

**LOCAL NAMES**

English (afzelia,African mahogany); French (lingue,doussie,afzelia d'Afrique)

**BOTANIC DESCRIPTION**

Afzelia africana is a large deciduous tree with a spreading crown, to 30 (-35) m tall in forests and 10-18 m tall in savannah. The average dbh is 1 m. The stem has relatively thick, unequal buttresses with a light concave profile; in general they are 1-1.5 m tall and 1-2 m wide. Twigs glabrous, with lenticels. The bark is a reddish-grey, scaly, about 2 cm thick. It exfoliates in rounded patches, protecting the tree effectively against the frequent bush-fires of the dry season. The rosy slash exudes a dark yellow, highly aromatic resin.

Leaves bright green, paripinnate, to 30 cm long each with 7-17 pairs of elliptic or ovate glabrous leaflets. Petioles 0.4-1.0 cm long.

Flowers white to yellowish, 1.5 cm long, with one single red striped petal, set in terminal panicles to 20 cm long.

Fruit a flat pod 12-17 x 5-8 x 3.5 cm hard, slightly rounded, dark brown to black, glabrous with a distinct beak at one end. Each pod contains several black seeds.

Seeds poisonous, 2-3 cm long, with sweet bright orange edible aril in one-third of its length from the base.

The genus name 'Afzelia' is after Adam Afzelius, a Swedish botanist (1750-1837) who made the first collection when he visited Sierra Leone in 1792 and from 1794-96

**BIOLOGY**

Flowering occurs at the end of the dry season (April-May in Guinea) and fruiting takes place from December to February. Wind and animals disperse the seeds.

### ECOLOGY

*A. africana* is found in the humid and dry forests, especially in the forest-savanna borders or semi-deciduous forest. The natural phytogeographical distribution corresponds to the 'Sudanian Regional Centre of Endemism', the 'Guineo-Congolia/Sudania Regional Transition Zone' and the drier peripheral semi-evergreen Guineo-Congolian lowland rainforests in West Africa (Guineo-Congolian Regional Centre of Endemism). In the latter it grows with *Khaya grandifoliola*, *Triplochiton scleroxylon*, and *Terminalia superba*. In the regional transition zone, the species is often found individually dispersed in natural dry forest and secondary forest, in association with *Daniellia oliveri*, *Khaya senegalensis* and *Erythrophleum guineense*. In the Sudan zone it is found in gallery forest and savannah woodlands, however regeneration is difficult due to the regularly passing bush-fires. It tends to be scattered in areas with rocky soils.

### BIOPHYSICAL LIMITS

Altitude: 200-1200 m

Mean annual temperature: 20-35°C

Mean annual rainfall: 1200-1800 mm

Soil type: *A. africana* prefers deep sandy soil in well-watered sites but tolerates seasonally hydromorphic and lateritic soils.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Benin, Burundi, Cameroon, Central African Republic, Cote d'Ivoire, Gambia, Ghana, Guinea-Bissau, Kenya, Liberia, Mali, Tanzania, Uganda

Exotic:



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:** The flour from seeds is used as a substitute for wheat flour in biscuits and doughnuts.

**Fodder:** The leaves, fruits and seeds are browsed by wildlife, particularly before the regrowth of grass in the early rainy season. Wild animals browse the arils, and antelopes eat the young shoots. Flying foxes and bats eat the flowers.

**Timber:** *A. africana* has a yellow white sapwood (3-8 cm thick) and a yellow brown heartwood, just after the tree has been felled, turning reddish brown once seasoned. The wood is heavy (790 kg/m<sup>3</sup> at 12% humidity, 820 kg/ m<sup>3</sup> when air-seasoned). It has properties, which make it excellent for many uses. It is used in carpentry, canoe and house building, furniture making, flooring, and heavy construction. It is also commonly used in woodcarvings, mortars, poles, pilings and other traditional uses. The white or yellow substance, afzelin, in the vessels can cause the wood to stain textiles and other materials that come into contact with it when damp. This species is under pressure from exploitation and it is considered vulnerable according to IUCN.

**Lipids:** *Afzelia* seed (containing 31% fat) may be a source of seed oil for domestic and industrial use.

**Medicine:** An infusion of the bark is used against paralysis, and a decoction against constipation. In Ghana the pulp is used with *Pericopsis* and *Tamarindus* as a diuretic and febrifuge. The maceration is a remedy for leprosy. The crushed bark, mixed with honey, is used in veterinary medicine. The ash of the bark, prepared with Shea butter as soap, is used against lumbago. In a decoction or prepared with food, it is a treatment for back-ache. The roots are pulverised with millet-beer in Côte d'Ivoire and used to treat hernias and, in a decoction with pimento, as a remedy against gonorrhoea and stomach-ache. A leaf decoction mixed with *Syzygium guineensis* leaves and *Xylopia* fruit forms a drink to treat oedema. The ash of the fruits is rich in potassium salts and is mixed with millet for veterinary purposes.

**Other products:** Pods are rich in ashes used for making soap. The seeds are used as a soup thickener

**SERVICES**

**Erosion control:** As a leguminous tree *A. africana* is used for soil conservation and improvement.

**Shade or shelter:** In Upper Guinea the tree serves as a site for hunters and provides shelter.

**Soil improver:** The tree associated with ectomycorrhizal fungi, which improve the soil. The nitrogen-rich leaves are used to enrich the soil especially when mulching and littered.

**Boundary or barrier or support:** In Guinea it is increasingly being planted privately by villagers for land demarcation and as a timber tree.

**Other services:** In many villages it is a sacred tree and is often situated more or less in the middle of the sacred village forest. Sometimes hunters just wait besides an *Afzelia* tree for the wildlife.

**TREE MANAGEMENT**

*A. africana* is a light demander that tolerates light shade when young. Pure stands can be established as well as mixed stands. No special soil preparation is necessary, plantation holes of 4 x 4 x 4 m should be dug early enough, particularly in savannah areas, to be able to plant if precipitation is favourable. Fertilization with PK will favour the growing process, but is not necessary. Spacing depends on the plantation type.

Enrichment planting seems to be the most appropriate plantation technique in transition and deciduous forest. In the savannah, it is recommended to create a favourable microclimate before plantation of *Afzelia* to help protect the plants against fire. A first plantation can be installed with *Gmelina arborea*, *Harungana madagascariensis* and *Acacia mangium* at a spacing of 3 x 3, pure or mixed. After 2 or 3 years, when these trees reach a height of 2-3 m, some of them are harvested and *A. africana* can be installed in the free lines. Further management of the plantation is undertaken in favour of *Afzelia*.

**GERMPLASM MANAGEMENT**

Seed collection starts soon after maturation because the seed is heavily browsed by wildlife and livestock. It may even be necessary to install a fence under a chosen seed bearer or to climb up the tree to collect the seed.

Seeds exhibit a recalcitrant behavior in storage. There are 350-450 seeds/kg.

**PESTS AND DISEASES**

Sensitivity to fungi and problems with grasshoppers that cut the root collar of seedlings has been observed in the nursery. Seedlings and young plants should be protected against browsing.

The heartwood is largely resistant to attack from termites or fungi, but sometimes damaged by marine borers (*Limnoria* and *Teredo* spp.)

**FURTHER READING**

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**SUGGESTED CITATION**

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