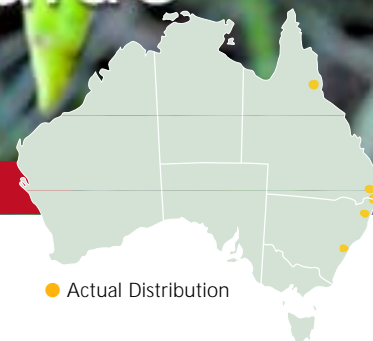


This document was originally published on the website of the CRC for Australian Weed Management, which was wound up in 2008.

To preserve the technical information it contains, the department is republishing this document. Due to limitations in the CRC's production process, however, its content may not be accessible for all users. Please contact the department's Weed Management Unit if you require more assistance.

Weed Management Guide

Leaf cactus – *Pereskia aculeata*



Leaf cactus (*Pereskia aculeata*)

The problem

Leaf cactus is on the *Alert List for Environmental Weeds*, a list of 28 non-native plants that threaten biodiversity and cause other environmental damage. Although only in the early stages of establishment, these weeds have the potential to seriously degrade Australia's ecosystems.

Introduced into Australia in the 1920s as a garden ornamental, and first recognised as naturalised in the suburb of Sherwood, Brisbane, leaf cactus is a potential threat to eucalypt communities in subtropical northern Australia.

Leaf cactus is native to the West Indies, Venezuela, Guyana, Brazil and Argentina. Elsewhere in the tropics, the plant has either been cultivated or has escaped. It is listed as a noxious weed in South Africa within forestry and conservation areas, due to its formation of dense infestations. In Australia the weed has been reported growing amongst riparian vegetation

along the banks of rivers in Queensland and New South Wales. The plant has a tendency to form large impenetrable clumps, and its extreme thorniness makes control of large infestations difficult. Because it is one of the 12 most significant weeds in South Africa, leaf cactus could become a threat in areas of Australia with similar climatic and environmental conditions.

The weed

Leaf cactus is a perennial, spiky, climbing shrub (liana) that attaches itself to trees in a vine-like manner, growing up to 12 m high. It has long, slender spines in groups along the trunk of the plant, and short recurved spikes in pairs on the branches. It bears unusually shaped small yellow to orange edible fruits 25 to 45 mm in diameter, which are popular with birds. The fruit contains a single black seed up to 5 mm in diameter.

The scented flowers can be white or pale yellow, sometimes ageing to pink, and are approximately 20–55 mm in diameter. There are numerous, long, yellow-tipped orange stamens in the middle of the flower. A prominent white style (the female part of the flower) sits in between the stamens. The flowers are generally grouped together to produce attractive bunches on the plant.

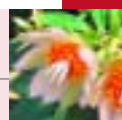
As its name suggests, leaf cactus belongs to a small group of cactus species that have leaves. The leaves are waxy, slightly succulent and edible. They are a flattened egg-shape with pointed ends, and approximately 45–110 mm long by 15–50 mm broad. Leaf cactus can be propagated by both seed and cuttings.

Key points

- Prevention and early intervention are the most cost-effective forms of weed control.
- Leaf cactus is a native of subtropical South America and the West Indies.
- The weed is a significant problem in forestry and conservation reserves in South Africa, which suggests it could establish here. For this reason it needs to be eradicated before it gets a chance to spread.
- Because it is capable of adapting to a variety of tropical and subtropical climatic conditions, leaf cactus has the potential to invade coastal subtropical areas of Australia.
- It reproduces from both cuttings or broken stem fragments and seed.



Leaf cactus can form dense infestations amongst riparian vegetation along watercourses. Photo: Geoff Nichols and Willem Hofland, Wildlife and Environment Society of South Africa



Growth calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering												
Germination												
Dormancy												
Regrowth												

■ General pattern of growth

Leaf cactus produces numerous scented white or pale yellow flowers in summer and autumn. It can lose its leaves in winter if it is cold enough, and appear dormant, but in subtropical areas this is a rare event. Germination generally occurs in the wetter winter and spring periods, providing there is not too much rain. The regrowth period is from spring to summer.



Leaf cactus spreads mainly by birds eating the fruit (often from garden plants) and dropping them under the trees in which they perch. Unripe leaf cactus fruit is shown here.

