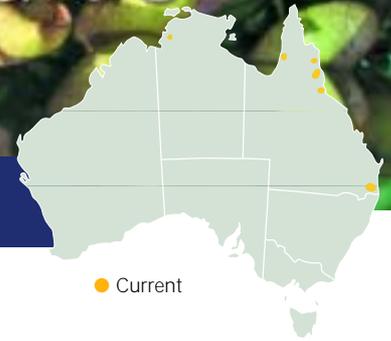


# Weed Management Guide

Laurel clock vine –  
*Thunbergia laurifolia*



## Laurel clock vine (*Thunbergia laurifolia*)

### The problem

*Thunbergia laurifolia* 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.

*Thunbergia* species were introduced to Australia as garden ornamentals but have escaped into native vegetation, and four species are now declared weeds in Queensland. *T. laurifolia* is very similar to the closely related blue trumpet vine *Thunbergia grandiflora*, which is a serious weed in northern Queensland. Both species were popular with gardeners for their large blue flowers and climbing habit.

*Thunbergia* species are a major threat to monsoon vine thickets and remnant tropical rainforests across northern Australia, including the World Heritage-listed Wet Tropics. They climb and smother native vegetation, shading out and killing the understorey and often pulling down mature trees with the weight of the vine.

### The weed

*T. laurifolia* is a vigorous, perennial climbing vine. It has oval-shaped leaves which narrow to a pointed tip. The leaves, mostly 70–180 mm long and 25–60 mm wide, grow in opposite pairs along the stem on stalks up to 60 mm long. The trumpet-shaped flower begins as a short



*T. laurifolia* climbs native vegetation, smothering, shading out and killing the understorey and can pull down mature trees with the weight of the vine.  
Photo: Forest & Kim Starr, USGS

broad tube, white on the outside with a yellowish throat, and opens out into five rounded, pale lavender-blue petals, one larger than the others. The flowers are up to 80 mm long and 60–80 mm across, and are borne in clusters on long, drooping branches.

The seed capsule is brown and inconspicuous. It is oval-shaped with pinched ends (ie elliptical), 10 mm long and 4 mm wide. The capsules usually contain two to four hemispherical seeds which have a hollow inner surface like a cap. The seeds are less than 10 mm in diameter and covered with brown scales.

The plant develops a very tuberous root system, which can resprout from many dormant buds when cut.

### Key points

- *Thunbergia* species are a major threat to remnant vegetation in the Wet Tropics.
- *T. laurifolia* is a vigorous, perennial, climbing vine. It is not as widespread as the closely related blue trumpet vine *T. grandiflora*, and infestations can be eradicated before they become uncontrollable.
- Prevention is the most cost-effective form of weed control. Keep uninfested areas free of *Thunbergia* species.
- In Queensland *T. laurifolia* is a declared weed and landholders are required to control it. However, contact your local council or state or territory weed management agency before attempting control.

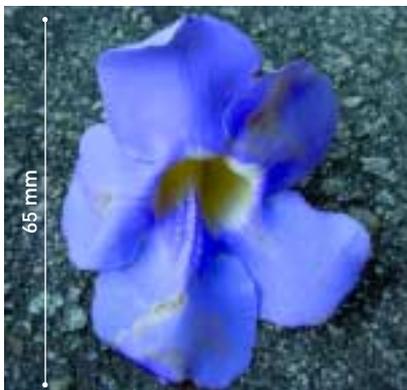


## Growth calendar

*T. laurifolia* grows rapidly in tropical and subtropical areas but elsewhere young plants die back when temperatures drop below freezing point. It mainly flowers from September to December but may continue flowering until March in ideal conditions. Little is known about seed formation, seed drop and germination in this species. Until recently, it was thought that *Thunbergia* species in Australia did not produce viable seed, but successful germination of seeds has now been recorded from several species, including *T. laurifolia*.



The flowers of *T. laurifolia* are borne in clusters on long, drooping branches.  
Photo: Forest & Kim Starr, USGS



The trumpet-shaped flower of *T. laurifolia* begins as a short broad tube, white on the outside with a yellowish throat, and opens out into five rounded pale lavender-blue petals, one larger than the others.  
Photo: Forest & Kim Starr, USGS

## How it spreads

*T. laurifolia* mainly reproduces vegetatively, when cuttings or fragments of stems and roots take root and send out new shoots. It is often spread through the careless disposal of garden waste, or through contaminated earth being removed for fill or other soil use. Infestations along riverbanks have been caused by root pieces breaking off and being transported further downstream by floodwaters.

*T. laurifolia* was first recorded as naturalised north of Cairns, Queensland, in 1987, having been introduced and widely grown as an ornamental plant since at least the 1960s.

## Where it grows

*T. laurifolia* is native to India and Malaysia. It grows in moist areas at low elevations and is most successful in frost-free locations. Until recently *Thunbergia* species, including *T. laurifolia*, were promoted and sold as garden plants. They are widespread in Queensland gardens, and are also common in eastern Australia as far south as Melbourne and occasionally extending to Adelaide, as well as across northern Western Australia and the Northern Territory (Darwin), and on Christmas Island.

