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***Gliricidia sepium* (Jacq.) Steud**
A selected bibliography

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ABBREVIATIONS USED

CATIE: Centro Agronomico Tropical de
Investigacion y Ensenanza.

FAO: Food and Agriculture Organization.

ILCA: International Livestock Centre for Africa.

UNDP: United Nations Development
Programme.

USDA: United States Department of
Agriculture.

INTRODUCTION

Gliricidia sepium (Jacq.) Steud. (syn. *Gliricidia maculata* H.B. & K.) is a tropical leguminous tree which has been widely used for plantation shade, green manure, living fence posts, firewood and livestock fodder. *Gliricidia* is native to Central and South America, and has been used most extensively in India, Sri Lanka, Southeast Asia and Central America.

Over the last decade there has been a strong interest in the use of fast-growing leguminous trees – including *Gliricidia* – in the tropics. There is now active research on *Gliricidia* throughout the humid and sub-humid tropics: the species is considered to have significant potential for use in intensified small-holder farming systems.

This bibliography should make the literature concerning *Gliricidia* more easily accessible. References to *Gliricidia* are scattered throughout journals of several disciplines. Since the use of *Gliricidia* has most often been an adjunct to other agricultural activities – as a cocoa shade or green manure of rice, for example – it is often referred to in the literature in passing, as a component of a larger production activity. Thus, the traditional uses of *Gliricidia* have tended to obscure the accumulated knowledge and experience concerning its biology, use and management.

There are 143 citations in the bibliography, covering the years 1928–1984; over 55% of these were published after 1975. Approximately 55% of the articles cited were published in the Indian sub-continent and southeast Asia. The remainder were published in Europe (25%), North America (13%), and South/Central America (12%).

This bibliography is not meant to be exhaustive; rather it is intended as a tool which can be used to gain access quickly to the major writings about *Gliricidia*. The library of the International Livestock Centre for Africa, P.O.Box 5689, Addis Ababa, Ethiopia, would be grateful to receive notification of articles that have been omitted, as well as new articles that should be included in future editions.

ACKNOWLEDGEMENTS

The competent assistance of Ms K. Cassaday and the staff of ILCA's Documentation and Publications Units is gratefully acknowledged.

BIBLIOGRAPHIC INDEX

GENERAL ARTICLES

001 Chadhokar, P.A. 1982. *Gliricidia maculata*: A promising legume fodder plant. *World Anim. Rev.* 44: 36-43.

002 Falvey, J. Lindsay. 1982. *Gliricidia maculata*—a review. *Int. Tree Crops J.* 2: 1-14.

General review article focused largely on the use of *Gliricidia* as livestock fodder. Thirty literature citations, French and Spanish summaries.

003 Gohl, G. 1975. *Gliricidia maculata* H.B., and *G. sepium*. In: *Tropical Feeds*. FAO, Rome. p. 188.

004 Haines, H.C. 1961. [Mother of cacao (*Gliricidia sepium*)]. *Madre de cacao (Gliricidia sepium)*. *Nuestra Tierra* 5(46): 115-116.

005 Iyengar, M.L.N. 1956. *Gliricidia maculata* H.B. and K. *Mysore Agric. J.* 31: 5-13.

006 Skerman, P.J. 1977. *Tropical forage legumes*. FAO, Rome. 508pp.

Brief description of *Gliricidia* included in catalogue of browse plants.

007 Thomas, C.A. 1961. *Gliricidia* has many uses. *Indian Farming* 11(4): 13.

A popular article describing the use of *Gliricidia* as a green manure, a support for pepper plants and as a tea shade.

BOTANICAL DESCRIPTION AND DISTRIBUTION

008 Little, E.L., Jr.; Wadsworth, F.H. 1964. *Common trees of Puerto Rico and the Virgin Islands*. *USDA Forest Service, Agricultural Handbook No. 249*, pp. 196-198.

General botanical description of *Gliricidia* including local names, distribution and uses in the Caribbean region.

009 Martinez, M. 1959. *Plantas utiles de la flora Mexicana*. Mexico, D.E., Botas. 621pp.

010 Molina, R.A. 1952. *Nuevas plantas de Nicaragua y Honduras*. *Ceiba* 3: 91-97.

011 Pittier, H. 1974. *Leguminosas de Venezuela, I. Papilionaceas*. *Boletin Tecnico No. 5*. Ministerio de Agricultura y Crea. 171pp.

