Azadirachta excelsa

(Jack) Jacobs.

Meliaceae

sentang

LOCAL NAMES

English (Philippine neem tree,marrango tree); Indonesian (sentang,kayu bawang); Malay (saurian bawang,ranggu,kayu bawang); Thai (sa-dao-thiam); Trade name (sentang)

BOTANIC DESCRIPTION

Azadirachta excelsa is a large deciduous tree up to 50 m tall, bole up to 125 cm in diameter, buttresses absent. Bark surface smooth, becoming fissured and shaggily flaky, pinkish-brown or pinkish-gray, becoming pale brownish or grayish buff in old trees, inner bark orange-red.

Leaves alternate, imparipinnate up to 60(-90) cm long, with 7-11 pairs of leaflets, leaflets asymmetrical, lanceolate to elliptical, up to 12.5 x 3.5 cm, margin entire.

Flowers greenish-white, in axillary many-flowered panicles, actinomorphic, 5-merous and fragrant.

Fruit drupaceous, 2.4-3.2 cm long, green turning yellow when ripe.

BIOLOGY

In Thailand A. excelsa flowers from February-March. Fruits, normally eaten by birds and bats, ripen 12 weeks after anthesis.

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ECOLOGY
A. excelsa is a plant of lowland monsoon forests in southeast Asia usually occurring in old clearings or secondary forest, but also found in primary dipterocarp forest up to 350 m altitude. It is mostly associated with Durio, Palaquim, Calophyllum and Agathis species.

BIOPHYSICAL LIMITS
Altitude range: 0 - 350 m
Mean annual rainfall: 1600 - 3000 mm
Mean maximum temperature: 21 - 34 deg C.
Preffers alluvial, medium textured, free draining, acidic soils. It is also found growing on clay soils, granite soils; lateritic soils and limestones.

DOCUMENTED SPECIES DISTRIBUTION

Native: Indonesia, Malaysia, Papua New Guinea, Philippines, Vietnam
Exotic: Singapore, Thailand

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: In the Malaysian Peninsular, the young shoots, leaves and flowers are consumed as a vegetable.

Apiculture: The fragrant flowers are a source of pollen and nectar.

Timber: Sentang is a lightweight to medium-weight hardwood, the heartwood is pale reddish-brown and distinctly demarcated from the yellowish-white, greyish white or sometimes grey-pink sapwood. The wood density is 550-780 kg/cu m at 15% moisture content. Sentang wood is rated as non-durable to moderately durable. The wood is generally easy to work with good boring and planing properties, and takes a good finish. The timber has been used for construction work (joinery, interior finishing and flooring) and for furniture. Its veneer potential is high.

Tannin or dyestuff: The tree's bark contains tannins.

Lipids: The seed oil fatty acid composition is: caprylic acid 0.30%, n-capric acid 0.96%, palmitic acid 9.8%, stearic acid 4.7%, heneicosanoic acid 0.72%, behenic acid 2.76%, and tricosanoic acid 0.75%.

Poison: The plant parts are insecticidal. The active principle marrangin (azadirachtin L) has multiple effects on the development of insects.

Medicine: Seed products of Azadirachta species have been used for a long time in traditional medicine.

Other products: The seed oil, with a saponification number 203.38, is used in the manufacture of soap. Marrangin (azadirachtin L) is a natural substance found in sentang with a complex tetranortriterpenoid structure which to date has resisted artificial synthesis.

SERVICES
Erosion control: Sentang can be planted for soil conservation purposes.

Shade or shelter: A. excelsa is a useful shade provider.

Reclamation: The sentang shows potential for plantation establishment and can be used in reforestation and afforestation programmes.

Soil improver: The leaves are used in agriculture as mulch.

Ornamental: The sentang is a beautiful tree planted in botanical and experimental gardens.

Intercropping: A. excelsa is a lesser known tropical fast growing evergreen multipurpose tree of agroforestry potential. Sentang and rubber are often mixed in plantations.

TREE MANAGEMENT
The species survives well with almost 100% survival in the field and is relatively free from pest and disease problems during the early growth phase. A. excelsa tolerates greater rainfall than A. indica. Growth is slow initially but subsequently increases significantly. Sentang is planted at a spacing of 2-4 m x 4 m. Harvest of sentang is usually 5 years after planting.

Thinning should be done to promote rapid growth and maintain wind firmness. The basis of selection is to choose the dominant leaders, i.e. straight stems and general good form. For medium-size sawlog production, the final crop can usually be achieved after two thinnings. The following thinning regime for A. excelsa has been proposed: first thinning at a mean top height of 10-15 m, stocking greater than 800 stems per hectare is reduced to 500-600 stems per hectare; commercial thinning when the mean top height is 20 m, stocking is reduced to a final crop of 250-300 stems per hectare.

Pruning is generally unnecessary, as A. excelsa will self-prune (lower older branches will naturally die and break off).

GERMPLASM MANAGEMENT
The germination rate for sentang is 75-80% when seeds are sown directly after harvesting and 50-60% when sown after harvesting. There are 470 seeds/ kg. Fruits should be collected off the trees to avoid contamination by soil borne pathogens and should not be placed directly on the ground. Fruits can be depulped by washing and seeds air dried for 3-7 days in a dry and shaded area before being stored. Density grading by immersion in water can be done, floating seeds should be discarded.

PESTS AND DISEASES
The sapwood is susceptible to dry-wood termites and powder-post beetles, and also to fungal attacks. Four species of thrips and a moth caterpillar, Loboschiza vulnerata have caused minor damage to plantations in Malaysia.

FURTHER READNG

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SUGGESTED CITATION

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