

Mesquite

Prosopis spp.



Mesquite *Prosopis* species are native to North and South America. They were introduced to Australia as fodder for stock, ornamentals in station homestead or town gardens, and used in mine dumps and other soil stabilisation programs. There are currently three known species of mesquite in addition to a hybrid present in Queensland. Mesquite is also called algaroba, Cloncurry prickly bush or Quilpie algaroba.

Mesquite has been recognised as a Weed of National Significance due to its invasiveness and potential impacts.

Declaration details

Mesquite species are declared Class 1 and 2 plants under the *Land Protection (Pest and Stock Route Management) Act 2002*. Declaration requires landholders to control declared pests on the land and waters under their control. A local government may serve a notice upon a landholder requiring control of declared pests.

Class 1

All *Prosopis* spp. and hybrids other than those listed as Class 2.

Class 2

Prosopis glandulosa, *Prosopis pallida*, *Prosopis velutina*.



Queensland Government

Description and general information

Size

Species vary in growth characteristics. Mesquite can occur as a multi-stemmed shrub with branches drooping to the ground, around 3–5 m high, or as a single-stemmed tree with a spreading canopy growing to 15 m.

Appearance

Older bark is rough and grey or brown. Small branches have smooth bark, dark red or green in colour, and in a zigzag shape. Mesquite has a rather untidy appearance, with individual zigzagged twigs sticking out beyond the main canopy.

Leaves

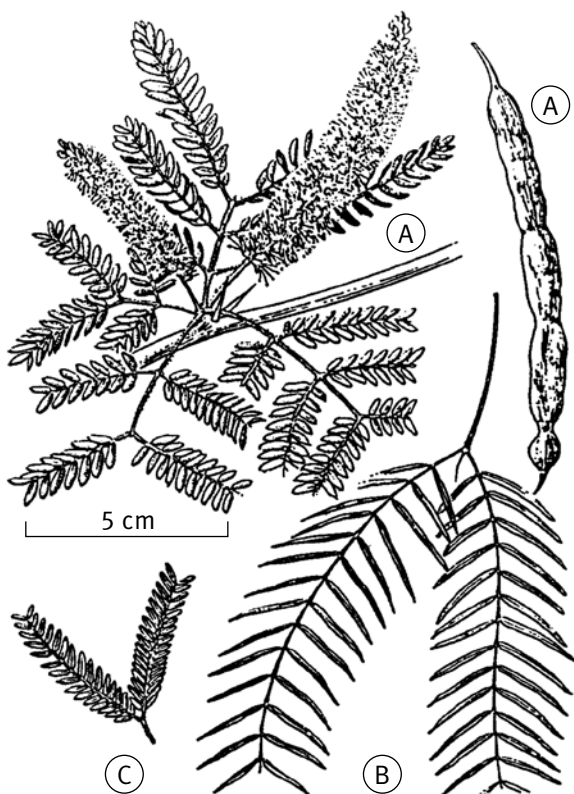
Leaves are fern-like in appearance. Each leaf has 1–4 pairs of leaf branches (pinnae), with each ‘branch’ having 6–18 pairs of individual leaflets. Leaflets vary from oval-shaped to long and narrow depending on the species. Foliage is usually dark green but can vary to bluish green. Paired thorns usually occur just above each leaf axil.

Flowers

Small greenish-cream ‘lamb’s tail’ shaped flowers grow near the ends of branches in wattle-like spikes, 5–12 cm long. Seed pods are 10–20 cm long, straight to slightly curved, smooth, with slight constrictions between the seeds. When ripe the pods are straw-coloured, or purplish in some species. Each pod contains between 5–20 hard seeds.

