

Prickly acacia

Vachellia nilotica subsp. *indica* (Benth) Kyal and Boatwr



Prickly acacia was introduced into Queensland for shade and fodder. Prickly acacia infestations favour bore drains and water courses where trees spread out onto adjacent grassland. Trees along bore drains use valuable water, make maintenance of bore drains more costly, and provide seed to further increase the spread of prickly acacia. As a tree increases in size it outcompetes pasture for water.

Thorny thickets interfere with mustering, movement of stock and access to water.

Prickly acacia is a threat to biodiversity through the transformation of natural grasslands into thorny scrub and woodlands. Prickly acacia also causes soil degradation by facilitating erosion.

Prickly acacia has been recognised in Australia as a Weed of National Significance.



Legal requirements

Prickly acacia is a restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment without a permit. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants and animals 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.

Description

Prickly acacia is a thorny shrub or small tree that typically grows 4–5 m high and up to 10 m. The umbrella shape and pods are characteristic features.

The young shrubs form dense thorny thickets, while mature trees are usually single stemmed, with spreading branches that have lost most of their thorns.

Bark on saplings are orange and/or green tinged. Older trees have dark, rough bark.

Leaves are finely divided and fern-like, with four to ten pairs of leaf branches and ten to twenty pairs of small, narrow, green leaves on each branch. Pairs of stout thorns, usually 1–5 cm long, grow at the base of the leaves.

Flowers are golden-yellow, ball-shaped, about 1 cm across, grow on stems from leaf joints with two to six flowers per group. Pods are 10–15 cm or longer, flat, with narrow constrictions between the seeds, grey when ripe.

Life cycle

Flowering generally occurs late February and continues through to June. Pods ripen and fall from late October through to January. Seeds germinate after significant rainfall in late spring and summer. Seedling growth can be rapid and trees flower and set seed with two to three years after germination under ideal conditions.

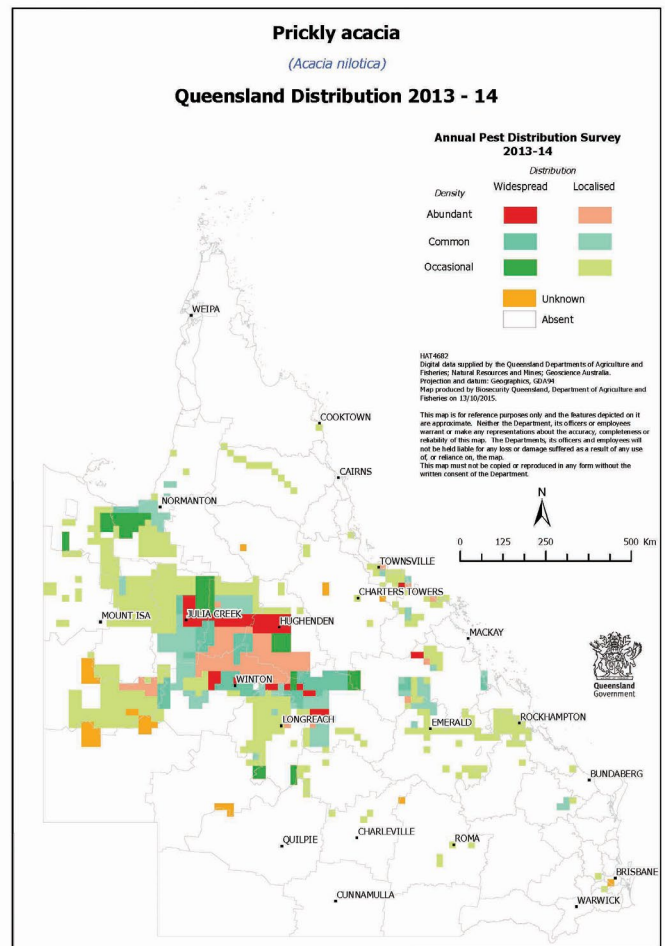
Methods of spread

Stock, particularly cattle, are the main agents for dispersing seed. The seed takes six days to travel through the gut so stock moved by road transportation can disperse seed over large distances. Water can also disperse pods during floods.

Habitat and distribution

There are widespread infestations of prickly acacia in areas of north-west and central-west Queensland. The variety of *Vachellia nilotica* has been cultivated in many parts of tropical Queensland for its shade and the fodder value of leaves and pods, and is now naturalised in many areas.

Map 1. Distribution of prickly acacia in Queensland



Several million hectares of the Mitchell grass plains are infested with prickly acacia. Major areas of infestation occur from Barcaldine north to Hughenden and west to Longreach, Winton and Julia Creek.

Prickly acacia is also found in the lower Gulf of Carpentaria region between Burketown and Normanton, at coastal locations including Bowen, Ayr and Rockhampton, in the Central Highlands and isolated occurrences elsewhere.

