SEED LEAFLET

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Acacia mangium Willd.

Taxonomy and nomenclature

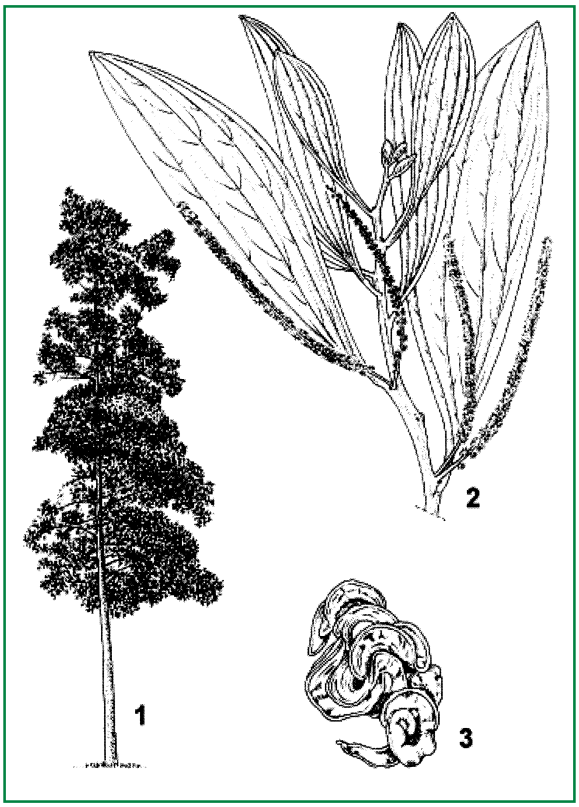
Family: Fabaceae (Mimosoideae)
Synonyms: *Rancosperma mangium* (Willd.) Pedley
Vernacular/common names: black wattle, hickory wattle, brown salwood (trade name).

Distribution and habitat

Native to northern Queensland in Australia, through Papua New Guinea into the Indonesian provinces of Irian Jaya and Maluku. A fast-growing, relatively short-lived (30-50 years) tree, adapted to a wide range of acidic (pH 4.5-6.5) soils in moist tropical lowlands.

It does not tolerate frost or shade. Grows better on fertile sites with good drainage but will tolerate soils of low fertility and impeded drainage. Young trees are susceptible to fire. Can become a weed under certain conditions.

Natural hybrids of *A. auriculiformis* and *A. mangium* have shown desirable characteristics.



1, Habit of young tree; 2, flowering twig; 3 pods. From: Plant resources of South-East Asia 5:2.

Uses

A major plantation species in Asia where it is grown mainly for paper pulp. Other uses include fuelwood, construction and furniture wood, wattle timber, erosion control, shade and shelter. A valuable feature is the ability to compete with *Imperata cylindrica* reducing the grass to a sparse ground cover.

Botanical description

Evergreen tree, up to 30 m tall. The bole can be unbranched for more than half of the total tree height; it is sometimes fluted at the base and the diameter rarely exceeds 50 cm. Bark is rough and furrowed, either grey or brown. Small branches are winged. Leaves (phyllodes) large, up to 25 cm long, 3-10 cm broad, dark green with normally four main longitudinal nerves (three in *A. auriculiformis*); leaves on juvenile trees are compound. Flowers bisexual, white or creamy, in rather loose spikes up to 10 cm long, single or in pairs in the upper leaf corners.

Fruit and seed description

Fruit: dehiscent pod that is tightly coiled when ripe, slightly woody, 7-8 cm long, 3-5 mm wide.
Seed: black and shiny, elliptical, 3-5 x 2-3 mm, with a bright yellow or orange funicle folded beneath the seed. There are 66,000-120,000 seeds/kg.

Flowering and fruiting habit

Time of flowering differs throughout its natural and planted range. In Australia flowering occurs February-May, and seed matures October-December. In Indonesia mature fruits are available from July, in Papua New Guinea in late September.

As an exotic, the normal flowering cycle may be disrupted and flowering can occur throughout the year; however, a distinct peak is usually discernible. The peak is reported to be June-July in Peninsular Malaysia, January in Sabah, October-November in Taiwan and September in Thailand. In Tanzania mature fruits are harvested June-July. It flowers precociously, and viable seed can be harvested 24 months after planting. The species is generally outcrossing; and pollination is by insects.

Harvest
Collection from the tree or from the ground.

Processing and handling
The pods should be processed as soon as possible after harvest. Pods and seeds should not be left long to dry in the sun, as temperatures over 43°C can reduce viability. Extraction with flailing thresher followed by winnowing as described in Doran et al. (1983) is suitable for this species. The funicle can be removed manually by rubbing the seed over a sieve.

Storage and viability
The seeds are orthodox and can retain viability for several years when stored in airtight containers in a dark, cool room. The recommended moisture content for storage is 5-7 %.

Dormancy and pretreatment
Mature seeds are pretreated by immersion in boiling water for 30 seconds followed by soaking in cold water for 24 hours; alternatively they can be manually scarified. Germination rate is high (75-90%) after suitable treatment.

Sowing and germination
Seeds can be sown in seedbeds, germination trays (wet towel method) or directly in containers. Awang and Taylor (1994) give a detailed description of nursery techniques. Vegetative propagation by cutting and tissue culture is very important for this species.

Selected readings

Awang, K. & Taylor, D. (eds.), 1993. *Acacia mangium: growing and utilisation.* MPTS Monograph Series No. 3. Jointly published with the FAO Forestry Research Support Programme for Asia and the Pacific (FORSPA) and Forest Tree Improvement Project (FORTIP). 280 pp.

Booth, T.H., ed., 1996. *Matching trees and sites*. Proceedings of an International Workshop held in Bangkok, Thailand, March 1995. ACIAR Proc. No. 63.

Doran, J.C., Turnbull, J.W., Boland, D.J., Gunn, B.V., 1983. *Handbook on seeds of dry-zone acacias*. A guide for collecting, extracting, cleaning, and storing the seed and for treatment to promote germination of dry-zone acacias. FAO, Rome, Italy.

Doran, J.C., Gunn, B.V., 1987. *Treatments to promote seed germination in Australian acacias*. In: Turnbull JW, ed. Australian Acacias in Developing Countries. Proceedings of an International Workshop, Gympie, Qld., Australia, 4-7 August 1986. ACIAR Proceedings No 16:57-63

Doran, J.C. & Turnbull, J.W. (eds.) 1997. *Australian Trees and Shrubs: species for land rehabilitation and farm planting in the tropics*. ACIAR Monograph No 24.

Lemmens, R.H.M.J., Soerianegara, I., Wong, W.C., eds. 1995. *Plant resources of South-East Asia No. 5 (2). Timber trees: minor commercial timbers*. 655 pp.; Prosea Foundation, Bogor, Indonesia. Leiden: Backhuys Publishers.

Preece, D. & Brook, R. 1996. *Acacia mangium: an important multipurpose tree for the tropic lowlands*. FACT Sheet 96-03

Wickneswari, R., 1994. *Acacia mangium x Acacia auriculiformis hybrids*. Research Pamphlet No. 116, FRIM, Malaysia.

Natural stand in Papua New Guinea. Photo: Maurice Mcdonald, CSIRO, Forestry & Forest Products, Australian Tree Seed Centre.

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