Mesquite

A. *Prosopis pallida*, B. *Prosopis hybrid*, C. *Prosopis velutina*



Potential damage

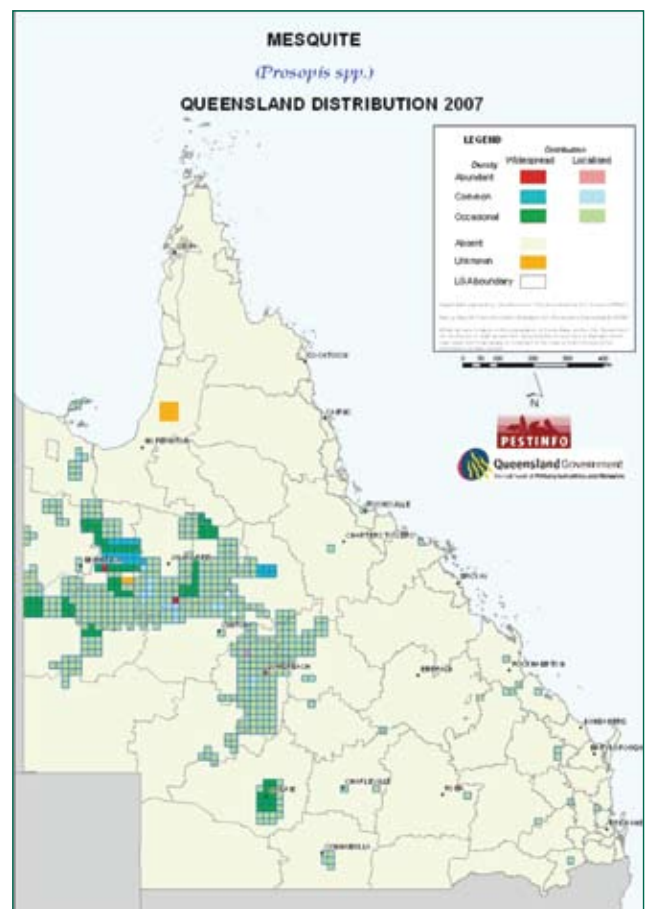
Mesquite was originally favoured as a shade tree around homesteads and as fodder for stock. However, sparse stands will often form into impenetrable thickets. Many infestations are along waterways, both natural and constructed. However, plants will do just as well away from water. Even in rangelands it is an aggressive competitor and can quickly invade upland country. Mesquite thickets can out-compete other vegetation, interfere with mustering and block access to watering places.

The sharp thorns can injure animals and puncture vehicle tyres. Seeds can lay dormant for years, and mesquite seedlings can therefore reappear in areas that have been previously cleared.

Habitat and distribution

Mesquite has spread along waterways and floodplains, along roadsides, and in horse-paddocks near homesteads across Queensland.

Map 1 Current distribution of mesquite in Queensland.



Class 1

All *Prosopis* spp. and hybrids other than those listed as Class 2.

Class 2

Prosopis glandulosa, *Prosopis pallida*, *Prosopis velutina*.

Control

Weed seed spread

The major method of spread of mesquite is by dispersal of seeds in the faeces of stock. Mesquite pods are relished by stock, particularly horses and cattle, some feral animals such as pigs, and native animals such as emus. Consequently, any mesquite control program should incorporate strategies that limit the spread of seeds. Suggested strategies include:

- incorporate strategic fencing to contain mesquite
- quarantine stock when moving them from infested paddocks with pods to clean areas
- reduce feral pig numbers where possible.

Do not let stock graze where mature pods are available.

Mechanical control

The use of machinery for mesquite control has not been extensive to date. However, trials and anecdotal evidence suggests that the following methods have been effective at different sites:

- stick raking
- pushing
- pulling
- blade ploughing
- fire.

When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.

When using machinery, treated areas will absorb and retain a larger percentage of rainfall than untreated areas. This may result in a higher seedling germination rate than is normally experienced, meaning that regular follow-up control is essential. However, using machinery may also provide the opportunity to re-sow pastures for rehabilitation purposes or provide fuel for a follow-up burn.

Care should also be taken to avoid native trees and shrubs, unless a permit has been granted.

Stick raking

Stick raking is most effective on medium to high density infestations of *Prosopis pallida*. A stick rake with cutter bars is attached onto a dozer. Best results are achieved when soil moisture is sufficient to allow machinery to work with minimum strain, but soil is dry enough so the root system desiccates (late autumn/winter for a normal wet season).

Pushing

Dozer pushing of *Prosopis pallida* has been effective around Cloncurry and Hughenden. Little suckering results although some seedling emergence may occur depending on the season.

Chain pulling

Chain pulling using dozers may kill up to 90% of trees in a mesquite infestation. However, the effectiveness of control may be reduced when either very dense infestations or a high proportion of young trees and seedlings are present.

Fire is often necessary as a follow-up measure to pulling and paddocks may need to be rested from grazing to allow a build-up of grass. It is better if burning can be delayed until seedlings have germinated as they will then be destroyed in the fire. Chain pulling is best undertaken from July to October.

Chain pulling is not recommended on *Prosopis velutina* due to its growth structure and potential for regrowth at the root system.

Blade ploughing

Either a front mounted or rear mounted blade plough can be used.