Prickly acacia has the potential to grow in most areas of Queensland, and about one-third of the state is well-adapted for prickly acacia growth.

Control

Managing prickly acacia

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

The following strategies are recommended for landholders to limit the spread of prickly acacia.

Map prickly acacia areas on your property before commencing control:

- a coordinated management strategy can then be devised.

1. **Try to eliminate all prickly acacia along bore drains, creeks and dams:**
 - these trees will produce seeds in most years
 - one medium-sized tree can produce 175 000 viable seeds per year
 - seeds can remain viable in the soil for at least seven years.
2. **Consider replacing open bore drains with piped water:**
 - trees along bore drains are the main seed producers
 - additional advantages of controlled waters are that supplements can be administered to animals via water.
3. **Clean up either least infested paddocks or seeding trees first:**
 - preventing the problem is easier than curing it
 - good management involves keeping some paddocks clean.
4. **Do not let cattle or sheep graze where mature pods are available (pods ripen from October onwards):**
 - insects can destroy much of the seed on the ground
 - cattle relish pods and spread the seed throughout paddocks and properties.
 - sheep and goats also spread prickly acacia by regurgitating seed.
5. **Incorporate strategic fencing to contain prickly acacia:**
 - seeds are primarily spread by stock.
6. **Run sheep instead of cattle in prickly acacia-infested paddocks, wherever possible:**
 - sheep graze seedlings more heavily than cattle.
7. **Quarantine cattle and sheep when moving them from infested paddocks to clean areas:**
 - prickly acacia seed can take up to six days or more to pass through an animal
 - seed also travels in mud packs on animals' feet.
8. **Do not let trees become thick:**
 - trees reduce grass production
 - as many as six plants per m² may be lying dormant in the soil underneath prickly acacia stand.
9. **Do not overgraze:**
 - conserve perennial grasses
 - a good stand of grass should reduce establishment of prickly acacia seedlings by competing for soil moisture and nutrients.
10. **Supplement animals with nitrogen at critical stages (e.g. lambing, weaning or in drought)**
 - dry Mitchell grass pastures usually have inadequate levels of protein for optimum production, especially in the case of pregnant and lactating animals. When prickly acacia is removed, consider providing supplements of non-protein nitrogen such as urea.

Mechanical control

Grubbing

Grubbing is ideal for large areas of scattered to medium density infestations. Wheeled tractors are usually used with a scoop or grubbing attachment. This method requires a tractor of around 80 hp. Trees greater than 15 cm in diameter can be difficult to grub out. Grubbing is best undertaken from May to September or before pod drop.

Pushing

Pushing with dozers or loaders is useful for large areas of medium density infestation. Timing of this method should be restricted to May-September to lessen the establishment of seedling regrowth or during drought conditions. Massive seedling emergence may occur in areas around permanent waters and drainage lines.

Stickraking

This technique utilises a stickrake with cutter bars attached to the bottom of the tines. Timing should be restricted to May-September or during drought conditions. Costs vary depending on the density of plants, terrain, operator skills and machinery used. This method gives immediate results and clean country.

Double chain pulling

This method is adopted by those with high density prickly acacia. It is effective against established stands but not plants below 40 mm in basal diameter.

Timing is important and the technique is best applied in the second year of drought, or before the first pod drop coming out of drought. Chaining along drainage lines and waterways is not recommended due to the high seed loads and the high probability of re-establishment.

Biological control

Six insects have been introduced into Australia as biological control agents against prickly acacia with two of these establishing and providing some benefit. The beetle *Bruchidius sahlbergi* established successfully and is now widespread. Seed predation is generally low but may reach up to 80% where mature pods are available. The leaf-feeding caterpillar *Chiasmia assimilis* has not established in western Queensland but is exerting pressure on prickly acacia in coastal locations. Recent surveys in India have identified potential new agents which will be subject to host-testing studies prior to release.

Native insect attack and dieback

Prickly acacia is attacked by native insects associated with Australian native acacias and other native plants. Generally, leaf-feeding, sap-sucking, root, pod and seed feeding insects attack actively growing prickly acacia. Bark and wood-feeding insects (including borers and twig-girdlers) prefer stressed and dying plants. Native insects can weaken prickly acacia and can contribute to the death of plants when other stresses are involved.

Since the 1970s, dieback of large areas of prickly acacia has occurred throughout western Queensland infestations. The causal factors remain unclear but may involve: water stress during dry seasons and drought, high salt concentrations in soils, root predation by cicada nymphs, and attack by insects and fungal diseases on stressed plants. The University of Queensland is currently undertaking dieback trials using fungal pathogens.

