

# GLIRICIDIA AS A MULTIPURPOSE TREE FOR COCONUT PLANTATIONS



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Gliricidia is a fast growing, medium-sized, perennial tree, capable of fixing nitrogen. It is widespread in the tropics. Since its discovery in the Central America, it has spread worldwide owing to its versatility and multiple uses. It has been introduced to Sri Lanka from Trinidad in the late 18th century as a shade tree for coffee and tea plantations and later spread to the other parts of the country. There are two distinct species of gliricidia, namely *Gliricidia sepium* which produces pink-coloured flowers and large round seeds and *Gliricidia maculata*, which produces white flowers and small round seeds. Of these, *G. sepium* is the commonest.

Potential uses of gliricidia in coconut plantations.

## 1. As a green manure

Gliricidia, being a nitrogen-fixing tree, has gained widespread recognition as a valuable green manure crop. Gliricidia loppings have often been used as green manure both in India and Sri Lanka on tea, coffee and cocoa, and to a limited extent in coconut plantations. Much interest has been evinced recently on the possible use of gliricidia as a green manure in coconut and thereby reducing the cost of artificial fertilizer. Experiments conducted at the Coconut Research Institute have shown that gliricidia has a wide adaptability to different soil types and a range

agroclimates. When interplanted in coconut lands at a density of approximately 1900 plants/ha, gliricidia gave an average green matter yields of 8.5 to 10.8 MT/ha with four loppings per year after two years of planting.

Gliricidia loppings are rich in plant nutrients, particularly nitrogen. On a dry weight basis, gliricidia leaves contain around 4.0% nitrogen, 2.0% potassium, 1.4% calcium, 0.4% magnesium and 0.3% phosphorus. Due to the low lignin content (3.9%) and the low carbon: nitrogen ratio (10:7), these leaves decompose easily within 2-3 weeks after incorporation into the soil, thereby providing nutrients relatively quickly. Gliricidia is therefore a potential nutrient source for coconut, and when applied at the rate of 30 kg of loppings/palm provides the total requirement of nitrogen and at least part of phosphorus and potassium requirements, thus reducing the cost of fertilizer by about 40%.

Gliricidia loppings also improve the soil conditions, and can be used to rehabilitate neglected palms and restore fertility in eroded and depleted soils where it grows better than other leguminous trees. For example, neglected palms in hard gravel soil were considerably improved by burying about 30 kg of gliricidia leaves in 30 cm (12 inches) deep and 30 cm wide trench cut 30 cm (12 inches) away from the base in a  $\frac{1}{4}$  circle only.

## 2. As a shade tree and live support

Gliricidia is still extensively used as a shade tree in coffee and tea plantations. Although gliricidia is not commonly used as a shade tree for young coconut, it has been shown that it could be beneficial at the time

ous studies have shown that gliricidia folia has a high feed value of 20–30% crude protein, 14% crude fibre and digestibility ranging from 50–75% and could be well supplemented with a low protein roughage such as grass or rice straw for cattle, goat and sheep.

*Incorporating gliricidia loppings into the manure circle.*



of establishment of the seedlings. This is particularly advantageous in the intermediate and dry zones. From time to time gliricidia has to be lopped to provide a controlled shade for coconut and these loppings can be used as a green manure for young coconut.

Gliricidia also serves as a promising live support for several intercrops in coconut lands such as pepper, passion fruit, winged bean and dioscorea yams.

## 3. As an Animal Feed

Livestock farming is popular amongst coconut growers. However, in most cases animals graze freely on native pasture species which are poor in feed value and often become scarce during the dry season. Also, in estates where improved pastures are grown, the scarcity of forage during the dry season is a common problem. In this situation gliricidia plays a valuable role as a high protein animal feed, especially during the dry season. Numer-

Several trials conducted by the Coconut Research Institute have demonstrated the value of gliricidia as an animal feed. Gliricidia loppings mixed with *Brachiaria miliiformis* in 50:50 ratio and fed to crossbred heifers resulted in an average live weight gain of 700 g/head/day. In another trial, a mixture of gliricidia and leucaena was planted alternatively 1.5 m apart along the fence in a pasture/cattle/coconut integrated system and produced more than 2 MT/ha/year of fresh green matter. This, when fed to heifers at the rate of 6 kg along with pasture during the dry season produced average live weight gains of 300 g/head/day. Freshly chopped gliricidia leaves can also reduce the duration of urea treated straw from 21 to less than 6 days. Although milk production in cattle fed with gliricidia is not affected, usually milk becomes tainted when gliricidia is more than 50% of the total feed.

