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# Common Agroforestry Species in Malawi



**MALAWI AGROFORESTRY EXTENSION PROJECT**

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## INTRODUCTION

This chapter is intended as a practical field guide to some common fast-growing agroforestry species used in Malawi. It is by no means a comprehensive list, since research is continually identifying other species.



## SPECIES DESCRIPTIONS

The plants listed are organized alphabetically by family according to botanical name. Common English and Chichewa names are included. A brief illustrated description is provided of each species, along with notes on uses, products, and any special notes. Several reference tables are included after the end of this chapter for more detailed information on species characteristics, uses and planting requirements for different technologies. The tables include the following:

- Table 1:** Plant Spacing and Density/ha for each Technology
- Table 2:** Agroforestry Species: Technology, Size and Altitude Range
- Table 3:** Agroforestry Species: Wood, Medicinal and Other Uses
- Table 4:** Planting Material Requirements by Technology and Species
- Table 5:** Index of Species



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## DESCRIPTION OF SPECIES

**FAMILY: AGAVACEAE**

*Agave sisalana*

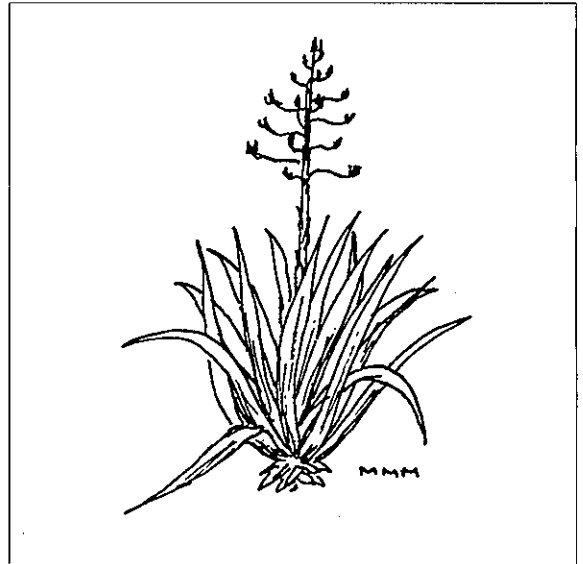
**Sisal**

**Khonje**

**Description:** Native of Mexico, now widely planted in the tropics. A medium-sized succulent, **leaves** large, dark green, and spiny, 2 m long; **flowers** creamy-yellow, in branched clusters along a 4-6 m woody pole, produced when 7-12 years old, after which the plant dies.

**Uses/Products:** An important producer of fibre for ropes, twine, mats, baskets, and sandals, and once grown widely on a commercial scale. The flesh from the leaves makes good fodder, and can be composted for organic manure; waxes, sodium pectates, alcohol, methane and hecogenin can be extracted from sisal waste.

**Special Notes:** Propagated from suckers growing on rhizomes at the base of the bole, or preferably from bulbils which are miniature sisal plants borne on the flowering stalk



*Agave sisalana*

*from: Useful Plants of Malawi, 1975.  
J. Williamson. ill: M. M. Moss*

(bulbils are easier to collect and grow more uniformly). Sisal makes a good live fence, but its shallow, spreading adventitious root system can be competitive with nearby crops.



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**FAMILY: ANACARDIACEAE**

*Sclerocarya birrea*

**Marula**

**Mfula**

**Description:** Indigenous. A medium-large handsome deciduous tree up to 15 m high with spreading crown. **Bark** grey, rough, and flaking in patches; **leaves** compound with oval to elliptic leaflets, dark green above, blue-green below; sexes separate with pistillate trees conspicuous in May with yellow, plum-size fruits, while staminate trees have red catkins appearing before the leaves in October; **fruit** yellow, fleshy, and spherical, up to 3.5 cm in diameter.



*Sclerocarya birrea*

**Uses/Products:** Edible fruits are high in vitamin C, are richly scented and can be made into jams, juices, and an alcoholic drink; the stone inside the fruits has 2-3 edible kernels containing a protein-rich oil which burns like a candle. The wood is used for carvings, furniture, flooring, and match-making; bark produces a brown dye, and is used for rope/string, also has a proven antihistamine and anti-diarrhoea properties; cut truncheons are grown as live fence posts; foliage and fruits make good browse for all stock. The tree has many medicinal and cultural uses, and is highly valued in many parts of Africa.

**Special Notes:** Best propagated from cuttings/truncheons. Food value of fruits is high, but not eaten much in Malawi. Fruits have commercial value for jams, juices and liqueurs in South Africa, Botswana and Zimbabwe. Kernels of the stones are edible and highly nutritious, but difficult to remove intact.



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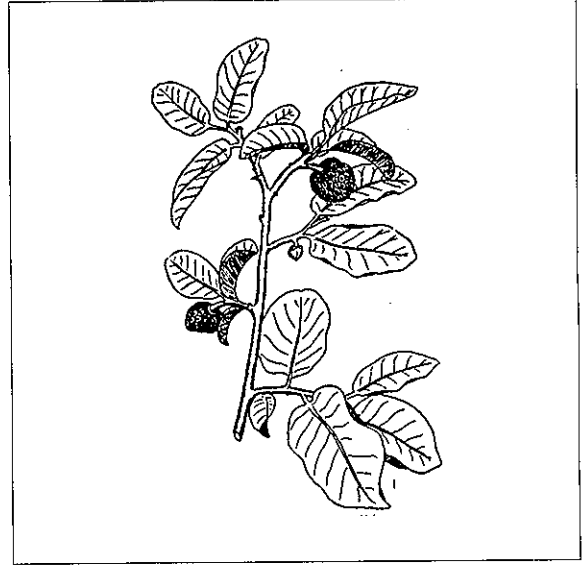
**FAMILY: ANNONACEAE**

*Annona senegalensis*  
**Wild Custard Apple**

**Mposa**

**Description:** Indigenous. A deciduous, spreading shrub or tree 3-8 m high. **Bark** grey, smooth to roughish with circular flakes; **leaves** large and oval, green to blue-green, often softly hairy below; **flowers** inconspicuous and greenish arising from leaf axils; **fruits** fleshy, lumpy and spherical, yellow orange.

**Uses/Products:** Edible fruit, regarded as the best of indigenous fruits in some parts of Africa; rope from bark; many medicinal uses: leaf tips and bark for colds, leaf poultices for pneumonia, roots boiled with sour oranges for stomach ache.



*Annona senegalensis*

*from: Useful plants of Malawi, 1975.*  
*J. Williamson.*



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**FAMILY: COMBRETACEAE**

*Terminalia sericea*

**Silver Terminalia**

**Napini**

**Description:** Indigenous. A handsome, deciduous medium-large tree 10-15 m tall, with spreading branches. **Bark** grey-black, deeply fissured, slender branches brown or purplish flaking in strips; **leaves** oblong-ovate, clustered at ends of branchlets pale green and covered in silvery hairs; **flowers** small, creamy-yellow in axillary racemes, sweet scented; **fruit** winged, rose-red when mature and drying to red-brown.



*Terminalia sericea*

*from: Useful Plants of Malawi, 1975.  
J. Williamson.*

**Uses/Products:** Wood hard and durable, providing good fuel, furniture, tool handles and general-purpose timber; the tree has many local medicinal and cultural uses. Common ones include taking a decoction of the roots to cure diarrhea, and to relieve colic, also applied as an eyewash, while pneumonia is treated with a fomentation from a hot infusion of the outer parts of the roots.





**FAMILY: EUPHORBIACEAE**

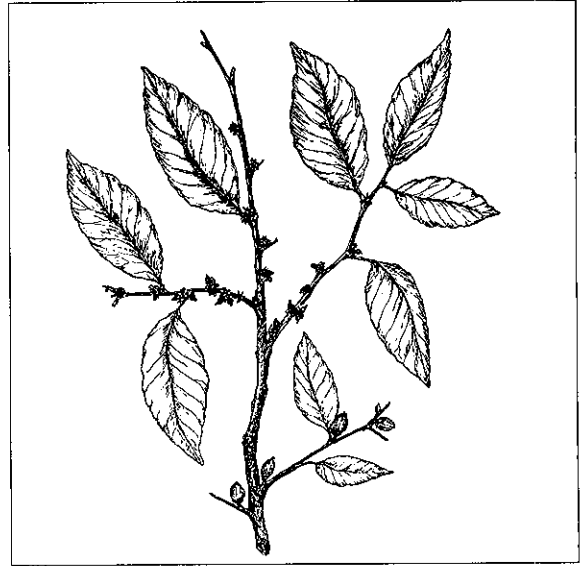
*Bridelia macrantha*

**Bridelia**

**Mpasa**

**Description:** Indigenous. A small to medium tree 7-12 m tall, with a dense, spreading canopy. Widely distributed in open woodland and riverine forests from 50-2000 m. above sea level. **Bark** brown to grey, rather flaky, becoming rough with age; **leaves** large, elliptic to obovate, usually 7 to 8 x 3.5 to 4 cm, dark, glossy green above, paler green below sometimes with sparse hairs, veins go right to the margin entire, wavy or scalloped; apex shortly attenuate, base broadly tapering to rounded; leaves develop bright colors in autumn; **flowers** very small, yellowish in tight clusters in the leaf axils; **fruit** ellipsoidal, 8 x 4 mm, black when mature, edible and sweet.

**Uses/Products:** The leaf sap is used to sooth sore eyes; root used as a purgative and to relieve stomach pains and ulcers. It is also powdered and rubbed with oil/fat into the head to cure headaches. The wood makes fine furniture, is dark brown, naturally



*Bridelia macrantha*

from: *Fifty common trees of Zambia.*  
1968. *Forest Department Bulletin No. 5.*

lustrous, fine grained, very durable and termite-resistant. This is a fast growing, shady and beautiful tree, easy to raise from seed that is planted fresh.



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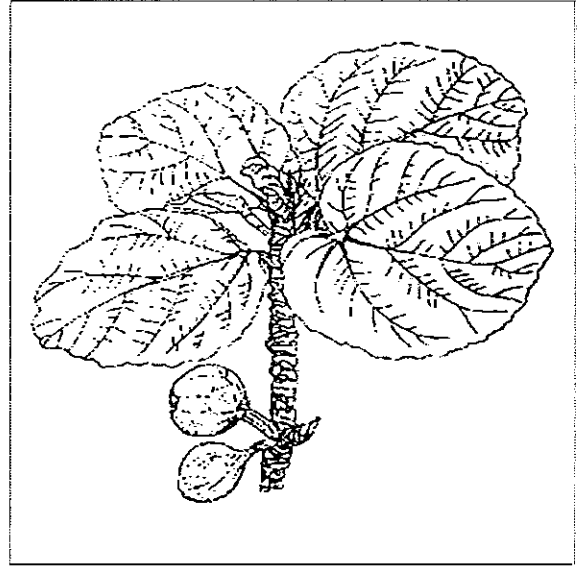
**FAMILY: EUPHORBIACEAE**

*Jatropha curcas*

Physic nut

Kamsatsi

**Description:** Native to America. Shrub or tree to 6 m with spreading branches and stubby twigs, has a milky exudate. **Bark** greyish-green, flaky; **leaves** deciduous, alternate, apically crowded, ovate, acute and cordate, 3 to 5 lobed, 6-40 cm long, 6-35 cm broad; **flowers** several in greenish cymes, bell-shaped, yellowish sepals; **fruit** capsule, 2.5 to 4 cm long, drying and splitting into 3 valves, each usually containing a black seed.



*Jatropha curcas*

**Uses/Products:** Many households grow the tree from truncheons as live fence posts for livestock enclosures and around toilets and bathing areas. Oil expressed from the seed has been used for illumination, soap, candles. The plant is reputed to have varied medicinal properties. Latex may be used to treat bee and wasp stings, and to dress sores, and ulcers.



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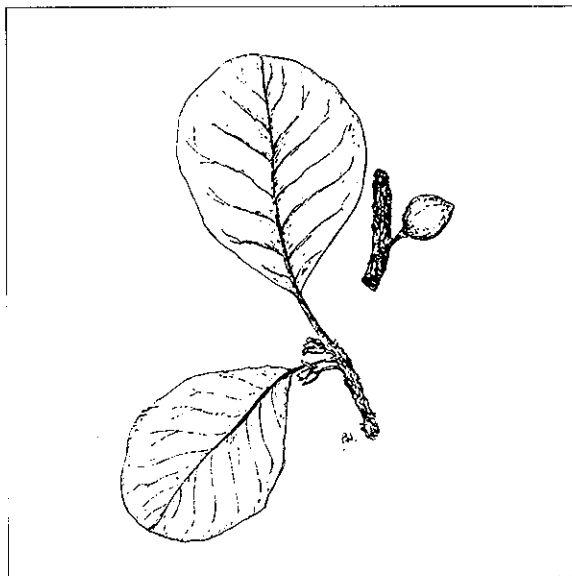
**FAMILY: EUPHORBIACEAE**

*Uapaca kirkiana*

**Wild Loquat**

**Masuku**

**Description:** Indigenous. A smallish, much-branched evergreen tree 5-12 m tall, with typical rounded crown. **Bark** dark grey and rough; **leaves** distinctive, clustered at branch tips, large and leathery, shiny dark green above, covered below with wooly hairs; **flowers** greenish-yellow to white, inconspicuous in terminal clusters; **fruit** round, fleshy, rusty-yellow, 2-3 cm diameter.



*Uapaca kirkiana*

*from: Useful Plants of Malawi, 1975.  
J. Williamson.*

**Uses/Products:** Fruit edible and delicious, produces a good wine; wood is fairly durable and borer proof, easy to work and polishes well; stems used as tooth brushes; a good general-purpose wood, makes good fuel, used for lids of grain stores; the tree has many medicinal uses: an infusion of the roots is used for abortions; and mixed with other plant species to treat many ailments, including rheumatism, colds, coughs, skin diseases, and yaws.



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**FAMILY: FLACOURTIACEAE**

*Flacourtia indica*

**Indian Plum**                      **Nthudja, Nthudza**

**Description:** Indigenous. A much-branched small tree, usually spiny 3-10 m high. **Bark** pale grey and smoothish, sometimes darker and flaking to reveal pale orange patches; **leaves** simple, oval to elliptical, light to dark green, turning colour in autumn and becoming brilliant red, plum coloured and purplish black; **flowers** greenish-yellow flushed with dull red, sometimes solitary or in short racemes or panicles; **fruit** berry-like, fleshy, 1-2.5 cm diametre, dark red-purple.

**Uses/Products:** Fruit edible with a pleasant flavour but acidic; tree has many medicinal uses from decoctions of the leaves and roots (intestinal worms, screw-worms in cattle, general body pains), and infusions of the bark and roots for treating pneumonia, sore throats, and rheumatism.



*Flacourtia indica*

*from: Useful Plants of Malawi.  
J. Williamson. ill: G. Jackson.*



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**FAMILY: LEGUMINOSAE**

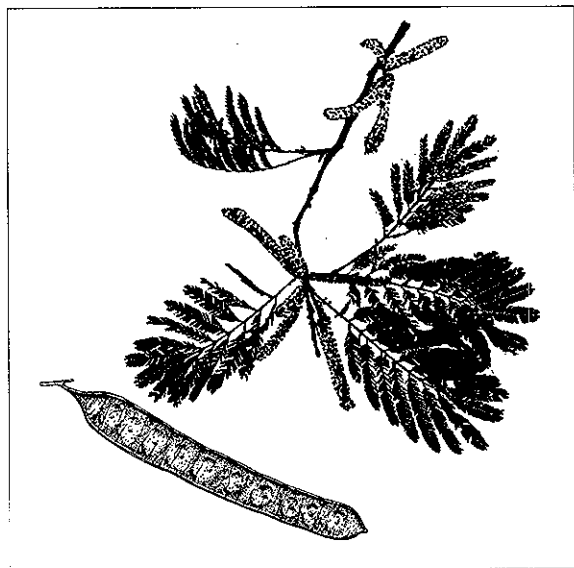
**Sub-Family: Mimosoideae**

*Acacia galpinii*

**Monkey Thorn**

**Nkunkhu**

**Description:** Indigenous. A fine, large deciduous tree up to 25 m high. **Bark** yellow-brown, rough and furrowed, paired thorns on branches and main trunk are dark, strong, and hooked; **leaves** 9-14 pairs of pinnae, 13-40 pairs of leaflets each; **flowers** in slender creamy spikes with red sepals that are a distinguishing feature; **fruit** a straight purple-brown pod.



