

Desmodium velutinum — a high-quality shrub legume for acid soils in the tropics

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Introduction

Drought-tolerant leguminous shrubs can enhance the sustainability of smallholder production systems in the tropics through the provision, year-round, of high-quality feed and through their positive effect on soil. *Desmodium velutinum* is one of the few shrub species that have been identified as (1) well adapted to acid tropical soils and (2) of good nutritive value (Schultze-Kraft 1996). It is a perennial, native to SE Asia and tropical Africa, growing up to 3 m high, the velutinous (velvety) surfaces of its 1-foliolate leaves being a characteristic feature. It grows well on soils ranging from pH 4.0 to alkaline, prefers high rainfall (1000 to >3000 mm/year) but tolerates up to five dry months. Though previous work in west Africa (e.g. Mzamane and Agishi 1986) and South America (e.g. Thomas and Schultze-Kraft 1990) has indicated the potential of the species, there are only few studies and these are restricted to only one or a few accessions. It is important to assess the genetic diversity and agronomic variability in the germplasm collection of about 140 accessions that is now available, in order to identify a core collection and accessions with promising agronomic performance and nutritive value. Possible relationships between accession origins, morphological-agronomic characteristics, and genetic diversity need to be assessed. The first-year results from a field experiment on forage yield and quality are presented here. The project is financially supported by the Volkswagen Stiftung, Hannover, Germany.

Materials and methods

The experiment was carried out at the CIAT-Quilichao Experiment Station near Cali, Colombia (03°06' N, 76°31' E; elevation 990 m asl; average rainfall

1800 mm/yr; Ultisol with pH 4.9 and high OM content). Accessions (137) of *D. velutinum* were sown into single-row plots with 5 plants each (1 m between plants, 1.5 m between rows). The experimental design was a randomised complete block with three replicates.

Results

Table 1 shows that there was a large range in dry matter (DM) production and nutritive value. It is noteworthy that, under the experimental conditions, there were no major seasonal yield differences.

Conclusions

These initial results confirm the potential of *D. velutinum* as a high-quality shrub legume adapted to acid soils. DM yields and CP concentrations are comparable with those in other shrubs (e.g. *Cratylia argentea*, *Flemingia macrophylla*) under similar conditions (CIAT 2002). Of particular interest is the outstandingly high IVDMD. Consequently, *D. velutinum* appears to be a promising option as a protein and energy supplement to the diet of ruminants in tropical regions. Studies are required to assess the persistence of selected accessions under frequent cutting and under grazing.

References

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Table 1. Herbage (edible = <5 mm stem diameter) yield of 8-week regrowth in the wet (mean of 2 cuts) and dry season (1 cut), CP concentration and IVDMD (wet season) in the 137-accession world collection of *D. velutinum*.

Accession		DM (g/plant)		CP (% N × 6.25)	IVDMD (%)
		Wet	Dry		
Whole collection	Range	14–325	20–346	17.2–26.1	58.9–76.2
	Mean (SD)	137 (82.6)	142 (81.9)	21.3 (2.1)	67.1 (4.2)
Promising accessions	CIAT 33443 (erect)	300	340	19.5	68.8
	CIAT 23981 (semi-erect)	281	283	22.1	68.2
	CIAT 33352 (erect)	195	276	23.7	70.2
	CIAT 13953 (erect)	302	274	21.1	70.5