The front mounted Ellrott blade plough has proven extremely effective in controlling hybrid mesquite at McKinlay and *Prosopis velutina* at Quilpie. It is very manoeuvrable and can handle all sizes of mesquite. Being attached directly to the arms of the dozer allows the blade to be raised or lowered quickly depending on the size of the tree to be treated.

Trial work using a 4.2 m Homan rear mounted blade plough on *Prosopis velutina* has proven to be extremely effective, giving very high kill rates on the treated area. The implement must be set at a depth of 30 cm to ensure that roots are severed below the bud zone. This requires significantly more tractor horsepower than is required to pull a similar implement at the settings usually used in treating Brigalow regrowth.

Fire

Fire has been effective against *Prosopis pallida* in the Cloncurry and Hughenden areas. Burnt *Prosopis pallida* have died quickly, with the bark splitting away from the trunk a few weeks after the fire. Both mature trees and seedlings are susceptible.

However, it is often not possible to kill a complete infestation because rarely is there an even distribution of fuel across a whole site. Usually there are 'patchy' burns, with some areas obtaining a good kill and other areas remaining unburnt. A medium density infestation of mesquite is the optimum for fire control. This will allow enough fuel (grass) to carry the fire through the mesquite. After burning, a follow-up program may be necessary to treat plants missed by fire.

Trials on *Prosopis velutina* have been limited due to insufficient fuel build-up. Anecdotal evidence suggests that fire has a limited impact on plants over 15 cm although fire may improve accessibility for other control methods.

Chemical control

The range of chemical control options available is detailed below.

Foliar (overall) spraying

This is an effective method for the control of seedlings up to 1.5 m tall. Spray leaf and stems to the point of runoff. A wetting agent must be used.

Basal bark spray

Carefully spray around the base of the plant to a height of about 30 cm above ground level.

Thoroughly spray all crevices and each stem of multi-stemmed *Prosopis* spp. Larger trees may be controlled by spraying to a greater height, up to 100 cm above ground level. The best time to spray is during autumn when plants are actively growing and soil moisture is good.

Cut stump treatment

Cut stems off horizontally as close to the ground as possible and immediately (within 15 seconds) swab the cut surface with the herbicide mixture. This treatment can be used at any time of the year.



Biological control

Four species of insects have been introduced as biological control agents against mesquite.

Algarobius bottimeri and *Algarobius prosopis* have been introduced as biological control agents. The larvae of these beetles destroy mesquite seeds in mature pods both in the trees and on the ground.

These two beetle species have been released in major mesquite infestations at Cloncurry, McKinlay, Hughenden and Quilpie. Field establishment has occurred at McKinlay, Hughenden and Quilpie. However, their impact is likely to be limited. This is thought to be due to vertebrate herbivores consuming most of the pods before the beetles have the chance to damage the seeds.

Prosopidopsylla flava is a sap-sucking psyllid that causes dieback. It appears to prefer cooler climates, has only established in small populations in south-west Queensland, where its numbers are too low for it to have any impact on mesquite. It is probable that ant predation is preventing this agent from being effective.

Evippe spp. is a leaf-tying moth that causes defoliation. In contrast to the psyllid the leaf-tying moth has become established at all release sites, but is most abundant in northern Queensland where it is causing moderate defoliation. However, this is probably not yet sufficiently prolonged to have a major impact in the area.

Further information

Further information is available from your local government office, or from your local primary industries and fisheries biosecurity officer: contact details are available through 13 25 23.

Table 1 Herbicides registered for the control of mesquite.

Situation	Herbicide	Rate	Optimum stage and time	Comments
Basal bark	triclopyr + picloram Access®	1 L/60 L diesel	As above	For plants up to 5 cm diameter. Wet stem thoroughly from ground to 30 cm height.
Cut stump	triclopyr + picloram Access®	1 L/60 L diesel	As above	Stem should be cut close to ground level and treated immediately.
Overall spray	triclopyr + picloram Grazon DS®	350 ml/100 L water plus a wetting agent	Plant must be actively growing	For seedlings and plants up to 1.5 m tall. Do not spray plants bearing pods.

Fact sheets are available from Queensland Primary Industries and Fisheries service centres and the Queensland Primary Industries and Fisheries Business Information Centre (telephone 13 25 23). Check our website at www.dpi.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this pest fact should be used in accordance with the restrictions (federal and state legislation, and local government laws) directly or indirectly related to each control method. These restrictions may prevent the use of one or more of the methods referred to, depending on individual circumstances. While every care is taken to ensure the accuracy of this information, Queensland Primary Industries and Fisheries does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.