Photo: Geoff Nichols and Willem Hofland, Wildlife and Environment Society of South Africa



The leaves of leaf cactus are waxy, slightly succulent and edible.
Photo: J.S. Peterson, ©USDA-NRCS

How it spreads

The spread of leaf cactus throughout the world has been assisted by its ornamental value and its nutritional properties. Leaf cactus reproduces vegetatively from branch cuttings, leaves and seeds. Its

main cause of spread is by birds eating the fruit (often from garden plants) and dropping them under the trees in which they perch. Once it is established in the soil, the plant seeks out the trunk of the tree and gradually climbs up to form dense thickets in the branches and canopy.

Dumping of the plant in roadside vegetation is another likely cause of spread. Where leaf cactus is near creeks and other water bodies, pieces of the plant may be washed downstream a considerable distance to establish new populations. In cities, birds can also move propagules (seeds or other parts from which a plant can reproduce) a long way from gardens using corridors provided by parks, streets, drains and other watercourses.

Where it grows

Leaf cactus has become a weed from garden and cultivation escape in Central America, Florida, South Africa and Australia. It grows quite vigorously in tropical and subtropical environments, and is drought tolerant. Leaf cactus adapts to a wide variety of soil types, but seems to prefer well-drained, high-nutrient soils. It dislikes too much water. Its native subtropical climate is warm for most months of the year, but can experience cool winters. In Australia leaf cactus grows well in the subtropical eucalypt communities of southeastern Queensland. It prefers light shade environments, as would be experienced

under a canopy. The plant has escaped from gardens in Brisbane and now occurs in riverside vegetation in the suburb of Sherwood. It was recorded in 1989 as being locally frequent in NSW at Chatsworth on the north coast, growing on a river bank amongst native vegetation. Another occurrence in 1993, now removed by a bush regeneration team, was recorded at Bar Island on the central coast of NSW.

The many uses of leaf cactus as a nutritional and medicinal plant have encouraged the spread of the plant throughout South and Central America, where it is commercially planted as well as used in the garden. The fruits can be made into deserts, preserves and jams, and the leaves are high in nutritional value. Leaves can be cooked as a green vegetable or put in salads and soups. They are also used in Brazil to treat inflammations and tumours. Leaf cactus is commonly grafted with other *Pereskia* species to produce ornamental varieties for home gardens.



Leaf cactus has groups of long slender spines on the trunk and pairs of recurved spines on its branches. Photo courtesy of: Mohammad Mehdi Fayyaz, Wisconsin University, USA

Why we need to be 'alert' to leaf cactus

The widespread invasion of leaf cactus in subtropical environments overseas

demonstrates the potential weediness of the plant. In South Africa forestry and native trees are smothered and killed by the plant. In Australia the suburbs and parks of Brisbane have a high risk of

The Alert List for Environmental Weeds

The Federal Government's *Alert List for Environmental Weeds* was declared in 2001. It consists of 28 weed species that currently have limited distributions but potentially could cause significant damage. The following weed species are therefore targeted for eradication:

Scientific name	Common name	Scientific name	Common name
<i>Acacia catechu</i> var. <i>sundra</i>	cutch tree	<i>Koelreuteria elegans</i> ssp. <i>formosana</i>	Chinese rain tree
<i>Acacia karroo</i>	Karoo thorn	<i>Lachenalia reflexa</i>	yellow soldier
<i>Asystasia gangetica</i> ssp. <i>micrantha</i>	Chinese violet	<i>Lagarosiphon major</i>	lagarosiphon
<i>Barleria prionitis</i>	barleria	<i>Nassella charruana</i>	lobed needle grass
<i>Bassia scoparia</i>	kochia	<i>Nassella hyalina</i>	cane needle grass
<i>Calluna vulgaris</i>	heather	<i>Pelargonium alchemilloides</i>	garden geranium
<i>Chromolaena odorata</i>	Siam weed	<i>Pereskia aculeata</i>	leaf cactus
<i>Cynoglossum creticum</i>	blue hound's tongue	<i>Piptochaetium montevidense</i>	Uruguayan rice grass
<i>Cyperus teneristolon</i>	cyperus	<i>Praxelis clematidea</i>	praxelis
<i>Cytisus multiflorus</i>	white Spanish broom	<i>Retama raetam</i>	white weeping broom
<i>Dittrichia viscosa</i>	false yellowhead	<i>Senecio glastifolius</i>	holly leaved senecio
<i>Equisetum</i> spp.	horsetail species	<i>Thunbergia laurifolia</i>	laurel clock vine
<i>Gymnocoronis spilanthoides</i>	Senegal tea plant	<i>Tipuana tipu</i>	rosewood
<i>Hieracium aurantiacum</i>	orange hawkweed	<i>Trianoptiles solitaria</i>	subterranean Cape sedge