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Description and distribution of *Gliricidia guatemalensis*, *G. meistophylla* and *G. sepium* in Guatemala.

013 White, P.S. 1980. *Gliricidia*. *Ann. Missouri Bot. Gard.* 67(3): 702-705.

Detailed botanical description of *Gliricidia*.

VEGETATIVE PROPAGATION

014 Afandi, M.H. 1983. [Influence of storage duration on sprout growth of *Gliricidia*.] Pengaruh lama penyimpanan terhadap pertumbuhan tunas *Gliricidia*. *Duta Rimba (Indonesia)* 8: 44-45. (English summary).

015 Choudhuri, N.C. Basu Roy. 1965. Effect of 2,4-D on the rooting of *Gliricidia* stem cuttings. *Sci. and Cult.* 31: 303-304.

Responses of hardwood and softwood cuttings to treatment with four levels of 2,4-D are discussed. Data on rooting and leaf production after 30 days are presented.

016 Delizo, R.F.; Fierro, Vito F., Jr. 1974. **The vegetative propagation of madre cacao, *Gliricidia sepium* (Jack) Steud. by cuttings using alpha naphthalene acetic acid (ANAA).** *Araneta Res. J.* 21(1-2): 20-23.

Results of treating *Gliricidia* cuttings with three concentrations of ANAA are reported. Response to treatment measured as number of sprouted and dead cuttings.

017 Kempanna, C.; Chandrasekhariah, S.R. 1959. **Growth promoting substances and rooting of cuttings of *Gliricidia maculata*.** *Indian J. Agric. Sci.* 29(4): 32-35.

Rooting responses of soft, medium and hardwood *Gliricidia* cuttings to various concentrations of IAA, IBA, NAA and cows' urine are reported. Percentage of cuttings that rooted and observations on the nature of root formation after 32 days are given.

018 Kempanna, C.; Lingaraj, D.S.; Chandrasekhariah, S.R. 1961. **Propagation of *Gliricidia maculata* H.B. and K. by air layering and with the aid of growth regulators.** *Sci. and Cult.* 27(2): 85-86.

Air layering of soft, medium and hardwood *Gliricidia* branches using the hormones NAA and IBA is reported. Percentage of cuttings rooted after 28 days is given.

FLOWERING AND SEED PRODUCTION

019 Benacchio, S. 1980. **Phenological studies on *Gliricidia sepium* (Jacq.) Kunth, a potential indicator species in Venezuela.** *Int. Soc. Trop. Ecol. (Kuala Lumpur)*, pp. 183-197.

020 Rockwood, L.L. 1973. **The effect of defoliation in seed production of six Costa Rican tree species.** *Ecology* 54: 1363-1369.

Reports a study to determine the effect of defoliation of 10 *Gliricidia* trees on the number and weight of fruits produced. Results are discussed in relation to herbivores feeding and the plant's reproductive fitness.

021 Sumberg, J.E. 1985. **Note on flowering and seed production in a young *Gliricidia sepium* seed orchard.** *Trop. Agric.* 62: 17-19.

Flowering and seed production of *Gliricidia* are described. Flowering patterns, number of flowers, percentage pod set, seeds/pod and seed yield/tree are reported for a sample of 20 trees.

022 Sumberg, J.E. 1984. **Producing seed of *Gliricidia sepium*.** ILCA, Addis Ababa, Ethiopia.

This booklet, based on 12 photographs, describes the steps in *Gliricidia* seed production.

AGROFORESTRY

023 Agboola Akinola, A.; Wilson, G.F.; Getahun, A.; Yamoah, C.F. 1982. ***Gliricidia sepium*: A possible means to sustained cropping.** In: L.H. MacDonald, ed. *Agroforestry in the African Humid Tropics*. United Nations University, Tokyo.

The use of *Gliricidia* to support yam vines and in short-term fallows in the vicinity of Ibadan, Nigeria is described. Analysis of 14 soil samples taken from farmers' fields is purported to show the beneficial effects of *Gliricidia* on soil fertility.

