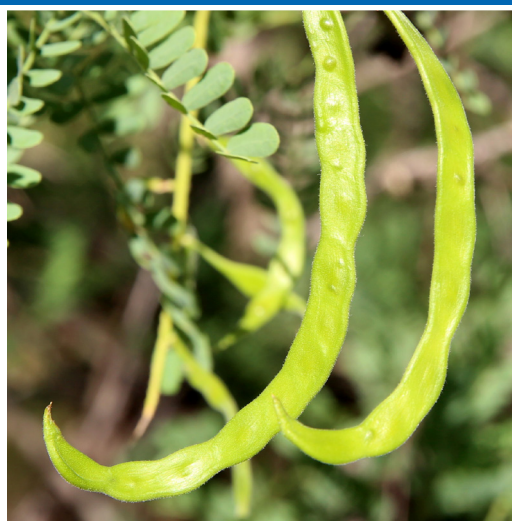
Restricted invasive plant
Prohibited invasive plant

Mesquite

Prosopis spp.

Prosopis velutina plant

Prosopis velutina flower



Prosopis velutina pods

Prosopis pallida plant

Prosopis pallida flower

Prosopis pallida pods

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 prickle bush or Quilpie algaroba.

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

Legal requirements

Honey mesquite (*Prosopis glandulosa*), mesquite or algarroba (*Prosopis pallida*) and Quilpie mesquite (*Prosopis velutina*) are category 3 restricted invasive plants under the *Biosecurity Act 2014*. They must not be given away, sold, or released into the environment. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

Queensland Government

At a local level, each local government must have a biosecurity plan that covers invasive plants in its area. This plan may include actions to be taken on certain species. Some of these actions may be required under local laws. Contact your local government for more information.

All other mesquite species are prohibited invasive plants under the *Biosecurity Act 2014*. The Act requires that all sightings of name be reported to Biosecurity Queensland within 24 hours. By law, everyone has a GBO to take all reasonable and practical steps to minimise the risk of these mesquite species spreading until they receive advice from an authorised officer.

Description

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.

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 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 are small greenish-cream 'lamb's tail' shaped that 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.

Life cycle

Mesquite plants generally produce their first flowers and seeds when they are between two and five years old, although pod production within one year has been observed under ideal conditions. Mesquite flowers predominantly in spring and early summer, with pods taking two to three months to mature. Mesquite plants can produce large quantities of seed, although the number of pods produced by trees can vary greatly from year to year, and from plant to plant. While there are no figures available for pod production in Australia, estimates for large trees growing overseas range from 16 kg of pods annually, to as much as 367 kg. In terms of seed production, this equates to about 140 000 seeds at the lower range, and millions of seeds for very large trees growing under favourable environmental conditions.

Several mesquite species are known to be self-incompatible, which means they require cross-fertilisation between plants before pods can be produced. This may help explain field observations at certain locations in Queensland where mature, isolated trees do not appear to have produced any seedlings.

Seeds can lay dormant for years, and mesquite seedlings can therefore reappear in areas that have been previously cleared.

Methods of 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.

Habitat and distribution

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 has spread along waterways and floodplains, along roadsides, and in horse-paddocks near homesteads across Queensland. Mesquite thickets can out-compete other vegetation, interfere with mustering and block access to watering places.

Control

Managing mesquite

The GBO requires a person to take reasonable and practical steps to minimise the risks posed by mesquite. This fact sheet provides information and some options for controlling mesquite.

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

Various mechnical methods have been used effectively for the control of mesquite. These include:

- stick raking
- pushing
- pulling
- blade ploughing
- grubbing
- 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 under the relevant legislation.

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.

Grubbing

Grubbing implements may be fitted to tractors, loaders or bobcats to sever the root base below the crown and/or physically remove plants from the soil. Effective grubbing requires machinery that is adequate for the size of plants being controlled.

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 there is rarely 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.

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. Although seasonal variation in *Evippe* spp. impacts have been observed, defolilation is likely reducing seed production.

Herbicide control

The range of herbicide 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.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit biosecurity.qld.gov.au.

Table 1. Herbicides for the control of mesquite

Situation	Herbicide	Rate	Comments
Agricultural non-crop areas, commercial and industrial areas, fence lines, forestry, pastures and rights-of-way	Triclopyr 240 g/L + Picloram 120 g/L (e.g. Access®)	1 L/60 L diesel	**Basal bark** For plants up to 5 cm diameter Wet stem thoroughly from ground to 30 cm height **Cut stump** Stem should be cut close to ground level and treated immediately
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (e.g. Grazon Extra®) or Triclopyr 300 g/L + Picloram 100 g/L (e.g. Conqueror)	350 mL/100 L water For *Prosopis velutina* 670 mL/100 L	High volume (overall spray) For seedlings and plants up to 1.5 m high Do not spray plants bearing pods Use a wetting agent

Read the label carefully before use. Always use the herbicide in accordance with the directions on the label.

This fact sheet is developed with funding support from the Land Protection Fund.