

LOCAL NAMES

Spanish (guaje delgado)

BOTANIC DESCRIPTION

Leucaena pallida is a small deciduous multiple-stemmed tree 3-7 m tall although occasionally to 10 m tall and a bole diameter of 10-15 (-30) cm, with an open, spreading or narrow crown. Bark smooth, metallic-grey, blotched lighter grey with horizontally aligned pale brown lenticels, slash greenish.

Leaves have 15-27 pairs of pinnae, pinnular rachis 8-11 cm long, sparsely hairy, leaflets 6-8(-10) mm long, 1-2 mm wide, 39-50 pairs per pinna, asymmetric truncate at base, linear or oblong, acuminate at apex. Petiole gland unstalked, shallow crater-shaped, elliptical, 3-4 mm long by 2-3 mm wide.

Flower head 14-16 mm in diameter, 95-110 flowers per head, in groups of 3-5 in leaf axils on actively growing shoots, sometimes with suppression of leaves on the flowering shoot, flowers appear pale pink or dull purplish mauve.

Pods 12-19 cm long, 14-18 mm wide, 3-5 per flower head, linear, slightly thickened and leathery, glossy maroon when unripe, turning reddish-brown, glabrous or occasionally hairy. Seed 5-7 mm wide, 6-8 mm long, slightly rhombic aligned transversely in pods.

The specific epithet means pale in reference to the flowers.

BIOLOGY

The flowering season begins in May and lasts up to October, while fruiting occurs mainly between December and March. The tree is leafless during part of the dry season from December to March.



Small trees along terrace boundaries: Trees to about 5m height, cultivated along terrace boundaries, Oaxaca, Mexico. (Colin Hughes)

ECOLOGY

It is mainly found in the mid interior highlands of south central Mexico on shallow calcareous soils, in disturbed dry thorn forest, dry matorral, oak forest, oak-pine forest and particularly in the oak-dry thorn forest transition zone. It is moderately frost tolerant and withstands 5-7 months dry season in its native range where rainfall is highly seasonal.

BIOPHYSICAL LIMITS

Altitude: 850-2 500 m

Mean annual rainfall: 500-1 000 mm

Soil type: *L. pallida* grows on free draining shallow calcareous soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Mexico

Exotic: Australia, Botswana, 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: *L. pallida* is extensively cultivated for its edible pods and seeds. It is valued because it produces unripe pods earlier than *L. esculenta*, therefore extending the overall production period. Unripe pods, seeds and flower head buds are harvested and consumed locally as well as being transported to local and regional markets.

Fodder: *L. pallida* is replacing *L. leucocephala* in forage production. Its hybrid with the latter is especially valued for its exceptional forage yields, psyllid resistance and its spreading branchy habit is ideal for forage production. However, the nutritive value of the species and the hybrid are doubtful due to their lower edible fraction, higher condensed tannin content and lower digestibility than *L. leucocephala*. Psyllid resistance of hybrids like *L. leucocephala* x *L. pallida*, however, exceeds that of any *L. leucocephala*, permitting higher fodder yields under psyllid attack and the short heavily forked trees are preferred for herbivore browsing. Most accessions of the tetraploid species *L. pallida* are low forking and they confer this trait to some of their hybrids with *L. leucocephala*, some low shrubby dwarfs also result.

Fuel: *L. pallida* is used widely for firewood.

Timber: The hybrid *L. diversifolia* x *L. pallida* is psyllid resistant and grows as a pseudo-shrub with many long straight branches. Poles are commonly used in the production of vine crops (black pepper, passion fruit, pole beans) where long, straight, thin poles are preferred.

Other products: *L. pallida* shows moderate to high psyllid resistance and has been used in breeding programmes.

SERVICES

Nitrogen fixing: *L. pallida* is nitrogen fixing.

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

Boundary or barrier or support: *L. pallida* is largely cultivated on terrace margins or field boundaries.

Intercropping: Farmers in dry zones use *L. pallida* over crops as a tree fodder and in hedgerow agroforestry systems.

TREE MANAGEMENT

The tree coppices well producing few seeds. Silvicultural practice should include dense planting (10 000 stems/ha) with thinning for fuelwood at one and three years, and harvest after 6-8 years. Trees are lopped annually during pod harvesting.

GERMPLASM MANAGEMENT

There are between 20 000-25 000 seeds/kg. Seeds can be stored for a long time if stored at ≤ 4 deg. C and < 10 % moisture content following conventional seed storage methods.

PESTS AND DISEASES

Four species of bruchids from the genus *Acanthoscelides* have been reported to infect seeds of *L. pallida*. *A. macrophthalmus*, *A. mankinsii*, *A. boneti* and *A. leucaenicola* have been identified as pests of this species as well as other *Leucaena* species.

FURTHER READNG

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

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.

Karachi M. and Lefofe BM. 1997. The performance of Leucaena spp. at Morale, Botswana. LEUCNET News 4: 11-12.

Luhende R, Nyadzi G, Malimbwi RE. 2006. Comparison of wood basic density and basal area of 5-year-old *Acacia crassicarpa*, *A. julifera*, *A. leptocarpa*, *Leucaena pallida* and *Senna siamea* in rotational woodlots trials in western Tabora, Tanzania: IUFRO NFT News. 9(1):5-6.

Nyadzi GI, Otsyina RM, Ong CK. 2002. Growth and water resource utilization of *Acacia crassicarpa*, *Senna siamea* and *Leucaena pallida* tree species established in rotational woodlots agroforestry system in western Tanzania: 12th ISCO Conference, Beijing, China. p. 410-414.

Wheeler RA et al. 1994. Forage yield and compositional analysis of *Leucaena* species and hybrids adapted to cool sites. *Agroforestry Systems*. 25(3): 263-274.

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>)