024 Beer, J. 1979. **Traditional agroforestry practices in the wet tropics: The "La Sulza" case study.** *Activities at Turrialba*, 7(3): 2-5.

Preliminary survey of agroforestry practices near Turrialba, Costa Rica. *Gliricidia* is briefly mentioned as a common living fence post; the role of these posts in controlling erosion near roads is considered.

025 Falvey, L.; Andrews, A.C. 1981. **Agroforestry in the highland regions of north Thailand.** In: *Proceedings of the 8th World Forestry Congress*, Jakarta, Indonesia. FAO, Rome.

026 Perino, J.M. 1979. **Rehabilitation of a denuded watershed through the introduction of Kakawate *Gliricidia sepium*.** *Sylvatrop: The Philipp. For. Res. J.* 4(2): 49-68.

LIVESTOCK FEED

027 Bunru Wilaipon. 1981. **[*Gliricidia maculata* - an important forage crop.]** Khaefarang - phut ahan sat thi samkhan. *Khon Kaen Agric. J. (Thailand)* 9: 34-38.

028 Carew, B.A.R. 1983. ***Gliricidia sepium* as a sole feed for small ruminants.** *Trop. Grassl.* 17: 181-183.

Results of feeding dwarf sheep and goats a diet of 100% *Gliricidia* for 21 weeks are reported. Feed composition, feed intake and weight changes are given.

029 Chadhokar, P.A. 1981. *Gliricidia maculata*, a valuable source of high protein feed supplement for animal feeding. In: *XIV International Grassland Congress - Summary of papers*. Lexington, Kentucky.

The value of *Gliricidia* as fodder is cited; estimates of fodder yields are given; and results of feeding trials with cattle are briefly mentioned.

030 Chadhokar, P.A. 1981. *Gliricidia* makes a good green protein supplement for heifers. *Asian Livestock*, April 1981, p.38.

Preliminary report of feeding trials with dairy heifers. *Gliricidia* was offered as two-thirds of the diet in varying combinations with grass, paddy straw, rice bran and dairy mix. Daily liveweight gains for four rations are cited.

031 Chadhokar, P.A. 1981. **Recommendations on Tropical Forage Development**. UNDP/FAO Trop. Past. Devel. Proj. (SRL/78/028) Getambe, Peradeniya.

032 Chadhokar, P.A. 1982. **Sri Lanka/IDA Dairy Development Project, Getambe, Peradeniya. Experimental results from the tropical pasture development project (SRL/78/028)**. Sri Lanka/IDA Dairy Devel. Proj. Tech. Publ.

Gliricidia is evaluated as a livestock fodder for Sri Lanka. Chemical composition, amino acid profile, nutritional value, methods of establishment and management, effects of stake size and frequency of cutting are discussed.

033 Chadhokar, P.A. 1983. **Forage development for dairy cattle in the Mid-Country region of Sri Lanka**. *World Anim. Rev.* 47: 38-45.

034 Chadhokar, P.A. 1983. **The effect of *Gliricidia* supplemented dry season forage on milk yield and composition of MRV (Netherlands) cows in Sri Lanka**. *Trop. Grassl.* 17: 39-41.

035 Chadhokar, P.A.; Kantharaju, H.R. 1980. **Effect of *Gliricidia maculata* on growth and breeding of Bannur Ewes**. *Trop. Grassl.* 14(2): 76-82.

Results from feeding varying proportions of *Gliricidia* and *Brachiaria milliformis* to breeding ewes over a period of 40 weeks are reported. Effects of *Gliricidia* on feed intake, bodyweight, lambing percentage and lamb survival are given.

036 Chadhokar, P.A.; Lecamwasam, A. 1978. **Effect of feeding *Gliricidia maculata* to dairy cows**. *Dairy Sci. Abstr.* 40: 73-74. (No.4376).

Results of feeding varying proportions of *Gliricidia* and *Brachiaria brizantha* to lactating dairy cows over four weeks are reported. Milk yield and milk composition are cited.

037 Chadhokar, P.A.; Lecamwasam, A. 1982. **Effect of feeding *Gliricidia maculata* to milking cows: A preliminary report**. *Trop. Grassl.* 16: 46-48.

