USDA United States Department of Agriculture

Natural Resources Conservation Service Plant Guide

Gliricidia

Gliricidia sepium (Jacq.) Kunth ex Walp.

Plant Symbol = GLSE2

Common Names: Quickstick, Nicaraguan cacao shade, mother of cocoa, Mexican lilac

Synonyms: *Guadelupa pungam* Blanco, *Gliricidia lambii* Fernald, *Gliricidia maculate* var. multijuga Micheli, *Gliricidia maculate* (Kunth) Walp., *Lonchocarpus sepium* (Jacq.) DC., *Mellettia luzonensis* A. Gray, *Robinia hispida* L., *Robinia maculate* Kunth, *Robinia rosea* Miller, *Robinia sepium* Jacq., *Robinia variagata* Schltdl.

Figure 1. *Gliricidia sepium* trees established at Hoolehua, Hawaii.

Description

General: *Gliricidia sepium* (Gliricidia) is a small to medium size leguminous tree that is fast-growing with a height range of 16 to 50 feet (Parotta, 1992; Elevitch and Francis, 2006). The trunk is short and usually twisted, with bark that is smooth to slightly fissured, gray to brown color, and thornless. Leaves are compound, pinnate with alternate sub-opposite or opposite pairs of leaflets, and a terminal leaflet. Leaflets are ovate or elliptical, 1.2 – 2.4 inches long and 0.6 to 1.2 inches wide. The tree is deciduous or semi-deciduous but may keep its leaves when soil moisture is sufficient (Elevitch and Francis, 2006; Simons and Stewart, 1994). Flowers are borne on racemes, have five petals light pink to light purple, and arranged similar as pea flowers. Pods are flat, 4 to 7 inches long, ½ inch wide, green, and carry 3 to 8 seeds. Seeds are elliptical, light to dark brown, and shiny (Parrotta, 1992).

Distribution: The native range for Gliricidia is along the Pacific coast from Mexico to northern South America, up to 1100 feet elevation (Elevitch and Francis, 2006; Simons and Stewart, 1994). The tree was historically planted outside its native range to provide shade for tropical crops such as cacao and coffee. The tree is now pantropical and can be found in the Americas, the Caribbean, Africa, Asia and Pacific islands: American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, New Caledonia, Papua New Guinea, Samoa, Solomon Islands, Tonga, and Vanuatu (Elevitch and Francis, 2006; Parrotta, 1992). Within the U.S., the tree can be found in Florida and Hawaii (USDA NRCS, 2023a). For current distribution, please consult the Plant Profile page for this species on the PLANTS Web site.

Habitat: Gliricidia is found in deciduous and semi-deciduous dry forests where there is a seasonal dry period of about 5 months (Parrotta, 1992).

Adaptation

Gliricidia grows in deep, well-drained soils where soil texture ranges from sand to clay (Elevitch and Francis, 2006). The tree can tolerate shallow or skeletal soils with high calcium content or highly eroded soil (Elevitch and Francis, 2006; Simons and Stewart, 1994). Soil pH from 5.0-8.5 is adequate but may grow where soil pH is as low as 4.5. The tree grows from sea level to 4000 feet elevation, where mean annual air temperature is 72-82 °F (Elevitch and Francis, 2006; Parrotta, 1992). While Gliricidia grows well where annual rainfall is 35-59 inches, it tolerates drought and can be found where annual rainfall is as low as 25 or as high as 200 inches (USDA NRCS, 2023b; Parrotta, 1992; Simons and Stewart, 1994; Elevitch and Francis, 2006). The tops are killed by fire but sprouts readily from the root collar when rain falls (Elevitch and Francis, 2006; Simons and Stewart, 1994). The tree tolerates wind (Elevitch and Francis, 2006).

Uses
Erosion control: Gliricidia may be used to achieve conservation objectives such as reforesting denuded areas and protecting coastal sands vulnerable to erosion (Elevitch and Francis, 2006; Parrotta, 1992).

The tree has many uses on farms in tropical areas across the world (Elevitch and Francis, 2006; Parrotta, 1992; Simons and Stewart, 1994). It is used to provide shade for crops that require shade such as cacao and coffee. It has also been used as a support for vanilla and pepper. The shoots and leaves are used as fodder for cattle and goats, or as green manure to enrich poor soils. The tree is commonly used as living fenceposts and fuelwood, and is suitable for windbreak use, though in multi-species and multi-row configurations due to its seasonal defoliation trait.

Although not recommended by USDA, there is evidence that gliricidia leaves and bark can be processed to produce a rodenticide (Simons and Stewart, 1994). The leaves or bark are boiled with corn grain, then allowed to ferment for a few days (Berkelaar, 2011). Fermentation changes the coumarin in the plant tissue into dicoumarol which causes hemorrhaging when consumed (Hochman, 1966).

As a traditional medicine, crushed Gliricidia leaves can be applied to body parts to relieve aches, inflammation or used as an antihistamine, antipyretic, expectorant, or diuretic (Elevitch and Francis, 2006).

Status
Threatened or Endangered: None

Wetland Indicator: None

Weedy or Invasive: Gliricidia is assessed as invasive in certain locations and microclimates, in particular Comoros, Malawi, Singapore, Jamaica, St. Lucia, Trinidad and Tobago, Australia (Queensland), and French Polynesia (Rojas-Sandoval, 2017). However, it is assessed as low risk in Hawaii or not invasive in other locations in the Pacific (Plant Pono, 2024; Elevitch and Francis, 2006). Weediness seems to coincide with environmental conditions that promote seed production, i.e. locations where the shortest daylength of the year immediately precedes the dry season (see Seeds and Plant Production section below).

Planting Guidelines
Gliricidia may be propagated by cutting or seed. Seed may be planted in a nursery or directly into a field.

