

## Anacardium occidentale

cashew nut

### LOCAL NAMES

Arabic (habb al-biladhir); Bengali (hijuli,hijlibadam); Burmese (thiho thayet si); Chinese (yao kuo); Dutch (kasjoe,mereke); English (cashew,cashew nut); Filipino (kasoy,balogo,bulabad); French (anacardier,acajou,pommier cajou,pomme d' cajou,anacadier,noix d' cajou,anacarde,anacardes,pomme acajou); German (Acajubaum,Kaschubaum,cashwenuß,elefantenlaus); Gujarati (kaju); Hindi (bojan,kashu-mavu,kaju,hijuli); Indonesian (jambu monyet,jambu mede); Italian (acagia); Japanese (kashu nattsu); Javanese (jambu mede,jambu monyet); Khmer (svaay chanti); Malay (gajus,jambu monyet); Mandinka (kasuowo,kasuwu); Nepali (kaaju); Portuguese (caju); Sanskrit (kajutaka); Spanish (cashú,merci,marañón,cacajuil,casho,cajuil,acaya); Swahili (mkanju,mkorosho,mbibo); Tamil (mindiri); Thai (yruang,mamuang,himmaphan,mamuang letlor); Trade name (cashew nut); Vietnamese (cây diều,dào lôn hôt)

### BOTANIC DESCRIPTION

*Anacardium occidentale* is a medium-sized tree, spreading, evergreen, much branched; grows to a height of 12 m. When grown on lateritic, gravelly, coastal sandy areas, it rarely exceeds 6 m and develops a spreading habit and globose shape with crown diameter to 12 m. Grown inland on loams, it reaches 15 m and is much branched, with a smaller (4-6 m) crown diameter. The root system of a mature *A. occidentale*, when grown from the seed, consists of a very prominent taproot and a well-developed and extensive network of lateral and sinker roots.

Leaves simple, alternate, coriaceous, glabrous, obovate, rounded at ends, 10-18 x 8-15 cm, with short petiole, pale green or reddish when young and dark green when mature.

The inflorescence is a terminal panicle-like cluster commonly bearing male and hermaphroditic flowers. The male flowers are the most numerous and usually bear 1 exerted stamen and 9 small inserted ones. *A. occidentale* normally comes into flowering in 3 to 5 years.

The nut, which is the true fruit, dries and does not split open. Inside the poisonous shell is a large curved seed, nearly 2.5 cm long, the edible cashew nut. As the nut matures, the stalk (receptacle) at the base enlarges rapidly within a few days into the fleshy fruitlike structure, broadest at the apex, popularly known as the fruit. This thin-skinned edible cashew fruit has a light yellow spongy flesh, which is very juicy, pleasantly acidic and slightly astringent when eaten raw and highly astringent when green.

The generic name was given by Linnaeus and refers to the vaguely heart-shaped look of its false fruit.

### BIOLOGY

Flies, bees and ants as well as wind carry out pollination. Bees promote greater pollination because scented flowers and sticky pollen grains attract them. Bagged inflorescence does not produce nuts unless it is hand pollinated or insects are allowed inside. Self-pollination is also possible, as nuts have developed from hand-pollinated, bagged inflorescence.

L.

Anacardiaceae



Immature fruit. (Anthony Simons)



Fruit (Chris Gardiner)



*Anacardium occidentale* foliage (Joris de Wolf, Patrick Van Damme, Diego Van Meersschaut)

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### ECOLOGY

*A. occidentale* requires high temperatures; frost is deleterious. Distribution of rainfall is more important than the amount of it. The tree fruits well if rains are not abundant during flowering and if nuts mature in a dry period; the latter ensures good keeping quality. The tree can adapt to very dry conditions as long as its extensive root system has access to soil moisture. In drier areas (800-1000 mm of rainfall), a deep and well-drained soil without impervious layers is essential.

### BIOPHYSICAL LIMITS

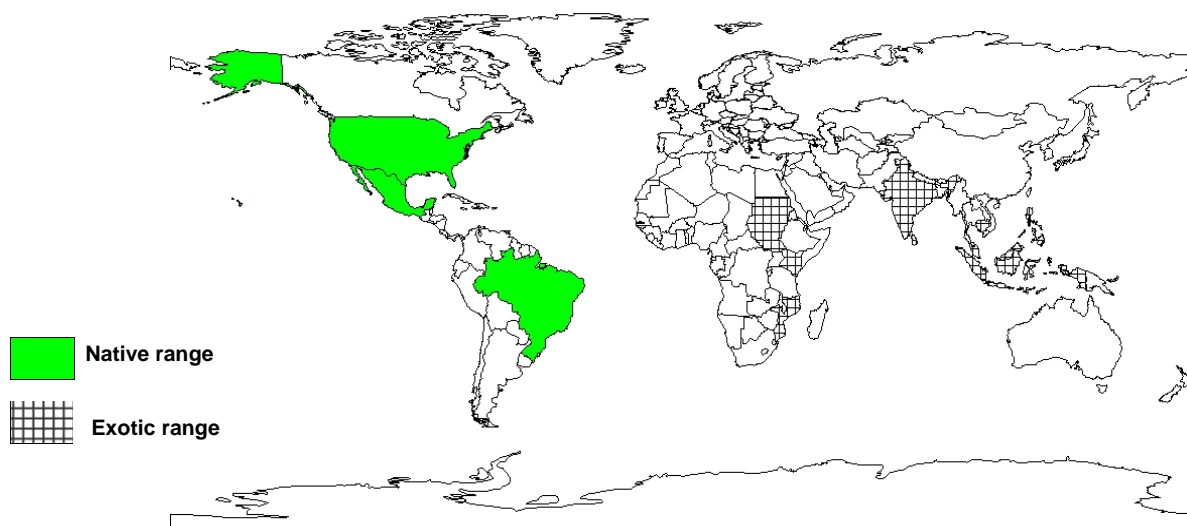
Altitude: 0-1000 m, Mean annual temperature: 17-38 deg. C, Mean annual rainfall: 500-3 500 mm

