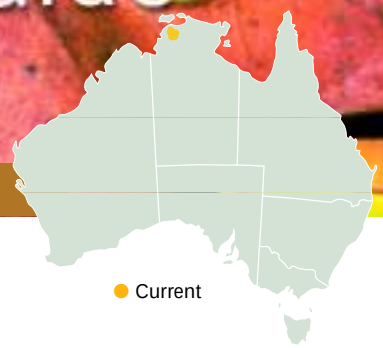
Weed Management Guide



Cutch tree (*Acacia catechu*)

The problem

Cutch tree 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.

Cutch tree causes economic damage by forming dense impenetrable stands. It can potentially reduce primary production by displacing and/or shading pastures. The sharp thorns on cutch tree branches can impede the movement and mustering of stock.

So far, cutch tree has only been found in Darwin in the Northern Territory. It spread from the Darwin Botanic Gardens to the nearby Darwin High School. Control of these two infestations was initiated in the 1980s, and is ongoing to ensure that cutch tree is completely eradicated.

Cutch tree leaves are fern-like and made up of 8–30 pairs of smaller, secondary leaves.
Photo: Colin G. Wilson

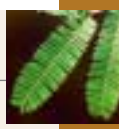
The weed

Cutch tree is a small tree, growing 3–15 m high. The stem is dark brown to black, with rough bark which peels off in long strips in mature trees; young trees have corky bark. The fern-like leaves are 100–200 mm long and contain between 8 and 30 pairs of small leaves made up of numerous, oblong pairs of secondary leaflets 2–6 mm long. Glands occur on the stem below the first pair of leaves, and between the uppermost six pairs of leaves. Pairs of stout thorns up to 10 mm long are found at the base of each leaf.

The flowers are white or pale yellow, about 3 mm long and bunched tightly together to form a cylindrical flower spike, 35–75 mm long, resembling a lamb's tail. The brown, beaked seed pods are 50–125 mm long on a short stalk and contain between four and seven seeds, which are dark brown, flat and 5–8 mm in diameter. The taproot branches to 2 m depth.

Key points

- Known infestations of cutch tree in Darwin, Northern Territory, are currently under control, with eradication as the target.
- Preventing its spread and further introduction will protect the savannas and grasslands of tropical Australia.
- Small infestations of cutch tree can be effectively eradicated if follow-up control is conducted.
- Contact your state or territory weed management agency or local council if you find cutch tree. Do not attempt control on your own.



Natural Heritage Trust
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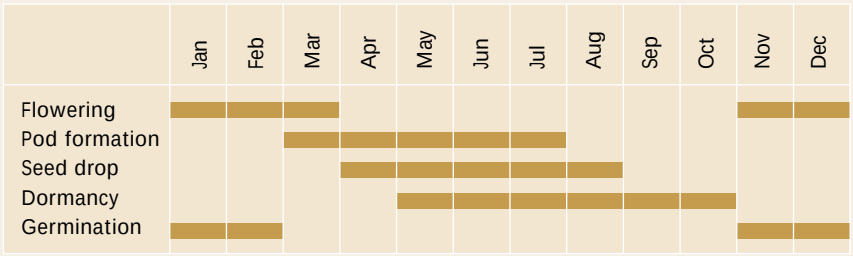
An Australian Government Initiative

Cutch tree – *Acacia catechu*

Growth calendar



Very little is known about the life cycle of cutch tree in Australia. It mainly flowers in the wet season, but mature trees can flower year round. Seeds ripen and drop at the end of the wet season and throughout the early dry season. Germination occurs after the first major storms of the wet season. Growth of the seedlings is slow initially but increases as roots develop. Growth is very slow or absent during the dry season.

In its native environment (India) it is a relatively slow growing tree, gaining a height of 10 m in about 55 years. In India cutch trees lose their leaves in January and February, with new leaves appearing in April–May and completely covering the tree by June–July.

