

LOCAL NAMES

Spanish (sipria, sipia, frijolillo, aserillo)

BOTANIC DESCRIPTION

Leucaena salvadorensis forms a small- to medium-sized thornless tree, 10-15 m tall with a dbh of 20-50 cm. Occasionally, mature trees can reach 20 m in height and 70-100 cm in diameter. Trees are typically branchy when young but may have a short, clear bole to 5 m in height when older. The upright angular branches form a narrow, open crown. Bark on young trees is smooth, mid-metallic grey or grey-brown; inner bark salmon pink, becoming darker grey-brown, rougher with shallower vertical fissures with age; the inner bark becomes deep red.

Leaves bipinnate, 20-25 cm long and 19-26 cm wide with a short petiole 19-25 cm long; strongly discolorous; a mid-green or orange gland, 5 mm long and 2.5 mm wide, below the basal pair of pinnae. Small glands occur at the base of the leaf rachis. There are 4-7 pairs of pinnae per leaf and 23-27 pairs of leaflets per pinna. The leaflets are 15-19 mm long and 3-4 mm wide with asymmetric venation.

Flowers occur in white globose heads arising in the developing leaf axils. Individual flowers small and subtended by the small peltate bracts. The only visible flower parts are the stamen filaments, anthers and white styles. Typically, the styles extend beyond the anthers, giving the flower heads a stellar appearance. The hidden calyx is pale greenish-cream, tinged yellow on the lobe tips and 3-3.5 mm long. The corolla has 5 glabrous, pale yellow-green petals, 4-5 mm long, free to the base; the ovary with 16 ovules is 2 mm long, reddish and covered with whitish hairs around the upper end.

Pod sturdier and more leathery than those of other *Leucaena* pods when ripe, greenish or reddish-green when immature, turning mid-chestnut brown when ripe and dehiscing along both margins. Typically, there are only 1-2 pods per flower head, borne on stout woody stipes 7-10 mm long. Pods 15-18 cm long and 27-30 mm wide with a slightly thickened margin, 10-15 seeds per pod. The seeds are large (8-12 mm x 5-6 mm), compressed, chestnut brown and glossy with a visible pleurogram.

The specific epithet means of El Salvador.

BIOLOGY

Trees are wholly or partially deciduous, losing some or all of their leaves for 1-4 months during the dry season. Flowering starts immediately following seed dispersal in the mid to late dry season. There is a major burst of flowering that often coincides with leaflessness as pods are shed. Trees are covered with sweetly scented flowers for a number of weeks and visited by a large number of bees, assumed to play a role in the pollination.

The precise time required for pod ripening is unknown. However, it is suspected that pods take approximately 10-11 months to ripen.



Mature tree of *L. salvadorensis* near San Juan de Limay, Esteli, northern Nicaragua in full flower and leafless at the peak of the dry season. (Colin E. Hughes)



Flower heads of *L. salvadorensis*. (Colin E. Hughes)



The unripe pods of *L. salvadorensis* are tough and leathery taking 10 months to ripen compared to the generally more papery, quickly ripening pods of most species of *Leucaena*. (Colin E. Hughes)

ECOLOGY

The species occupies a clearly defined, largely contiguous, distribution area. It has been found almost exclusively on the southern slopes of the hills of the Pacific watershed and is rarely, if ever, on the flat coastal plains. It is also notable that the distribution rarely overlaps with other *Leucaena* species. In El Salvador, Honduras and Nicaragua, it occurs in the seasonally dry, tropical forest formations that extend throughout the Pacific coastal zone of Central America and Mexico. Trees normally found in association with *L. salvadorensis* include *Enterolobium cyclocarpum*, *Gliricidia sepium*, *Senna atomaria* and *Myrospermum frutescens*.

BIOPHYSICAL LIMITS

Altitude: 200-1000 m, Mean annual temperature: 25-30 deg. C, Mean annual rainfall: 800-2000 mm

Soil type: The soils where *L. salvadorensis* is found are young, superficial and primarily of volcanic origin. They are extremely rocky, shallow, skeletal and generally freely drained.

DOCUMENTED SPECIES DISTRIBUTION

Native: El Salvador, Honduras, Mexico, Nicaragua, United States of America

Exotic:



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS

Fodder: Natural regeneration is browsed by cattle, and the tree may have fodder potential, but there is little detailed knowledge about its fodder quality.

Apiculture: The sweetly scented flowers attract a large number of several species of small bees, an indication that it is an important honey source.

Fuel: The wood is an excellent fuelwood because it is dense and is easily split and dried.

Timber: It is believed that reported straight, single-stemmed provenances may be the result of active manipulation by farmers. The poles are used in traditional houses as large-diameter corner posts and in roof construction. The wood is reputedly resistant to decay and durable in the ground; according to local residents, corner posts last 10-20 years.

SERVICES

Erosion control: In Nicaragua and Honduras, *L. salvadorensis* is used in soil-conservation programmes, where it is planted as a soil-conservation barrier.

Intercropping: The traditional retention by farmers of *L. salvadorensis* in fields in parts of its natural range indicates the agroforestry potential of the species. In several areas in Nicaragua, it was used in a series of alley-cropping trials and has been intercropped with corn, sorghum and cowpea (*Vigna unguiculata*).

TREE MANAGEMENT

In the seasonally dry areas like Central America, *L. salvadorensis* should be planted at the beginning of the rains in early June at a spacing of 1.5 x 1.5 m to 1 x 3 m. If the species is to be used in alley cropping or soil-conservation barriers, the spacing should be reduced to 10-15 cm. The rows are then thinned and lopped as necessary. Further research is needed to define optimal silvicultural regimes. In many parts of the range where natural regeneration is protected, farmers actively manage trees by regularly pruning branches to produce a single stem for posts.

GERMPLASM MANAGEMENT

Seeds can be stored under conventional conditions of low mc (7-8%) and temperature (4 deg. C). Germination percentages of 70-80% are readily obtained for fresh seedlots, and there is no significant reduction in seed viability after 5 years of cold storage. The seeds of *L. salvadorensis* are large; there are 10 000-15 000 seeds/kg.

PESTS AND DISEASES

The psyllid *Heteropsylla cubana*, which feeds on young shoots and new leaves, has been found to attack *L. salvadorensis* in both Honduras and Hawaii. An unidentified pod disease has also been discovered, which on preliminary analysis has been shown to be a complex of *Ravenelia* species and a *Fusarium* species.

FURTHER READNG

Hellin JJ, Hughes CE. 1993. *Leucaena salvadorensis*: conservation and utilization in Central America. Serie Miscelanea de CONSERFORH 39-21/93.

Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.

Hughes CE. 1998. *Leucaena*; a genetic resources handbook. Tropical forestry Papers No. 37. Oxford Forestry Institute, Department of Plant Sciences, University of Oxford and Department for International Development.

SUGGESTED CITATION

Orwa C, A Mutua, Kindt R , Jamnadass R, S Anthony. 2009 *Agroforestry Database*: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp>)