

Productivity of a *Leucaena leucocephala*-*Cynodon nlemfuensis* silvopastoral system with sheep in Yucatan, Mexico

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Introduction Animal production in the tropics of Mexico is based on grazed grasslands of low productivity; this type of production system has reduced the areas of natural vegetation and damaged the ecology (erosion of flora, fauna and soil). Silvopastoral technologies may improve the welfare and economic conditions of the rural population and, consequently, preserve their natural resources. The current work was designed to assess the introduction of *Leucaena leucocephala* in a silvopastoral system with *Cynodon nlemfuensis* (star grass) grazed by sheep.

Materials and methods The experiment was carried at the ITA 2, located in Conkal (20° 59' N, 89° 39' W), Yucatan, Mexico. The climate of the area is Aw_o (García, 1998) with a mean annual rainfall of 850 mm and mean temperature of 26.5 °C. Soils are Lithosols with pH 7-8 (Duch-Gary, 1988). The study was conducted from September 1999 till February 2000. The design was a completely randomised block with three repetitions and a 2 x 2 factorial arrangement. The experimental factors were 1) Systems (a. star grass alone; b. star grass and leucaena; 2) Seasons of grazing (a. late-rainy season; b. dry season). Availability of green dry matter (GDM), percentages of leaf, stem and dead material of the forage grass, and daily liveweight gain (DLG) of Pelibuey sheep was recorded. Experimental plots were 525 m² in size, which were rotationally grazed, with 7 days grazing and 28 days rest during the late-rainy season, and 5 days grazing with 35 days rest during the dry season. There were 16 grazing cycles with 24 young male sheep (Pelibuey).

Results The GDM yield in the late-rainy season was greater ($p < 0.0001$), with 2,678 kg GDM/ha, than, in the dry season with 2,272. The GDM was lower ($p < 0.01$) with star grass alone than with star grass and leucaena, (2,350 and 2,600 kg/ha, respectively). The leaf:stem index was significantly ($p < 0.001$) lower during the late-rainy season (0.28) than in the dry season, (0.39), but was similar ($p > 0.05$) in the 2 systems. At the beginning of the trial, leucaena was at the flowering phase, resulting in many flowers and pods before pruning. The many branches per plant of leucaena (6.5 during the rainy and 4.9 in the dry season), resulted in a high leaf availability. The stem diameter was similar in both seasons. The DLG of Pelibuey sheep was 29 and 46 g for star grass alone and star grass and leucaena, respectively ($p < 0.01$). However, DLG was similar ($p > 0.05$) in the 2 seasons. The low GDM yield contribution of leucaena to the system could be associated with the climatic and soil conditions of the experimental site; in addition, the pruning may have reduced the leucaena yield. DLG was higher in the leucaena- star grass treatment. Alayon *et al.* (1998) found a positive effect of *Gliricidia sepium* as a supplement to low quality *C. nlemfuensis* hay on DM production, organic matter and crude protein intake with Pelibuey sheep. It should be possible then to expect a similar effect with leucaena.

Conclusions The use of leucaena in a silvopastoral system with *C. nlemfuensis* grasslands increased the GDM of forage biomass during the late-rainy season and, consequently, the DLG of Pelibuey sheep in Yucatan.

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References

- Alayon, J.A., L. Ramirez-Aviles & J.C. Ku-Vera (1998). Intake, rumen digestion, digestibility and microbial nitrogen supply in sheep fed *Cynodon nlemfuensis* supplemented with *Gliricidia sepium*. *Agroforestry Systems*, 4, 115-126
- Duch-Gary, J. (1988). La conformacion territorial del Estado de Yucatan. Los componentes del medio fisico. Centro Regional de la Peninsula de Yucatan. Universidad Autonoma Chapingo. Mexico, D.F. pp. 295-395
- Garcia E. 1998. Modificaciones al sistema de clasificacion climatica Köppen (para adaptarlo a las condiciones de la Republica mexicana). 3ª Edición. México, D.F. p. 120