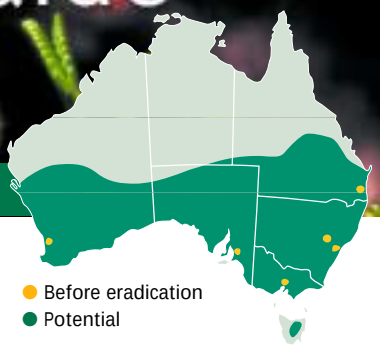
Weed Management Guide

Karroo thorn – *Acacia karroo*



Karroo thorn (*Acacia karroo*)

The problem

Karroo thorn 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.

Karroo thorn is one of southern Africa's most widespread trees but in many parts of this region it is considered a weed. A vigorous competitor, it can invade rangelands and open grasslands, particularly when land is overgrazed. Because it forms dense, thorny thickets, it can reduce agricultural productivity by suppressing the growth of grasses and adding to the costs of mustering, preventing stock movement and restricting watering.

The potential environmental impacts caused by the loss of native habitat to Karroo thorn would also be significant, especially because the conservation of native plants and animals in its potential range is already severely threatened by other factors (eg intense agriculture, urbanisation, feral animals).

The weed

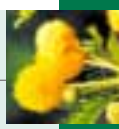
Karroo thorn is a shrub or tree which grows up to 12 m high. It has paired thorns, usually up to 100 mm long although occasionally as long as 250 mm, which protect the leaves from browsing animals such as rhinoceros and giraffe.



Karroo thorn has been planted in the African exhibits of Australian zoos and botanical gardens.
Photo: Peter Martin

In Australia the bark is dark red-brown to blackish and rough. The leaves are light-green and fern-like, up to 120 mm long and about 50 mm wide, and composed of 8–20 pairs of small oblong leaflets. Fluffy yellow ball-shaped flowers, 10–15 mm in diameter (like Australian wattle flowers), grow in clusters of between four and six and are sweetly scented. The seed pods, which grow up to 160 mm long and 10 mm wide, are sickle-shaped, woody and slightly constricted between the seeds. The tree is usually evergreen but loses its leaves in droughts or in very cold or dry localities.

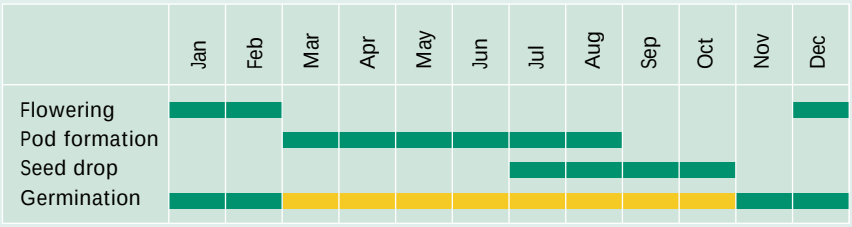
Key points



- Prevention and early intervention are the most cost-effective methods of weed control.
- Karroo thorn is drought tolerant and forms dense, impenetrable thickets.
- Its seeds are spread by animals, wind and water, as well as by people – it has been intentionally cultivated in several states.
- The widespread distribution of Karroo thorn in southern Africa indicates that it could become established over most of subtropical and southern Australia.
- Contact your state or territory weed management agency or local council if you find Karroo thorn. Do not attempt control on your own.

Natural Heritage Trust
Helping Communities Helping Australia
An Australian Government Initiative

Growth calendar



Karroo thorn seedlings grow faster during their first three months than most other African acacia species and can reach a height of 2 m in their first year under favourable conditions. Trees develop a deep root system and usually live for 20–30 years. Plants may flower several times during the summer. The flowers are followed by development of seed pods, which split open on the tree to release small, shiny, brown seeds. The seeds often stay attached to the pods and hang by a thread-like membrane. Germination, which can take place at temperatures from 10 to 40°C, occurs mainly throughout summer but is possible year round under suitable conditions. Optimum temperatures for growth are between 25 and 30°C.



The spines are longer, stronger and more numerous at the base of the tree.
Photo: Rod Randall

How it spreads

Karroo thorn reproduces by seed; large trees produce up to 19,000 seeds per year. The seeds can lie in the soil for 7 years and still germinate. Seeds are dispersed by wind and water or in the droppings of animals. In fact, germination is improved when the hard outer casing of the seed is disturbed, for example by fire, passing through the digestive system of animals or gradual weathering over time.

The exact origin of the plantings of Karroo thorn in Australia is unknown. It was first recorded in metropolitan Perth in the early 1960s and may have spread from a residential planting or the Botanic Gardens. Karroo thorn is well suited to much of Australia's rangelands. It has been widely planted throughout botanic gardens and zoos in South Australia, Victoria and New South Wales as it is particularly evocative of the African landscape and is said to be the favourite food of the black rhinoceros.