Cutch tree grows well in open areas but will not set seed or reshoot under a dense canopy: Darwin High School, NT, in April.
Photo: Sharon Wilson

How it spreads

Cutch tree reproduces by seed. Mature trees produce large numbers of seeds, which can be transported from the parent tree by cattle. The seeds remain viable even after passing through the digestive tract, and can be spread large distances in this way. Seeds can also be spread by the actions of water and people, or in mud sticking to animals or machinery.

It is not known how cutch tree escaped the Darwin Botanic Gardens to reach Darwin High School at Bullocky Point, about half a kilometre away, although transport by people, animals or machinery appears likely.

Although the exact length of time of seed viability is not known, based on related woody weed species it is likely that some seeds remain viable for about 20 years in suitable conditions.

Cutch tree will also resprout from the base if the main stem is removed and the cut stump is not treated with herbicide. The regrowth is frequently very dense and composed of numerous stems.

Thorns occur in pairs on the stem.
Photo: Colin G. Wilson

Where it grows

Cutch tree prefers subtropical or tropical open woodlands and grasslands. It grows well on most soils, but well-drained, shallow to medium-depth sandy soils suit it best. In its native range cutch tree has the tendency to invade degraded areas, eg overgrazed grasslands. Regular burning is also conducive to its spread.

Cutch tree is found throughout the Indian subcontinent, including Assam and Myanmar (Burma), as far as the lower Himalayan ranges and Afghanistan. It also occurs in some parts of Indonesia, where it has apparently been planted as an ornamental.

Cutch tree has many important uses in its native range. Its hard wood is useful in manufacturing, building and making charcoal, while extracts from the wood (called catechu or kath) are used for tanning, dyeing and preserving, and for their medicinal properties in the treatment of a wide range of ailments.

Why we need to be 'alert' to cutch tree

Cutch tree has the potential to be a very serious woody weed of the tropical savannas and grasslands of Australia. At present the Darwin infestation of cutch tree is under control. However, there are several reasons why vigilance must be maintained.

The long life of cutch tree seeds means that any infestation must be continually revisited and treated until all seeds have either germinated or died.

There are numerous similar examples of weeds escaping from contained areas. One example is mimosa (*Mimosa pigra*), which escaped from the Darwin Botanic Gardens and for about 80 years was confined to the Darwin city area. It was not until 1952 that an infestation outside Darwin was discovered. Within 20 years it had started to spread to other catchments and it became evident that it was not practical to attempt to eradicate much of the infestation. Efforts to control the spread and impact of mimosa by chemical, mechanical and biological means have cost millions of dollars.

There is also the potential for reintroduction of cutch tree, either accidentally or deliberately, in imported material from its homeland. The long life of its seeds and the economic value of this tree in its home environment add to this threat.

Mature trees can produce large numbers of seed pods, each containing up to seven seeds: Darwin Botanic Gardens, NT, in August.
Photo: Colin G. Wilson

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 cutch tree, into uninfested natural ecosystems.

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.

Early detection and eradication are also important to prevent the spread of cutch tree. 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 cutch tree 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.

Seeds drop from the beaked seed pods during the dry season: Darwin Botanic Gardens, NT, in August.
Photo: Colin G. Wilson

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 cutch tree. 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

The public should be made more aware of the economic and environmental impacts of cutch tree, and other issues such as how to identify cutch tree and what to do if they find it.

Cutch tree has spread from the Darwin Botanic Gardens

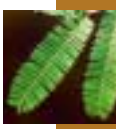
Cutch tree is quite similar in appearance to the *Weeds of National Significance* species mesquite (*Prosopis* spp.), prickly acacia (*Acacia nilotica*) and mimosa (*Mimosa pigra*) in that it has fern-like leaves and spines. However, mesquite is the only one of these weeds that has a lamb's tail type flower. Also, cutch tree seed pods have a distinctive beak at the end. If not seeding or in flower, the bark is quite different in cutch tree – corky in young trees and dark and flaky in mature trees. For more information on the *Weeds of National Significance*, see other guides in the companion series.

