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**INTAKE AND YIELD OF *CYNODON NLEMFUENSIS* ALONE AND ASSOCIATED  
WITH *LEUCAENA LEUCOCEPHALA* GRAZED BY SHEEP**

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**Abstract**

The objective of the present study was to determine dry matter intake (DMI) and the forage yield of green dry matter (GDM) of star grass (*Cynodon nlemfuensis*) alone and associated with *Leucaena leucocephala* cv. Perú grazed by sheep. The experimental treatments were: Systems T1) Star grass alone, and T2) Star grass + *L. leucocephala*. These treatments were evaluated during three seasons (i.e. Late-rainy, Dry and Rainy seasons). The availability of forage was lower ( $P < 0.0001$ ) in T1, 2543 kg GDM/ha, than with T2, 3092 kg GDM/ha. Green dry matter in the rainy season was greater ( $P < 0.0001$ ), with 3910 kg GDM/ha, than in the late-rainy and dry seasons, 2492 and 2052 kg GDM/ha, respectively. DMI was 5.9 and 7.6 g DM/kg of LW<sup>0.75</sup>/hour for the T1 and T2, respectively ( $P < 0.0001$ ). DMI during the rainy season was lower ( $P < 0.01$ ) than that of the dry and late-rainy seasons, 6.2, 6.4 and 7.5 g DM/kg LW<sup>0.75</sup>/hour, respectively. The association *C. nlemfuensis*-*L. leucocephala* increased the availability of forage and the voluntary intake.

**Keywords:** *Leucaena leucocephala*, *Cynodon nlemfuensis*, voluntary intake, grass-legume yield, grazing sheep

## **Introduction**

Animal production in the tropics is, generally, based on the use of pure grass swards, which are low in protein content and high in fiber, both of them limit animal productivity. Natural resources (e.g. soil) in pure grass swards are easily lost from the system, mainly because of the lack of biodiversity, and results in a reduction of productivity. The introduction of forage tree legumes in pure grass paddocks could improve animal diet (and consequently, its production) and plant biodiversity (Gutteridge and Shelton, 1994). *Leucaena leucocephala*, a native shrub from Central America, has been shown to have a great potential in animal production systems (Shelton and Brewbaker, 1994). Despite the amount of information on *L. leucocephala*, very little is known about its contribution when it is associated with grass swards grazed by sheep under the conditions of Yucatán. Therefore, the present study was designed to determine the influence of associating *L. leucocephala* and Star grass grazed by sheep on voluntary intake and forage yield.

## **Material and Methods**

The present experiment was carried at the Instituto Tecnológico Agropecuario 2 (20° 59' North Latitude, 89° 39' West Length) of Yucatán, México. The climate of the area is Aw<sub>o</sub>, with a mean annual rainfall and temperature of 850 mm and 26.5 °C, respectively. Soils are classified as Litosols with pH of 7-8 (Duch-Gary, 1988). A completely randomized design with three repetitions and a factorial arrangement (2x3) were used. The experimental factors were: Systems T1) Star grass alone, and T2) Star grass + *Leucaena leucocephala* cv. Perú, and Seasons: Late-rainy, Dry and Rainy. Experimental paddocks were of 525 m<sup>2</sup> in size, which were split into four

sections and rotationally grazed, with 7/28 days of grazing and rest periods, respectively, during the late-rainy and rainy seasons, and 7/42 days grazing and rest periods, during the dry season. Rows of *L. leucocephala* were planted into star grass 3 m apart. After planting, *L. leucocephala* was allowed to grow for one year and then cut down to 0.5 m; subsequently, it was cut every three months during the following year. After the second year, and once the legume produced enough foliage (2 months after the last cut), sheep were allowed to graze it. Availability of forage grass was determined by cutting ten quadrats of 0.25 m<sup>2</sup>/paddock, located at random in each experimental paddock. *L. leucocephala* green forage was determined by cutting four plants selected at random in the central rows of the paddocks. Percentage of leaf, stem and dead material of the forage grass were determined to calculate the green dry matter (GDM) yield. The voluntary forage intake was determined using the rumen evacuation technique described by Osuji *et al.* (1995). Six ruminally cannulated experimental male sheep (Pelibuey) were employed. Collected rumen ingesta was dried in an oven at 60 °C for 48 h. Experimental data were submitted to an analysis of variance using SAS (SAS, 1985). Significance among means was tested by the Tukey procedure.