More detailed account of experiment reported in 036. Another trial feeding *Gliricidia* in combination with grass and one of two concentrates is cited. Milk yields and composition are cited.

038 Chadhokar, P.A.; Sivasupiramaniam, S. 1983. ***Gliricidia* (*Gliricidia maculata* H.B. & K.) leaves as a protein supplement to paddy straw in growing cross bred heifers**. *Indian J. Anim. Sci.* 53(2): 120-125.

Results of an experiment feeding *Gliricidia* in combination with paddy straw, fresh grass and rice polishings to cross-bred heifers over 11.5 months are presented. Feed composition, feed intake, weight gain and the component feed costs are given.

039 Department of Agriculture, Sri Lanka. 1977. **Dairy-farming in the coconut triangle**. *Agric. Newsl.* 3: 12.

Gliricidia is recommended as a fodder tree for use in dairy farming based on grazing under coconut trees.

040 Devendra, C. 1983. **Physical treatment of rice straw for goats and sheep and the response to substitution with variable levels of cassava (*Manihot esculenta*), leucaena (*Leucaena leucocephala*) and *gliricidia* (*Gliricidia maculata*) forages**. *MARDI Res. Bull.* 11: 272-290.

041 Edwards, D.G. 1979. **Consultancy report on nutritional limitations on pasture production and quality in Sri Lanka**. UNDP/FAO Trop. Past. Devel. Proj. (SRL/78/028) Getambe, Peradeniya.

042 Humphreys, L.R. 1979. **Consultancy report on dairy pasture development and seed production in Sri Lanka**. UNDP/FAO Trop. Past. Devel. Proj. (SRL/78/028) Getambe, Peradeniya.