Weed control contacts

State / Territory	Department	Phone	Email	Website
ACT	Environment ACT	(02) 6207 9777	EnvironmentACT@act.gov.au	www.environment.act.gov.au
NSW	NSW Agriculture	1800 680 244	weeds@agric.nsw.gov.au	www.agric.nsw.gov.au
NT	Dept of Natural Resources, Environment and the Arts	(08) 8999 4567	weedinfo.nreta@nt.gov.au	www.nt.gov.au
Qld	Dept of Natural Resources and Mines	(07) 3896 3111	enquiries@nrm.qld.gov.au	www.nrm.qld.gov.au
SA	Dept of Water, Land and Biodiversity Conservation	(08) 8303 9500	apc@saugov.sa.gov.au	www.dwlbc.sa.gov.au
Tas	Dept of Primary Industries, Water and Environment	1300 368 550	Weeds.Enquiries@dpiwe.tas.gov.au	www.dpiwe.tas.gov.au
Vic	Dept of Primary Industries/Dept of Sustainability and Environment	136 186	customer.service@dpi.vic.gov.au	www.dpi.vic.gov.au www.dse.vic.gov.au
WA	Dept of Agriculture	(08) 9368 3333	enquiries@agric.wa.gov.au	www.agric.wa.gov.au

The above contacts can offer advice on weed control in your state or territory. If using herbicides always read the label and follow instructions carefully. Particular care should be taken when using herbicides near waterways because rainfall running off the land into waterways can carry herbicides with it. Permits from state or territory Environment Protection Authorities may be required if herbicides are to be sprayed on riverbanks.

invasion, and outside the metropolitan area subtropical eucalypt woodlands may be threatened. The nutritional and ornamental values of leaf cactus will continue to promote its spread throughout Australia unless preventive measures are put in place. Its tendency to form dense thickets, and its sharp spines, prevent easy removal. Consequently it is important to gain control of the weed in the early stages of infestation and pursue complete eradication as a goal.

What to do about it

Prevention is better than cure

As with all weed management, prevention is better and more cost-effective than control. The annual cost of weeds to agriculture in Australia, in terms of decreased productivity and management costs, is conservatively estimated at \$4 billion. Environmental impacts are also significant and lead to a loss of biodiversity. To limit escalation of these impacts, it is vital to prevent the further introduction and establishment of new weed species, such as leaf cactus. Small infestations may be eradicated if they are detected early, but an ongoing commitment to its removal is needed to ensure new infestations do not establish.



Naturalised populations of leaf cactus are likely to have 'escaped' from gardens where they have been planted as ornamentals.

Photo: Terry Hewitt, Holly Gate Cactus Garden Centre, UK

Quarantine to prevent further introductions

Although on the Alert List, leaf cactus is currently a permitted import. However, importation of leaf cactus to Australia is not encouraged due to its potential to be a serious environmental weed.

Do not buy seeds via the internet or from mail order catalogues unless you check

with quarantine first and can be sure that they are free of weeds like leaf cactus. Call 1800 803 006 or see the AQIS import conditions database <www.aqis.gov.au/icon>. Also, take care when travelling overseas that you do not choose souvenirs made from or containing seeds, or bring back seeds attached to hiking or camping equipment. Report any breaches of quarantine you see to AQIS.

Controlling leaf cactus in KwaZulu-Natal, South Africa

Leaf cactus was already well established in South Africa's forestry and conservation areas prior to 1979. Since this time, both the forest industries and parks and wildlife service have managed the weed with careful hand removal, on-site burning and registered herbicide application. It was observed, after years of treatment and control experiments, that a great deal of follow-up treatment is required for the total eradication of leaf cactus because the plant can regrow from the stump, stem and leaf pieces. On-site burning is used because of the high risk of dropping

pieces of the plant and spreading the infestation. Specially adapted oil drums were used in this instance so plant pieces could be burnt upon immediate removal. A forestry worker described the plant as 'extremely hard to manage, and not something that will die with the first treatment'.