## **Results and Discussion**

The availability of forage (Figure 1) was significantly ( $P < 0.0001$ ) lower with T1 than with T2, 2543 and 3093 kg of GDM/ha, respectively. Forage yield during the rainy season was greater ( $P < 0.0001$ ) than during the late-rainy season, 3910 and 2492 kg of GDM/ha, mainly because of the better growing conditions in the former season. The lowest forage yield was recorded in the dry season, 2052 kg of GDM/ha. DMI throughout the year (Figure 2) was lower ( $P < 0.0001$ ) for T1 than for T2, 5.9 and 7.6 g of DM/kg of LW<sup>0.75</sup>/hour. DMI in the late-rainy season was lower ( $P < 0.01$ ) than in the dry season, which could be related to the low forage

availability. The lowest DMI was observed during the rainy season, 6.2 g of DM/kg of LW<sup>0.75</sup>/hour. The increased DMI on grass-legume mixture, compared with the pure grass sward, could be associated with the high protein content of the forage, which encouraged microbial activity, and the rate of passage of solid digesta through the rumen, as it has been shown by Devendra (1995), Poppi and Norton (1995) and Manyuchi *et al.* (1997). A factor that could have influenced negatively DMI during the late-rainy and rainy seasons was the high water content of the forage. According to results, grass-legume mixture increased the voluntary intake of sheep under grazing conditions. Also, DMI during the dry season was greater than in the rainy and late-rainy seasons.

### **Acknowledgments**

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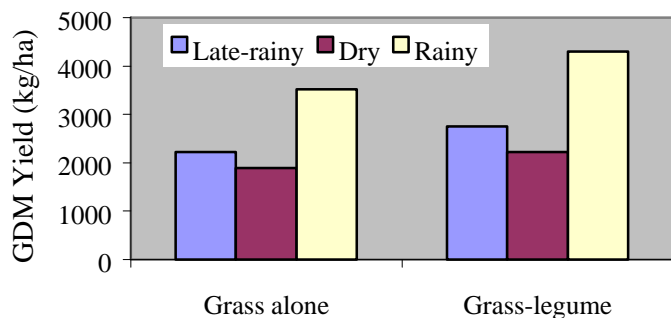
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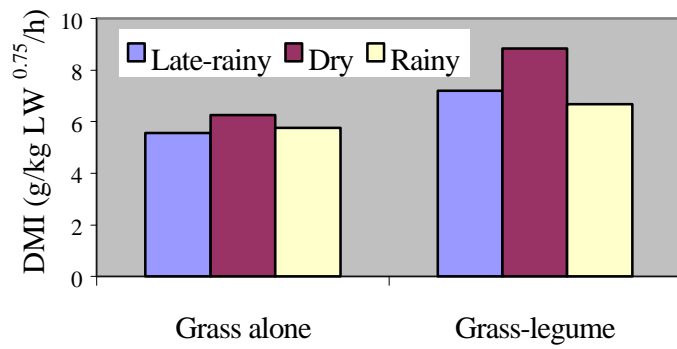
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**Figure 1** - Availability of Green dry matter (GDM) from star grass alone and associated with *L. leucocephala* grazed by sheep through out the year in Yucatán, México



**Figure 2** - Dry matter intake (DMI) of sheep grazing star grass alone and associated with *L. leucocephala* through out the year in Yucatán, México.