- 043** Hutagalung, R.I. 1981. **The use of tree crops and their by-products for intensive animal production.** *Br. Soc. Anim. Prod.* Occasional Publication No. 4: 151-184.
- This paper deals with by-products of tropical crops used as concentrates. In a section on forage tree crops the use of *Gliricidia* and the integration of animals with plantation tree crops is discussed.
- 044** Kantharaju, H.R.; Chadhokar, P.A. 1981. **Feeding *Gliricidia maculata* (seplum Steud.) to pregnant maiden ewes: A preliminary study.** *Indian Vet. J.* 58(8): 655-659
- Results of a feeding trial with varying levels of *Gliricidia* and *Brachiaria milliformis* fed to ewes over a six-month period are presented. Feed composition, feed intake, weight gains, lambing percentage and yield and quality of wool are discussed.
- 045** Kantharaju, H.R.; Chadhokar, P.A. 1981. **Performance of Bannur ram weaners on *Gliricidia maculata* (seplum) as a protein feed supplement.** *Indian Vet. J.* 58(2): 157-161.
- 046** Llano Posado, A. 1962. **[Palatability of *Gliricidia seplum* leaves in rations for poultry.]** Palatabilidad de la hoja de matarraton en raciones de ponedoras. *Rev. Nac. de Agr. (Colombia)* 55(680): 47-48.
- Total feed intake of laying hens on concentrate rations with 2% alfalfa or 2% *Gliricidia* is reported. Use of *Gliricidia* as a source of carotene in poultry rations is discussed.
- 047** Mahadevan, V. 1956. **Nutritive value of green manure crops: 2. *Gliricidia maculata*.** *Indian Vet. J.* 32: 457-462.
- 048** Mani, Rabe Isa. 1984. **Browse selection and intake behaviour of West African Dwarf sheep and goats.** Unpublished M.Sc. thesis, Dept. of Animal Science, University of Ibadan, Nigeria.
- The selection behaviour of dwarf sheep and goats stall-fed varying amounts of intact *Gliricidia* branches is described. Nitrogen, ADF, lignin and other characteristics of *Gliricidia* leaves, petioles and bark are given.
- 049** Minor, S.; Hovell, F.D. deB. 1979. **Rate of rumen digestion of different protein sources using the in vivo nylon bag technique with cattle fed sugar cane.** *Trop. Anim. Prod.* 4(1): 105-106. [abst.]
- Rumen degradation of *Gliricidia* leaves and leaf nitrogen is compared with that of other leaves and concentrate feeds.
- 050** Mishra, M.; Singh, I.; Sahoo, G. 1977. **Effect of feeding *Gliricidia maculata* leaf meal on the performance of white leghorn chicks.** *Indian J. Poult. Sci.* 12(4): 17-21.
- Feed composition, feed intake, weight gains, mortality, blood and histopathological characteristics are reported for chicks fed rations containing 0, 5, 10 and 15% *Gliricidia* leaf meal.
- 051** Mishra, M.; Swain, N.; Nayak, J.B. 1977. **Use of *Gliricidia maculata* tree fodder as a source of legume with hybrid Napier.** *Orissa Vet. J.* 11(1): 31-38.
- 052** Montilla, J.J.; Reveron, A.; Schmidt, B.; Wiedenhofer, H.; Castillo, P.P. 1974. **Leaf meal of mousetail (*Gliricidia seplum*) in rations for laying hens.** *Agron. Trop. (Venez.)* 24(6): 505-511.
- 053** Ortigas, R.Z. 1956. **The nutritive value and palatability of combinations of corn and madre de cacao (*Gliricidia seplum* Steud.) silage.** *Philipp. Agric.* 40: 171-177.
- 054** Ranaweera, K.N.P.; Siriwardene, J.A. de S.; Manampeni, H.B. 1981. **The feeding value of *Gliricidia* (seplum) leaf meal for broiler chickens.** *Ceylon Vet. J.* 29: 4-6.
- 055** Ranjhan, S.K. 1980. **Consultancy report on utilization of crop residues and industrial by-products for animal feeding in Sri Lanka.** UNDP/FAO Trop. Past. Devel. Proj. (SRL/78/028) Getambe, Peradeniya.
- 056** Reveron, A.; Montilla, R.J. de J.; Funes, A. 1967. **[Preliminary studies on the forage characteristics of *Gliricidia seplum*].** Investigaciones preliminares sobre las características forrajeras de la planta de roba de raton *Gliricidia seplum*. *Zootech. e Vet.* XXII: 36-44.
- 057** Reveron, A.E.; Montilla, J.J.; Castillo, P.P.; Gonzalez, C.D. 1972. **[Pigmentation value of dried-ground roba de raton whole plant, *Gliricidia seplum*, in laying hen rations.]** *Act. Cient. (Venez.)* 23 S1: 54.
- 058** Ruize, G.; Ffoulkes, D.; Preston, T.R. 1979. **Digestibility and voluntary intake of derinded cane and stalk supplemented with different forages.** *Trop. Anim. Prod.* 4(1): 109-110.

Zebu bulls were used to evaluate the effects of protein-rich forages from perennial trees – including *Gliricidia* – on the voluntary intake and digestibility of derinded cane stalk.

059 Swain, N.; Mishra, M.; Nayak, J.B. 1978. **Use of *Gliricidia maculata* tree fodder as source of legume with hybrid Napier for preparation of silage.** *Orissa Vet. J.* 12(1): 1–8. [Extracted from *Nutr. Abstr. Rev.* B 49,98.]

060 Vearasilp, T. 1981. **Digestibility of rice straw rationa supplemented with *Leucaena leucocephala* and *Gliricidia maculata*.** *Thailand J. Agric. Sci.* 14: 259–264.

Reports result of an experiment with sheep fed rice straw and *Gliricidia*, *Leucaena* or combinations of the two legumes. Feed composition, feed intake, digestibility and animal weight changes are given.

FIREWOOD

061 National Academy of Sciences, USA. 1980. **Firewood crops – shrub and tree species for energy production.** U.S. National Academy of Sciences, Washington, D.C.

062 Otarola, T.A.; Ugalde, A.L. 1982. **[Productivity and biomass tables of *Gliricidia sepium* (Jacq.) Steud in natural forests in Nicaragua].** Productividad y tablas de biomasa de *Gliricidia sepium* (Jacq.) Steud en bosques naturales de Nicaragua. CATIE, Turrialba, Costa Rica.

