

MESQUITE

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Six species of mesquite or *Prosopis* (family Fabaceae) have become established in Southern Africa. They were originally introduced as a source of shade and fodder for domestic livestock.

Some species have enormous aesthetical value. The pods of all species are highly nutritious and suitable for both animal and human consumption. Mesquite wood has also been used as fencing material and firewood at times; the flowers serve as a source of nectar for beekeepers.

Unfortunately some species and their hybrids have invaded vast tracts of valuable land, mostly in the arid interior of South Africa and Namibia. The habitats favoured are those where ground-water is assured, such as river banks and the beds of seasonal and episodic watercourses, pans and depressions (Fig. 1). The most troublesome invaders are honey mesquite (*Prosopis glandulosa* J. Torr. var. *torreyana*), velvet mesquite (*Prosopis velutina* Woot.) and their hybrids.

FIG. 1. An impenetrable thicket of mesquite. FIG. 2. (Bottom left) Mesquite has yellow, finger-like clusters of flowers. FIG. 3. (Top-right) The mature pods are woody and yellow in colour



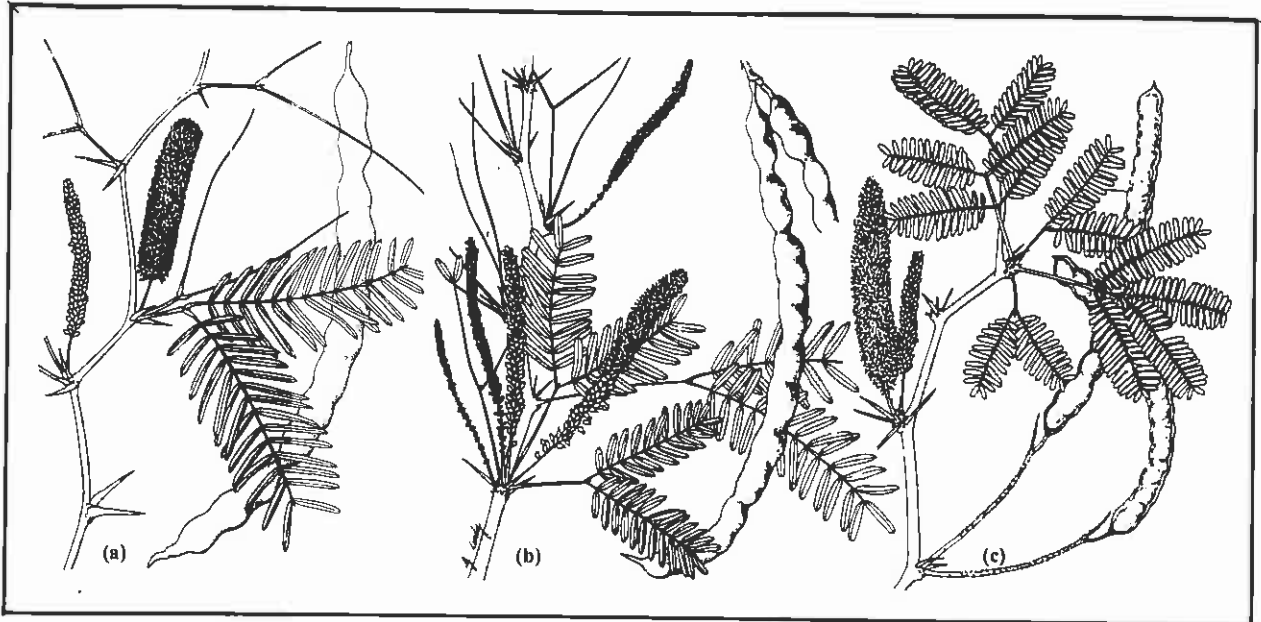


FIG. 4. Differences between the leaves, flowers and pods of three species of mesquite: (a) South West thorn (*Prosopis chilensis*), (b) honey mesquite (*Prosopis glandulosa* var. *torreyana*) and (c) velvet mesquite (*Prosopis velutina*)

MORPHOLOGY

The invasive mesquite species in Southern Africa are usually multistemmed shrubs or small trees averaging 2 to 4 m tall. Their leaves are compound having one or two pairs of pinnae each with seven to 22 opposite pairs of small leaflets. Each leaf axil is usually armed with paired or solitary straight spines. The small yellow flowers are borne in axillary finger-like clusters (Fig. 2). The pods range from sulphur or brownish-yellow to purplish. They are straight or slightly curved, 100 to 200 mm long, and about 8 mm wide (Fig. 3). The margins of the pods are slightly to markedly constricted between the seeds. The pods become woody with age, but do not split open to release their seeds.

Velvet mesquite is so named because all its parts, at least initially, are covered with short, velvety hairs. It is a densely thorny shrub branching close to the ground. Its leaves are compact with small oblong, closely spaced leaflets (Fig. 4). Its pods are sometimes markedly curved.

Honey mesquite usually grows taller than velvet mesquite in Southern Africa and on deep moist soils it can even develop into a shapely tree with a round-topped, spreading crown. Its leaves are not as compact as velvet mesquite and the leaflets are larger and more widely spaced (Fig. 4).

