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SEED LEAFLET

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Ceiba pentandra (L.) Gaertn.

Taxonomy and nomenclature

Family: Bombacaceae

Synonyms: *Bombax pentandrum* L., *Ceiba casearia* Medik., *Eriodendron anafractuosum* DC.

Vernacular/common names: kapok, cotton silk tree (Eng.); kapokier (Fr.); kapokbaum (Germ.); ceiba, ceibo (Sp.);

Distribution and habitat

Natural occurrence from 16°N in the United States, through Central America to 16°S in South America. Common on coastal plains up to 500 m altitude, with annual precipitation of 1000-2500 mm and temperatures from 20 to 27°C. A light demanding pioneer, found in moist evergreen and deciduous forests; also in dry forests and in gallery forests.

Cultivated widely in the tropics between 16°N and 16°S. Can grow on a variety of soils, from sand to clay soils provided they are well drained. Prefers alluvial soils, slightly acidic to neutral. Tolerates drought and for shorter periods temperatures below zero; sensitive to fire. At the time of fruit setting, temperatures below 15°C can be detrimental.

Fruiting branch and flowering branchlet. From: Plant Resources of South-East Asia.

Uses

The fibre makes an excellent material for a number of purposes, the foliage is used for fodder and oil is extracted from the seeds and used industrially. The tree is an important source of honey and also suitable for soil erosion control and watershed protection. In agroforestry it is grown with coffee, cacao, and in Java as support for pepper trees. In India it is used in taungya systems.

The wood is very light with specific gravity of 0.24 g/cm^3. When dry, the colour varies between grey and yellow, with white parts. The grain is interlocked, the texture coarse, lacking luster and shape. The porosity is diffuse and the pores large. It has a high natural durability, is easy to work and preserve. Used for boxes and crates, plywood and pulp and paper products.

Saplings and mature trees are used for temporary and permanent shade for cocoa. Maintains moisture in the soil around it thereby ensuring a high humidity in cocoa farms. This characteristic is beneficial in the dry season but negative in the wet season since it encourages fungal diseases.

Botanical description

Tall tree, 25-70 m with a diameter of 100-300 cm. The trunk is cylindrical to slightly convex. Crown spherical to round, with bright green, open foliage; branches verticillate and abundant, sloping upwards; the bark is smooth to slightly fissured, pale grey, with horizontal rings, protruding lenticels and sharp prickles that are irregularly distributed on the upper part of the trunk.

The leaves are digitally compound, alternate and clustered at the end of the branches. Petioles 5-25 cm long, partly red towards the base, slender and glabrous. 5-9 leaflets, 5-20 cm long, 1.5-5 cm wide, lanceolate to oblanceolate, apex acuminate, base cuneate, margin entire, dark green on upper side, pale green on lower side, glabrous.

Flowers in pendulous fascicles, clustered at the tip of the twigs; hermaphroditic, whitish, large. The calyx is bell-shaped, 1 cm long, with 5 to 10 short lobes; corolla 3-3.5 cm long, with 5 lobes, white to rose coloured, covered with silky hairs; stamens 5, united into a column at the base, longer than the petals; pistil with superior ovary, style long and curved near the apex, stigma enlarged.

Fruit and seed description

Fruit: a leathery, ellipsoid, pendulous capsule, 10-30 cm long, 3-6 cm wide, rarely dehiscing on the tree. Capsules split open into 5 valves, revealing a mass of grey woolly hairs in which the 120-175 seeds are embedded.

Seed: black or dark brown, covered with wool. Oil content 20-25%. There are 10,000-45,000 seeds/kg depending on provenance.

Flowering and fruiting habit

The flowers are pollinated by birds, bats and bees. Flowering takes place Dec-Jan in Honduras, Nov-Jan in El Salvador. Fruiting Mar-Apr in Honduras, Jan-Apr in El Salvador. The trees will normally begin to produce fruits when they are 4-5 years old.

Harvest

When the fruits have turned dark brown, they can be collected from the ground or cut from the tree using hooked knives. 600-900 fruits per tree has been reported.

Processing and handling

The fruits are left on sieves or in boxes to dry in the sun 3-4 hours every day for 2-3 days until they open. Extraction and cleaning is done manually, by shaking the fruits in a bag.

Storage and viability

The seeds are probably orthodox. They contain large amounts of oil that tend to go rancid quickly and the viability diminishes rapidly. When the seeds are stored at 10-12 % moisture content in hermetically closed plastic bags at 15°C, they retain viability for 5-6 months.

Dormancy and pretreatment

Immersion in boiling water for 1 min and then left in the cooling water for 24 hours has been reported to improve germination.

Sowing and germination

The seeds are sown in seed beds or in sand boxes in a greenhouse. Fresh seeds normally germinate 90-95%. When the first pair of leaves appears and the seedlings are 12-15 cm, the roots are pruned and the seedlings transferred to polybags. The plants are ready for planting in the field 4-6 months after sowing when they are 30-35 cm tall. Easy to propagate vegetatively by cuttings.

Selected readings

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Young fruits and flower. Photo: Duncan Mcqueen, OFI

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