*Acacia galpinii*

*from: Trees of Southern Africa, 1977.*

*K. O. Palgrave. ill: Terry Duggan, O.*

*Anderson.*



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**FAMILY: LEGUMINOSAE**

**Sub-Family: Mimosoideae**

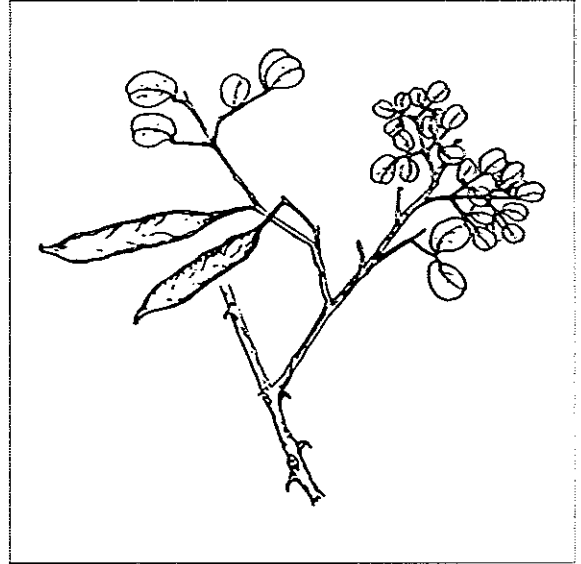
*Acacia nigrescens*

**Knobthorn**

**Mkunkhu**

**Description:** Indigenous. A medium size deciduous tree 10-15 m tall with a rounded canopy, raised knobby thorns on trunk and branches; **bark** dark brown; **leaves** 1-3 pairs of pinnae, 1-2 pairs of circular leaflets each; **flowers** creamy in long conspicuous spikes; **fruit** is a straight dark-brown pod.

**Uses/Products:** Considered an indicator of good ranching country with valuable fodder but very thorny. Wood very hard, fire and termite resistant. Makes good fuelwood, furniture (though difficult to work), mine props, sleepers, fence posts, and parquet floorings.



*Acacia nigrescens*

*from: Useful Plants of Malawi, 1975.*

*J. Williamson.*



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**FAMILY: LEGUMINOSAE**

**Sub-Family: Mimosoideae**

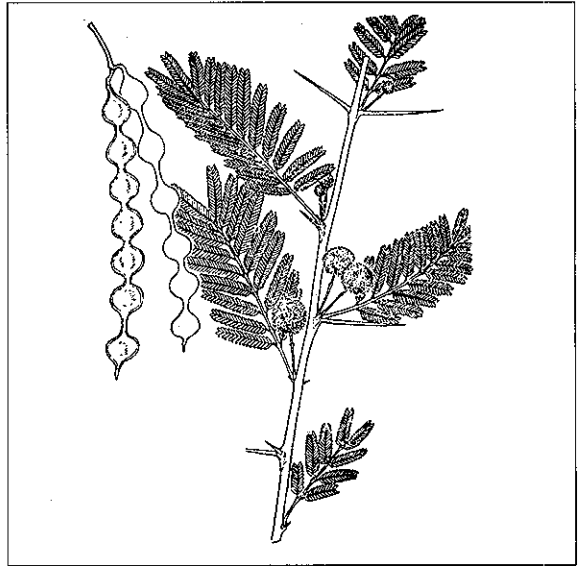
*Acacia nilotica*

**Scented Thorn**

**Mpampa, Ngagaga**

**Description:** Indigenous. A small deciduous tree up to 10 m tall, usually smaller; **bark** smooth reddish-brown when young, rough blackish-grey with age. White or reddish long straight spines; **leaves** 2-11 pairs of pinnae, 7-25 pairs of leaflets each; **flowers** in yellow balls; **fruit** long, thickish and slightly curved, green when young, becoming dark or black.

**Uses/Products:** Wood is reddish, hard, and durable, good for fuel and fence posts; gum exudations for adhesive and confectionery; pods valuable fodder and sometimes used for dyeing cloth black; a decoction of the bark and roots used to treat impotence, and leaves for pneumonia.



*Acacia nilotica*

*from: Common Fuelwood Crops.*  
*Elbert L. Little, Jr. ill: Sahni.*



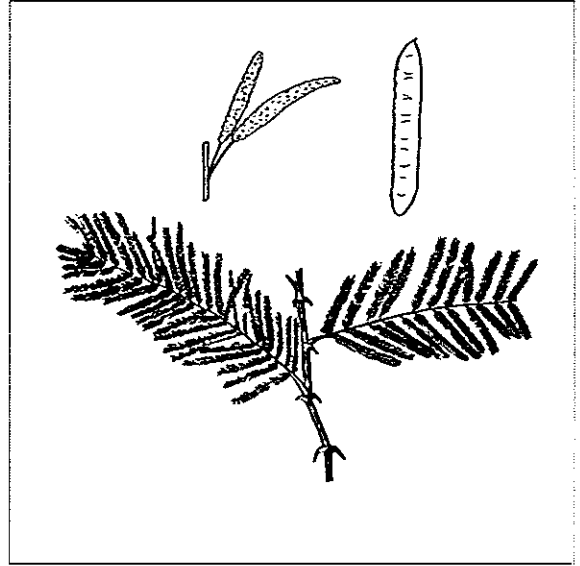
**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Acacia polyacantha*  
**White Thorn**

**Mthethe**

**Description:** Indigenous. A large, handsome deciduous tree to 20 m. **Bark** pale yellow-white and flaking, with strongly hooked prickles in pairs on branches, sometimes on trunk; **leaves** 13-40 pairs of pinnae, 25-65 pairs of leaflets each; **flowers** in long white spikes; **fruit** a straight longish, brown pod.

**Uses/Products:** Regarded as an indicator of fertile soils; good fuelwood and fodder; wood is hard and resistant to borers; used for mine shafting, building materials, and tool handles; gum is good quality for confectionery; roots used to ward off snakes and to treat snakebites.



*Acacia polyacantha*

*from: A Field Guide to Lengwe National  
Park, 1984. B.Y. Sherry and A. J.  
Ridgeway.*





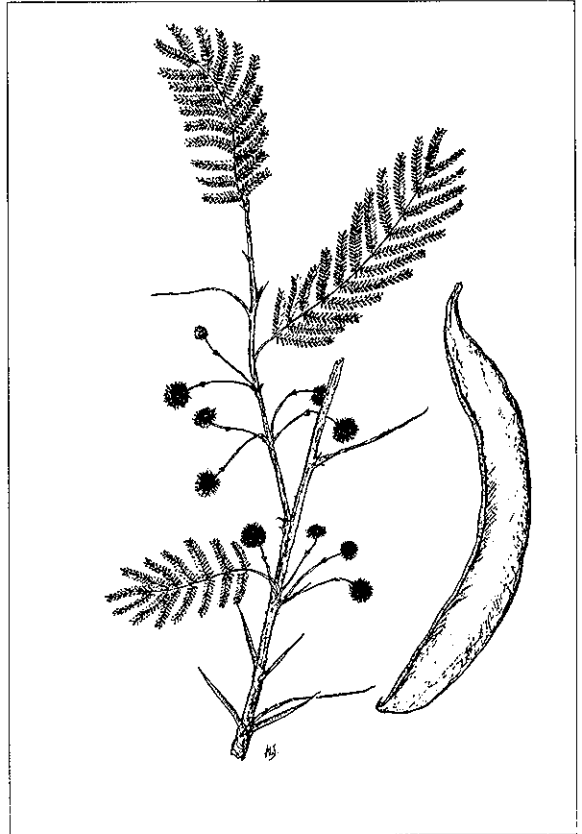
**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Acacia sieberiana*  
**Paperbark acacia**

**Minganzolo**

**Description:** Indigenous. A common flat-crowned thorn tree up to 17 m tall occurring in woodland and wooded grassland, often along rivers and in floodplains. **Bark** greyish-yellow, a little corky, sometimes peeling in papery strips. Stipules spinescent, the spines white, straight up to 9 cm long, no swellings; **leaves** 6-23 pairs of pinnae, each with 14-45 pairs of leaflets, which are narrowly oblong, 2 to 6.5 x 1 mm; **flowers** in white or cream balls; **fruit** a pod 20 x 3.5 cm, without hairs to densely velvety, brown, straight to curved, reluctantly dehiscent, thick and woody.

**Uses/Products:** Wood light and soft, the trunk can be made into mortar to press seeds for oil. Leaves and pods valuable fodder.



*Acacia sieberiana*

*from: Fifty common trees of Zambia.*  
*1968. Forest Department Bulletin No. 5.*



**FAMILY: LEGUMINOSAE**

**Sub-Family: Mimosoideae**

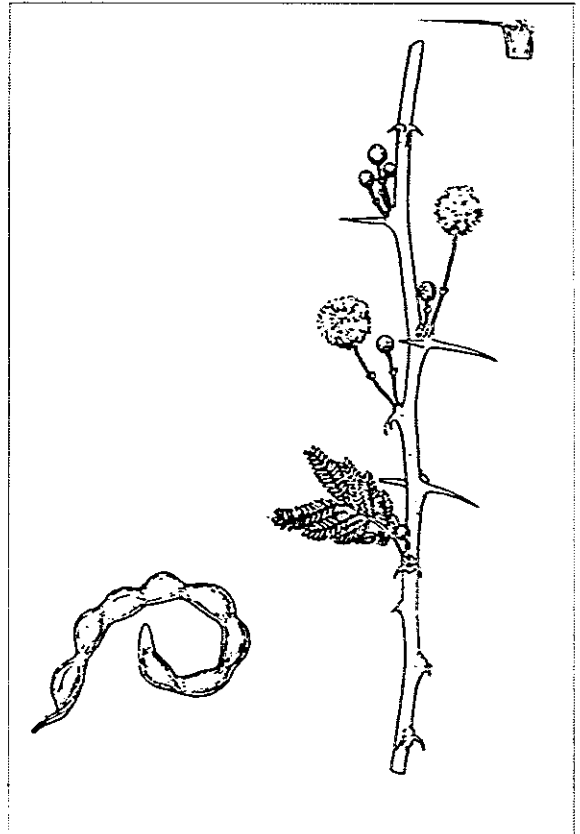
*Acacia tortilis*

**Umbrella Thorn**

**Nchongwe**

**Description:** Indigenous. A flat-crowned deciduous tree 6-15 m tall. **Bark** grey to dark brown and fissured, spines variable, sometimes hooked, or long and straight both often found on same tree; **leaves** blue-grey green, 2-10 pairs of pinnae, 6-19 pairs of leaflets each; **flowers** in cream or yellow balls; **pod** narrow, small and spirally contorted.

**Uses/Products:** Leaves and pods valuable fodder; wood makes good fuel; bark used for string.



*Acacia tortilis*

from: *Common Fuelwood Crops.*  
Elbert L. Little, Jr..



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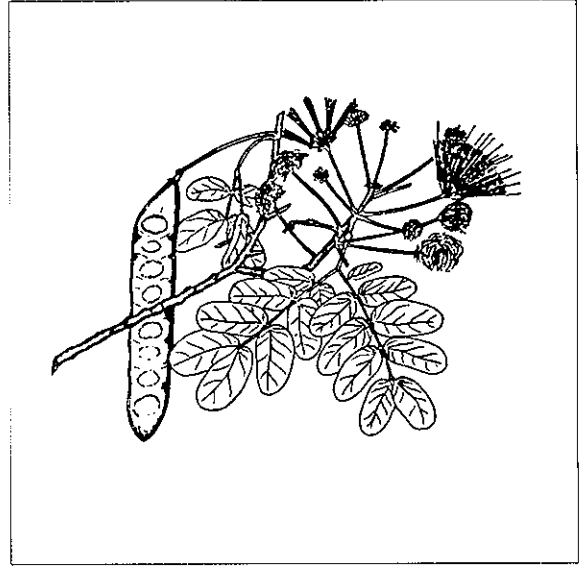
**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Albizia lebbek*

**Woman's Tongue**

**Mtangatanga**

**Description:** Native to tropical Asia, now naturalised in Malawi. A deciduous tree 6-12 m tall, usually a short trunk. **Bark** grey and smoothish becoming rough or fissured; **leaves** large and compound with oblong leaflets; **flowers** greenish-yellow clustered in long stalked heads; **Pods** broad and oblong, straw-coloured, papery and flat, rattling continuously in the wind.



*Albizia lebbek*

*from: Useful Plants of Malawi, 1975.*  
*J. Williamson.*

**Uses/Products:** **Wood** medium hard, heavy and durable; good furniture, paneling, general construction, and carving but not easy to work by hand. Bark used in tanning; good fuelwood and fodder; attractive to bees for honey; used widely for shade and ornamental along roads, gardens and plantations.



**FAMILY: LEGUMINOSAE**

**Sub-Family: Mimosoideae**

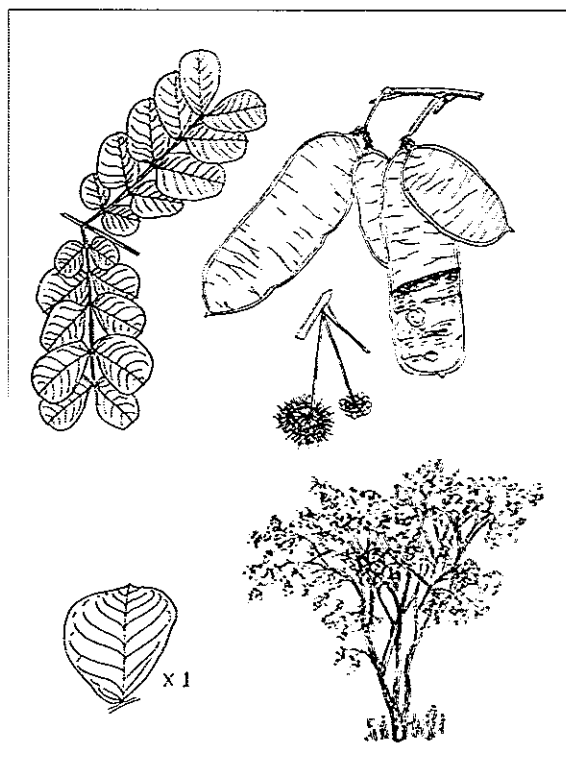
*Albizia versicolor*

**Poison-Pod Albizia**

**Mtangatanga**

**Description:** Indigenous. A medium-large deciduous tree 10-18 m tall. **Bark** grey-brown and rough; **leaves** with 1-3 pairs of pinnae, each with 3-5 pairs of leaflets, which are large, oblong to ovate, 5 x 3 cm, under surface with dense rusty hairs, apex rounded, base broadly tapering, margin entire; **flowers** in large semi-spherical heads, creamy-white; **fruit** a large red-brown pod up to 25 x 6.5 cm.

**Uses/Products:** The seeds and pods are toxic to livestock. The root and bark make a good soap. The wood resembles *Pterocarpus angolensis*, is hard, heavy and durable; used for furniture, drums and mortars.



*Albizia versicolor*

*from: Fifty common trees of Zambia.  
1968. Forest Department Bulletin No. 5.*



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**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Faidherbia albida*  
**Winter Thorn**

**Msangu**

**Description:** Indigenous. A majestic deciduous tree, 18-25 m high with a rounded crown and spreading branches. **Bark** white when young, turning grey and fissured; **leaves** feathery and grey-green, thorns white, straight and thick; **flowers** in creamy-white spikes; **fruits**, a thick and often spirally twisted pod, orange-brown when dry.

**Uses/Products:** Loss of nutrient-rich leaves during the rainy season improves soil fertility and allows farming beneath the canopy with good benefits to crop yields. Trunks and branches used for fuelwood, canoes, pestles and mortars; pods and leaves are excellent fodder; in times of famine, people can eat the seeds after repeated boilings; flowers attract bees for honey-making, and hollow trunk or branches make good bee-hives; bark is boiled and drunk to cure diarrhea; leaf growth provides good shade during hot, dry season.

**Special Notes:** Ideal agroforestry tree and widely appreciated by farmers, but return on investment may be fairly long-term (over



*Faidherbia albida*

from: ICRAF 1992: *A Selection of Useful Trees and Shrubs for Kenya.*

7-10 years) due to variable growth rate. Fast growing tap-root can be deformed in nursery or when out-planting due to mismanagement. Young seedlings need protection from browsing and weeds, and should be marked for visibility due to small size. Increased land and grazing pressures are reducing natural regeneration.



