

# The leguminous shrub, *Cratylia argentea*: A dry season feeding alternative for the humid tropics

P. J. Argel, M. Lobo di Palma, F. Romero, J. González, C.E. Lascano, P.C. Kerridge and F. Holmann

## The Problem - need for a source of protein

Much of the milk produced in Central America is by small farmers in areas with a dry season of 5-6 months. Farmers face a serious problem in supplying feed at this time; pastures are often overgrazed. Sugar cane is a suitable high energy feed provided it is fed with a high protein feed. Concentrates are now relatively expensive as a result of trade liberalization and a decrease in real prices for milk.

## Identification of a protein source - *Cratylia argentea*

Legume leaf can provide adequate protein but available legumes were not suitable because they lost their leaf in the dry season. In 1996, researchers turned to a leguminous shrub, *Cratylia argentea*, from the seasonally dry savannas of Brazil, collected in 1980-84 and evaluated in adaptation trials during 1988-1995. It performed well in Brazil, Costa Rica, Mexico and West Africa in tropical areas below 1200 mm. It is a leafy shrub 1.5-3.0 m height, adapted to acid infertile soils, with an ability for strong regrowth following cutting.



## Evaluation - cutting trials

An initial cutting trial demonstrated that *C. argentea* could be planted in dense swards and continued to produce high yields after 3 years of cutting.

Density (plants/ha)	Yield edible material (kg/ha/60 d DM)
3,700	20,000
2,500	10,000
2,300	6,670

A second trial has demonstrated that high protein content is obtained with frequent cutting (every 60 days) and a high cutting height (90cm)

Cutting frequency (days)	Cutting height (cm)	Protein (%)
60	60	18.0
	90	19.1
90	60	15.2
	90	15.9

## Evaluation - feeding trials

*C. argentea* was evaluated at the Livestock School for Central America, Atenas, Costa Rica, with pure bred Jersey cows. Atenas is 460 masl, mean temp. 23.7°C and 1600 mm rainfall.

### Milk production of Jersey cows fed different protein supplements during the dry season (on-station)

Treatments	Milk yield (kg/cow/d)	Fat %	Solids %	Cost \$/kgDM	Benefit : Cost
Concentrate	11.1	3.5	12.4	0.20	1.33
Fresh <i>Cratylia</i>	10.9	3.7	12.5	0.16	1.68
Silage <i>Cratylia</i>	10.7	3.8	12.5	0.43	0.62

It has since been evaluated by farmers using crossbred cows. One farmer at Barrancas (280 masl, mean temp 28°C, rainfall 2500 mm) also compared *C. argentea* fed fresh or as silage.

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## Farmers contributed to this forage technology

- they evaluated several shrub legumes (e.g. *Leucaena*, *Gliricidia*) and chose *Cratylia*
- they first experimented with producing silage as there was no need for *Cratylia* in the wet season when there was ample good quality feed from pastures
- they also found they could feed it to horses and goats
- they made more efficient use of labor in producing fresh *Cratylia* and *Cratylia* silage

## Management of *Cratylia argentea*

*C. argentea* produces abundant seed with no dormancy and hence seed scarification is not necessary. It responds to inoculation with rhizobia in new situations. It should be sown less than 2 cm depth.

Establishment is slow and weeding may be necessary. It can be cut back 4 months after planting; preferably to 90 cm height and cut every 60 days to maintain a high protein content.

Cut material is best allowed to wilt overnight but can be fed fresh when chopped and mixed with sugar cane.

Where supplementary feeding is not necessary, the wet season, regrowth can be made into silage for dry season feeding.

Observations suggest that it is persistent under continuous grazing when sown in dense strips.



## Limitations

- *Cratylia* is not well adapted to cool environments (above 1200m in the tropics)
- Production is low in the establishment year

## Conclusions

- This adaptive research has verified a new tropical legume
- Management of a *Cratylia* technology is not a problem
- It provides an economical alternative for small farmers

## Contacts

The project is conducted by researchers from CIAT, ILRI, Central American Livestock School and the Ministry of Agriculture in Costa Rica.

P.Argel 'P.argel@cgiar.org'; M. Lobo 'mlobo@ns.mag.go.cr'; F. Romero 'ecagcr@sol.racsa.co.cr'