## Other uses

Although gliricidia stakes are commonly used as firewood in many Asian countries, it is not commonly used for this purpose in Sri Lanka. Gliricidia stakes are hard with a heating value of 4,550 – 4,900 kcal/kg which make them suitable as firewood.

Live fences of gliricidia are common in coconut estates which will not only strengthen the fence but also provides sufficient green manure, fodder and firewood to the household. It has the advantage of being highly resistant to termites.

Gliricidia flowers attract bees and therefore is a useful bee pasture.

## Method of planting gliricidia

### Planting material

Gliricidia can be easily established from 60 cm mature cuttings taken from plants at least one year old. For poles and shade trees, cuttings of 1.5 m height could be planted. The bark of the cutting may be incised with a knife to facilitate rooting. The cuttings develop a shallow, laterally spread root system, especially in the early stages of growth. Although establishment by cuttings is convenient, it is suitable only when a few trees are to be established. In large scale planting, cuttings are costly, inconvenient and impractical. In such circumstances propagation by seed is the most convenient and reliable means of establishment. Seedlings also develop a deep root system. Trees with deeper root systems are more effective in taking up and recycling nutrients from deeper layers of soil.

Gliricidia normally flowers during January to March. Unpruned trees produce a large number of flowers, but only a few pods reach maturity which occurs over a short period, limiting the harvesting period to about 20 days, generally in April. A kilogramme will contain from 5,000–10,000 seeds.

Seeds, which do not require pretreatment, should be sown directly in seed beds and the seedlings will be ready for planting in the field in 4–6 weeks.



*Gliricidia plant raised from a seed.*

### Planting

The most suitable time for planting seedlings or cuttings is with the onset of the south-west monsoon rains. Pits of 30×30×30 cm (1×1×1 ft) filled with a mixture of dry cow dung and top soil would be ideal for planting. In less-fertile soils, it is useful to apply about 30 g each of saphos phosphate and muriate of potash at planting time. If labour is limited, planting at least 10-15 cm deep without cutting pits would be sufficient in fertile soils.

### Planting system

It is suggested that gliricidia be planted along the boundary fence in a double row at 60 cm (2 ft) equilateral triangular system. In the dry and intermediate zones, gliricidia can be alley cropped with short-term food crops. In such a system, a double row, 3 to 4 m apart, can be grown between two coconut rows. Within a row, gliricidia can be planted 0.5 m apart.

### **Management**

It is important to adopt a proper lopping system for gliricidia. First cutting can be done around 9-12 months after planting. Cuttings can be taken for wood production after the second year and thereafter annually and biennially. Foliage production is optimised by harvesting every three months. Trees can be lopped at about 3m above ground level in cropping system or 1-2 m above ground level in fences and shade trees. In the first two years, an average of 5-8 kg of green matter can be obtained from one plant. Foliage production increases with time.

Although gliricidia has been known for long time as a nitrogen fixing tree, its usefulness in coconut cultivation has not been recognized as yet. In the recent past, attempts have been made to popularize ipil ipil (*Leucaena leucocephala*). However, due to profuse seeding of some of the popularly-used varieties, it has become a problem plant. Also, ipil ipil has been heavily infested by an insect, *Heterosphylla cubana*, limiting its productivity. These limitations in ipil ipil make gliricidia even more important.

## **YOUNG COCONUT JUICE CAN CURE KIDNEY STONES**

According to a report in the Manila Bulletin, cited in the COCOMUNITY of 30 May, 1988, the Chief of Urology Section of the Chinese General Hospital and Medical Centre of the Philippines has stated that two glasses of young coconut juice every day can reduce the chances of having kidney or ureter stones.

Almost 2000 patients have been cured by following the young coconut juice formula. The Urologist who had been experimenting with the curative properties of young coconut juice since the early 70's has recommended that the juice must come from 7-10 month old coconut to reduce or dissolve the stones in the upper urinary tract.

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