

Parkinsonia

Jerusalem thorn or jelly bean tree

Parkinsonia aculeata



Parkinsonia is native to tropical America but has spread throughout the world as an ornamental and shade tree. It can form dense impenetrable thorny thickets along river courses, bore drains, floodplains and grasslands. This makes land inaccessible for people and animals, restricts stock access to drinking water, decreases the amount of pasture available and excludes native vegetation.

Because of its invasiveness, parkinsonia has been recognised in Australia as a Weed of National Significance.

Legal requirements

Parkinsonia is a category 3 restricted invasive plant under the *Biosecurity Act 2014*. It 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). 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.

Description

A hairless shrub or small tree that rarely grows any more than 10 m high. Parkinsonia has slender green photosynthetic zigzag branches armed with sharp spines.

Its leaves have a short, spine-tipped stalk, with leaf branches 20–40 cm long, flattened with small, oblong leaflets along each edge.

Flowers are yellow, fragrant, five petals, each on a long, slender drooping stalk. Seeds are oval and hard, about 15 mm long, and borne in pencil-like pods 5–10 cm long, constricted between the seeds.

Life cycle

Parkinsonia is fast growing and may flower in early summer of its second or third year of growth. Once established, flowering can occur opportunistically to exploit variable seasonal conditions. Pods mature in late summer, float on water and hence are readily dispersed by flood waters.

Under favourable warm and wet field conditions, most seeds germinate within two years. However, a small proportion of seed may remain dormant for longer periods if it's under heavy pasture cover, buried deeper in the soil profile, when inundated or when insufficient rain has fallen.

Methods of spread

The pods float easily on water so can be carried long distances in floods. Seeds can spread in mud, sticking to vehicles, machinery and on footwear.

Parkinsonia can be spread by livestock, native and feral animals consuming the seed, though this is more in drought times as the pods have low palatability.

Habitat and distribution

As parkinsonia is adapted to an extremely wide range of soil types, there is little doubt that it will continue to spread through watercourses and adjoining areas throughout the sub-humid and semi-arid environments of Queensland.

The most vulnerable areas are the lower Gulf of Carpentaria region, Lake Eyre catchment especially the Channel country, Central Queensland including coastal areas and highlands, and Cape York.

Control

Managing parkinsonia

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

Mechanical control

Initial clearing by stick raking, blade ploughing or ripping is effective, however:

- it is restricted to reasonably level areas away from watercourses
- clearing will hasten seed germination, necessitating follow-up control either mechanically or chemically
- before clearing, legislative obligations and restrictions must be considered.

Establishing improved pasture will aid in managing parkinsonia by competition.

Fire

Fire may be a useful tool for the management of parkinsonia infestations. Kill rates may vary from 30% to 90% with best results obtained from slow moving fires.

Fire will destroy seedlings if sufficient fuel load is present, but mature plants will usually survive.

Biological control

Four species of insects have been introduced into Australia as biological control agents against parkinsonia.

Parkinsonia seed beetles (*Penthobruchus germani* and *Mimosetetes ulkei*)

Both *Penthobruchus germani* and *Mimosetetes ulkei* are seed beetles that attack only parkinsonia and whose larvae destroy mature parkinsonia seeds.

Penthobruchus germani is a small (5–6 mm long) brown beetle from Argentina. It was first released in 1995 and has established much more readily than *Mimosetetes*. It has established readily at all release sites and spreads rapidly.

Penthobruchus can exert heavy pressure on parkinsonia seeds in some areas. In the field its presence is indicated by white eggs against a darker background of the pods. Round holes in the pods indicate that beetles have emerged.

Mimosetetes ulkei is a small (about 5 mm long) two-tone grey beetle from the USA. While it is established at several sites, it does not establish as readily as *Penthobruchus*. It has potential to contribute to the destruction of parkinsonia seeds. In the field, round emergence holes are the only external indication of its presence.

Parkinsonia leaf bug (*Rhinacloa callicrates*)

Rhinacloa callicrates is a small green bug (about 3 mm long) imported from the USA. It feeds on leaves and shoots of parkinsonia resulting in tiny round white spots where it destroys photosynthetic tissue. It is well established throughout Queensland.

Leaf-feeding looper (*Eueupithecia cisplatensis*)

Eueupithecia cisplatensis (UU) is a leaf-feeding looper caterpillar from Argentina who was imported by CSIRO. DAF releases commenced in 2013 and it is now widely established throughout Queensland. The caterpillar stage eats and damages the leaves, affecting flower and seeding production.

