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International Grassland Congress Proceedings   23rd International Grassland Congress

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Paper ID: 456
Theme 2. Grassland production and utilization
Sub-theme 2.2. Integration of plant protection to optimise production

Description of *Leucaena* on-offer browse at different *Leucaena* density

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Keywords: Browsing, Fodder, Leaves, Tree legume

Introduction
Leucaena (*Lecuaena lecucephala* (Lam.) de Wit) is a tree legume widely used to establish silvopastoral systems along with different tropical grasses. The relation of Leucaena density to browse available at the start of each grazing period in a rotational grazing management is important information when designing a silvopastoral pasture (Anguiano *et al*., 2013). Then the objective of the study was to determine Leucaena on-offer browse at different Leucaena density.

Materials and Methods
Three Leucaena densities: 2050, 3928 and 6250 plants/ha during three grazing cycles were evaluated under a split-plot design (Steel and Torrie, 1988) main plots were Leucaena densities and sub-plot the grazing cycles; there were three replications, the experimental unit was a plot with 13 Leucaena plants, each plot was of 26.4, 58.3 and 95.3 m^2 for the highest to the lowest Leucaena density, respectively. For all plant densities Leucaena rows were 2 m apart, target plant densities were reached by changing plant distance within the row. Massai grass was sown between Leucaena rows. Experiment was done in the Ejido El Limón, state Morelos, México and lasted from late July to early November 2012. Grazing was done by replications, within each grazing cycle only three replications were grazed at the time. Grazing periods were of 8, 10 and 9 days for the first, second and third grazing cycles, respectively. Grazers were ewes at a stocking density of 150, 268 and 375 ewes/ha. Leucaena on-offer browse was determined by removing all leaves from one plant per plot, leaves were weighed after drying at 60°C for 72 h, in each sampling a different plant was selected, no estimation of residual *Leucaena* browse was done as there were no leaves left at the end of each grazing period. Statistical analysis was by analysis of variance, mean separation was by Tukey at α=0.05.

Results and Discussion
The interaction Leucaena density X grazing cycle and grazing cycle showed influence (P<0.05) on on-offer browse with no effect (P>0.05) of Leucaena density (Table 1). At the first grazing cycle the higher the Leucaena density so it was on-offer browse; however, as the grazing season went on, on-offer browse was the same across the three *Leucaena* densities. In the first grazing *Leucaena* on-offer browse was 2.5 times higher at the highest *Leucaena* density in relation to the lowest; however, the highest Leucaena density was 3 times higher than the lowest. From the first to the last grazing cycle *Leucaena* on-offer browse decreased 64%.

Table 1. Leucaena on-offer browse (kg DM/ha) at three grazing cycles and three Leucaena plant densities.

Grazing cycle	Leucaena density (plants/ha)			Grazing cycle mean
	2050	**3928**	**6250**	
First	167.2 ± 6.7 ab	319.5 ± 72.2 ab	417.6 ± 135.4 a	301.4 ± 57.3 A
Second	83.2 ± 28.9 b	119.2 ± 25.7 b	267.5 ± 92.1 ab	156.6 ± 40.3 B
Third	72.5 ± 44.3 b	135.5 ± 26.4 b	117.0 ± 9.6 b	108.3 ± 17.8 B
Season mean	107.6 ± 21.4	191.4 ± 39.7	267.3 ± 64.2	
No effect (P>0.05) of Leucaena density; a,b. and A, B. means with one letter in common were not different (Tukey; α=0.05)				

From the first to the last grazing cycle there was a gradual reduction of on-offer browse, at the same time there were no more differences among *Leucaena* densities. At the early part of the grazing season on-offer browse was dependent of *Leucaena* density, after that on-offer browse could be determined by climate factors as lower night temperatures and available soil moisture rather than *Leucaena* density.

Conclusion

Early in the season, Leucaena on-offer browse increases as Leucaena density is higher, after that Leucaena density shows no influence on on-offer browse.

References

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