



Mesquite

Neltuma spp.



Neltuma velutina plant form



Neltuma velutina flowers



Neltuma velutina pods



Neltuma pallida plant form



Neltuma pallida flower



Neltuma pallida pods

Mesquite (*Neltuma* 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 waste storage 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.

Legal requirements

Honey mesquite (*Neltuma glandulosa* syn. *Prosopis glandulosa*), mesquite or algaroba (*Neltuma pallida* syn. *Prosopis pallida*) and Quilpie mesquite (*Neltuma velutina* syn. *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 measures to minimise the biosecurity risks associated with invasive plants under their control. This is called a general biosecurity obligation (GBO).

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 mesquite. Some of these actions may be required under local laws. Contact your local government for more information.

Description

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

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 an 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 measures to minimise the biosecurity 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 to clean areas
- reduce feral pig numbers where possible.

Do not let stock graze where mature pods are available.

Mechanical control

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

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

Stick raking

Stick raking is most effective on medium to high density infestations of *Neltuma 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 dry enough so the root system desiccates (late autumn/winter for a normal wet season).

Pushing

Dozer pushing of *Neltuma 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 *Neltuma 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 *Neltuma 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 *Neltuma 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 *Neltuma pallida* in the Cloncurry and Hughenden areas. Burnt *Neltuma 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 *Neltuma 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 and 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, defoliation 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 high. 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 *Neltuma* 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.

More information

More information is available from your local government or call 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 per 60 L diesel	Basal bark For plants up to 5 cm diameter. Wet stem thoroughly from ground up to 30 cm high. Cut stump For plants with diameter greater than 5 cm. Stem should be cut close to ground level and treated immediately. Treat all stems on multi-stemmed plants.
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 per 100 L water + wetter For <i>Neltuma velutina</i> 670 mL per 100 L + wetter	Foliar spray For seedlings and plants up to 1.5 m high. Do not spray plants bearing pods. Use a wetting agent.
Native conservation areas, pastoral grazing land, industrial sites such as railways, roadways, and utility rights-of-way	Aminocyclopyrachlor 240 g/L (Method 240)	200–500 mL per 100 L water	Foliar spray Apply with handgun or backpack sprayer. Use sufficient spray volume for thorough coverage.
		0.5 mL (undiluted) per cut	Trunk injection Drill holes or make axe cuts in a downward direction around the trunk at 5 cm spacings. Immediately apply herbicide into the hole within 15 seconds of cutting.

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



Neltuma glandulosa syn. Prosopis glandulosa plant form



Neltuma glandulosa syn. Prosopis glandulosa flower

Fact sheets are available from biosecurity.qld.gov.au. The control methods recommended 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, the department does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.

