kg dry matter disappearance/100 kg of body weight/day

¹ DMSG - dry matter of sheets of green leaves

² DMS - dry matter of stems

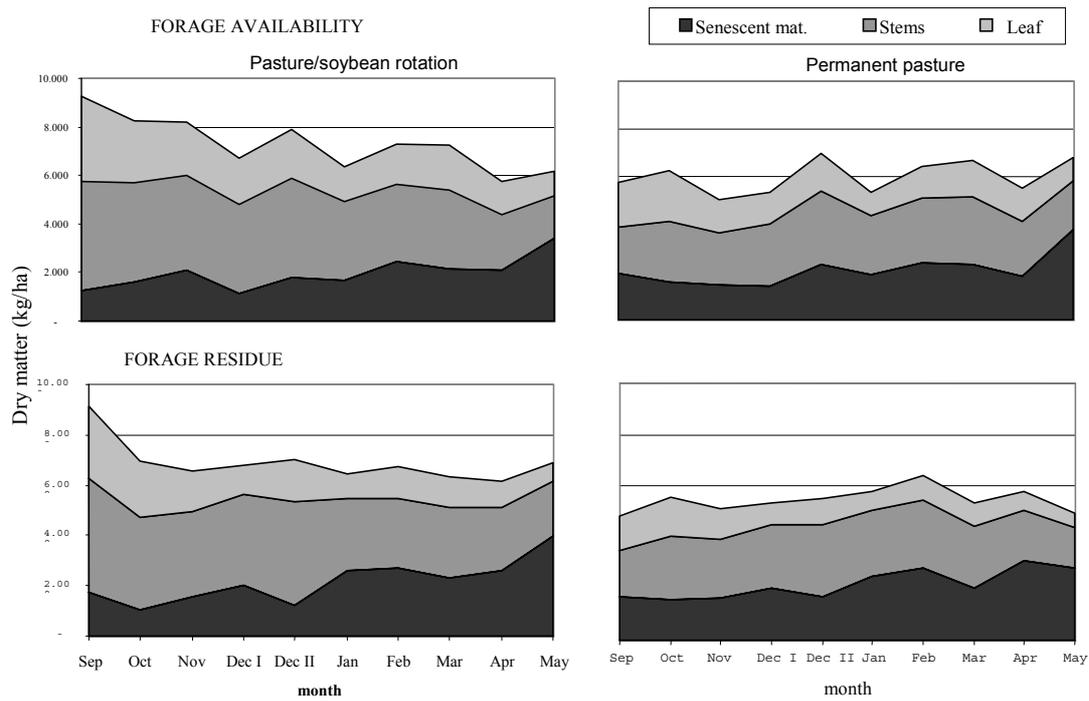


Figure 1 - Forage availability and residue and their component in the soybean/pasture rotation and permanent pasture systems.