**FAMILY: LEGUMINOSAE**

**Sub-Family: Mimosoideae**

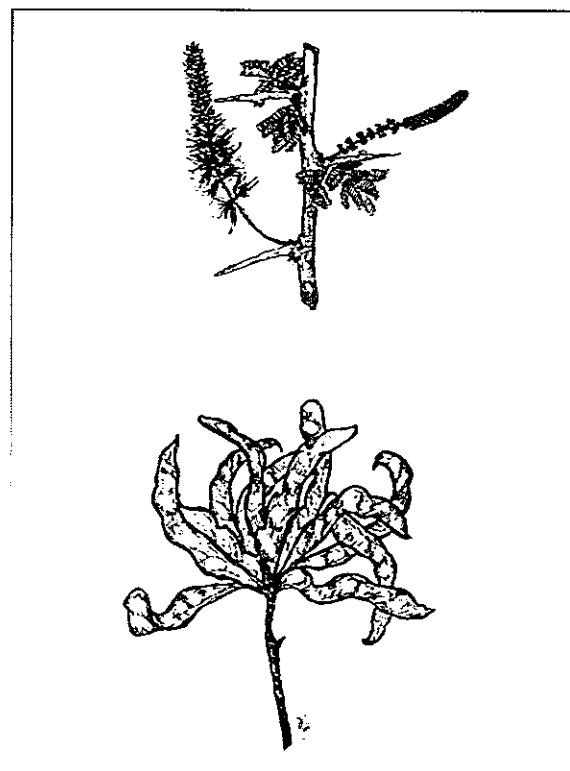
*Dichrostachys cinerea*

**Sickle Bush**

**Chimphongala**

**Description:** Indigenous. Shrub or small tree 5-6 m tall, found in low to medium altitudes in wooded grassland, sometimes forming secondary thickets on impoverished soils, which could be an indicator of overgrazing. **Bark** dark grey-brown, stems often twisted with intertwined branches, dwarf lateral shoots modified to form compact spines; **leaves** compound paripinnate, with 4 to 13 pairs of pinnae, each with up to 27 pairs of leaflets, which are narrowly obovate to lanceolate up to 10 x 3 mm, dark green, glossy above, dull below; **flowers** in axillary spikes, all parts in fives, the spike is 2-colored with pink sterile staminoids and a short yellow catkin of fertile flowers; creamy-white spikes; **fruits**, a cluster of twisted pods, each up to 10 x 1 cm.

**Uses/Products:** Pods are valuable, nutritious fodder for livestock and wildlife. Roots and leaves are chewed and placed on the sites of snakebites and scorpion stings. The leaves are also used as an anesthesia, and a remedy for sore eyes and toothache. Wood extremely hard and durable for poles and tools, but use



*Dichrostachys cinerea*

*from: Fifty common trees of Zambia.  
1968. Forest Department Bulletin No. 5.*

limited by the small size of the tree. Excellent firewood and charcoal.



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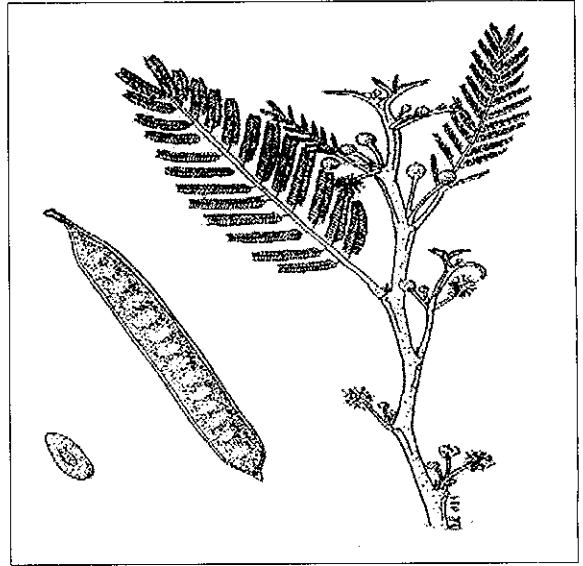
**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Leucaena diversifolia*    *Leucaena Lukina*

**Description:** Native to Mexico and Central America. A medium-sized tree 10 to 20 m tall. **Bark** grey-brown and smooth, **leaves** dark green and compound with large numbers of small leaflets, each 1 to 2 mm wide and 1 cm long, the apex is usually off-center and pointed; **flowers** bright red to light pink, borne in clusters at leaf axils and average under 1 cm diameter; **fruit** a pod slender and red-brown.

**Uses/Products:** Nutritious fodder with low mimosine content, but levels of more than 50% of the forage in animal diets are not recommended. Makes good firewood and poles.

**Special Notes:** Better adapted to most parts of Malawi than *Leucaena leucocephala*, especially the medium to higher altitudes. Also more resistant to psyllids and termites. Very fast-growing, drought-resistant, nitrogen-fixing tree that coppices readily; used extensively for green manure, soil conservation and livestock feed.



*Leucaena diversifolia*

from: *NFT Highlights*

*NFTA 92-05, October 1992*



**FAMILY: LEGUMINOSAE**  
**Sub-Family: Mimosoideae**

*Prosopis juliflora*

Mesquite

**Description:** Native of tropical America. Small to medium semi-evergreen spiny tree, or multi-stemmed shrub, 3-12 m high, short trunk with open flat-topped or rounded crown of spreading branches; bark dark brown or grey, furrowed, twigs with single or paired stout straight spines; leaves compound and green to pale green; flowers greenish-white to pale yellow in clustered spikes; fruits long, narrow, slightly curved pods, yellow to brown, seeds in a 4-angled case.



*Prosopis juliflora*

*from: Common Fuelwood Crops.*  
*Elbert L. Little, Jr.*

**Uses/Products:** Wood hard, heavy, and durable, excellent for fuel; used for fence posts, door and window frames and other light carpentry; pods valuable livestock feed, and can be ground into flour for human consumption; flowers good source for honey.

**Special Notes:** A fast-growing, deep-rooted, nitrogen-fixing tree that coppices readily, used for improving soil fertility, dune stabilisation, and providing fuelwood and fodder. Foliage is unpalatable so it can become a weed if grazing and land-use pressures are low.





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**FAMILY: LEGUMINOSAE**  
**Sub-Family: Caesalpinioideae**

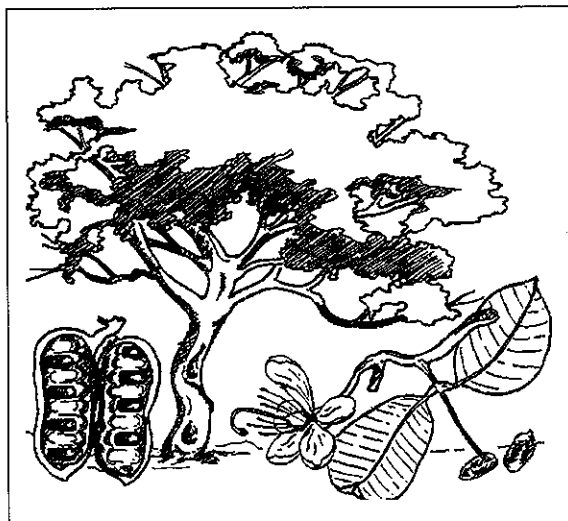
*Afzelia quanzensis*

**Pod Mahogany**

**Msambamfumu**

**Description:** Indigenous. Medium to large tree with a spreading crown up to 24 m, occurring in low-medium altitudes, semi-arid woodland, often on deep sand. **Bark** flaking in thick roundish scales, greyish-white; **leaves** paripinnate, glossy dark green above, margin wavy, petioles twisted; **flowers** with a single large streaked pink-red petal; **fruit** a large, thick flatish pod, dehiscing while on tree, seeds black with scarlet aril.

**Uses/Products:** Wood very durable and fairly resistant to termites, used for quality joinery, doors, window frames, floors and staircases. Leaves and pods are valued as fodder. The leaves are edible for humans. Roots used to treat chest pains, kidney problems and snakebites.



*Afzelia quanzensis*

*from: Indigenous multipurpose trees of Tanzania. Uses and economic benefits for people.*



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**FAMILY: LEGUMINOSAE**  
**Sub-Family: Caesalpinioideae**

*Caesalpinia decapetala*

**Mauritius Thorn**

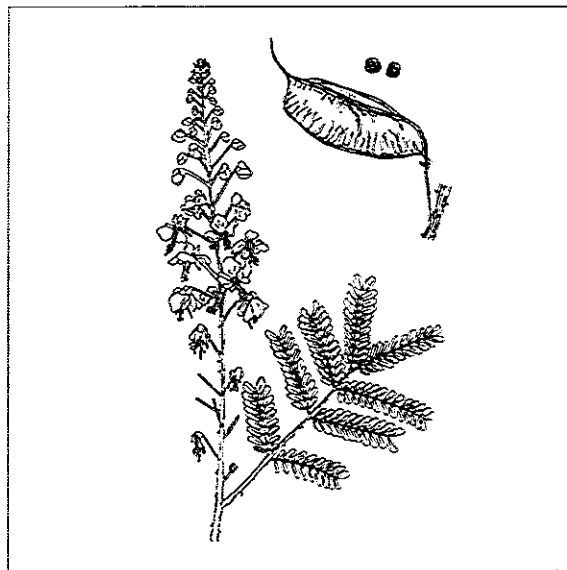
**Kapitagwilere**

**/Mlunguzi**

**Description:** Native of India. A scandent thorny shrub up to 7 m high; **leaves** compound and dark grayish-green; **flowers** yellow in long attractive racemes; **fruit** a roundish pod, in clusters, pointed, brown, oblong and somewhat woody.

**Uses/Products:** Makes an impenetrable live hedge, planted around vegetable gardens or kholas as livestock enclosures.

**Special Notes:** Needs careful management to keep it from overgrowing and becoming a weed, but this is difficult as it is so thorny.



*Caesalpinia decapetala*

*from: Trees of Kenya, 1989.*  
*T. Noad and A. Birnie. ill: A. Birnie*



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**FAMILY: LEGUMINOSAE**  
**Sub-Family: Caesalpinioideae**

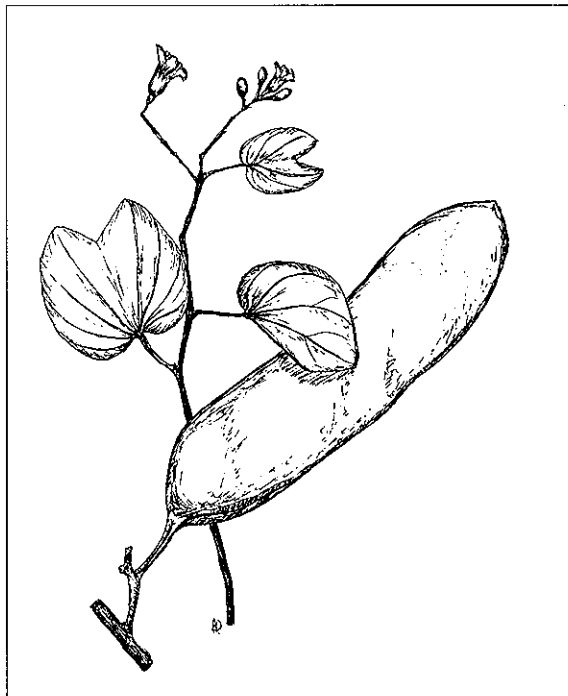
*Bauhinia thonningii*

**Monkey Bread,**  
**Camel's Foot**

**Chitimbe**

**Description:** Indigenous. A small to medium sized, deciduous tree with rounded crown up to 10 m. **Bark** dark brown and furrowed; **leaves** large 2-lobed, wing-shaped and leathery; **flowers** white and small in racemes opposite the leaves, sexes separate; **fruit** a large, thick pod becoming woody at maturity.

**Uses/Products:** Bark used for string and rope; wood for fuel, poles, and tool handles; green pods used as a soap-substitute; whole pods excellent animal fodder, and can be ground for human consumption, the softer inside can also be eaten; the leaves, roots, and bark have various medicinal values including treatment of stomach ache, rheumatism, gum infections, eye inflammation, and venereal diseases.



*Bauhinia thonningii*

*from: Fifty common trees of Zambia.*  
*1968. Forest Department Bulletin No. 5.*



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**FAMILY: LEGUMINOSAE**  
**Sub-Family: Caesalpinioideae**

*Senna siamea*

Cassia

Keshya wa Milimo

**Description:** Native of southeast Asia. Medium-sized evergreen tree to 18 m high, straight trunk, dense upright crown often irregular and spreading. Bark grey, smooth to slightly fissured; leaves compound, long, shiny green on top, sometimes tinged with red-brown; flowers yellow in upright showy clusters; fruit long, narrow, flat pods hanging in clusters.

**Uses/Products:** Wood excellent but smoky fuel, susceptible to dry-wood termites, also used for posts, construction, and furniture; widely grown as plantation tree in Africa; popular fast-growing tree for reforesting hills and waste land; common as a shade and ornamental tree along roads, parks and gardens.



*Senna siamea*

from: *Common Fuelwood  
Crops.*  
Elbert L. Little, Jr.



**FAMILY: LEGUMINOSAE**  
**Sub-Family: Caesalpinioideae**

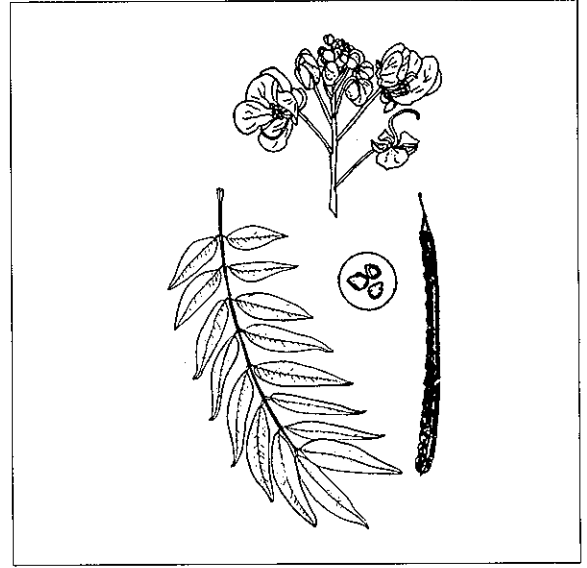
*Senna spectabilis*

Cassia

Keshya wa Maluwa

**Description:** Native of tropical America, widely planted elsewhere in the tropics. A rounded deciduous tree to 10 m. **Bark** smooth grey; **leaves** compound, long, and dark green with narrow elliptic leaflets; **flowers** bright yellow in showy clustered spikes; **fruit** long, cylindrical pods with honey-combed horizontal seed chambers, green turning black.

**Uses/Products:** Popular as a shade and ornamental tree along roads, parks and gardens; fast-growing with good fuelwood, and poles for light construction; coppices readily; not good fodder, can be poisonous to pigs and horses. Can also be used as a green manure bank.



*Senna spectabilis*

*Trees of Kenya, 1989.*  
*T. Noad and A. Birnie. ill: A. Birnie*



**FAMILY: LEGUMINOSAE**  
**Sub-Family: Papilionoideae**

*Cajanus cajan*  
**Pigeon Pea**

**Nandolo**

**Description:** Native range uncertain, perhaps southeast Asia, East Indies, or northeast Africa, widely cultivated throughout the tropics and sub-tropics. Deciduous upright, bushy, and much-branched shrub 1-3.6 m tall, generally short-lived 2-7 years; **leaves** dark grey-green, compound with 3 lance-shaped leaflets; **flowers** in clustered racemes, pea-shaped, usually yellow or orange; **fruit** abundant, oblong 5-8 cm long pods, green turning pale brown.

**Uses/Products:** Nutritious, high-protein seed, cooked or eaten fresh; pods, seeds, and dried foliage good livestock feed; woody stems have some fuelwood value.

**Special Notes:** Widely grown for food, and for improving soil fertility through its deep root system and nitrogen fixing nodules, commonly used for green manure, soil conservation, and hedge windbreaks. Many varieties have been bred for different purposes and environments. Plants are often susceptible to root nematodes and fusarium wilt.



*Cajanus cajan*

*from: Useful Plants of Malawi, 1975.*  
*J. Williamson. ill: M. M. Moss.*



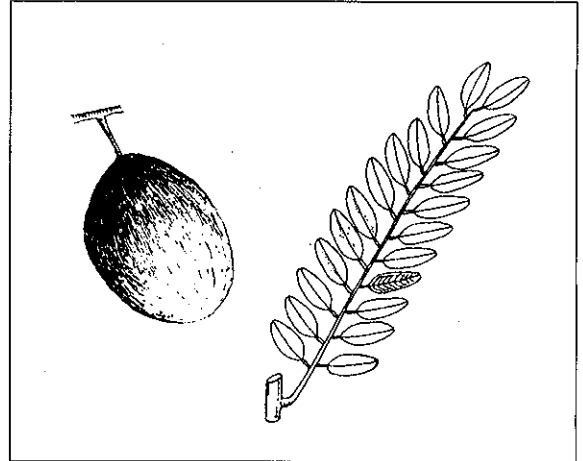
**FAMILY: LEGUMINOSAE**  
**Sub-Family: Papilionoideae**

*Cordyla africana*  
**Wild Mango**

**Mtondo**

**Description:** Indigenous. A large spreading tree up to 25 m, occurring at low altitudes in hot areas, often part of river rine vegetation. **Bark** brown and rough; **leaves** alternate, compound and imparipinnate with 11 to 28 pairs of leaflets and a terminal one, 2 to 5 x 1.8 cm, with rounded apex, slightly notched, base rounded, margin entire; **flowers** a semi-spherical head of orange-yellow stamens 2.5 cm long, flowers in axillary sprays, petals absent; **fruit** a very unusual pod, spherical and fleshy, 4 to 8 x 3 to 6 cm, thin walled, indeshiscent, yellow when ripe with seeds imbedded in the pulp.

