

Gliricidia sepium

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(Editor)

Extract from FAO Tropical Feeds Database

Gliricidia sepium (Jacq.) Steud. (Syn. *Gliricidia maculata* H.B.K.) is a fast-growing, tropical, leguminous tree up to 10-15 m. high. It is one of the commonest and best-known multipurpose trees in many parts of Central America, where it probably originated, but it has also spread to West Africa, the West Indies, southern Asia and the tropical Americas. (28 provenances have been collected from Central America by the Oxford Forestry Institute and are being tested world-wide.)

Used for timber, firewood, medicinal purposes, charcoal, living fences, plantation shade and green manure, it has good potential as fodder for livestock.

The plant grows best in warm, wet conditions with optimal temperatures of 22-30°C and rainfall 800-2300mm. It flourishes on fertile soils but has also been observed to grow well on acidic soils and those with a high clay content. It is easily established from cuttings or seed, although seed-establishment is recommended when used in situ because of deeper rooting.

Gliricidia may be harvested at 3 month intervals to maximize foliage yield. Reported yields are 14.9 tonnes green foliage/ha/yr (6.6 tonnes DM) over 5 years (30.2 tonnes fresh/ 11.9t DM in the first year) but in a trial of different provenances in Colombia (562), 53-98 tonnes/ha/yr of biomass was obtained, corresponding to 15-25 tonnes DM/ha/yr. Leaf represented 53-63% of edible biomass. Total yield of crude protein was up to 4.7 tonnes/ha/yr.

Available data indicate that *Gliricidia* is rich in protein (23% CP) and calcium (1.2%), two nutrients found at only low levels in non-leguminous tropical forages. Its high fibre content (45% NDF) makes it a good roughage source for ruminants. The plant contains sufficiently high levels of most minerals (except phosphorus and

copper) to meet tropical livestock requirements and it would therefore make an excellent feed during the dry season.

Nutrient content varies with age, season and physiological stage (before and after flowering). In leaves of older plants (after flowering), protein and calcium decline whereas fibre, phosphorus and other minerals increase.

Digestibility of DM is moderately high (c. 60%) and it should improve the digestibility of poor quality feeds when used as a supplement. Rumen (nylon-bag) degradability of *Gliricidia* is high (62% DM and 19% N in 24 hours cp. to 49% and 7% for *Leucaena*).

Antinutritional Factors

Some potentially toxic substances have been found in *Gliricidia*. HCN content has been reported upto 4mg/kg and cyanogens may be present. High levels of nitrates (during the rainy season) are suspected of causing 'cattle fall syndrome' in Colombia but levels declined to negligible in winter. *Gliricidia* may be a 'nitrate accumulator'. Un-identified alkaloids and tannins have also been reported.

However, evidence of toxicity under practical feeding conditions has been rare. The balance of evidence suggests that the plant could be toxic to non-ruminants but conclusive evidence of toxicity to ruminants under normal feeding is lacking.

Uses

Gliricidia is most likely to be used as a green fodder/protein supplement to low-quality tropical forages and by-products for cattle, sheep and goats. It may be used as the sole feed in the dry season. There is some localised evidence of poor palatability and reduced intake of basal diet (there is some suggestion that a period of adjustment may be required) but substitution of *Gliricidia* for grass, rice straw/rice polishings, cocoa-pods and bagasse/molasses/rice-polishing/poultry manure diets to weaner lambs, goats, growing heifers and growing bulls have produced the same or improved growth performance. Normal feeding levels have been 1-3% of body weight (i.e. 3-9kg/day fresh to 300kg cattle) although goats have

been fed solely on *Gliricidia*.

In one trial, ewes have produced a higher lamb crop, better lamb weights and had reduced ewe weight loss. In another, lambing results were poorer - attributable to lower feed intake.

The few results with milk cows and buffaloes showed similar or slightly increased milk yield and milk fat yield.

Laying chickens have been fed 4.5% sun-cured *Gliricidia* in diets and gave good egg production, egg weight and yolk colour. It has been found that diets containing up to 10% *Gliricidia* can be fed to growing chicks without affecting performance and survival. At 15% intake, f.c.e. and growth were reduced and haemoconcentration, fatty liver and coagulation necrosis lesions were observed.

As % of dry matter

	DM	CP	CF	EE	Ash	NFE	Ca	P	Ref
Average	21.9	23.0	20.7	3.1	9.7	42.8	1.3	.18	558
Leaves	19.5	26.8	16.8	6.7	9.8	39.9			559
Stem	19.8	13.9	50.4	1.7	6.9	27.0			"
Whole plant	19.6	21.2	28.8	5.1	8.2	36.8			"
Leaves	25.4	30.0	14.4	4.3	8.0	43.6			117
Stem	14.1	20.5	30.2	1.5	10.2	37.6			"
Whole plant	24.1	23.1	13.4	4.2	9.6	49.7			"

Digestibility %

	Animal	CP	CF	EE	NFE	Ref
Leaves/stems	Cattle	55.3				560
Leaves/stems	Sheep	53.5				"

Nylon bag degradability

	a (%)	b (%)	c (/hour)	12hr (%)	48hr (%)	Ref
<i>Gliricidia</i> leaves						
DM	19.1	48.6	0.105	53.9	67.4	633
N (CP 18.3)	28.9	44.9	0.074	55.3	72.5	"
<i>Gliricidia</i> (freeze dried)						
DM				73.7	79.1	630
N				84.1		"
<i>Gliricidia</i> , 6 weeks						
DM					75.7	632
<i>Gliricidia</i> , 12 weeks						
DM					70.4	"

$$[P \text{ (rumen degradability at time } t) = a+b*(1-\exp(-c*t))]$$