Leucaena pallida

Britton & Rose

Fabaceae - Mimosoideae

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.

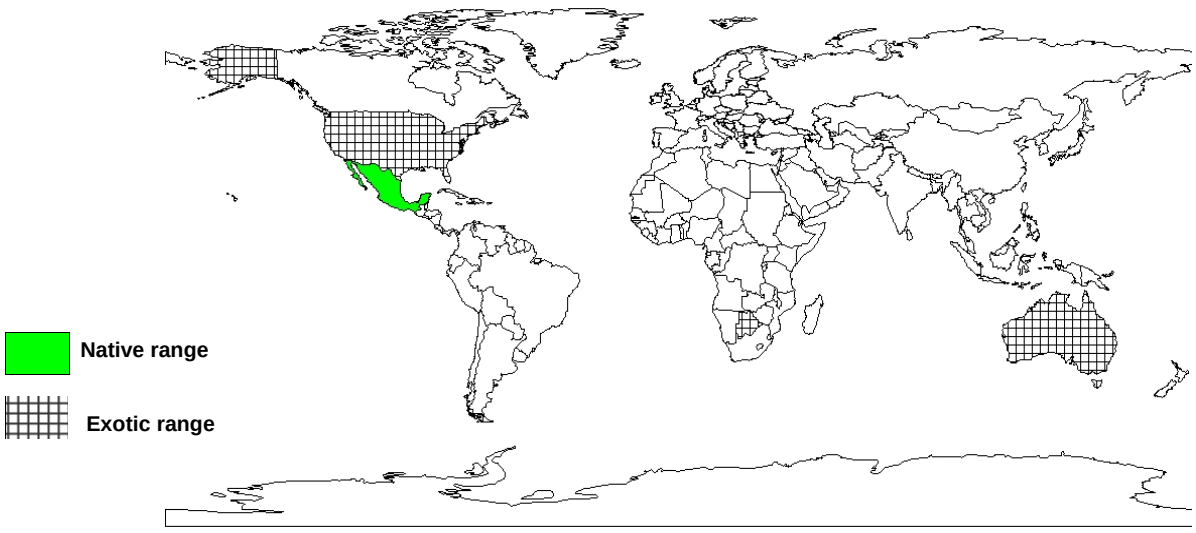
Small trees along terrace boundaries: Trees to about 5m height, cultivated along terrace boundaries, Oaxaca, Mexico. (Colin Hughes)

ECOLOGY
It is mainly found in the mid interior highlands of south central Mexico on shallow calcareous soils, in disturbed dry thorn forest, dry mattoral, 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, US



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 Instite. 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 hibrids adapted to cool sites. Agroforestry Systems. 25(3): 263-274.

SUGGESTED CITATION

Orwa C, Mutua A , Kindt R , Jamnadass R, Simons A. 2009. Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/af/treedb/)