**Uses/Products:** Fruts are high in vitamin C, can be eaten fresh or cooked. The heartwood is brown and hard, used for building and making drums.



*Cordyla africana*

*from: Trees of Southern Africa, 1977.*  
*K. O. Palgrave.*



**FAMILY: LEGUMINOSAE**  
**Sub-Family: Papilionoideae**

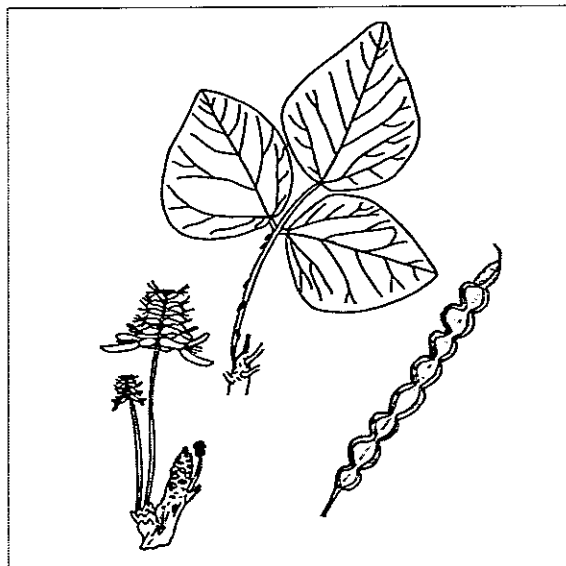
*Erythrina abyssinica*  
**Red-Hot Poker Tree**

**Muwale**

**Description:** Indigenous. A deciduous, thorny tree 8-15 m tall, often with a rounded crown. **Bark** thick, corrugated, and corky; **leaves** compound with 3 large, broad leaflets; **flowers** in red showy racemes before leafing out; **fruit** a woody constricted pod, seeds bright red with a black aril.

**Uses/Products:** Wood soft and pithy, used for carving spoons, pestles, drum barrels, toys and beehives; good for live fence posts cut from truncheons before flowering; regarded as a soil improving tree from nitrogen fixation and abundant leaf-fall. Colorful seeds used in bracelets and necklaces; seeds contain a poison that can be fatal if swallowed but is likely to pass through undigested because of their hardness; tree has various local medicinal and cultural uses.

**Special Notes:** A valued tree, best grown from truncheons, also raised from seed.



*Erythrina abyssinica*

*from: Useful Plants of Malawi, 1975.*  
*J. Williamson.*





**FAMILY: LEGUMINOSAE**  
**Sub-Family: Papilionoideae**

*Gliricidia sepium*  
**Mexican-Lilac**

**Gliricidia**

**Description:** Native to tropical America. Small deciduous tree 6-10 m tall with irregular, spreading crown and thin canopy. **Bark** grey, smooth; **leaves** compound, 15-40 cm long, dull green or grey green, slightly hairy underneath; **flowers** whitish-pink, pea-shaped in clustered racemes along branches, **fruit** a narrow, flat pod 10-15 cm long, yellow-green turning blackish at maturity.



*Gliricidia sepium*

*from: NFT Highlights.*  
*Little and Wadsworth, 1964.*

**Uses/Products:** Wood hard and heavy, good fuelwood, used for posts, construction, furniture, tool handles; stem cuttings grown for living fences; used for cattle fodder, green manure, shade for coffee and cocoa plantations, reforestation, and as a support for vanilla and black pepper vines; enriches soil by nitrogen-fixation in root nodules; flowers good for honey making.

**Special Notes:** Seed availability in Malawi is presently limited. Bark, roots, seeds, and leaves contain poisons used to kill rodents. Fresh foliage should not generally be browsed

by animals, especially monogastrics like pigs and horses, due to toxic compounds which break down considerably when dried or wilted.



**FAMILY: LEGUMINOSAE**

**Sub-Family: Papilionoideae**

*Sesbania sesban*

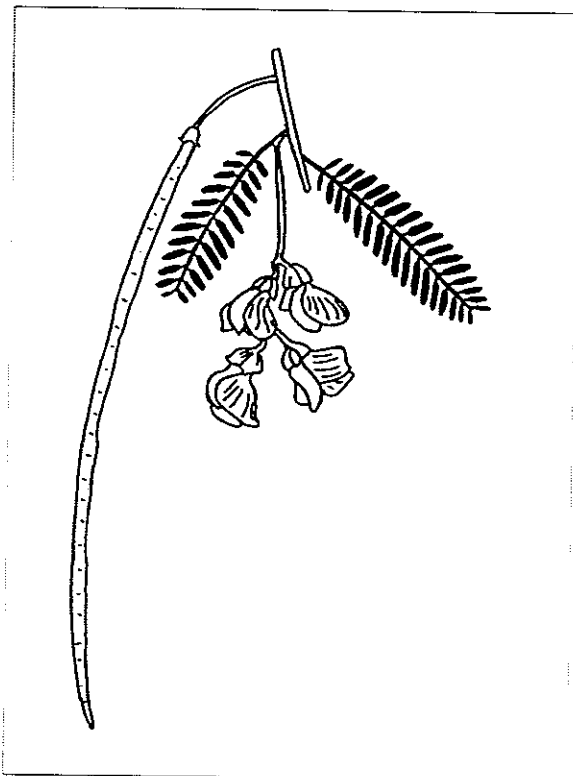
**River Bean**

**Jelejele, Binu**

**Description:** Indigenous. A deciduous shrub or small tree 4-8 m tall, short-lived. **Bark** reddish-brown; **leaves** compound with small, oblong blue-green leaflets; **flowers** yellow, pea-shaped, the standard petal veined with dark maroon, in sprays 15 cm long; **fruit** a slender, curved, pale-brown pod up to 20 cm long and cylindrical.

**Uses/Products:** The wood is light and soft, but makes good firewood and useful for light construction; good fodder and green manure; tree has various medicinal uses.

**Special Notes:** Easy to establish and very fast-growing from seed on a wide range of soils; deep root system and nitrogen-fixing nodules improve soil fertility. Problems include short-lived nature, susceptibility to root nematodes, and poor response to pruning.



*Sesbania sesban*

*from: Trees of Kenya, 1989.  
T. Noad and A. Birnie.*



**FAMILY: LEGUMINOSAE**  
**Sub-Family: Papilionoideae**

*Tephrosia vogelii*

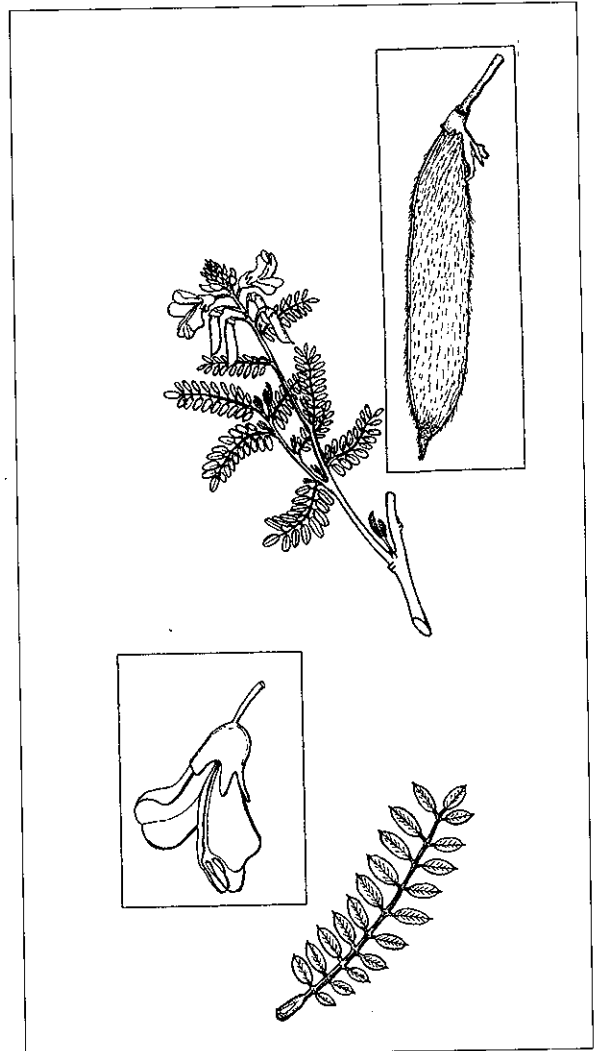
**Fish Bean**

**Mthuthu, Mtetezga**

**Description:** Possibly indigenous, but may have been introduced long ago, now naturalised. A herbaceous shrub 2-3 m tall, with dense covering of yellowish hairs. **Bark** smooth, greenish turning dark grey; **leaves** compound, blue-green and velvety; **flowers** in dense racemes of red, purple or white flowers; **fruit**, a furry pod, hanging in clusters with numerous black and white seeds.

**Uses/Products:** Leaves, branches and pods pounded and thrown on water to stun or kill fish, which rise to the surface to be collected and eaten; valuable insecticide with leaves containing 15% tephrosin and seeds 30%, locally used to treat stem borers in maize; used as a shade-windbreak tree for tea and coffee.

**Special Notes:** Easy to establish and very fast-growing from seed on a wide range of soils, best at medium to high altitudes; deep root system, heavy leaf-fall and nitrogen-fixing nodules improve soil fertility. Problems include short-lived nature, susceptibility to root nematodes, and poor response to pruning.



*Tephrosia vogelii*

*ill: D. Chimutu*



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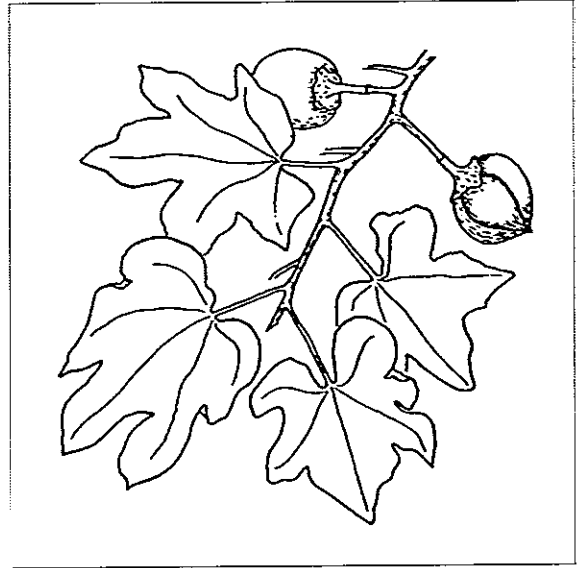
**FAMILY: MALVACEAE**

*Azanza garckeana*

**Snot Apple**

**Mtowo**

**Description:** Indigenous. A bushy shrub or smallish tree 3-10 m high. **Bark** brown and rough, branchlets with shaggy wooly hairs; **leaves** hairy, simple, 3-5 lobed up to 20 cm x 20 cm, usually smaller; **flowers** showy, not opening fully, aging from yellow to orange-red; **fruit** a woody, hairy spherical capsule 2.5-4 cm divided into 5 clear sections, yellow to brownish-green when mature.



*Azanza garckeana*

**Uses/Products:** Fruits edible, eaten like chewing gum; wood used for tool handles, and the inner bark provides a fibre.

**Special Notes:** Tree is host to the cotton stainer, therefore unpopular in cotton-growing areas.

*from: A Field Guide to Lengwe National  
Park, 1984. B.Y. Sherry and A.J.  
Ridgeway.*



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**FAMILY: MELIACEAE**

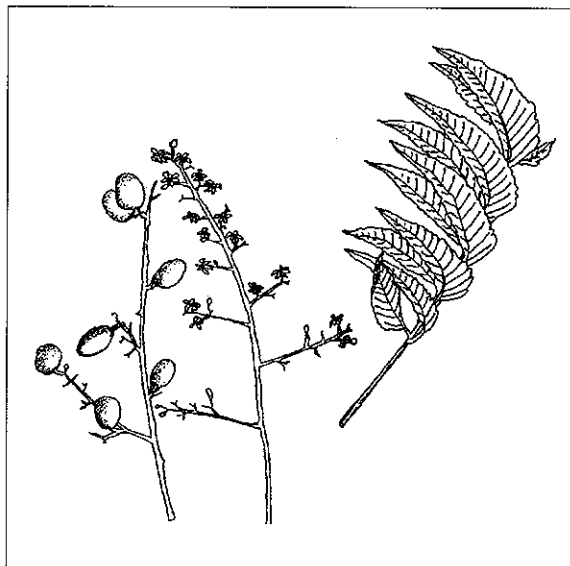
*Azadirachta indica*

**Neem**

**Nimu**

**Description:** Native of Burma and India, now widely planted throughout the tropics in Asia and Africa. A semi-evergreen, medium-sized handsome tree, 10-15 m tall, with straight short trunk and spreading branches forming a dense rounded crown. **Bark** grey-brown, thick with scaly plates; **leaves** compound at ends of twigs 20-35 cm long, leaflets lance-shaped, pointed with saw-tooth edges, dull green above, paler below; **flowers** fragrant, small and white in clusters; **fruit** a fleshy drupe, numerous, oblong 1.3-2 cm long, light yellow turning purple, 1-seeded.

**Uses/Products:** The wood is moderately heavy, hard and durable; resistant to decay and attack by insects; excellent fuel; used for construction, poles, lumber, furniture, farm tools, and carving; most parts of the tree yield commercial by-products, and nearly all have medicinal uses; oil from the seed used in soaps, disinfectants, drugs, cosmetics, and lubricants; seed cake is an excellent fertiliser; used for shade and windbreaks along streets and pastures, and for reclamation of arid lands.



*Azadirachta indica*

from: *Trees of Kenya, 1989.*  
T. Noad and A. Birnie.

**Special Notes:** Neem is a fast growing tree that coppices readily. Azadirachtin from the seed and leaves is a promising insect repellent. Dried leaves are used to protect stored crops, cloth and books from insect attack. Leaves and twigs have been used as mulch and green manure. Without proper storage, seed has short viability, so needs to be planted quickly in pots or as bare-root stock.



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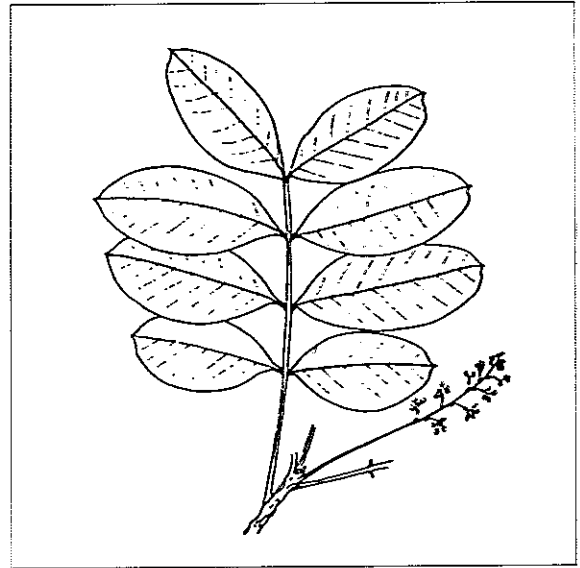
**FAMILY: MELIACEAE**

*Khaya nyasica* (anthotheca)

**Red Mahogany**

**Mbawa**

**Description:** Indigenous. A large handsome tree up to 45-60 m tall, with long straight trunk and enormous rounded crown of glossy foliage. **Bark** grey, mostly smooth but flaking; **leaves** compound and large; **flowers** small, white and inconspicuous in many-flowered panicles; **fruit** an oval woody capsule 3-5 cm, splitting into 4-5 valves that release many winged seeds.



*Khaya nyasica*

*from: Useful Plants of Malawi, 1975.  
J. Williamson.*

**Uses/Products:** An important timber species, used extensively for furniture, doors, cabinets, and panelling as it works easily and takes a fine polish; infusion of the bark to relieve colds.