Infestations of leaf cactus in some KwaZulu-Natal forests are embedded in the canopy and very difficult to remove. Trials using trunk absorption of a concentrated herbicide over a few days were somewhat successful in killing the

plant in the canopy, where it could not be reached or removed efficiently by hand. Cutting the cactus off at the base of the main trunk and then applying herbicide mixed with diesel to the stump has been successful. It is also possible to pull up or dig out the root mass.

Forest managers in KwaZulu-Natal control leaf cactus with a management plan and regular site inspections 4–6 months apart. This clearly shows that unless eradication is carried out while infestations are minor, managing leaf cactus will require ongoing commitment.



The scented flowers of leaf cactus can be white or pale yellow, sometimes ageing to pink, and have numerous, long, yellow-tipped orange stamens and a prominent white style in the middle of the flower. Photo: Terry Hewitt, Holly Gate Cactus Garden Centre, UK

Raising community awareness

Some 65% of weeds that have recently established in Australia, including leaf cactus, have escaped from plantings in home gardens and parks. The detrimental impacts of these weeds far outweigh any potential horticultural benefits. The public should be made more aware of these impacts, and of other issues such

as how to identify leaf cactus and what to do if they find it.

Leaf cactus can be distinguished by the long slender spines on the trunk of the plant, its succulent green leaves, clumps of white to pale yellow flowers and unusually shaped fruit. It is the only cactus species to have green leaves.

New infestations of leaf cactus

Because there are relatively few leaf cactus infestations, it can still be eradicated. Any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control leaf cactus without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread a weed and worsen the problem.

Legislation

There is currently no legislation to control leaf cactus but it is on the Federal Government's *Alert List for Environmental Weeds*, meaning that it is marked for eradication and should not be imported into Australia or further spread.

Acknowledgments

Information and guide revision: Rachel McFadyen (Weeds CRC), Jim Space (US Forest Service), Jean Moore (Alien Plant Watch), Willem Hofland (Wildlife and Environment Society of South Africa).

Map: Base data used in the compilation of distribution map provided by Australian herbaria via Australia's Virtual Herbarium.

If you find a plant that may be leaf cactus

Quick reference guide

Identification

If you suspect you have found leaf cactus, you will first need to confirm its identity. Contact your state or territory weed management agency for help in identifying the plant. You will need to take note of the characteristics of the plant in order to accurately describe it. Features to aid in the identification of leaf cactus include:

- long slender spines on the trunk of the plant

- waxy, succulent green leaves
- white to pale yellow flowers occurring in clumps
- unusually shaped fruit.

Reporting occurrences

Once identified, new occurrences of leaf cactus should be reported to the relevant state or territory agency, which will offer advice and assistance in its control. Because leaf cactus represents a potentially serious environmental and

economic threat to Australia, its control should be undertaken with the appropriate expertise and adequate resources.

Follow-up work will be required

Once the initial infestation is controlled, follow-up monitoring and control may be required for several years.

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice on how to best collect and preserve specimens.

State/Territory	Postal Address	Phone	Web
Australian National Herbarium	GPO Box 1600 Canberra, ACT, 2601	(02) 6246 5108	www.anbg.gov.au/cpbr/herbarium/index.html
National Herbarium of New South Wales	Mrs Macquaries Rd Sydney, NSW, 2000	(02) 9231 8111	www.rbg Syd.nsw.gov.au
National Herbarium of Victoria	Private Bag 2000 Birdwood Avenue South Yarra, Vic, 3141	(03) 9252 2300	www.rbg.vic.gov.au/biodiversity/herbarium.html
Northern Territory Herbarium	PO Box 496 Palmerston, NT, 0831	(08) 8999 4516	http://www.nt.gov.au/ipe/pwcnt/
Queensland Herbarium	c/- Brisbane Botanic Gardens Mt Coot-tha Rd Toowong, Qld, 4066	(07) 3896 9326	www.env.qld.gov.au/environment/science/herbarium
South Australian Plant Biodiversity Centre	PO Box 2732 Kent Town, SA, 5071	(08) 8222 9311	www.flora.sa.gov.au/index.html
Tasmanian Herbarium	Private Bag 4 Hobart, Tas, 7000	(03) 6226 2635	www.tmag.tas.gov.au/Herbarium/Herbarium2.htm
Western Australian Herbarium	Locked Bag 104 Bentley DC, WA, 6983	(08) 9334 0500	http://science.calm.wa.gov.au/herbarium/

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