

LOCAL NAMES

Spanish (guash, guaje, chalip)

BOTANIC DESCRIPTION

Leucaena collinsii is a small to medium sized deciduous tree, 10-15 (-20) m tall, and 20-40 cm diameter at breast height. Bark grey brown with shallow rusty orange brown vertical fissures, slash cream white. Trees frequently grow with a pronounced lean and branches are sometimes planar.

Leaves consist of (5) 6-16 pairs of pinnae, pinacular rachis 4-9 cm long, leaflets 4-7 mm long, 1-2 mm wide, 25-56 pairs of pinna, asymmetric about mid vein, broadly linear. The petiole gland is yellow green or green, sessile, round or elliptic, dome-shaped or rounded with a narrow central pore, 2 by 1 mm.

Flower heads 9-24 mm in diameter, 55-170 pale cream-white flowers, in groups of 2-3(6) in leaf axils on actively growing shoots, the leaves developing with the flower heads, the flowering shoot indeterminate in growth with pods borne on older wood within crown.

Pods 11-18(-20) cm long, (7-)10-19 mm wide, 1 or 2(-4) per flower head, linear-oblong, acuminate, or sometimes obtuse apically, sometimes with a short beak, flat, 9-20 seeded, mid-brown, glabrous, opening along both sutures.

Two subspecies are recognized, ssp. *collinsii*, which occurs in Mexico and ssp. *zacapana*, restricted to Guatemala. Tree form varies greatly, ssp. *collinsii* generally has a wide, open crown and heavy branching while ssp. *zacapana* is very branchy when young with numerous small branches and a spreading crown.

BIOLOGY

Flowering is between August and November and fruiting occurs from February to April. The species is highly deciduous and sheds its leaves during the prolonged dry season from December to April.



Small tree: Small fenceline *L. collinsii* subsp. *collinsii* tree, Chiapas, Mexico. (Colin Hughes)



Tree in maize field: *L. collinsii* subsp. *zacapana* (to 15 m tall) in maize field, Chiquimula, Guatemala. It is leafless during the dry season. (Colin Hughes)



Foliage and flowers (Hughes C.E.)

ECOLOGY

L. collinsii is a species of the seasonally dry tropical inland valleys of southern Mexico and Guatemala. It occurs in valleys with marked rain shadow and seasonally dry or semi-arid tropical, frost-free climate with a long dry season lasting for 6-7 months. The species is drought tolerant, and notably ssp. *zacapana*, extends in to dry thorn scrub and semi-arid areas, often forming dense thickets in secondary vegetation.

BIOPHYSICAL LIMITS

Altitude: 100-900 m

Mean annual rainfall: 500-1 000 mm

Soil type: Soils are variable across the species natural range, from the stony unstratified regosols, low in organic matter and freely drained to black clay vertisols.

DOCUMENTED SPECIES DISTRIBUTION

Native: Guatemala, Mexico

Exotic: United States of America



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

Food: Trees of ssp. are cultivated for pod production. The unripe seeds are consumed locally and the pods marketed in regional markets in Guatemala and Mexico.

Fodder: The leaves are readily consumed by stock and are highly digestible. Those of ssp. zacapana have highly nutritious leaves with low tannin content, high crude protein combined with low fibre.

Fuel: The species is valued for high quality fuelwood. ssp. zacapana is particularly managed as a bush fallow on a 4-year rotation to produce high quality firewood.

Timber: *L. collinsii* produces wood of high density and a high proportion of heartwood with mean wood density ranging between 0.75-0.91. It is very durable and therefore highly valued for poles and fence posts. Subspecies zacapana is extremely valued for its dense wood with abundant heartwood. Secondary stands are managed in parts of Guatemala on a four year coppice rotation specifically for fuelwood production.

Gum or resin: The tree stem exudes a gum that is similar to gum arabic in properties.

SERVICES

Nitrogen fixing: The species is nitrogen fixing.

Soil improver: Lopped leaves and twigs are applied as green manure.

Boundary or barrier or support: Trees of ssp. *collinsii* are planted at field boundaries and around houses as a living fence.

Intercropping: The tree is intercropped under taungya or whole rotation with fruit tree primarily as livestock feed and green manure.

Other services: *L. collinsii* is one of the most psyllid resistant leucaena species and it has been used in breeding programmes to improve resistance of other species.

TREE MANAGEMENT

The tree's coppice resprouts are numerous and are lopped for fodder; ssp. zacapana shows very good coppicing ability and is managed as a bush fallow on a 4-year coppice rotation.

GERMPLASM MANAGEMENT

There are 22 000-23 000 seeds/kg in ssp. collinsii and 30 000-36 000 seeds/kg in ssp. zacapana. Seed can be stored under conditions of <10 % moisture content at <4 deg. C for long periods while retaining high viability. Seed should be stored in hermetically sealed containers.

PESTS AND DISEASES

There are three identified pests infesting seeds of *L. collinsii*. *Acanthoscelides macrophthalmus* infests both subspecies, while *A. mankinsii* infests seed of ssp. collinsii and *A. boneti* infests seed of ssp. zacapana.

FURTHER READING

Bray RA et al. 1997. The World Leucaena Catalogue. Department of Agriculture, The University of Queensland, Brisbane, Australia, 48pp + PC Diskette.

Hughes CE. 1991. Two new subspecies of *Leucaena* (Leguminosae: Mimosoideae) from Guatemala. *Kew Bulletin* 46: 547-557.

Hughes CE. 1993. *Leucaena* genetic resources. The OFI leucaena seeds collections and a synopsis of species characteristics. Oxford Forestry Institute. University of Oxford, UK.

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.

Stewart JL et al. 1993. Screening of non-industrial tree species on reclaimed desert land in middle Egypt. *Journal of Arid Environments*. 25(4): 375-385.

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>)