**FAMILY: MELIACEAE**

*Melia azedarach*

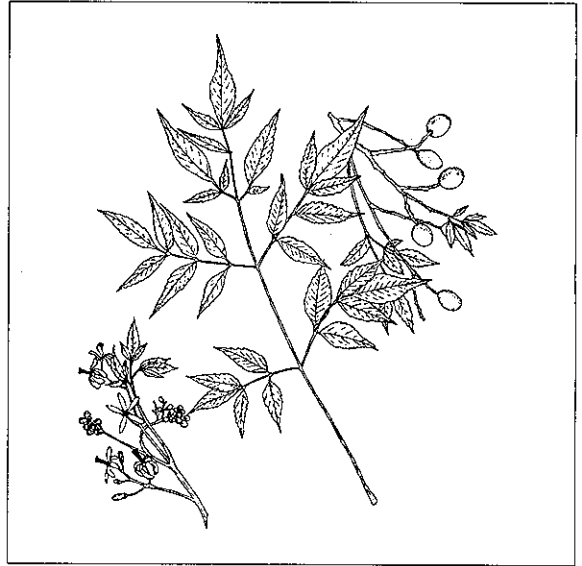
**Persian Lilac, Chinaberry**

**Indya**

**Description:** Native of southern Asia, widely planted as an ornamental throughout the tropics. A small to medium size deciduous tree 6-15 m tall with spreading branches and hemispherical crown. **Bark** grey and smooth becoming brown and furrowed with age; **leaves** compound 20-40 cm long, leaflets lance-shaped, long-pointed with saw-toothed edges, dark green above, paler below; **flowers** pink-purple, showy, fragrant, and numerous on slender stalked panicles; **fruits** a fleshy yellow berry about 1 cm diametre, hanging in persistent clusters, stone hard with 3-5 seeds.

**Uses/Products:** Wood used for fuelwood, roofing poles on houses, furniture, and tool handles; has insecticidal properties for locust control and protecting stored clothing and books; various tree parts have medicinal uses.

**Special Notes:** Berries are extremely poisonous to people and some livestock.



*Melia azedarach*

*Common Fuelwood Crops.*  
*Elbert L. Little, Jr.*



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**FAMILY: MELIACEAE**

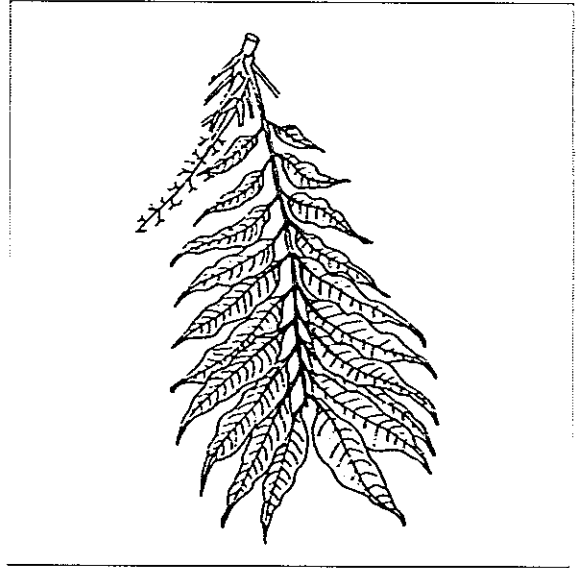
*Toona ciliata*

**Toon Tree**

**Sendrella**

**Description:** Native of tropical Asia, now widespread in the tropics. A large, spreading deciduous tree with thick trunk up to 20-25 m. **Bark** dark grey-brown, rough, furrowed and cracking in squares; **leaves** compound and large up to 90 cm long with narrow leaflets up to 15 cm long; **flowers** small, white, bell-shaped, and inconspicuous; **fruit** an oblong brown capsule splitting into star shapes, releasing small winged seeds.

**Uses/Products:** Good fuelwood; used for light construction and furniture; often planted as a street or park tree, also in plantations and for afforestation.



*Toona ciliata*

*from: Trees of Kenya, 1989.  
T. Noad and A. Birnie. ill: A. Birnie.*



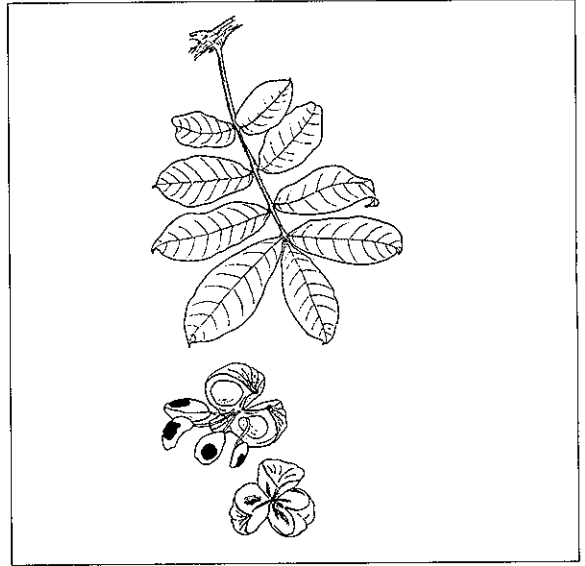


**FAMILY: MELIACEAE**

*Trichilia emetica*  
Natal Mahogany

**Msikidzi**

**Description:** Indigenous. A handsome medium-large evergreen tree 8-20 m high, with dark hanging foliage and dense rounded crown. **Bark** dark grey to brown, smoothish to rough; **leaves** compound, up to 45 cm long, leaflets oval up to 15 cm long, dark glossy above with dense curly hairs below; **flowers** inconspicuous, dull white, fragrant, in axillary clusters; **fruit** a round, velvety brown capsule, 3 cm diameter, splitting into 3-4 valves, black seeds enclosed with a brilliant orange aril.



*Trichilia emetica*

**Uses/Products:** Good fuelwood, works well but needs treatment against borer attack; used for furniture, household utensils, shelving and dug-out canoes; bark soaked in warm water and used as an emetic; boiled seed that has been ground and pounded produces a superior oil for anointing the body and hair; it is also rubbed into cuts and bruises to aid healing; can also be taken internally for rheumatism and the high fat content of the seeds is used for cooking and soap-making.

*from: Trees of Kenya, 1989.*  
*T. Noad and A. Birnie. ill: A. Birnie.*

**Special Notes:** This is a fast-growing tree with many uses. Plant the seeds quickly after removing the orange aril as viability is short.



**FAMILY: MORACEAE**

*Ficus capensis*

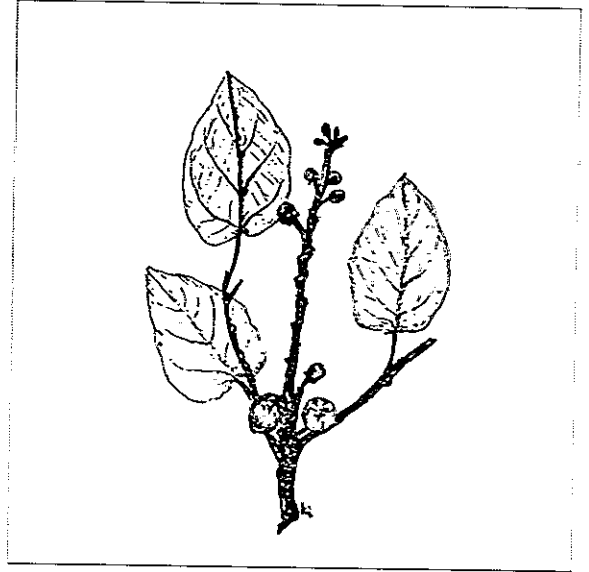
**Cape Fig**

**Mkuyu**

**Description:** Indigenous. A large spreading tree 12-25 m tall. **Bark** grey, smoothish; **leaves** large and ovate up to 23 x 12 cm, greenish-grey but conspicuously red when young; **flowers** small, inconspicuous; **fruits** in large, heavy branched clusters or fascicles on stems and trunk, each 3-4 cm in diameter.

**Uses/Products:** Fruit is edible and can be made into jams; leaves used for sandpaper; wood for making drums and mortars; the tree has many medicinal uses: latex used to treat burns and septic conjunctivitis; leaf and bark infusions are given to cows to increase milk yields, and there are many cultural values and beliefs ascribed to the tree.

**Special Notes:** A good shade tree growing well from truncheons.



*Ficus capensis*

from: *Trees of Kenya, 1989.*  
T. Noad and A. Birnie. ill: A. Birnie.



**FAMILY: MORACEAE**

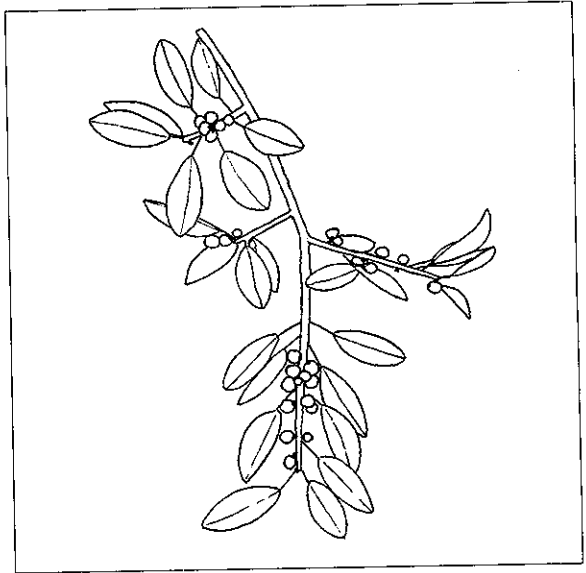
*Ficus natalensis*  
**Common Wild Fig**

**Kachere**

**Description:** Indigenous. A much branched deciduous tree, variable size, up to 20 m with a rounded crown, sometimes a strangler of other trees. **Bark** grey, smoothish, often with aerial roots hanging down; **leaves** variable, mostly narrow-oblong and dark green; **flowers** small, inconspicuous; **fruits** about 1 cm diameter, smooth and solitary or paired.

**Uses/Products:** Fruits eaten by animals and birds; bark is used for cloth, to induce lactation and to treat influenza; the tree may have other medicinal or cultural uses.

**Special Notes:** A good shade tree; growing well from truncheons.



*Ficus natalensis*

*from: Trees of Southern Africa, 1977.  
Keith Coates Palgrave. ill: Terry Duggan.*



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**FAMILY: MORINGACEAE**

*Moringa oleifera*  
Horse-radish Tree

Chamwamba,  
Kangaluni

**Description:** Native of India and Arabia, now naturalised in many areas of the tropics. A small deciduous tree 5-10 m tall with a light canopy. **Bark** pale grey, thick and corky; **leaves** pale green, compound 30-60 cm long, leaflets small and oval 1-2 cm long; **flowers** creamy-white, fragrant, in long sprays; **fruit** a long, triangular shaped capsule, splitting to release 3-winged seeds.



*Moringa oleifera*

*from: Common Fuelwood Crops.*  
*Elbert L. Little, Jr.*

**Uses/Products:** Foliage is good fodder; leaves, flowers and young fruit are cooked after pounding and used as a relish in a solution of potatoes, also used in flavouring curries; oil from the seeds known as Ben oil used in salads, skin poultices, soap-making, lubricating machinery, and in cosmetic and textile industries. Pressed seed cake has potential as a livestock feed. Powder ground mostly from the seeds makes an excellent water purifier, replacing alum; also used as a cure for scurvy.

**Special Notes:** A useful fast-growing tree, mostly grown from truncheons, but also from seed.



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**FAMILY: MYRTACEAE**

*Eucalyptus camaldulensis*

**Gum**

**Bulugama**

**Description:** Native to Australia, now widely planted around the world. Large, 25-40 m tall, aromatic evergreen tree. **Bark** smooth white-grey with patches of darker gray and red, peeling in long strips. **Leaves** alternate, lance-shaped, often curved, hairless, drooping along twigs. **Flowers** 5-10 in cluster at leaf base. **Fruits** consist of hard seed capsules that open at top with many small seeds.

**Uses/Products:** Planted as windbreak. Red hardwood resistant to termites, used for firewood, charcoal, construction wood and poles.

**Special Notes:** The Genus consists of many different species adapted to different climates. For the following four species the recommended environment is given: *E. camaldulensis*, wide range of environments; *E. cloeziana*, medium altitude on flat good soils; *E. grandis*, higher elevations, like Viphya; *E. tereticornis*, wide range of environments.



*Eucalyptus camaldulensis*

from: *Common Fuelwood Crops.*  
Elbert L. Little, Jr. ill: Mueller, 1879.

Although very popular for its fast growth, trees of this genus have the disadvantages of exhausting the soil of nutrients and water, due to this fast growth and to storing nutrients in the stem. Eucalyptus trees are not suitable for association or rotation with crops.



**FAMILY: MYRTACEAE**

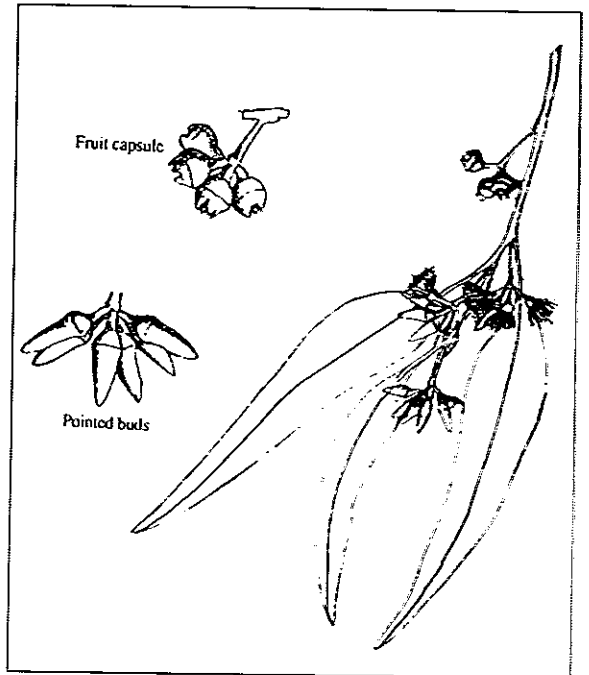
*Eucalyptus tereticornis*

**Forest Red Gum**

**Bulugama**

**Description:** Native to Australia, now widely planted around the world. Evergreen tree 18–46 m high with straight stout trunk 1–1.8 m in diameter, large and open or fairly dense crown. **Bark** smooth, whitish, peeling in irregular thin sheets or large flakes, becoming mottled with white, gray, or blueish patches; **leaves** alternate, lanceolate, 10–21 cm long, 12–25 mm wide, often curved, acuminate, acute at base, slightly thickened, shiny green on both surfaces, glabrous; **flowers** 5–12, spreading on equal stalks on 5–7 mm, stamens many, threadlike, white, 10–12 mm long; **fruit**, a capsule, hemiglobose or turbinate, 6–9 mm long, 8–10 mm in diameter, containing many tiny seeds, shiny dark brown to black.

**Uses/Products:** Planted for shade and as windbreak. Red heartwood, hard, durable and resistant to termites. Used for fuel, pulp, pilings, fiberboard, and construction; also for crossties and fenceposts.



*Eucalyptus tereticornis*

from: James A. Duke. 1983. *Handbook of Energy Crops*. unpublished.

**Special Notes:** The Genus consists of many different species adapted to different climates, but generally not suitable for growing with crops



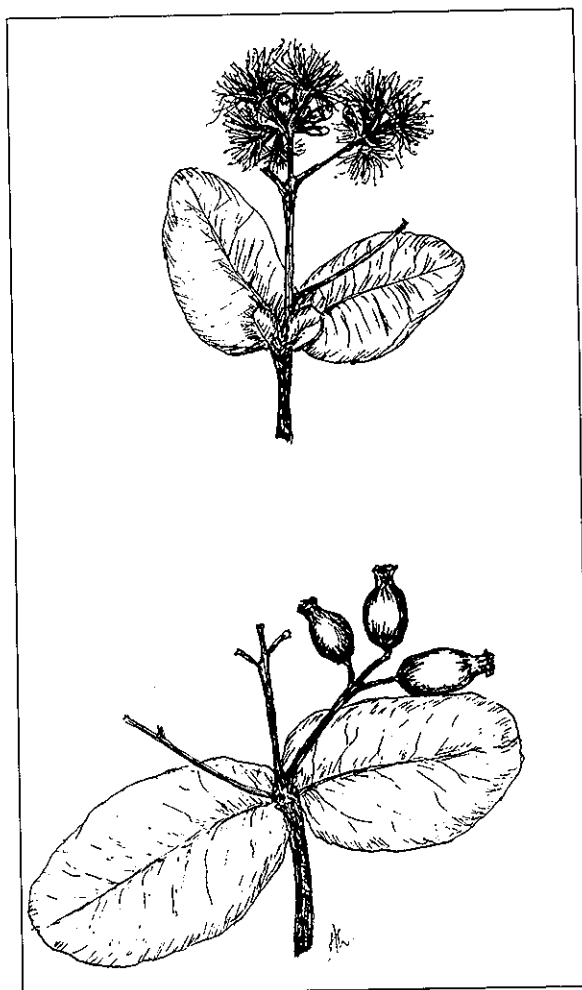
**FAMILY: MYRTACEAE**

*Syzygium cordatum*  
**Water Berry**

**Katope**

**Description:** Indigenous. Medium to large evergreen tree 8 to 15 m often with crooked stem and rounded crown, nearly always close to water. **Bark** dark brown, rough and fissured; **leaves** elliptic to circular, bluish green, 8 x 6 cm, successive pairs set at right angles to each other; **flowers** in dense heads at the ends of branches, white to pinkish, with numerous fluffy stamens, sweet scented; **fruit** ovoid, fleshy 1.5 cm long, purple when mature, edible but acidic.