063 Picado, W.; Salazar, R. 1984. **[Biomass and firewood production of 2-year-old living fence of *Gliricidia sepium* (Jacq.) Steud in Costa Rica.]** Produccion de biomasa y lena en circoas vivas de *Gliricidia sepium* (Jacq.) Steud de dos anos de edad en Costa Rica. *Silvaenergia* No. 1. CATIE, Turrialba, Costa Rica.

064 Salazar, R. 1984. **[Wood production from trees of *Gliricidia sepium* used for coffee shade in Costa Rica.]** Produccion de lena en arboles de *Gliricidia sepium* usados como sombre en cafetales en Costa Rica. *Silvaenergia* No. 2. CATIE, Turrialba, Costa Rica.

065 Zaonotti de Leon, J.R.A. 1983. **[Experiments with six forest legume species for fuelwood production.]** Ensayo de seis especies leguminosas forestales par a produccion de lena. Unpublished Ing. Agr. thesis, Facultad Agronomia, Univ. de San Carlos.

GREEN MANURE

066 Anonymous. 1954. ***Gliricidia* can slash off your manure budget.** *Indian Farming* 4(10): 16–17.

The cultivation of *Gliricidia* along field bunds and its use as green manure is advocated for Madras, India. Instructions are given for establishment of trees with transplanted seedlings and vegetative stakes. Cutting management and expected yields of green manure are briefly discussed.

067 Anonymous. 1956. ***Gliricidia maculata* – a suitable green manure bush for coconut plantations.** *Bull. Indian Centr. Coconut Ctee.* 9: 193–195.

068 Bindumadhava Rao, R.S.; Krishnan, R.H.; Theetharappan; T.S. Sankaranarayanan, R.; Venkatesan, G. 1966. **A note on *Gliricidia* shrubs.** *Madras Agric. J.* 53(9): 375–377.

Results from three cutting treatments with *Gliricidia* grown along field bunds are compared relative to green manure needs of paddy rice in Madras, India. It is concluded that 180 (445) trees yielding 13.4 kg fresh green matter each with one or two harvests per year will be sufficient to fulfill the green manure requirements of one acre (1 hectare) of rice.

069 Holland, T.H. 1931. **The green manuring of tea, coffee, and cacao.** *Trop. Agric. (Ceylon)* 74(2): 71–98.

070 Joachim, A.W. 1928. **Manurial values of *Dadaps* and *Gliricidia* leaves, stems and branches.** *Trop. Agric. (Ceylon)* 71: 7–8.

071 Joachim, A.W.R. 1931. **The principles of green manuring and their application in Ceylon.** *Trop. Agric. (Ceylon)* 74: 4–32.

072 Joachim, A.W.R. 1961. **The shade-tree question and green manures.** *Tea Quart.* 32: 63–68.

General discussion of shade trees and green manure in tea plantations in Ceylon. Nutrient cycling and competition for moisture, particularly under drought conditions, are considered.

073 Katyal, J.C. 1977. **Influence of organic matter on the chemical and electrochemical properties of some flooded soils.** *Soil Biol. Biochem. (UK)* 9(4): 259–266.

The effects of adding the equivalent of 20 tonnes of fresh *Gliricidia* leaves and 5 tonnes of chopped rice straw on the electrochemical properties of three flooded soils were investigated in a pot experiment. A period of 3-4 weeks is advocated between green manure application and planting.

074 Kumaraperumal, N.; Baskaran, T.L.; Daniel, S.C.; Rajamanickam, D.; Rajan, S.D.; Srinivasan, T.R. 1975. **Response of sugarcane to green manuring.** *Indian Sugar* 25(8): 681-684.

075 Nagarajah, S.; Amarasiri, S.L. 1977. **Use of organic materials as fertilizers for lowland rice in Sri Lanka.** IAEA, Vienna, pp. 97-104.

Experimental data on the use of *Gliricidia* as a green manure for lowland rice cultivation in Sri Lanka is presented.

076 Prasad, N.N.; Mani, A. 1980. **Effect of organic amendments on the persistence of phorate in soil and rice plants.** *Indian J. Plant Prot.* 7(1): 8-33.

077 Raghupathy, B.; Raj, D. 1973. **Availability fluctuations of soil phosphorus fractions during paddy growth under flooded conditions.** *Madras Agric. J.* 60(1): 17-22.