Cuttings: Utilize cuttings 20 inches or longer with a diameter greater than ½ inch from branches more than 6 months old (Elevitch and Francis, 2006; Parrotta, 1992). Cuttings up to 8 feet long with a diameter greater than 4 inches may be used when planting a living fencepost (Elevitch and Francis, 2006). To aid identification of the bottom end of the cutting when planting, it is recommended that cuts at the end toward the branch tip are angled while cuts at the end towards the trunk are perpendicular to the branch. This also helps the cutting shed water during rain. Wounding the bottom end of the cutting with shallow parallel cuts or light shaving of the bark distributes root development along the wound for a more robust root system (Parrotta, 1992). Plant cuttings to a depth of 20% its length with its bottom end down soon after collecting from the maternal tree (Elevitch and Francis, 2006). If the cuttings cannot be planted immediately, they should be stored in a manner that prevents desiccation and bruising such as under shade and stacked no more than 4 layers high. Generally, it is recommended that cuttings be planted within a few days of being harvested. Firmly pack the soil and keep moist to allow roots and leaves to develop. Keep area immediately surrounding the planted cutting free from weeds until established. One study in an extremely low rainfall environment (21 inches annual rainfall) showed that establishment was achieved when a cutting had developed multiple branches, with the longest branch measuring 40 inches in length seven months after planting (Ogoshi et al., 2020). In addition, 1.3 ounces of hydrogel crystals (0.4% w/w) mixed into the planting hole soil (8 inch diameter, 12 inch deep) improved the proportion of cuttings that established by 69%.

Seed planted in nursery as provided by Elevitch and Francis (2006): Before planting, seed may be placed in water at ambient temperature overnight to accelerate germination. Plant pre-moistened seed 0.2 inch deep into six-inch deep root trainer tubes filled with a well-prepared planting medium. A mixture of 50% peat moss, 25% perlite, 25% vermiculite, or light-textured, well-drained soil, is recommended. Planted seed should be watered daily, kept under full sun, and provided with soil amendments as needed. Seed should germinate in 3 – 15 days. Inoculate seedlings with *Rhizobium* spp. within 2 weeks after germination. Before out-planting, reduce frequency of irrigation to harden seedlings (Elevitch and Francis, 2006). Seedlings are ready to outplant within 8 – 12 weeks of sowing, or when they are 8 – 12 inches tall, and base stem diameter is 0.3 – 0.4 inches.

Seed direct planted in field: Plant seed at a depth of 0.2 inch and keep the surrounding area clear of weeds. Keep soil moist until seedling is established (Elevitch and Francis, 2006).

Management
When establishing trees, weed control is essential to avoid competition (Elevitch and Francis, 2006; Parrotta, 2006). Control weeds in the immediate vicinity of saplings until they are taller than the surrounding vegetation.

Trees readily tolerate regular pruning or even coppicing all stems at heights ranging from 1-3 feet above grade.

Pests and Potential Problems
Gliricidia is reported to be damaged by insect pests including aphids (*Aphis craccivora, Aphis liburni*), scale (*Orthezia praelonga* Douglass), mealy bug (*Puto barberi*), mites (*Oligonychus biharensis* Hirst and *Eutetranychus orientalis* Klein), tussock moths (*Orgyia postica* Wlk. and *Dasychira mendosa* Hb.) It is also reported that Gliricidia is susceptible to the fungal diseases thread blight (*Pellicularia koleroga* Cke.), anthracnose (*Colletotrichum gloeosporioides* Penz.), brown leaf spot (*Cercosporidium gliricidiasis*), root fungus (*Sphaerostilbe repens* Berk. & Br.), and root and stem rot (*Pellicularia filamentosa*) [Elevitch and Francis, 2006; Parrotta, 1992].

Environmental Concerns
This plant may become weedy or invasive in some regions or habitats and may displace desirable vegetation if not properly managed. Please consult the PLANTS Web site (http://plants.usda.gov/) and with your local NRCS Field Office, Cooperative Extension Service office, state natural resource, or state agriculture department regarding its status and use (e.g., threatened or endangered species, state noxious status, and wetland indicator values).

Control
Please contact your local agricultural extension specialist or county weed specialist to learn what works best in your area and how to use it safely. When employing herbicide control, always read the chemical label and safety instructions for each product.

Seeds and Plant Production
Seed production has been observed to be related to environmental and physiological conditions, namely short daylength, dry season, time of leaf fall, and cooler temperature (Gutteridge and Stur, 1998). In its native environment, seed production occurs when shortest day of the year, leaf fall, and the beginning of the dry season coincide in December/January. Flowers initiate soon after and seed mature a few months later. In cooler locations, i.e. higher elevations, flowering may be delayed by 2 months. In other locations where the four conditions coincide such as Timor, Indonesia, and Brisbane, Australia, seed production is similar (Gutteridge and Stur, 1998). In locations where the environmental and physiological conditions do not coincide, for example where flowering occurs during the wet season, seed production is lower.

Cultivars, Improved, and Selected Materials (and area of origin)
The Oxford Forestry Institute (OFI) evaluated collections from the native range and identified superior performers. Retalheleu, La Garita and Pontezuela were best for stem length (Dunsdon and Simons, 1996). Top leaf production was found in Retalhuleu, Belen Rivas and Monterrico. For wood production, top performers were Retalhuleu, Pontezuela and Belen Rivas. Top fuelwood producer was Gualan (Attapau et al., 2017). The best for producing biomass were a composite hybrid and Laguna Tecomapa, Masaguara, Esteli and Retalhuleu (Timyan et al., 1997). Consult with your local land grant university, local extension, or local USDA NRCS office for recommendations on adapted cultivars for use in your area**.**

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