

Agronomic evaluation of twenty ecotypes of *Leucaena* spp. for acid soil conditions in México

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Introduction

Leucaena leucocephala has been shown to be a good forage producer and to possess good persistence under grazing conditions in México, tolerating well the management of local cattlemen (Quero *et al.* 2004). The *Leucaena* genus is native to central America and Mexico (Hughes 1998), but *L. leucocephala* is a low producer under acid soil conditions. The natural diversity is a good source of tolerance of acid soil conditions and resistance to other adverse factors. Several *Leucaena* accessions were evaluated for production under acid soil conditions in tropical Mexico.

Materials and methods

In order to compare 17 *Leucaena* species for forage-production potential under acid soils conditions in the dry tropics, 20 ecotypes: local, from Oxford Forestry Institute (UK), and from the International Center for Tropical Agriculture (CIAT, Colombia), were established and evaluated at CAEPAP (Campo Agrícola Experimental del Papaloapan) in Isla, Veracruz (Table 1), under rainfed conditions in Acrisol soils (4.7 pH). Plants were transplanted, under a randomised complete block design with three replicates. Plots consisted of a 9 m row with 7 m for evaluation in each replicate. Plants were allowed an eight-month establishment period. No fertilisation or soil amendment was used. Three and six months after transplantation, plants were measured for plant size and stem width. During the second year, forage production was measured in cuts every two months.

Results

Leucaena lempirana (1510 mm height; 13 mm stem width), *L. esculenta paniculata* (142 mm; 15 mm), and *L. leucocephala* (131 mm; 17 mm; native) had fast development ($P < 0.05$). *L. salvadorensis* did not grow well in the acid soil conditions. Six ecotypes did not provide enough plant material to be evaluated during the second year, although the plants survived: *Leucaena esculenta paniculata*, *L. diversifolia diversifolia*, *L. multicapitulata*, *L. lempirana* and *L. pulverulenta*. After one year of evaluation, total forage production was superior for the three *L. leucocephala* accessions ($P < 0.05$; Table 1); the ecotypes 9904 and Isla gave 1043 and 1128 g/plant per year, respectively. Most of the forage was produced during the rainy season. The most productive accession for the windy season was *L. leucocephala* 9904 ($P < 0.05$) and for the dry season *L. leucocephala* cvv. Isla and 9904, with production of 97 and 99 g/plant, respectively (Table 1).

Conclusions

There is considerable variation in acid soil resistance within the evaluated species. Because of a higher production potential, it is suggested that studies on within-species acid soil resistance should concentrate on the genetic resources in *L. leucocephala*.

References

- HUGHES, E.C. (1998) *Leucaena. Manual de recursos fitogenéticos*. Tropical Forestry Papers. Oxford Institute. Plant Science Department. 280pp.
 QUERO, C.A.R., ENRIQUEZ Q., J.F. and HERNANDEZ G., A. (2005) La pradera ideal y el ganadero ideal en los trópicos. In: INIFAP-CIFAP Veracruz (eds) *XXV aniversario del CAEPAP, Veracruz, México*. pp. 21–33. (in press).

Table 1. Forage production (g/plant) of *Leucaena* spp. at each cut and the total annual yield.

Species	Accession	Harvest 1	Harvest 2	Harvest 3	Harvest 4	Harvest 5	Harvest 6	Total yield
<i>L. leucocephala</i>	Isla	219	191	138	100	76	99	823
<i>L. leucocephala</i> Glabrata	34/92	213	204	180	108	73	97	875
<i>L. leucocephala</i>	17263	214	196	157	94	74	97	832
<i>L. leucocephala</i>	9904	206	191	162	104	82	96	841
<i>L. leucocephala</i>	774	221	193	165	101	76	87	844
<i>L. leucocephala</i> collinsii	52/88	180	152	124	116	69	79	720
<i>L. leucocephala</i> trichodes	61/88	136	118	76	55	50	50	485
<i>Cratylia</i> spp.	18957	106	117	94	56	72	82	527