The effects of the equivalent of 5000 lbs/acre (5.6 t/ha) of *Gliricidia* on phosphorus fluctuations in paddy soils in a complex pot experiment are reported.

078 Raghupathy, B.; Raj, D. 1971. **Leachate analysis in paddy soils of Tamil Nadu.** *Annamalai Univ. Agr. Res. Annu.* 3: 30-34.

079 Rao, A.S.V. 1959. **The advantages of *Gliricidia*.** *Indian Farming* 9: 38.

Farmer's testimonial on the value of *Gliricidia* as green manure for rice.

080 Reddi, S.N.; Rao, G.P.; Rao, Y.Y.; Reddi, G.H.S. 1972. **Note on the effect of green leaf manuring with and without fertilizers on the growth and yield of IR20 rice.** *Indian J. Agric. Res.* 6(1): 67-69.

The effects of combinations of *Gliricidia* green manure and inorganic P and K fertilizer on yields of irrigated IR20 rice are reported. A regression equation is presented to predict the optimum dose of green manure.

081 Sutaria, M.H.; Patel, A.S. 1975. **Relative efficiency of different green manure crops in relation to yield of subsequent rice crop.** *Gujarat Agric. Univ. Res. J. (India)* 1(1): 30-35.

Results are reported from a three-year experiment measuring the effects of four green manures on rice yields in Gujarat, India.

082 Weeraratna, C.S. 1979. **Pattern of nitrogen release during decomposition of some green manures in a tropical alluvial soil.** *Plant and Soil* 53: 287-294.

In this laboratory experiment, patterns of release of ammonium and nitrate nitrogen during decomposition of *Gliricidia* and other green manures over seven weeks are reported.

LIVING FENCE

083 Baggio, Amilton Joao. 1982. **[Establishment, management and utilization of living fences of *Gliricidia sepium* (Jacq.) Steud., in Costa Rica.]** Establecimiento, manejo y utilizacion del sistema agroforestal cercos vivos de *Gliricidia sepium* (Jacq.) Steud., en Costa Rica. Unpublished M.S. thesis, Univ. de Costa Rica.

Reports a survey of farmers' knowledge and use of *Gliricidia* for living fence posts in five life zones of Costa Rica. Chemical composition of leaves and tree biomass production are reported. An experiment concerning rooting, survival and growth of *Gliricidia* stakes is also reported.

084 Craner, J.C. 1945. **Living fence posts in Cuba.** *Agriculture in the Americas* 5(2): 34-38.

085 Howes, F.N. 1946. **Fence and barrier plants in warm climates.** *Kew Bull. Misc. Inf.*: 51-87.

086 Lozaro Jimenez, O.R. 1962. **Postes vivos para cercos.** *Turrialba (Costa Rica)* 12(3): 150-152.

Gliricidia and two other species are evaluated for use as living fence posts near Turrialba, Costa Rica. Percentages of rooting with different size stakes, planting dates and hormone treatments are reported.

087 Sauer, J.D. 1979. **Living fences in Costa Rican agriculture.** *Turrialba, (Costa Rica)* 29(4): 255-261.

SHADE

- 068 Alconero, R.; Stone, E.G.; Cairns, J.R. 1973. **Intensive cultivation of vanilla in Uganda.** *Agron. J.* 65(1): 44-46.

Reports the use of *Gliricidia* for shade in a vanilla plantation as part of a complex shade, fertilizer and irrigation experiment. Concludes that *Gliricidia* is an adequate support tree; the fact that it sheds its leaves during the dry season helps induce flowering of the vanilla vines.

- 089 Bonaparte, E.E.N.A. 1975. **Yield gradients in cocoa (*Theobroma cacao* L.) - shade and fertilizer experiments.** *Acta Hort.* 49: 251-257.

Reports yield of cocoa planted at different distances from *Gliricidia* and other shade trees in Ghana. Competitive interaction of cocoa and shade trees is discussed.

- 090 Department of Agriculture, S.S. and F.M.S. 1938. **The growth of pepper on living supports.** *Malay Agric. J.* 26: 288-289.

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As part of a survey of 219 species representing 109 genera, *Gliricidia* seeds are reported to contain the free amino acid canavanine. The taxonomic significance of canavanine is discussed.