The yellow fluffy ball-shaped flowers are prominent during summer.
Photo: Jennifer Gardner

Where it grows

In southern Africa Karroo thorn is the most widespread acacia. It is very adaptable, growing under many different soil, climate and altitude conditions. Its limiting factors appear to be intense cold and lack of moisture. Eastern Cape Province (with 400–900 mm annual rainfall) is the area mainly affected by infestations of Karroo thorn, where it forms a major part of the vegetation and has invaded grasslands and large areas of rangelands. Plant densities of 1000–2000 trees/ha have been recorded. In Natal (with 750–900 mm annual rainfall) Karroo thorn forms part of the coastal dune forest. It is common in the watercourses of the Karroo region of central Cape Province. It is also present in southern Angola, Zambia, Zimbabwe and Mozambique.

In the early days of colonisation in southern Africa, Karroo thorn was used for fuel, fodder and shade, and for the construction of wheels, poles and rural implements. The thorny branches were also used for protection against wild animals.



Why we need to be 'alert' to Karroo thorn

The attributes of Karroo thorn suggest it has considerable potential to become a troublesome weed. It is a known invader of established vegetation over a wide climatic range. It has a persistent seedbank and is fire resistant, fast growing and protected from browsing by its thorns. It is weedy in South Africa, where it grows in similar habitat and climate to that found in native grasslands from central New South Wales to southern Queensland. Losses to agriculture in these areas would be significant.

In many places where Karroo thorn has been cultivated, people could easily have collected the seeds. Planting these seeds in gardens or incorrectly disposing of them could lead to new infestations.

As well as Karroo thorn, other exotic acacias are already naturalised in Australia, including prickly acacia (*Acacia nilotica*), a *Weed of National Significance* which infests over 6.6 million ha of arid and semi-arid Queensland, and cutch tree (*Acacia catechu*), another *Alert List* species which is currently being eradicated from small infestations in Darwin, Northern Territory. Similar to Karroo thorn, a major weed of Northern Territory wetlands, the *Weed of National Significance* mimosa (*Mimosa pigra*) was also originally planted in a botanic garden. Efforts to control the spread and impact of mimosa by chemical, mechanical and biological means have cost millions of dollars.

Another unwanted acacia – giraffe thorn

Giraffe thorn (*Acacia giraffae*) is another African acacia that is now a prohibited plant in Australia. Like Karroo thorn, it can grow either as a small, spiny shrub or as a large tree. It is much slower growing than Karroo thorn and has shorter spines (up to 60 mm long) and short, squat seed pods. Plants flower from winter to spring.



Karroo thorn is considered a weed throughout much of South Africa because it invades grasslands and rangelands.
Photo: Jennifer Gardner

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
Acacia catechu var. *sundra*	cutch tree	*Koelreuteria elegans*	Chinese rain tree
Acacia karroo	Karroo thorn	*Lachenalia reflexa*	yellow soldier
Asystasia gangetica ssp. *micrantha*	Chinese violet	*Lagarosiphon major*	lagarosiphon
Barleria prionitis	barleria	*Nassella charruana*	lobed needle grass
Bassia scoparia	kochia	*Nassella hyalina*	cane needle grass
Calluna vulgaris	heather	*Pelargonium alchemilloides*	garden geranium
Chromolaena odorata	Siam weed	*Pereskia aculeata*	leaf cactus
Cynoglossum creticum	blue hound's tongue	*Piptochaetium montevidense*	Uruguayan rice grass
Cyperus teneristolon	cyperus	*Praxelis clematidea*	praxelis
Cytisus multiflorus	white Spanish broom	*Retama raetam*	white weeping broom
Dittrichia viscosa	false yellowhead	*Senecio glastifolius*	holly leaved senecio
Equisetum spp.	horsetail species	*Thunbergia laurifolia*	laurel clock vine
Gymnocoronis spilanthoides	Senegal tea plant	*Tipuana tipu*	rosewood
Hieracium aurantiacum	orange hawkweed	*Trianoptiles solitaria*	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 Infrastructure, Planning and Environment	(08) 8999 5511	weedinfo.ipe@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.

What to do about it

Prevention is better than the 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 further introduction of new weed species, such as Karroo thorn, into uninfested natural ecosystems.

Early detection and eradication are also important to prevent the spread of Karroo thorn. Small infestations can be easily eradicated if they are detected early but an ongoing commitment is needed to ensure new infestations do not establish.