**Uses/Products:** Wood pale reddish brown, hard, heavy and very durable, used for beams, rafters and boat building. Bark produces a brown dye. An alcoholic drink is made from the fruits.



*Syzygium cordatum*

*from: Fifty common trees of Zambia.*  
*1968. Forest Department Bulletin No. 5.*



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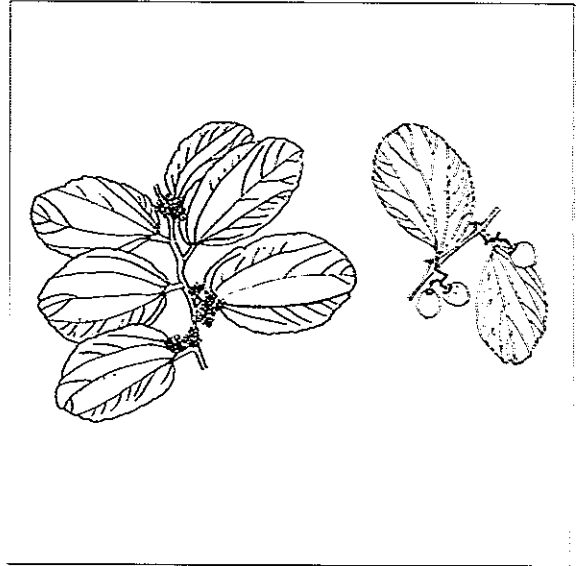
**FAMILY: RHAMNACEAE**

*Ziziphus abyssinica*

**Jujube**

**Kankhande**

**Description:** Indigenous. A wickedly armed shrub or small tree to 7 m high, with rounded crown and drooping, tangled branches having scattered recurved thorns. **Bark** grey-brown, becoming rough and fissured; **leaves** ovate up to 8 x 5 cm, 3-veined from base, dark green above, paler below due to dense furry hairs; **flowers** yellow and small in tight axillary clusters; **fruit** round, shiny red-brown, 2-3 cm in diameter.



*Ziziphus abyssinica*

*from: Trees of Kenya, 1989.  
T. Noad and A. Birnie.*

**Uses/Products:** Fruit edible; foliage and fruits valued fodder/browse; wood moderately durable, hard, and heavy; excellent fuelwood; used for light construction, making tool handles, farm implements, posts, bedlegs.



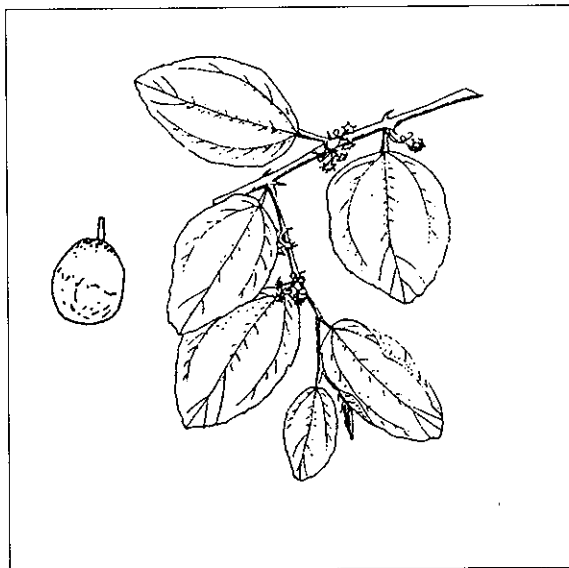


**FAMILY: RHAMNACEAE**

*Ziziphus mauritiana*  
**Jujube**

**Masawo**

**Description:** Native of southern Asia, now widely naturalised in much of the tropics and sub-tropics. A semi-evergreen, small-medium tree 6-20 m tall, with rounded spreading crown, drooping branches, and recurved thorns. **Bark** dark grey, irregularly fissured; **leaves** oval to elliptical 2-6 cm long, shiny green above, softly hairy below; **flowers** yellow, small and fragrant; **fruits** round and yellow, turning brown, about 1-2 cm in diameter.



*Ziziphus mauritiana*

*from: Trees of Kenya, 1989.*  
*T. Noad and A. Birnie.*

**Uses/Products:** Fruit edible and marketed locally; also made into a refreshing drink and alcoholic spirit; foliage and fruits valued fodder/browse; wood moderately durable, hard, and heavy; excellent fuelwood; used for light construction, making tool handles, farm implements, posts, beds.



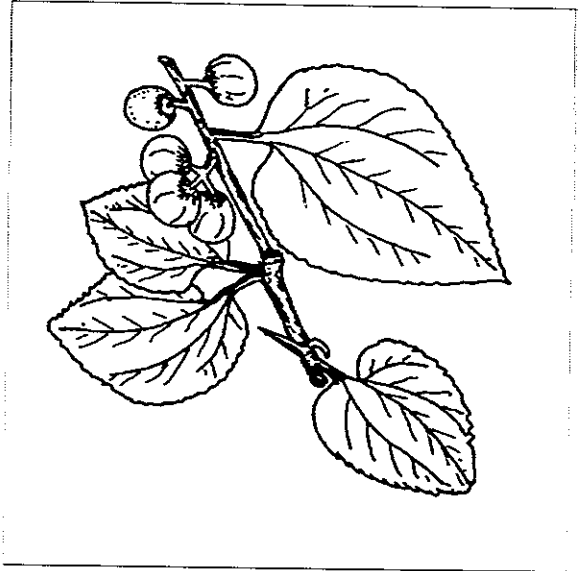
**FAMILY: RHAMNACEAE**

*Ziziphus mucronata*

**Buffalo Thorn**

**Kankhande**

**Description:** Indigenous. A deciduous shrub or small tree to 10 m high with rounded crown and branches with paired thorns, one straight to 2 cm long, the other recurved. **Bark** dark grey, irregularly fissured; **leaves** oval 3-6 cm long, shiny green on both sides, apex tapering and margin finely toothed; **flowers** yellow, small and inconspicuous; **fruits** round and red-brown, about 1-1.5 cm in diameter.



*Ziziphus mucronata*

from: *Trees of Kenya, 1989.*  
*T. Noad and A. Birnie.*

**Uses/Products:** Fruit edible but pulp is rather dry and mealy; also made into an alcoholic spirit; foliage and fruits valued fodder/browse; wood moderately durable, hard, and heavy; excellent fuelwood; used for light construction, making tool handles, farm implements, posts, beds. This tree has many medicinal and cultural values: a remedy for almost any pain is made from a poultice of powdered and baked roots which are eaten afterwards; a leaf paste is used to treat boils and other skin infections; an infusion of the root is used to treat dysentery and lumbago; powdered leaves and bark to treat chest complaints, and an infusion of the bark to cure coughs.



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**FAMILY: ROSACEAE**

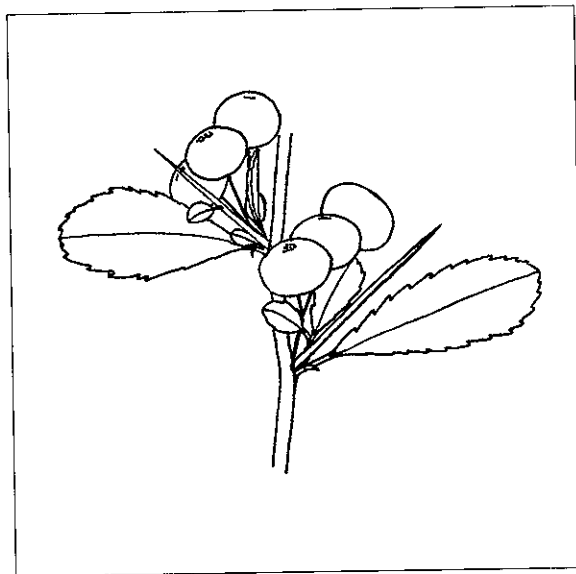
*Pyracantha coccinea*

**Fire Thorn**

**Mchende**

**Description:** Shrub, native to S.E. Europe and W. Asia, now widely planted as ornamental hedge. Does well in cool, wet areas; **Leaves** simple, small, obovate with toothed margin, in alternate clusters, on dwarfed lateral shoots that form thorns; **Flowers** white, in clusters at intervals along the stem; **Fruits** clusters of red berries, about 7 mm in diameter.

**Uses / Products:** Planted as a live fence and ornamental hedge.



*Pyracantha coccinea*

*ill. F. Bodnar*



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**FAMILY: GRAMINACEAE**

*Pennisetum purpureum*

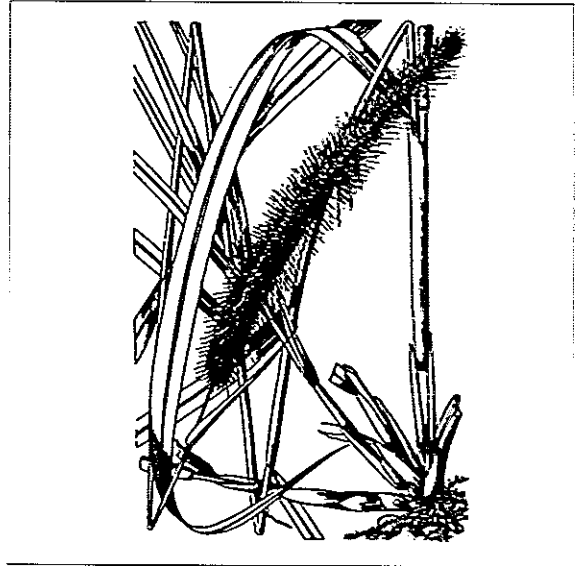
**Napier Grass**

**Nsenjere**

**Description:** Indigenous. A perennial grass with reed-like stems 2.5 cm in diameter, up to 4.5 m tall. **Leaves** sharp-edged; **flower** a bulrush-like spike, sometimes not producing seed.

**Uses/Products:** Stout stems used for hut walls and fences, sometimes thatching; provides useful fodder, making good hay if cut when less than 1.3 m high; also makes good quality paper.

**Special Notes:** Since napier grass rarely produces viable seed, it is established from stem or root cuttings. Stem cuttings are pushed into the soil at an angle of 45 degrees, burying at least 2 nodes. Root cuttings are planted 7.5 cm deep. Although very productive, repeated cuttings cause yields to decline, requiring replanting after 4 years. Napier is fairly disease resistant, but susceptibility to nematodes precludes its use in tobacco rotations.



*Pennisetum purpureum*

*from: Useful Plants of Malawi, 1975.  
J. Williamson.*



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**FAMILY: GRAMINACEAE**

*Vetiveria zizanioides*

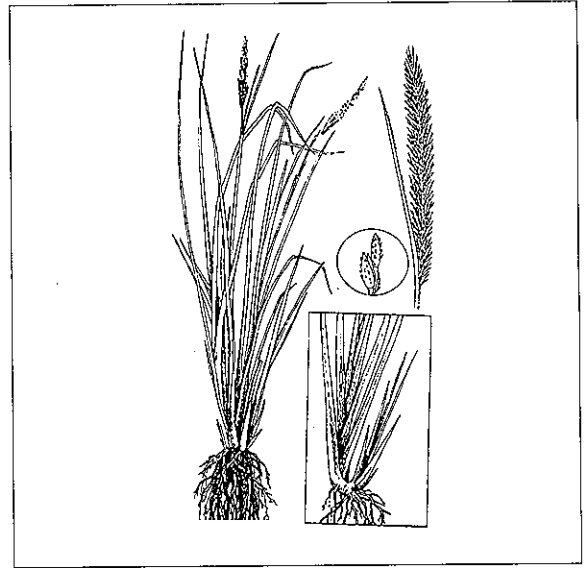
**Vetiver Grass**

**Thedzi**

**Description:** An introduced grass aimed at erosion control. Vetiver is a densely tufted, awnless, wiry, deep-rooted perennial. It grows in large clumps from a much-branched spongy root-stock with erect culms 1-2.5 m tall. **Leaves**, are stiff, narrow and up to 100 cm long, **flower heads**, purple with panicles 15-30 cm long, some cultivars rarely flower.

**Uses/Products:** Cultivated mostly for erosion control and to stabilise road/dam embankments; makes good thatching; generally unpalatable but will be grazed when other forage is limiting; roots used for baskets and other woven crafts, which also yield an oil used in the cosmetics industry.

**Special Notes:** Since vetiver grass rarely produces viable seed, and has no stolons or rhizomes, it is propagated from root divisions or "slips".



*Vetiveria zizanioides*

*from: Mickey Patel & Co, 1987.*



## REFERENCE TABLES

**Table 1: Plant Spacing and Density/HA for Each Technology**

TECHNOLOGY		DIRECT SOWN SEEDS		NURSERY SEEDLINGS	
		Field Spacing	Plants/ha or /km	Field Spacing	Plants/ha or /km
Undersowing	Tephrosia and Cajanus	0.9 x 0.45 m	24,691 /ha	NA	NA
	Sesbania	NA	NA	0.9 x 0.9 m	12,346 /ha
Short Term Fallows	Medium-Large Trees	NA	NA	1.8 x 1.8 m	3,086 /ha
	Small trees			0.9 x 0.9 m	12,346 /ha
	Tephrosia and Cajanus	0.9 x 0.45 m	24,691 /ha	NA	NA
<b>Dispersed Systematic Interplanting</b>		NA	NA	10 x 5 m	200 /ha
Green Manure / Fodder Banks	Tephrosia and Cajanus	0.9 x 0.45 m	24,691 /ha	NA	NA
	Leucaena, Gliricidia and Sesbania	NA	NA	0.9 x 0.9 m	12,346 /ha
	Senna spectabilis (Green manure banks)	NA	NA	1.8 x 1.8 m	3,086 /ha
Alley Cropping	Tephrosia	3.6 x 0.45 m	6173 /ha	NA	NA
	Gliricidia, Leucaena and Senna	NA	NA	4.5 x 0.9 m	2469 /ha
<b>Mixed Tree Intercropping</b>		NA	NA	1.8 x 0.9 m	6,173 /ha
Homestead / Farm Boundaries	Small and medium trees	NA	NA	2 m	500 /km
	Large trees			4 m	250 /km
Woodlots	For Poles	NA	NA	1 x 2 m	5,000 /ha
	For Fuelwood			2 x 2 m	2,500 /ha
Live Fences	Tree seedlings			0.4 m	2,500 /km
	Tree truncheons	NA	NA	1 m	1,000 /km
	Sisal			1.0 m	1,000 /km
Live Farm Sheds	Seedlings and Truncheons	NA	NA	2 x 2 m	NA
<b>Tree Seed Orchards</b>		NA	NA	4 x 4 m	625 /ha
<b>SOIL AND WATER CONSERVATION</b>					
Contour Strips *	Vetiver Slips / Napier Cuttings	NA	NA	0.10 m	10,000 /km
	Large Multipurpose Trees	NA	NA	5 m	200 /km
	Small trees like Sesbania	NA	NA	1 m	1,000 /km
	Tephrosia, Cajanus	0.4 m	2,500 /km	NA	NA
<b>Vetiver Grass Nurseries</b>		NA	NA	0.9 x 0.45 m	24,691

After establishment, thin out trees so that there is only one seedling per station.

Carefully done at an early stage, thinned plants can be transplanted into containers where seeds failed to germinate.

Numbers of seeds to sow per station depends on the species used (see Table 11 for more information).

\* Distance between grass strips varies from 15 m on gentle slopes, 10 m on medium slopes and 5 m on steep slopes.