Soil type: Prefers deep, fertile, sandy soils but will grow well on most soils except pure clays or soils that are otherwise impermeable, poorly drained or subject to periodic flooding.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Brazil, Mexico, US

Exotic: Cambodia, Gambia, India, Indonesia, Kenya, Malaysia, Mozambique, Myanmar, Philippines, Sri Lanka, Sudan, Tanzania, Thailand, Uganda, Vietnam



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.

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Anacardiaceae

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### PRODUCTS

**Food:** *A. occidentale* is cultivated for its nuts. Botanically, the nut is the fruit; the cashew apple is the swollen, fleshy fruit stalk. The seeds kernels are extracted by shelling the roasted nuts. In production areas, cashew serves as food. Elsewhere it forms a delicacy. The kernels are nutritious, containing fats, proteins, carbohydrates, vitamins and minerals. In Brazil, Mozambique and Indonesia, the cashew apple is also important; it is eaten fresh or mixed in fruit salads, and a drink is prepared from the juice; sweets and jams can also be prepared from it. Young shoots and leaves are eaten fresh or cooked.

**Fodder:** The cake remaining after oil has been extracted from the kernel serves as animal food. Seed coats are used as poultry feed.

**Fuel:** The wood is popular for firewood and charcoal. The residue of the shell is often used as fuel in cashew nut shell liquid extraction plants.

**Fibre:** Pulp from the wood is used to fabricate corrugated and hardboard boxes.

**Timber:** The wood of *A. occidentale* ('white mahogany' in Latin America) is fairly hard with a density of 500 kg/cm. It finds useful applications in wheel hubs, yoke, fishing boats, furniture, false ceilings and interior decoration. Boxes made from the wood are collapsible but are strong enough to compete with conventional wooden packing cases.

**Gum or resin:** The bark contains an acrid sap of thick brown resin, which becomes black on exposure to air. This is used as indelible ink in marking and printing linens and cottons. The resin is also used as a varnish, a preservative for fishnets and a flux for solder metals. The stem also yields an amber-coloured gum, which is partly soluble in water, the main portion swelling into a jellylike mass. This gum is used as an adhesive (for woodwork panels, plywood, bookbinding), partly because it has insecticidal properties.

**Tannin or dyestuff:** The acrid sap of the bark contains 3-5% tannin and is employed in the tanning industry.

**Lipids:** An oil, cashew nut shell liquid, is produced in the large cells of the pericarp; it has industrial applications and is used as a preservative to treat, for instance, wooden structures and fishing nets. It is also in good demand for paints, synthetic resins, laminated products, brake linings and clutch facings.

**Alcohol:** In Brazil, Mozambique and Indonesia cashew wine (slightly fermented juice) is enjoyed at harvest time and can be distilled to produce strong alcoholic drinks. In Goa, India, fermenting the juice makes a type of brandy called 'fenni'. In Tanzania, a product called 'konyagi', akin to gin, is made from cashew apple.

**Poison:** One of the components of the bark gum acts as a vesicant and has insect repellent properties.

**Medicine:** Cashew syrup is a good remedy for coughs and colds. Cashew apple juice is said to be effective for the treatment of syphilis. Root infusion is an excellent purgative. Old cashew liquor in small doses cures stomach-ache. The oil obtained from the shell by maceration in spirit is applied to cure cracks on the sole of the feet, common in villagers. Cashew apple is anti-scorbutic, astringent and diuretic, and is used for cholera and kidney troubles. Bark is astringent, counterirritant, rubefacient, vesicant, and used for ulcer. Cashew nut shell oil is anti-hypertensive and purgative; it is used for blood sugar problems, kidney troubles, cholera, cracks on soles of feet, hookworms, corns and warts. The kernel is a demulcent, an emollient and is used for diarrhoea. Buds and young leaves are used for skin diseases. The resinous juice of seeds is used for mental derangement, heart palpitation, rheumatism; it was used to cure the loss of memory that was a sequel to smallpox.

### SERVICES

**Reclamation:** Because of its extreme tolerance of external conditions, it has been planted in poor soils to check erosion.

