

Improvement of the Unit Area Productivity from Forages by Agroforestry (*Leucaena leucocephala* (Lam.) De Wet) with Some Grasses Species

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THE PRESENT investigation aimed to determine the optimum productivity and increase the efficiency of saline soils of Wadi Sudr district, South Sinai, Egypt. A field experiment was performed on a saline soil at Ras Sudr Research Experiment Station, Desert Research Centre during two successive seasons 2005/2006 and 2006/2007 to study the effect of agroforestry systems and nitrogen rates on forage yields of *Leucaena* shrubs and the studied grasses, *i.e.* Panicum, Kallar grass and Rhodes grass in a split plot design where main plots assigned for agroforestry systems: *i.e.* single *Leucaena*, *Leucaena* + Panicum; *Leucaena* + Kallar grass; *Leucaena*+Rhodes grass, while nitrogen rates (60,90,120 kgN/fed) were allocated in the sub plots. The experimental work focused on the effect of integrated system and nitrogen fertilizer on growth, forage yield and its quality of shrub and grasses species.

The important results could be summarized as follows:

- Increasing nitrogen levels up to the highest rates (120 kgN/fed) significantly increased growth trait and forage yield of *Leucaena*. Meanwhile, chemical constituents of *Leucaena* increased with the highest rate of nitrogen.

- Agroforestry systems between *Leucaena* and grasses affected on growth trait and forage yields. The forage yield of *Leucaena* monoculture was higher than that when intercropped with grasses. *Leucaena* that intercropped with Panicum gave higher yields than when intercropped with other species. Also crude protein and crude fiber increased with *Leucaena* intercropped with Panicum.

- The interaction between nitrogen rates and agroforestry system was significant on all studied traits of shrubs. Data obtained showed that, the highest value of shrubs with monoculture *Leucaena* with the highest rate of nitrogen, as compared with grasses Panicum with *Leucaena* which surpassed other species.

- Significant increase in growth trait, fresh and dry forage yield and chemical content of grasses as well as increase rate up to 120 kg N/fed.

- Agroforestry system affected on grasses species, where forage yield were increased when grasses were intercropped with *Leucaena*. Panicum with *Leucaena* gave the highest crude protein.

Keywords: *Leucaena leucocephala*, Grasses, Nitrogen fertilizer, Growth criteria, Forage yield and its quality.