**Table 2: Agroforestry Species: Technology, Size and Altitude Range**

SPECIES			Technology <sup>1</sup>	Size <sup>2</sup>	Altitude Range <sup>3</sup>
Botanical Name	Chichewa	English			
<i>Acacia galpinii</i>	NKUNKHU	Monkey thorn	BH, SI, FA, WL, LF, SB	L	L-M
<i>Acacia nigrescens</i>	MKUNKHU	Knob thorn	BH, FA, WL, LF	M	L
<i>Acacia nilotica</i>	MPAMPA	Scented thorn	BH, FA, WL, LF, SB	S-M	L-M
<i>Acacia polyacantha</i>	MTHETHE	White thorn	BH, SI, FA, WL, SB	M	W
<i>Acacia sieberiana</i>	MINGANZONO	Paperbark acacia	BH, FA, WL, LF, SB	M	W
<i>Acacia tortilis</i>	NCHONGWE	Umbrella thorn	BH, FA, WL, LF	S-M	L
<i>Agava sisalana</i>	KHONJE	Sisal	LF, BH	-	L-M
<i>Azela quanzensis</i>	MSAMBAMFUMU	Pod Mahogany	BH, WL	L	L-M
<i>Albizia lebbek</i>	MTANGAMTANGA	Woman's tongue	BH, FA, WL	M	L-M
<i>Albizia versicolor</i>	MTANGAMTANGA	Poison-pod albizia	BH, FA, WL, SB	M	W
<i>Annona senegalensis</i>	MPOSA	Wild custard apple	BH	S	L-M
<i>Azadirachta indica</i>	NIMU	Neem	BH, WL	M	L
<i>Azanza garkeana</i>	MTOWO	Snot apple	BH, SI	S	W
<i>Bauhinia thonningii</i>	CHITIMBE	Monkey bread	BH, FA, SB	S-M	W
<i>Bridelia micrantha</i>	MPASA	Bridelia	BH, WL	S-M	M
<i>Caesalpinia decapetala</i>	KAPITAGWILERE	Mauritius thorn	LF	S	W
<i>Cajanus cajan</i>	NANDOLO	Pigeon Pea	AC, US, FA, CS	SS	W
<i>Combretum imberbe</i>	MNANGALI	Leadwood	BH, WL	M-L	L
<i>Cordyla africana</i>	MTONDO	Wild mango	BH, SB	L	L
<i>Dichrostachys cinerea</i>	CHIMPHONGALA	Sickle bush	F/MB	S	L-M
<i>Erythrina abyssinica</i>	MUWALE	Red-hot poker tree	BH, FA, LF	M	W
<i>Eucalyptus species</i>	BULUGAMA	Gum	BH, WL	L	W
<i>Faidherbia albida</i>	MSANGU	Winter thorn	BH, SI, FA, SB	L	W
<i>Ficus capensis</i>	MKUYU	Cape fig	BH, LF, LFS, SB	M-L	W
<i>Ficus natalensis</i>	KACHERE	Common wild fig	BH, LF, LFS, SB	L	W
<i>Flacourtia indica</i>	NTHUDZA	Indian plum	BH	S	W

<sup>1</sup> Technologies: AC=Alley Cropping; BH=Boundary Homestead; CS=Contour Vegetation Strips; FA=Fallows;

F/MB=Fodder / Green Manure Banks; LF=Live Fences; LFS=Live Farm Sheds; MTI=Mixed Tree Intercropping;

SB=Streambank Planting; SI=Systematic Interplanting; US=Undersowing; WL=Woodlots

<sup>2</sup> Tree size: SS small shrub; S=small; M=medium; L=large.

<sup>3</sup> Altitude range: W=Wide range; L=Low altitudes; M=Medium altitudes; H=High altitudes.



**Table 2 continued: Agroforestry Species: Technology, Size and Altitude Range**

SPECIES			Technology <sup>1</sup>	Size <sup>2</sup>	Altitude Range <sup>3</sup>
Botanical Name	Chichewa	English			
<i>Gliricidia sepium</i>	GLIRICIDIA	Mexican lilac	AC, FMB, FA, MTI, CS, WL	S-M	W
<i>Khaya nyasica</i>	MBAWA	Red mahogany	BH, WL, SB	L	W
<i>Leucaena diversifolia</i>	LUKINA	Leucaena	AC, FMB, FA, CS, WL	S	L-M
<i>Melia azedarach</i>	INDYA	Persian lilac, China berry	BH, WL	S-M	W
<i>Moringa oleifera</i>	CHAMWAMBA	Horse-raddish tree	BH, LF	S	L-M
<i>Pennisetum purpureum</i>	NSENJERE	Napier grass	CS, F/MB	-	W
<i>Prosopis juliflora</i>	-	Mesquite	BH, LF, FA, WL	S	L
<i>Pyracantha coccinea</i>	MCHENDE	Fire thorn	LF	SS	M-H
<i>Sclerocarya birrea</i>	MFULA	Marula	BH, LF, LFS, SB	M-L	L-M
<i>Senna siamea</i>	KESHYA WA MILIMO	Cassia	BH, WL, LFS	M	L-M
<i>Senna spectabilis</i>	KESHYA WA MALUWA	Cassia	AC, BH, CS, WL, LFS	S-M	W
<i>Sesbania sesban</i>	JELEJELE	River bean	US, FA, CS, F/MB, SB	SS	W
<i>Syzygium cordatum</i>	KATOPE	Water berry	BH, SB	M	W
<i>Tephrosia vogelii</i>	MTHUTHU	Fish bean	AC, BH, US, FA, CS	SS	M-H
<i>Terminalia sericea</i>	NAPINI	Silver terminalia	BH, WL	M-L	L-M
<i>Toona ciliata</i>	SENDRELLA	Toon tree	BH, WL	L	W
<i>Trichilia emetica</i>	MSIKIDZI	Natal mahogany	BH, WL, SB	M-L	L-M
<i>Uapaca kirkiana</i>	MSUKU	Wild loquat	BH	S	M-H
<i>Vetiveria zizanioides</i>	THEDZI	Vetiver grass	CS	-	W
<i>Ziziphus abyssinica</i>	KANKHANDE	Jujube	BH, WL, LF, SB	S	M-H
<i>Ziziphus mauritiana</i>	MASAWO	Jujube	BH, WL, LF, SB	S	L-M
<i>Ziziphus mucronata</i>	KANKHANDE	Buffalo thorn	BH, WL, LF, SB	S	W

<sup>1</sup> Technologies: AC=Alley Cropping; BH=Boundary Homestead; CS=Contour Vegetation Strips; FA=Fallows;

FMB=Fodder / Green Manure Banks; LF=Live Fences; LFS=Live Farm Sheds; MTI=Mixed Tree Intercropping;

SB=Streambank Planting; SI=Systematic Interplanting; US=Undersowing; WL=Woodlots

<sup>2</sup> Tree size: SS small shrub; S=small; M=medium; L=large.

<sup>3</sup> Altitude range: W=Wide range; L=Low altitudes; M=Medium altitudes; H=High altitudes.





**Table 3: Agroforestry Species: Wood, Medicinal and Other Uses**

Species	Origin	Fuelwood	Timber/ building	Furniture	Tools/ Carvings	Rope/ Textiles	Animal Fodder	Edible Parts	Medicine/Other
<i>Acacia galepinii</i>	I	++	+	++			+		
<i>Acacia nigrescens</i>	I	++	+	++			+		
<i>Acacia nilotica</i>	I	+	++	++			++	Gum	DY,IM,RP
<i>Acacia polyacantha</i>	I	++	++	+	++		++	Gum	VD,SN,TR
<i>Acacia sieberiana</i>	I	+	+	o	o		++		
<i>Acacia tortilis</i>	I	++				+	+		
<i>Azelia quanzensis</i>	I	+++	+++	+++	+++		+		
<i>Agava sisalana*</i>	E						+		
<i>Albizia lebbek</i>	E	++	+++	++	++		++		TN
<i>Albizia versicolor</i>	I	+++	+++	+++	+++		++		SP, Pod are Poisonous
<i>Annona senegalensis</i>	I	+	+		+	+		fruit/root	RP,ST,TR
<i>Azadirachta indica</i>	E	+++	++	++	++		o		OL,IN,MM
<i>Azanza garkeana</i>	I	+			+	+		Fruit	Host to cotton stainer
<i>Bauhinia thonningii</i>	I	+	o		o	++	+++	Pods	GP,DY,SP,BP,RU,CN
<i>Bridelia macrantha</i>	I	+++	+++	+++	+++				BP, GP, PE, ST,
<i>Caesalpinia decapetala</i>	I								
<i>Cajanus cajan</i>	E	o					++	Pods	
<i>Combretum imberbe</i>	I	+++	++	o	++				SP,CO,RP
<i>Cordyla africana</i>	I	+++	+++	+++	+++		+++	Fruit	Gum-resin
<i>Dichrostachys cinerea</i>	I	+++			+++		+++		SN, BP, GP
<i>Erythrina abyssinica</i>	I				o				PO
<i>Eucalyptus species</i>	E	+	++						
<i>Faidherbia albida</i>	I	++	+	+	+		+++	Seeds	TN, ST
<i>Ficus capensis</i>	I	o	o			++	++		SK

Origin: I = Indigenous, E = Exotic  
 Use Ratings: +++ ++ + o Blanks: Poor or unknown  
 Excellent Very Good Good Fair

**Medicinal and other uses:**

- |                              |                         |                         |
|------------------------------|-------------------------|-------------------------|
| AB: Aborigine                | MAL: Malaria            | SN: Snake bites         |
| BP: Head/Body pains          | MM: Multi medicinal     | SP: Soap                |
| CN: Contraceptive            | OL: Oil                 | ST: Stomach disorders   |
| CO: Cosmetic                 | PE: Purgative / Enema   | TN: Tannins             |
| DY: Dyes                     | PO: Poisonous           | TR: Traditional beliefs |
| GP: General purpose medicine | RP: Respiratory / Colds | VD: Venereal diseases   |
| IM: Impotence                | RU: Rheumatism          | WT: Water treatment     |
| IN: Insecticide              | SK: Skin disorders      |                         |



**Table 3 continued: Agroforestry Species: Wood, Medicinal and Other Uses**

Species	Origin	Fuelwood	Timber/ building	Furniture	Tools/ Carvings	Rope/ Textiles	Animal Fodder	Edible Parts	Medicine/Other
<i>Ficus natalensis</i>	I	o	o			++	++	Fruit	RP, GP
<i>Flacourtia indica</i>	I							Fruit	BP, GP, RP, RU, ST
<i>Khaya nyasica</i>	I	++	+++	+++	++				RP
<i>Leucaena diversifolia</i>	E	++	o				++	Leaves	
<i>Melia azaderach</i>	E	++	o	o					PO, IN
<i>Moringa oleifera</i>	E	o				+	++	All	CO, OL, SK, SP, WT
<i>Pennisetum purpureum</i>	I						++		
<i>Prosopis juliflora</i>	E	+++	+	o	+		++	Pods	
<i>Pyracantha coccinea</i>	E								
<i>Sclerocarya birrea</i>	I	+	++	++	++		++	Fruit	OL, CO, MAL, GP, TR, ST
<i>Senna siamea</i>	E	++	+	+					PO
<i>Senna spectabilis</i>	E	+	+	+					PO
<i>Sesbania sesban</i>	I	o					+++		
<i>Syzygium cordatum</i>	I	++	+++	++	++		++	Fruit	
<i>Tephrosia vogelii</i>	I/E								
<i>Terminalia sericea</i>	I	++	+++	++	++				GP, ST, RP, TR
<i>Toona ciliata</i>	E	++	+	+					
<i>Trichilia emetica</i>	I	+	+	+	+				PE, BP, GP, RU, SP, OL, PO
<i>Uapaca kirkiana</i>	I	++	++	++	++			Fruit	AB, RU, RP, SK
<i>Vetiveria zizanioides</i>	E						o		
<i>Ziziphus abyssinica</i>	I	+++	+	+	+		++	Fruit	RP
<i>Ziziphus mauritiana</i>	E	+++	+	+	+		++	Fruit	
<i>Ziziphus mucronata</i>	I	+++	+	+	+		++	Fruit	GP, TR, ST, RP, SK

Origin: I = Indigenous, E = Exotic

Use Ratings: +++

Excellent

++

Very Good

+

Good

o

Fair

Blanks: Poor or unknown

**Medicinal and other uses:**

AB: Aboricide

BP: Head/Body pains

CN: Contraceptive

CO: Cosmetic

DY: Dyes

GP: General purpose medicine

IM: Impotence

IN: Insecticide

MAL: Malaria

MM: Multi medicinal

OL: Oil

PE: Purgative / Enema

PO: Poisonous

RP: Respiratory / Colds

RU: Rheumatism

SK: Skin disorders

SN: Snake bites

SP: Soap

ST: Stomach disorders

TN: Tannins

TR: Traditional beliefs

VD: Venereal diseases

WT: Water treatment



**Table 4: Planting Material Requirements by Species and Technology**

SPECIES	Planting Method <sup>1</sup>	Treatment <sup>2</sup>	Seed /hole	Seeds per Kg	AC g/ha		MTI g/ha NS	IF g/ha		CVS g/km		F/GMB g/ha NS
					DS	NS		DS	NS	DS	NS	
<i>Acacia galpinii</i>	NS	1	2	4,800					<u>1,415</u>		<u>115</u>	
<i>Acacia nigrescens</i>	NS	1	2	4,800					<u>1,415</u>			
<i>Acacia nilotica</i>	NS	1	2	6,329					<u>1,073</u>			
<i>Acacia polyacantha</i>	NS	1	3	9,900					<u>1,029</u>		<u>83</u>	
<i>Acacia sieberiana</i>	NS	1	2	9,000								
<i>Acacia tortilis</i>	NS	1	3	13,330					<u>764</u>			
<i>Azelia quanzensis</i>	NS	1	1	250					<u>13,580</u>			
<i>Agava sisalana</i> *	SU, BU	NA	NA	NA								
<i>Albizia lebbeck</i>	NS	1	3	9,000					<u>1,132</u>		<u>92</u>	
<i>Albizia versicolor</i>	NS	1	2	4,800					<u>1,415</u>		<u>115</u>	
<i>Annona senegalensis</i>	NS	0, F	3	12,500								
<i>Azadirachta indica</i>	NS	3, F	2	11,000					<u>617</u>			
<i>Azanza garkeana</i>	NS	3, F	2	4,000								
<i>Bauhinia thonningii</i>	NS	1	3	6,100					<u>1,670</u>			
<i>Bridelia micrantha</i>	NS	2	2	11,000								
<i>Caesalpinia decapetala</i>	NS	1	2	3,380								
<i>Cajanus cajan</i>	DS	0	3	12,000				<u>6,790</u>		<u>688</u>		
<i>Combretum imberbe</i>	NS	0, F	3	7,300								
<i>Cordyla africana</i>	NS	3, F	1	200								
<i>Dichrostachys cinerea</i>	NS	1	3	13,000								
<i>Erythrina abyssinica</i>	CT, NS	1	2	6,800					<u>999</u>		<u>81</u>	
<i>Eucalyptus camaldulensis</i>	NS, SB	0	5	500,000								
<i>Eucalyptus tereticornis</i>	NS, SB	0	5	1,000,000								
<i>Faidherbia albida</i>	NS	1	3	6,900							<u>120</u>	
<i>Ficus capensis</i> *	CT	NA	NA	NA								
<i>Ficus natalensis</i> *	CT	NA	NA	NA								
<i>Flacourtia indica</i>	NS	3, F	5	22,000								

Technology Codes: AC=Alley Cropping; CVS=Contour Vegetation Strips; DSJ=Dispersed Systematic Interplanting

F/GMB=Fodder/Green Manure Banks; H/BP=Homestead/Boundary Planting; IF=Improved Fallows;

LF=Live Fences; LFS=Live Farm Sheds; MTI=Mixed Tree Intercropping; SBP=Streambank Planting; WL=Woodlots

<sup>1</sup> Planting Method: DS=Direct sowing; NS=Nursery seedlings; SB=First sown in seedbed;

CT=Cuttings; SU=Suckers; BU=bulbils; SL=Slips.

<sup>2</sup> Seed treatments: 0=no treatment; 1=nick side of seed with knife or nail clippers;

2=soak in cold water for 24-48 hrs; 3=remove fleshy pulp, capsule or aril; 4=crack shell of nut; F=Plant fresh

\* No. of slips or cuttings Vegetative propagation material underlined.

Figures that are underlined indicate no. of cuttings/slips or truncheons



**Table 4 continued: Planting Material Requirements by Species and Technology**

SPECIES	DSI g/ha NS	US g/ha		H/BP & SBP g/km		WL g/ha		LF g/km NS	LFS No./km NS
		DS	NS	Small	Large	Fuel	Poles		
<i>Acacia galpinii</i>	92				115	1,146	2,292	1,146	
<i>Acacia nigrescens</i>				229		1,146	2,292	1,146	
<i>Acacia nilotica</i>				174		869	1,738	869	
<i>Acacia polyacantha</i>	67			167		833	1,667	833	167
<i>Acacia sieberiana</i>					61	611	1,222	611	
<i>Acacia tortilis</i>				124		619	1,238	619	
<i>Azelia quanzensis</i>					1,100	11,000	22,000		
<i>Agava sisalana*</i>					500				1,000
<i>Albizia lebbek</i>				183		917	1,833		
<i>Albizia versicolor</i>					115	1,146	2,292		
<i>Annona senegalensis</i>				132					
<i>Azadirachta indica</i>				100		500	1,000		
<i>Azanza garkeana</i>				275					
<i>Bauhinia thonningii</i>				270		1,352	2,705		
<i>Bridelia micrantha</i>				100		500	1,000		
<i>Caesalpinia decapetala</i>								1,627	
<i>Cajanus cajan</i>		6,790							
<i>Combretum imberbe</i>					113	1,130	2,260		
<i>Cordyla africana</i>					1,375	13,750	27,500		
<i>Dichrostachys cinerea</i>						635	1,269		
<i>Erythrina abyssinica</i>				162		809	1,618	324	162
<i>Eucalyptus camaldulensis</i>				6		28	55		
<i>Eucalyptus tereticornis</i>				3		14	28		
<i>Faidherbia albida</i>	96				120				
<i>Ficus capensis*</i>					250				1,000
<i>Ficus natalensis*</i>					250				1,000
<i>Flacourtia indica</i>				125		625	1,250		

Technology Codes: AC=Alley Cropping; CVS=Contour Vegetation Strips; DSI=Dispersed Systematic Interplanting

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<sup>1</sup> Planting Method: DS=Direct sowing; NS=Nursery seedlings; SB=First sown in seedbed;

CT=Cuttings; SU=Suckers; BU=bulbils; SL=Slips.