New infestations of cutch tree

Because there are relatively few cutch tree 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 cutch tree without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.

Methods to control cutch tree

The treatment of cutch tree described here is based on the experience of the Northern Territory Government agencies that dealt with the Darwin infestation. Any control of cutch tree should be undertaken cooperatively with your local state or territory weed management agency.



This regrowth had reached a total height of almost 5 m and was bearing seed pods approximately 2 years after the initial treatment: Darwin High School, NT, in April.
Photo: Sharon Wilson

Mature trees can be controlled with herbicides

Mature cutch trees can be killed with herbicide applied by basal bark spraying, stem injection or the cut-stump method. In basal bark spraying the herbicide is sprayed around the entire circumference of the stem from the soil level to a minimum of 300 mm height. The herbicide must soak into the bark and therefore be sprayed liberally until it runs off the bark.

In stem injection herbicides are applied immediately (ie within ten seconds) after either drilling or cutting holes around the circumference of the stem. In the cut-stump technique the tree is cut as close to the soil as possible and then similarly quickly painted with herbicide.

Cutch tree will reshoot readily from a cut stump, so simply removing the stem without herbicide application will not kill it. All of these techniques allow the herbicide to be transported to the root systems and ultimately cause death. Note that although herbicides are most effective when plants are actively growing (ie the wet season for cutch tree), the basal bark technique is least effective when the bark is wet.

Seedlings can be easily removed by hand or with herbicides if numerous

Seedling cutch trees can be removed by physical or chemical means. If there are large numbers of seedlings, herbicides applied by spraying the entire plant may be the most time- and cost-effective technique. Otherwise, isolated occurrences of small seedlings can be removed by hand if the soil is moist, or can be grubbed out using a mattock, ensuring that as much root material as possible is also removed.

Small infestations can be controlled with herbicides

Follow-up control procedures are crucial

Once the infestation is initially controlled, follow-up monitoring and treatment should be undertaken at least three times each year. In particular, attention should be paid to re-treating any regrowth from mature trees and removing seedlings that have germinated from the seedbank. Because seeds can remain viable for such a long time, it is important to continue follow-up control for up to 20 years after the last seed drop.

Other control notes – cutch tree is sensitive to shade

Cutch tree is particularly sensitive to shade, and will not set seed or reshoot from a cut-stump when it occurs in dense forest with limited daylight. Therefore, to further inhibit regrowth of cutch tree plants, sites of infestations should be planted out with shady trees preferably native to the area.

Biological control is not a priority

At present there are no known biological control agents for cutch tree, and these would only be investigated if cutch tree re-established itself as an actual, rather than a potential, weed.

Legislation

It is illegal to introduce cutch tree to any of the three regions where it could most readily naturalise (the Northern Territory, Queensland and Western Australia). If any infestations are found in these regions, by law they must be eradicated.

Acknowledgments

Information and guide revision: Ian Miller (NT DBIRD), Andrew Mitchell (AQIS/Weeds CRC), Blair Grace (NT DIPE/Weeds CRC), Sharon Wilson (NT Botanic Gardens) and John Thorp (National Weeds Management Facilitator).

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

The bark of mature cutch tree peels off from the stem in long strips.
Photo: Colin G. Wilson

If you find a plant that may be cutch tree

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 cutch tree are:

- The white-yellow cylindrical flower, consisting of numerous individual flowers, with the overall appearance of a lambs tail and up to four flower spikes extending out from each leaf joint on the stem
- the flat, tubular seed pod, 50–125 mm long, containing between four and seven seeds, and with a distinct beak on the end.
- flaky dark bark in older specimens and corky bark in immature plants.

Reporting occurrences

Once identified, new occurrences of cutch tree 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 cutch tree represents such a large environmental and economic threat to northern 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 will be required for approximately 20 years after the last seeding event, as seeds remaining in the soil are long lived.

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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