

## ***Leucaena* production in Arid Botswana**

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**Introduction** The value of browse species as a source of nitrogen for grazing animals is restricted to wet seasons, with protein deficiencies being experienced by September (in dry winter season) in Southern Africa (Moleele 1998). This is when highly productive planted browse species would become useful to supplement the protein diet requirement of grazing animals (Morris & Du Toit 1998). Further, browse species can provide partly for protein requirement of intensive production systems, such as in feedlots and dairies. This paper reports work on the introduction and screening of *Leucaena* for Botswana conditions.

**Materials and methods** *Leucaena* species and a hybrid were evaluated for cold tolerance, productivity and quality at Morale for 3 seasons. The site (circa 23°S and 27°E) receives erratic rainfall that averages 450mm between October and May. Its temperature range is 30-22°C mean max and 17-3°C mean min, with absolute max and min of 40 and -6°C, respectively. The soils are haplic acrisols with a pH (H<sub>2</sub>O) of 6.7, organic carbon 0.3%, available P 3 ppm, total N, 0% and Ca 1.7, Mg 0.6 and K 0.7 meq/100g. Rainfall during the experimental period amounted to 554.3, 284.3, 322.7mm for 1996/97, 1997/98 and 1998/99 growing seasons. Cold tolerance was rated on a scale of 0-5 (0=no leaf death and 5=maximum leaf death), 1 month after freezing temperatures (0-5°C) were recorded. Dry matter of edible component was determined by drying in forced draught oven at 65°C to a constant weight. The dry material was hammer-milled to pass through a 1mm sieve for nitrogen, calcium, phosphorus, fibre and digestibility analyses.

**Results** There was no correlation between cold tolerance and productivity in this genus (Table 1). Chemical composition shows that the high yielding accessions also had high N value (>3.2%) and equally high dry matter digestibility (55.6-57.3%), showing characteristics of high feed value. *L. leucocephala* dominated in production of high edible dry matter and feed value. Termites and wild animals were observed to be a problem during establishment.

**Table 1** Cold tolerance, dry matter yield and feed value of some of *Leucaena* accessions in Botswana

Species	Acc. No.	Cold tolerance rating	Mean yield (kg/ha)	N	Ca	P	NDF	DMD
<i>L. pallida</i>		2.5	1,749	3.46	1.28	0.17	29.0	50.8
<i>L. leucocephala</i>	K 88A	3.0	1,979	3.46	1.68	0.22	36.0	47.4
<i>L. esculenta</i> subsp. <i>Paniculata</i>	79/92	3.0	1,795	3.84	0.94	0.19	30.5	50.1
<i>L. leucocephala</i> cv. <i>Cunningham</i>	K500	3.5	2,229	3.25	1.67	0.16	34.4	57.3
<i>L. leucocephala</i>	95/20	3.5	1,847	-	-	-	-	-
<i>L. leucocephala</i> cv. <i>Taramba</i>	K636	5.0	1,728	-	-	-	-	-
<i>L. diversifolia</i> x <i>L. Leuco.</i> (Kx3, F4)	4/95	5.0	2,099	3.63	0.95	0.16	29.1	55.6
LSD (P<0.05)			135	0.80	0.67	0.06	12.1	8.7

**Conclusion** *L. leucocephala* was productive under arid conditions prevailing in Botswana and can therefore be used to offset protein deficiency in grazing animals in such environments. Its medium to low cold tolerance indicates that the edible dry matter should be conserved for feeding in dry winters.

### **References**

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