<sup>2</sup> Seed treatments: 0=no treatment; 1=nick side of seed with knife or nail clippers;

2=soak in cold water for 24-48 hrs; 3=remove fleshy pulp, capsule or aril; 4=crack shell of nut; F=Plant fresh

\* No. of slips or cuttings Vegetative propagation material underlined.

Figures that are underlined indicate no. of cuttings/slips or truncheons



**Table 4: Planting Material Requirements by Species and Technology**

SPECIES	Planting Method <sup>1</sup>	Treatment <sup>2</sup>	Seeds /hole	Seeds per Kg	AC g/ha		MTI	IF g/ha		CVS g/km		F/GMB
					DS	NS	g/ha	DS	NS	DS	NS	g/ha
<i>Gliricidia sepium</i>	CT, NS	0, F	1	7,000		388	970		1,940		39	1,940
<i>Jatropha curcas</i>	CT, NS	4	3	1,670								
<i>Khaya nyasica</i>	NS	0, F	5	2,980								
<i>Leucaena diversifolia</i>	NS	1	3	22,500		362	905		1,811		37	1,811
<i>Melia azedarach</i>	NS	3, F	3	1,750							183	
<i>Moringa oleifera</i>	CT, NS	0, F	3	4,500								
<i>Pennisetum purpureum</i>	CT	NA	NA	NA							5,000	24,691
<i>Prosopis juliflora</i>	NS	1	3	10,900				3,738			76	3,738
<i>Pyracantha coccinea</i>	NS, SB	3	10	370,400								
<i>Sclerocarya birrea</i>	CT, NS	4, F	3	100								
<i>Senna siamea</i>	NS	1	3	33,000								
<i>Senna spectabilis</i>	NS	1	3	32,000		255			318		26	318
<i>Sesbania sesban</i>	NS	2	5	82,305					825		167	825
<i>Syzygium cordatum</i>	NS	3, F	2	3,000								
<i>Tephrosia vogelii</i>	DS	0	3	17,500	1,164			4,656		429		4,656
<i>Terminalia sericea</i>	NS	0, F	5	3,906								
<i>Toona ciliata</i>	NS, SB	0, F	5	300,000					57			
<i>Trichilia emetica</i>	NS	0, F	2	1,200								
<i>Uapaca kirkiana</i>	NS	3, F	2	2,860								
<i>Vetiveria zizanioides*</i>	SL	NA	NA	NA							10,000	
<i>Ziziphus abyssinica</i>	NS	4	2	250							2,200	
<i>Ziziphus mauritiana</i>	NS	4	2	1,500							367	
<i>Ziziphus mucronata</i>	NS	4	2	1,100							500	

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Figures that are underlined indicate no. of cuttings/slips or truncheons



**Table 4 continued: Planting Material Requirements by Species and Technology**

SPECIES	DSI		US		H/BP & SBP		WL		LF	LFS
	g/ha	NS	g/ha	NS	g/km	g/km	g/ha	g/ha	g/km	No./km
			DS	NS	Small	Large	Fuel	Poles	NS	NS
<i>Gliricidia sepium</i>					79		393	786		
<i>Jatropha curcas</i>					988				1,976	988
<i>Khaya nyasica</i>						461	4,614	9,228		
<i>Leucaena diversifolia</i>					73		367	733		
<i>Melia azedarach</i>					943		4,714	9,429		
<i>Moringa oleifera</i>					367				1,833	367
<i>Pennisetum purpureum*</i>										
<i>Prosopis juliflora</i>					151		757	1,514	757	
<i>Pyracantha coccinea</i>									74	
<i>Sclerocarya birrea</i>						8,250				16,500
<i>Senna siamea</i>					50		250	500		50
<i>Senna spectabilis</i>					52		258	516		52
<i>Sesbania sesban</i>				825						
<i>Syzygium cordatum</i>					183					
<i>Tephrosia vogelii</i>			4,656							
<i>Terminalia sericea</i>					352		3,520	7,040		
<i>Toona ciliata</i>						5	46	92		
<i>Trichilia emetica</i>						458	4,583	9,167		
<i>Uapaca kirkiana</i>					385					
<i>Veiveria zizanioides*</i>										
<i>Ziziphus abyssinica</i>					2,000		22,000	44,000	22,000	
<i>Ziziphus mauritiana</i>					333		3,667	7,333	3,667	
<i>Ziziphus mucronata</i>					455		5,000	10,000	5,000	

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**Table 5: Index of Species**

*Latin names in italics*

CHICHEWA NAMES in CAPITALS

English names in bold and not capitalized.

<i>Species</i>	page	<i>Species</i>	page	<i>Species</i>	page
<i>Acacia galpinii</i>	10	<b>China Berry</b>	36	KAMSATSI	7
<i>Acacia nigrescens</i>	11	CHITIMBE	24	KANGALUNI	41
<i>Acacia nilotica</i>	12	<b>Common Wild Fig</b>	40	KANKHANDE	45/47
<i>Acacia polyacantha</i>	13	<i>Cordyla africana</i>	28	KAPITAGWILERE	23
<i>Acacia sieberiana</i>	14	<i>Dichrostachys cinerea</i>	19	KATOPE	44
<i>Acacia tortilis</i>	15	<i>Erythrina abyssinica</i>	29	KESHYA WA MALUWA	26
<i>Azelia quanzensis</i>	22	<i>Eucalyptus camaldulensis</i>	42	KESHYA WA MILIMO	25
<i>Agava sisalana</i>	2	<i>Eucalyptus tereticornis</i>	43	<i>Khaya nyasica</i>	35
<i>Albizia lebeck</i>	16	<i>Faidherbia albida</i>	18	KHONJE	2
<i>Albizia versicolor</i>	17	<i>Ficus capensis</i>	39	<b>Knob Thorn</b>	11
<i>Annona senegalensis</i>	4	<i>Ficus natalensis</i>	40	<b>Leucaena</b>	20
<i>Azadirachta indica</i>	34	<b>Fire Thorn</b>	48	<i>Leucaena diversifolia</i>	20
<i>Azanza garkeana</i>	33	<b>Fish Bean</b>	32	LUKINA	20
<i>Bauhinia thonningii</i>	24	<i>Flacourtia indica</i>	9	<b>Marula</b>	3
BINU	31	<b>Forest Red Gum</b>	43	MASAWO	46
<b>Bridelia</b>	6	GLIRICIDIA	30	MASUKU	8
<i>Bridelia macrantha</i>	6	<i>Gliricidia sepium</i>	30	<b>Mauritius Thorn</b>	23
<b>Buffalo Thorn</b>	47	<b>Gum</b>	42	MBAWA	35
BULUGAMA	42/43	<b>Horse-Raddish Tree</b>	41	MCHENDE	48
<i>Caesalpinia decapetala</i>	23	<b>Indian Plum</b>	9	<i>Melia azaderach</i>	36
<i>Cajanus cajan</i>	27	INDYA	36	<b>Mesquite</b>	21
<b>Cape Fig</b>	39	<i>Jatropha curcas</i>	7	<b>Mexican Lilac</b>	30
<b>Cassia</b>	25/26	JELEJELE	31	MFULA	3
CHAMWAMBA	41	<b>Jujube</b>	45/46	MINGANZOLO	14
CHIMPHONGALA	19	KACHERE	40	MKUNKHU	11



**Table 5: Index of Species**

*Latin names in italics*

CHICHEWA NAMES in CAPITALS

English names in bold and not capitalized.

<i>Species</i>	page	<i>Species</i>	page	<i>Species</i>	page
MKUYU	39	NIMU	34	<b>Snot Apple</b>	33
MLUNGUZI	23	NKUNKHU	10	<i>Syzygium cordatum</i>	44
<b>Monkey Bread</b>	24	NSENJERE	49	<i>Tephrosia vogelii</i>	32
<b>Monkey Thorn</b>	10	NTHUDJA, NTHUDZA	9	<i>Terminalia sericea</i>	5
<i>Moringa oleifera</i>	41	Paperbark acacia	14	THEDZI	50
MPAMPA	12	<i>Pennisetum purpureum</i>	49	<b>Toon Tree</b>	37
MPASA	6	<b>Persian Lilac</b>	36	<i>Toona ciliata</i>	37
MPOSA	4	<b>Pigeon Pea</b>	27	<i>Trichilia emetica</i>	38
MSAMBAMFUMU	22	<b>Pod Mahogany</b>	22	<i>Uapaca kirkiana</i>	8
MSANGU	18	<b>Poison Pod Albizia</b>	17	<b>Umbrella Thorn</b>	15
MSIKIDZI	38	<i>Prosopis juliflora</i>	21	<b>Vetiver grass</b>	50
MTANGATANGA	16/17	<b>Pulsa nut</b>	7	<i>Vetiveria zizanioides</i>	50
MTETEZGA	32	<i>Pyracantha coccinea</i>	48	<b>Water Berry</b>	44
MTHETHE	13	<b>Red Mahogany</b>	35	<b>White thorn</b>	13
MTHUTHU	32	<b>Red-Hot Poker Tree</b>	29	<b>Wild Custard Apple</b>	4
MTONDO	28	<b>River Bean</b>	31	<b>Wild Loquat</b>	8
MTOWO	33	<b>Scented thorn</b>	12	<b>Wild Mango</b>	28
MUWALE	29	<i>Sclerocarya birrea</i>	3	<b>Winter Thorn</b>	18
NANDOLO	27	SENDRELLA	37	<b>Woman's Tongue</b>	16
<b>Napier grass</b>	49	<i>Senna siamea</i>	25	<i>Ziziphus abyssinica</i>	45
NAPINI	5	<i>Senna spectabilis</i>	26	<i>Ziziphus mauritiana</i>	46
<b>Natal Mahogany</b>	38	<i>Sesbania sesban</i>	31	<i>Ziziphus mucronata</i>	47
NCHONGWE	15	<b>Sickle bush</b>	19		
<b>Neem</b>	34	<b>Silver Terminalia</b>	5		
NGAGAGA	12	<b>Sisal</b>	2		





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## GLOSSARY

**Agroforestry:** A practice of deliberately growing or retaining trees or shrubs within an agricultural or pastoral land-use system, either under the same form of spatial arrangement or in temporal sequence. There are both ecological and economic interactions between the various agroforestry components. A more simple definition is any deliberate planting or use of a tree by a farmer.

**Alternate:** (of leaves) alternating along the stem; not opposite.

**Annual:** A plant that grows for only one season (or year) before dying, in contrast to a perennial, which grows for more than one season.

**Arid:** A climate characterized by so little rainfall that cultivation is possible only if supported by water management.

**Aril:** An extension, sometimes fleshy, from the placenta at the base of the seed, partially or completely enveloping the seed.

**Berry:** A soft, juicy fruit with pulp surrounding the seeds.

**Capsule:** A dry fruit, releasing seed from pores or breaking open when ripe.

**Clump:** A close grouping of stems or trees, bushes or grasses.

**Compound (leaf):** A whole leaf made up of similar leaflets; not simple.

**Coppicing:** Cutting certain tree species close to ground level to produce new shoots from the stump. Also occurs naturally in some species if the trees are damaged.



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**Cotyledons:** These are the first leaves that emerge when the seed germinates; they are morphologically different from the subsequent developing leaves.

**Culm:** The stem of grasses, often hollow.

**Deciduous:** Leaves (of trees) that all shed periodically; not evergreen.

**Dehiscent:** Splitting.

**Dormancy:** The period when seed is not active. The seed dormancy period needs to be broken to activate the germination process--by soaking in water, for example.

**Dormant buds:** Buds that do not normally grow into branches, but which are able to do so if the stem or branch is cut.

**Drupe:** A fleshy seed enclosed in a stony covering, e.g., stone fruits such as peach. Also, one-celled fruit with one or two seeds, e.g. plum.

**Erosion:** The wearing away of the land surface by running water, wind, ice or movement due to gravity.

**Evergreen:** Leaves (of trees) that fall and grow continuously throughout the year; not deciduous.

**Exotic:** Introduced from outside (Malawi); not indigenous.

**Family:** A taxonomic category between order and genus. Plants or animals in the same family that share some common characteristics.

**Fruit (botanical):** The ripened ovary of a seed plant, with its contents.



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**Genus:** A classification of plants or animals with common distinguishing characteristics.

**Herb:** Any plant with soft, non-woody stems; a term also commonly applied to plants used for culinary or medicinal purposes.

**Herbaceous:** A plant that is not woody and does not persist above ground beyond one season.

**Hybrid:** The offspring of two plants of different species or varieties.

**Indigenous:** Native to a specific area; not introduced. Opposite of exotic.

**Leaflet:** A single division of a compound leaf. See compound leaf.

**Leguminous plants:** Plants of the family *Leguminosae* that produce seed in pods. The nutrient rich leaves of leguminous plants, when they fall and rot, help to improve soil fertility by increasing the levels of nitrogen available to plants. Many leguminous species develop root nodules that contain bacteria which fix nitrogen from the air for use by the plant.

**Mycorrhiza:** The association of a higher plant (such as a tree) and fungal mycelium (the vegetative body of a fungus) in which the fungus lives within or on the outside of roots forming a symbiotic or parasitic relationship. The fungus benefits the tree by supplying nutritional requirements in the early stages of development, and later through nitrogen fixation in root nodules.

**Multipurpose tree (MPT):** A woody perennial which is grown or used to provide more than one product or service.

**Naturalised (of plants):** So successfully introduced (into Malawi) that they reproduce naturally.



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**Nitrogen-fixing:** Relating to a plant that has the ability to convert nitrogen in the air into a form which can be used by plants. This process is performed by another organism that lives within the roots of the plant. In leguminous plants the organism is a bacterium. In other plants, such as *Casuarina* species, it is an actinomycete.

**Nut:** A dry seeded fruit with a hard outer covering.

**Obovate:** Inversely egg-shaped leaf with the narrow end at the bottom or stem end of the leaf and rounded at the top.

**Perennial:** A plant that grows for more than one year, in contrast to an annual, which grows for only one year (or season) before dying.

**Pod:** A dry fruit, usually splitting into two, typical of the leguminosae family.

**Provenance:** A stand of trees of the same species that provides a source of high-quality seed.

**Raceme:** A cluster of flowers with the blossoms arranged along the sides of the flower stalk, the oldest at the base.

**Rhizobia:** Nitrogen fixing bacteria living together with a fungus, mycorrhizae, usually on the roots of leguminous plant species.

**Scadent:** Tendency to climb by means of tendrils.

**Semi-arid:** Climate with a substantial dry season(s) and an average annual rainfall of 150 to 900 mm. In semi-arid areas, rainfall in some years is insufficient to maintain crop cultivation.

**Shrub:** A woody plant branching at or near the base with no defined trunk, usually smaller than a tree.



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**Shoot:** A stem; may also refer to new growth of a plant, usually including a stem.

**Species:** A taxonomic category below genus. Individuals within a species can interbreed, but breeding between species does not normally occur or results in sterile offspring (hybrids).

**Spine:** A sharp, rigid outgrowth, deeply attached, not pulling off readily with the bark; sometimes the tip of a branch, or a specialized form of leaf.

**Sp., spp.:** Abbreviation for species, and the plural of species.

**Ssp., subsp.:** Abbreviations for subspecies.

**Superficial roots:** Plant roots at or near the soil surface.

**Tannin:** A substance often extracted from tree bark, among other sources, and used to tan animal hides.

**Tap root:** A persistent, and often enlarged, main plant root that grows downward into the soil.

**Tree:** A woody plant with one main trunk and a more-or-less distinct and elevated head or crown.

**Thorn:** A sharp outgrowth which is relatively superficial, often a specialized leaf.

**Viability:** A measure of the potential of seed to germinate. A seed with short viability will germinate well only within a short time after ripening; one with long viability will germinate readily long after it has matured, perhaps after pretreatment.

**Wildling:** A wild seedling that grows from seed dispersed by natural means.

**Woody:** Plants, usually perennial, which consist in part of wood; not herbaceous.



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