Dieback research

Naturally occurring fungal pathogens have been identified as causing dieback within many infestations of parkinsonia across Northern Australia. Studies by the University of Queensland and BioHerbicides Australia have resulted in the registration of an effective bioherbicide.

Herbicide control

Herbicides for the control of parkinsonia are listed in Table 1.

Aerial application

Aerial application is undertaken by purpose-built applicators by helicopter. This is useful for dense, strategic infestations although it may be expensive on a broad scale.

Foliar (overall) spray

This is an effective control method for seedlings up to 2 m tall. Spray leaf and stems to point of runoff. A wetting agent must be used.

Basal bark spray

For stems up to 15 cm diameter, carefully spray around the base of the plant to a height of 30 cm above ground level. Larger trees may be controlled by spraying to a greater height, up to 100 cm above ground level. Plants should be actively growing and preferably flowering. Field experience has shown that good soil moisture is essential for effective control.

Because parkinsonia infested areas are often subject to flooding, care is needed to ensure mud and flood debris does not prevent spray penetration to the bark. The trunk may need to be cleared before spraying. Addition of petrol or A-1 jet fuel will aid penetration.

Cut stump treatment

Cut stump treatment may be performed at any time of the year. Cut stems off horizontally as close to the ground as possible. Immediately (within 15 seconds) swab or spray the cut surface and associated stem with herbicide mixture.

Soil application

Use one dose of herbicide per metre of tree height. Place doses close to tree trunk, either with spot gun on clear bare ground, or underground with ground injector. Rain or sufficient soil moisture is required before herbicide is taken up by the plant. Do not use near watercourses or within a distance equal to at least twice the height of desirable trees.

Stem injected encapsulated bioherbicide

Treatment occurs through drilling 8 mm holes into the plant, inserting a bioherbicide capsule and re-sealing the hole (1 or 2 holes and capsules per plant). The bioherbicide causes infection, leading to severe stem damage and eventual plant death.

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 parkinsonia

Situation	Herbicide	Rate	Optimum stage and time	Comments
Agricultural non-crop areas on floodplains	Triclopyr 300 g/L + picloram 100 g/L (e.g. Conqueror) or Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (e.g. Grazon Extra)	3 L/ha	Seedlings 1–2 m high, or 12–24 months old	Aerial application (helicopter only) Use specified wetting agent (consult label)
Grazing land	Tebuthiuron 200 g/kg registered for aerial application (e.g. Clearview)	10–15 kg/ha	Any time, but needs moisture to activate herbicide	Aerial application Use the high rate on dense infestations or heavy clay soils (consult label)
Agricultural non-crop areas, commercial and industrial areas, forests, pastures and rights-of-way	Triclopyr 300 g/L + Picloram 100 g/L (e.g. Conqueror) or Triclopyr 300 g/L + Picloram 100 g/L + Aminopyralid 8 g/L (e.g. Grazon Extra)	350 mL/100 L water	Seedlings less than 2 m tall and actively growing	High volume foliar spray Wet plant thoroughly Use wetting agent (consult label)
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	See details above Stems up to 5 cm diameter	Basal bark spray Do not treat wet stems Parkinsonia can be treated using the alternative ThinLine method (consult label)
			See details above Plants up to and in excess of basal bark size	Cut stump Cut close to ground level and treat immediately
Around agricultural buildings and in pasture situations	Hexazinone 250 g/L (e.g. Velpar L, Bobcat SL Herbicide)	4 mL per spot 1 spot for each shrub/tree	Any time, but needs moisture to activate herbicide	Soil application (hand application via spotgun) Shrubs/trees up to 5 m high Avoid damage to off target species (consult label)
Grazing land	Tebuthiuron 200 g/kg (e.g. Clearview 200 GR, Scrubmaster)	1 to 1.5 g/m ²	Any time, but needs moisture to activate herbicide	Avoid damage to off target species (consult label)
Grazing lands and non-crop areas	Di-Bak Parkinsonia Bioherbicide Lasiodiplodia pseudotheobromae NT039, Macrophomina phaseolina NT094, Neoscytalidium novaehollandiae QLD003	One or two capsules per shrub	Any time	Consult label for directions for use and critical comments

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



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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 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.