Herbicide control

Basal bark spray

For stems up to 10 cm diameter, carefully spray around the base of the plant to a height of about 30 cm above ground level. Thoroughly spray into all crevices. Large trees may be controlled by spraying to a height of up to 100 cm above ground level. The best time for treatment is autumn.

Cut stump treatment

At any time of the year, cut stems off horizontally as close to the ground as possible and immediately swab or spray the cut surface and stem with the herbicide mixture.

Soil-applied treatments

Soil-applied herbicides are taken up by the roots of plants after rainfall. The major benefit of this method is the speed and ease of application and suppression of new seedlings in treated area. Prickly acacia is a deep rooted plant with the canopy acting as a funnel for rainfall. It is best to apply these herbicides as close to the trunk as possible, preferably when rainfall is likely to occur within a few months. October to January is the best application period.

Foliar (overall) spraying

Foliar spraying of seedlings and young plants to 2 m high may be undertaken with Starane Advanced® mixed with water and a wetting agent. This method is a useful and relatively cheap follow-up control option.

Bore drains (Desert channels)

A bore drain is generally a man-made open earth channel that carries water from a bore to a particular point such as a stock trough or turkey's nest dam. Heaviest infestations of prickly acacia plants normally occur along bore drains tending to produce a large number of pods annually. When treating a bore drain the water needs to be temporarily diverted away from the channels or dam for 24 hours prior to herbicide application. Diuron is then sprayed along a 1-m strip of mud along the sides of the bore drains. The artesian water source is to be returned slowly to the drain 72 hours after initial diuron application. Water flowing past treated drains must also bypass house rainwater tanks and desirable trees for seven days after reopening the drain. To allow maximum uptake of the diuron by prickly acacia roots the drains should not be delved for a minimum of two weeks after treatment.

Further information

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



Table 1. Herbicides for the control of prickly acacia

Situation	Herbicide	Rate	Comments
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Fluroxypyr 200 g/L (e.g. FMC Starane 200) Fluroxypyr 333 g/L (e.g. Starane Advanced®) Fluroxypyr 400 g/L (e.g. Comet® 400)	Refer to product label for rate for specific formulation	Basal bark/cut stump Basal bark only when plant is actively growing and up to 10 cm basal diameter; or cut stump at any time of year and all plant sizes (swab or spray stump within 15 seconds of cutting)
	Triclopyr 600 g/L (e.g. Garlon 600®)	500 mL/60L diesel	
	Triclopyr 240 g/L+ picloram 120 g/L (e.g. Access®)	1 L/60L diesel	Any time of year Basal bark plants up to 10cm basal diameter; or cut stump and all plant sizes (swab or spray stump within 15 seconds of cutting)
Around agricultural buildings and in pasture situations	Hexazinone 250 g/L (e.g. Velpar L®, Bobcat SL®)	4 mL/spot, 1 spot for each metre of height	Soil applied (hand application) Apply October-March for best results For seedlings/bushes/trees up to 5 m tall Avoid damage to off target species – refer to product label for product restraints and critical comments
Grazing land	Tebuthiuron (e.g. Clearview 200GR® Tebulan 200GR®)	1.5 g/m ²	Avoid damage to off target species – refer to product label for product restraints and critical comments
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Fluroxypyr 200 g/L (e.g. FMC Starane 200) Fluroxypyr 333 g/L (e.g. Starane Advanced®) Fluroxypyr 400 g/L (e.g. Comet® 400)	Refer to product label for rate for specific formulation	Foliar (overall) spraying For seedlings and young plants up to 2 m high Add uptake spraying oil
Grazing land	Tebuthiuron 200 g/kg registered for aerial application (e.g. Clearview)	10–15 kg/ha	Aerial application Use the high rate on dense growth or heavy clay soils Refer to product label for product restraints and critical comments
	Diuron 500 g/L (e.g. Diuron 500SC®) Diuron 900 g/kg (e.g. Diuron 900WG)	64 L/ha 36.5 kg/ha Consult label for details	Bore drains (Desert Channels) DO NOT apply between 1 December and 30 March each year DO NOT apply more than once per calendar year DO NOT open drains for 72 hours following treatment DO NOT apply if heavy rains are predicted within three days of application Application should be limited to 1 m strips along the sides of bore drains Withholding period – do not allow animals to drink water from treated bore drains for three days, before slaughter for human consumption

Landholders and contractors should check if the property is situated in a hazardous area. This prevents the use of some herbicides, as defined in the *Agricultural Chemicals Distribution Control Act 1966*.

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.

Fact sheets are available from Department of Agriculture and Fisheries (DAF) service centres and our Customer Service Centre (telephone 13 25 23). Check our website at www.biosecurity.qld.gov.au to ensure you have the latest version of this fact sheet. The control methods referred to in this fact sheet 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, DAF does not invite reliance upon it, nor accept responsibility for any loss or damage caused by actions based on it.