Quarantine to prevent further introductions

The importation of Karroo thorn and all other exotic Acacia species into Australia is not permitted because of the risk of further spread, and the potential introduction of new genetic diversity that could make future control more difficult.

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 Karroo thorn. Call 1800 803 006 or see the Australian Quarantine and Inspection Service (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.

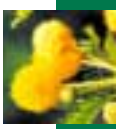
Raising community awareness

Although the plantings of Karroo thorn supply information about African flora, and provide food and habitat for African animals in Australian zoos, the potential detrimental impacts of this weed far outweigh these benefits. The public should be made more aware of these impacts, and other issues such as how to identify Karroo thorn and what to do if they find it.

If left unchecked, Karroo thorn would damage Australia's environment and economy



Curved sickle-shaped seed pods are a distinctive feature of Karroo thorn.
Photo: Sarah Keel



Karroo thorn is quite similar to a number of other yellow-flowering thorny weeds in Australia, collectively known as the prickle bushes, which comprise the *Weeds of National Significance* mesquite (*Prosopis* spp.), prickly acacia (*Acacia nilotica*) and parkinsonia (*Parkinsonia aculeata*), and another species, mimosa bush (*Acacia farnesiana*). The distinguishing features that identify Karroo thorn are the exceptional length of the spines and the curved, or sickle-shaped, seed pods. Also, only prickly acacia and mimosa bush have similar flowers to Karroo thorn. For more information on the prickle bushes, the Queensland Department of Natural Resources and Mines produces a Fact Sheet (PP40) titled 'Identification of Prickle Bushes', which clearly outlines the distinguishing characters of each prickle bush. Also see guides in the *Weeds of National Significance* companion series.

New infestations of Karroo thorn

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

Legislation

Karroo thorn, along with all other non-Australian acacias, is a declared plant and cannot be imported into Western Australia, or cultivated or sold. Any infestations must be reported and all known plants must be eradicated. In Victoria it is a 'state' prohibited weed, which means it is the responsibility of the government to eradicate any existing infestations. Karroo thorn is also listed as a noxious weed in New South Wales and Queensland, requiring notification and eradication, respectively.

Acknowledgments

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Map: Base data used in the compilation of actual and potential distribution maps provided by Australian herbaria via Australia's Virtual Herbarium and Queensland DNRM, respectively.



...case study

Pre-emptive removal of Karroo thorn from the Waite Arboretum, University of Adelaide

The University of Adelaide's Waite Arboretum was established in 1928 as a scientific, horticultural, educational and recreational resource. It is home to some 880 plant species, about half of which are Australian natives, with the remainder being from similar climates overseas. Two specimens of Karroo thorn were planted in the 1980s.

Although the Karroo thorn had not spread from the arboretum, and there were no seedlings present, awareness of the potential risks posed was increased by experiences elsewhere in Australia, particularly at the Western Plains Zoo near Dubbo, New South Wales, where the Karroo thorn had spread from original plantings and required a long and expensive eradication campaign.

The decision was made to pre-emptively remove the Karroo thorn trees from the arboretum before they became a nuisance. Although a difficult decision given the high value of the specimens to the collection, the manager of the arboretum Dr Jennifer Gardner explained that 'The last thing we want is our wonderful Waite Arboretum to be the source of a major environmental problem'.

As part of the promotion for National Tree Day, in mid 2002 the Karroo thorn trees were cut at the base by chainsaw. The stumps were then ground out to ensure that they did not coppice and send out new stems, which Karroo thorn are known to do.

Other parks, zoos and councils have also sought to remove their specimens. Karroo thorn plants have recently been removed from Kings Park in Perth, Western Australia, Stockton in New South Wales, and the Werribee Open Range Zoo and Melbourne Zoo in Victoria. Other sites are preparing similar removals.



Large thorns up to 250 mm protect the leaves from browsing animals.
Photo: Peter Martin



If you find a plant that may be Karroo thorn

Quick reference guide

Identification

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. Some important features of Karroo thorn are:

- long, white paired thorns, usually 100 mm long but occasionally up to 250 mm, which are longer, stronger and more abundant at the base of the tree
- fern-like green leaves composed of 8–20 pairs of small oblong leaflets
- fluffy yellow ball-shaped flowers, 10–15 mm in diameter
- dark flattish seed pods, 50–130 mm long and usually sickle-shaped.

Reporting occurrences

Once identified, new occurrences of Karroo thorn should be reported to the relevant state or territory weed management agency or local council, who will offer advice and assistance on its control. Because Karroo thorn represents a potential threat to Australia's environment and agriculture, 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 will be required to ensure that reinfestation does not occur.

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice on how to 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.rbgsyd.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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