**Intercropping:** Has been intercropped with cowpea, groundnuts and horsegram in India. In Andhra Pradesh and Orissa in India, casuarina and coconut constitute a popular crop combination.

**TREE MANAGEMENT**

Weeding is necessary to conserve soil moisture for the seedlings during the dry months. After the tree starts bearing, it is important to apply fertilizers and spray against pests and diseases. *Anacardium occidentale* is rarely pruned. Removal of dead and diseased branches is necessary, however. When an initial closer planting is adopted, thinning is done after about 5 years. Shape the tree by removing the lower branches to allow nut collection and human movement.

**GERMPLASM MANAGEMENT**

Seed storage behaviour is orthodox; 100% germination has been recorded after 4 months of open storage at room temperature, but viability is reduced to 50% after 10 months and none survives after 13-14 months. Viability can be maintained for 1 year in storage at room temperature with low seed mc; viability for more than 3 years in hermetic storage at ambient temperature with seeds at 11-15% mc.

**PESTS AND DISEASES**

*A. occidentale* is susceptible to over 60 known species of insect pests during different stages of its growth. The major pests in India are considered to be stem borers and root borers including *Plocaederus ferrugineus*, tea mosquito (*Helopeltis antonii*), leaf miner (*Acrocercops syngramma*) and leaf and blossom webber (*Lamida moncusalis*). In Tanzania, important pests include sucking bugs (*Helopeltis schoutedeni* and *H. anacardii*), the theraptus bug (*Pseudotheraptus wayi*), thrips (*Selenothrips rubrocinctus*), bark borers (*Mecocorynus loripes*) and the defoliating caterpillar (*Nudaurelia bellina*).

Common diseases include die-back or pink disease (*Corticium salmonicola*), damping-off of seedlings (*Phytophthora palmivora*); anthracnose disease (*Collectotrichum gleosporioides*), leaf spots, shoot-rot and leaf fall. A combination spray of BHC and a copper fungicide like Blitox at the time of emergence of new flush has been found an effective prophylactic measure.

**FURTHER READING**

Aiyadura SG, Premanad PP. 1965. Can cashew become a more remunerable plantation crop? *India Cashew Journal*. 4(1):2-7.

Anon. 1962. The cultivation of annatto. *Farmer Jamaica*. 67(5):156-158.

Anon. 1986. The useful plants of India. Publications & Information Directorate, CSIR, New Delhi, India.

Beentje HJ. 1994. Kenya trees, shrubs and lianas. National Museums of Kenya.

Cobley L.S & Steele W.M. 1976. An Introduction to the Botany of Tropical Crops. Longman Group Limited.

Crane JH, Balerdi CF, Campbell CW. 1994. The avocado. Fact Sheet HS-52, Horticultural Sciences Department, Florida Cooperative Extension Services, Institute of Food and Agricultural Sciences, University of Florida.

Dale IR, Greenway PJ. 1961. Kenya trees and shrubs. Buchanan's Kenya Estates Ltd.

Hocking D. 1993. Trees for Drylands. Oxford & IBH Publishing Co. New Delhi.

Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.

ICRAF. 1992. A selection of useful trees and shrubs for Kenya: Notes on their identification, propagation and management for use by farming and pastoral communities. ICRAF.

Jain SK, Lata S. 1996. Unique indigenous Amazonian uses of some plants growing in India. *Indigenous Knowledge and Development Monitor*. 4(3): 21-23.

Katende AB et al. 1995. Useful trees and shrubs for Uganda. Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).

Lanzara P. and Pizzetti M. 1978. *Simon & Schuster's Guide to Trees*. New York: Simon and Schuster

Mbuya LP et al. 1994. Useful trees and shrubs for Tanzania: Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).

Nair KM et. al. 1979. Monograph on plantation crops-1, cashew (*Anacardium occidentale* L.). Central Plantations Institute, Kerala, India.

Nair PK. 1980. Agroforestry species: A crop sheet manual. ICRAF.

Nicholson B.E, Harrison S.G, Masefield G.B & Wallis M. 1969. *The Oxford Book of Food Plants*. Oxford University Press

Noad T, Birnie A. 1989. *Trees of Kenya*. General Printers, Nairobi.

Northwood PJ. 1966. Some observations on flowering and fruit setting in the cashew (*Anacardium occidentale* L.). *Trop. Agriculture, Trin.* 43(1).

Perry LM. 1980. Medicinal plants of East and South East Asia : attributed properties and uses. MIT Press. South East Asia.

Vaughan JG. 1970. The structure and utilization of oil seeds. Chapman and Hall Ltd.

Verheij EWM, Coronel RE (eds.). 1991. Plant Resources of South East Asia No 2. Edible fruits and nuts. Backhuys Publishers, Leiden.

Vogt K. 1995. A field guide to the identification, propagation and uses of common trees and shrubs of dryland Sudan. SOS Sahel International (UK).

Williams R.O & OBE. 1949. The useful and ornamental plants in Zanzibar and Pemba. Zanzibar Protectorate.

**SUGGESTED CITATION**

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