Velvet mesquite and honey mesquite readily hybridise with each other and with South-West thorn (*Prosopis chilensis* (Mol.) Stuntz). Pure South-West thorn spreads in disturbed sites around human habitation, but is minimally invasive. It is a large, spreading tree with gracefully arching branches and drooping leaves. It has long slender, widely spaced leaflets (Fig. 4).

Mesquite may be confused with the indigenous thorn trees or *Acacia* species. They can be readily distinguished when in flower since mesquite has only ten stamens per individual flower whereas the *Acacia* species have many.

Only one indigenous *Acacia* species, the ana tree (*Acacia albida*) has, like the introduced mesquite species, the combined features of straight thorns and flowers in fingerlike clusters. The ana tree, however, can be readily distinguished by its unusual pods which are up to 50 mm broad, bright orange or reddish brown in colour and characteristically curled and twisted. The young branches of the ana tree are white to ashen in colour as opposed to the reddish-brown of mesquite. The natural distribution of the ana tree only overlaps the present distribution of mesquite in the Namib Desert region of Namibia.

ORIGIN AND DISTRIBUTION

All the mesquite species in Southern Africa have been introduced from the Americas. Velvet mesquite and honey mesquite are indigenous in the South-Western United States and Northern Mexico. South-West thorn is indigenous in the South American countries of Peru, Bolivia, Chile and Argentina.

Honey mesquite was introduced into Southern Africa no later than 1880 and seed has been reimported several times since. South-West thorn was introduced into Namibia (then South-West Africa) in 1912. Velvet mesquite probably made its appearance in Southern Africa during the early 1900s.

Mesquite trees occur predominantly in the drier regions of Namibia and South Africa where they have been actively propagated for shade, fodder and other uses. Their distribution stretches from the Okaukuejo district in Northern Namibia (19° S) to the Southern Karoo (34° S) and from the Atlantic seaboard on the Namibian coast (13° E) to Kroonstad in the Orange Free State (27° E). In South Africa the distribution of mesquite is centred around Vanwyksvlei in the central North-Western Cape. Dense infestations (more than 1 000 trees/ha)

occur in the Kenhardt, Carnarvon, Calvinia, Prieska, Griekwastad, Hopetown and Britstown regions.

PROPAGATION

Mesquite can produce up to 60 million seeds/ha/year in Southern Africa. The seeds are hard-coated and their germination is enhanced by their passage through the digestive tracts of animals. Sheep can destroy up to 90 % of the seeds eaten, but if all seeds were fed to these animals that would still leave 6 million viable seeds/ha for re-establishment. Cattle do less damage to the seed and therefore feeding the pods to cattle would result in a greater number of viable seeds being passed. Seed is also eaten by a wide range of indigenous animals. Mesquite seed is dispersed in the faeces of domestic livestock and wild animals. It can also be dispersed by flowing water and in this manner spread far from its source.

Seed can lie dormant in the soil for up to 10 years, but readily germinate in dung. Destruction of the natural plant cover and exposure of the soil are conducive to the establishment and rapid spread of infestations.

Mesquite can propagate vegetatively from buds just below ground level. These buds can send up new shoots if the aerial portions of the plants die-off or are damaged. Inefficient control methods can therefore result in denser stands of mesquite.

DANGER

Mesquite is one of the most important groups of plants associated with the dramatic increase of woody plants on former grasslands in the southern USA. Released from the controlling influence of their natural enemies, these plants could become even more troublesome in Southern Africa.

The uncontrolled spread of mesquite is a threat to the natural resources and farming communities in the arid and semi-arid parts of Southern Africa. All low-lying areas such as pans, depressions and water-courses are prime sites for invasion (Fig. 1). Unfortunately these areas with their deep sediments and high water tables are the most fertile, and hence most valuable, in the arid interior.

Mesquite trees are extravagant users of readily available ground-water. This could have serious consequences for the hydrology of the ecosystems they invade, particularly where extensive stands are formed. They are also capable of enduring drought conditions when the soil water is limited and there is a danger that they will spread to drier higher-lying sites.

Extensive stands of mesquite threaten the indigenous plants and their associated animal life. Dense stands also displace natural pasturage without providing pods in return. Since the thickets are impenetrable and virtually sterile due to the poor crown development of the constituent plants, they are of little value as a source of pods or fuel. Their densely thorny growth not only restricts the movement of livestock, but can result in their injury and even death.

CONTROL BY UTILISATION

Despite the seriousness of mesquite invasion, conflicting opinions still remain as to whether this vast source of fodder and fuel should be utilised. Investigations have shown that effective control is not economically feasible without using the products of mesquite to defray costs. Utilisation of mesquite is therefore seen as an integral part of any control programme. It has even been speculated that a large-scale mesquite industry could be established, which might, if run with secure management practices, turn a problem plant into a productive arid-land crop.

LEGISLATION

In the regulations under the Conservation of Agricultural Resources Act, Act No. 43 of 1983, mesquite species are declared invader plants in the Cape Province and the Orange Free State. In terms of the Act, mesquite must be effectively controlled on farm units where it is or could become detrimental to the production potential of the natural agricultural resources.

Suitable methods for the control of mesquite are described in a separate leaflet in this Weed Series.