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- 099 Jurd, L. 1981. **Pesticidal and antimitotic agents from plants.** *Toxicol. Res. Proj. Dir.* 6(8). USDA, Western Regional Research Center, Albany (Calif).

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Chemical constituents of *Gliricidia* heartwood are presented with reference to its moderate resistance to attack by marine organisms.

- 101 Manners, G.D.; Jurd, L. 1979. **Additional flavanoids in *Gliricidia sepium*.** *Phytochemistry* 18(6): 1037-1042.

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Presence of the flavanoids quercetin and kaempferol in fresh *Gliricidia* flowers is reported.

- 103 Namhoo-diripad, C.P. 1966. **Investigation of certain seed oils.** *Indian Oil and Soap J.* 31(10): 286-289.

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TOXICITY

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110 Enrique, T.P.; Jose, M.A.; Fernando, V.A. 1978. **Total nitrites in plants and stagnant water in the Cordoba and Sucre areas, as a factor of the "cattle fall syndrome".** *Rev., Inst. Colomb. Agropecu.* 13(3): 567-74.

111 Leon, D. de; Salas, B.; Figarella, J. 1977. **Hydro cyanic acid poisoning in dairy cows. A case report.** *J. Agric. Univ. P. R. (USA)* 61(1): 106-107.

The presence of *Gliricidia* is noted in a pasture in relation to a case of poisoned dairy cows. Further studies revealed the cows probably died of HCN poisoning from *Cynodon* spp.

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Effects of supplementation of a growth medium with a crude extract of *Gliricidia* leaves on growth and differentiation of *Cattleya* protocorms are reported. Results are briefly discussed in relation to effects of plant hormones on growth and differentiation.

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The cation exchange capacity of *Gliricidia* roots from one-year old and well-grown plants are reported in relation to the root hemiparasite, *Santalum album*.

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119 Rajagopala Iyer, N. 1976. Nodule formation and haemoglobin content in some species of Papilionaceae. *Plant and Soil* 44(2): 451-454.

Characteristics of nodule formation in eleven genera of Leguminosae, including *Gliricidia macrocarpa*, are reported. Mean nodule weight and haemoglobin contents are given.

CHROMOSOMES AND EMBRYOLOGY

120 Chandravadana, P. 1965. A note on the embryology of *Gliricidia sepium* (Jacq.) Steud. *Curr. Sci.* 34(6): 185-186.

Anthers, ovules, fertilization and related processes are described.

121 Dasgupta, Aparna; Bhatt, R.P. 1976 IOPB Chromosome Number Reports LIII. *Taxon* 25: 495.

Reports chromosome number of *Gliricidia* as $n=10$.

122 Gill, L.S.; Abubakar, A.M. 1975. IOPB Chromosome Number Reports L. *Taxon* 24: 375.

123 Rao, C.K. 1972. A supernumerary isofragment in *Gliricidia sepium* (Jacq.) Steud. *P.I.A. Sci. B.* 75 (3): 117.

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125 Hernandez, E.M. 1983. [Introduction to the study of the phenotypic variability of *Gliricidia sepium*.] Introduccion al estudio de la variabilidad fenotipica de Madero Negro *Gliricidia sepium* (Jacq.) Steud. CATIE, Turrialba.

This review covers the botany, propagation, management and utilization of *Gliricidia*. A preliminary survey of phenotypic variability in *Gliricidia* is reported, and recommendations made for germplasm collection.

126 Sumberg, J.E. 1985. Collection and initial evaluation of *Gliricidia sepium* from Costa Rica. *Agroforestry Systems* (in press).

Report of collection of 47 *Gliricidia* seed samples largely from Guanacasta region of Costa Rica. Results of initial evaluation of these materials in Nigeria are discussed.

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127 Oakes, A.J.; Skov, O. 1962. Some woody legumen as forage crops for the dry tropics. *Trop. Agric.* 39: 281-287.

Results of a trial comparing forage yield and protein contents of *Gliricidia* and four other species over five years are reported.

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A regression equation for predicting the weight of fresh foliage on whole *Gliricidia* branches is given.

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The influence of *Gliricidia* shade on the insect fauna of cocoa in Ghana is reported.

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