Naturalised infestations of *T. laurifolia* are scattered throughout Far North Queensland. There are known infestations at Freshwater Valley near Cairns, in surrounding areas of Cairns and Innisfail, and near Inkerman on the west coast of Cape York. It also occurs on the Daly River, southwest of Darwin in the Northern Territory.

*T. laurifolia* is a weed in Hawaii, where it spreads vegetatively from garden plantings into nearby disturbed lowland scrub, and is also present on several Pacific islands.

## Why we need to be 'alert' to *T. laurifolia*

*T. laurifolia* is invading rainforest in the Wet Tropics and has the same capacity to smother coastal lowland rainforest in tropical northern Queensland as *T. grandiflora*. Individual patches completely cover several hectares, eventually leading to the destruction of most other vegetation. In agricultural areas it infests roadsides, pastures and headlands of canefields, forming impenetrable colonies.

## 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 *T. laurifolia*, into uninfested natural ecosystems.

In the past various *Thunbergia* species, including *T. laurifolia* and other declared weeds such as *T. grandiflora*, have been offered for sale in nurseries around Australia. Notify the vendor or state or territory weed control contacts if you find any of these species for sale.

Early detection and eradication are also important to prevent infestations of

*T. laurifolia*. 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 some species of *Thunbergia*, particularly *T. annua* and *T. fragrans*, 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 *T. laurifolia*. Call 1800 803 006 or see the Australian Quarantine and Inspection Service (AQIS) import conditions database <[www.aqis.gov.au/icon](http://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.



*T. laurifolia* is a vigorous, perennial, climbing vine that flowers from September through to December, or March in ideal growing conditions. Photo: Forest & Kim Starr, USGS

## 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.

## Raising community awareness

Some 65% of weeds, including *T. laurifolia* and *T. grandiflora*, which have recently established in Australia have escaped from plantings in 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 other issues such as how to identify *T. laurifolia* and *T. grandiflora* and what to do if they find either species. See the



*T. laurifolia* has oval-shaped leaves which narrow to a pointed tip. They grow in opposite pairs along the stem on stalks up to 60 mm long. Photo: Forest & Kim Starr, USGS

box below for more information on identifying these species of *Thunbergia*.

## New infestations of *T. laurifolia*

Because there are relatively few *T. laurifolia* 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 *T. laurifolia* without 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 *T. laurifolia*

Control of *Thunbergia* species is very difficult because they can regenerate from extensive underground tubers if they are not all killed or removed. Consequently, any control of *T. laurifolia* should be undertaken cooperatively with your state or territory weed management agency or local council.

## Differences between weedy *Thunbergia* species

*T. laurifolia* and *T. grandiflora* are both weeds in Far North Queensland. Although the two species are similar looking, there are differences that can be used to distinguish them.

Although the leaves are the same size, the shape of the leaves is different. *T. laurifolia* has oval-shaped leaves with entire margins (ie edges that are not lobed), whereas *T. grandiflora* has 'choko-like' leaves which are broadest at the base and narrow to a pointed tip, usually with deeply scalloped lobes near the base.

Although the seed capsules of both species are quite inconspicuous and may not be present on all plants, the size and shape of the capsules are quite different when present. *T. laurifolia* has an elliptical seed capsule, whereas that of *T. grandiflora* is round with a comparatively long beak of about 30–35 mm, about two-thirds the length of the entire seed capsule.

Although both species have escaped from gardens in the tropics, *T. laurifolia* tends to be found at higher altitudes and *T. grandiflora* is more common in coastal environments.



## Thunbergia control near Cairns in Far North Queensland

While controlling an infestation of *T. grandiflora*, weed control officers from Cairns City Council started to find a very similar plant that was growing up to 12 m high and smothering native vegetation. They identified it as *T. laurifolia* by the shape of its leaves.

Herbicide trials by the Queensland Department of Natural Resources and Mines investigating 26 different herbicides for control of the two *Thunbergia* species showed that only one was effective. Most of the vast infestations treated were of *T. grandiflora*, while some pockets near Cairns and on Dunk Island were of *T. laurifolia*.

Many more plants are still growing in backyards around Cairns although major escapes have been controlled.

On large vines herbicide is applied after the vines have been cut back to ground level. Once the foliage has died off, it is possible to trace the vines back to the tubers, which are usually in the top layer of soil, and these can be injected with herbicide. If the landholder cuts back the vegetation, the council's weeds officer will usually inject the herbicide.

In long-lived infestations plants are likely to have developed an extensive tuber system, which may remain dormant for some years and then resprout. In cases where *T. grandiflora* has been controlled, weeds officers are still returning to do follow-up work up to ten years later.

In the Johnson shire of Far North Queensland weeds officers have treated infestations of *T. laurifolia* up to 2 ha in

size. In these dense infestations injecting the tubers is not practical as they are so numerous and large, often the size of a 4WD vehicle. Weeds officers have found the most effective method is to get under the vine curtain and spray the underside of leaves. They have also tried scoring stems and painting on the herbicide, especially in gardens where vines are growing over ornamentals. However, this is difficult where there are a large number of stems because each time one falls to the ground it takes root again. In the infestation in Johnson shire *T. laurifolia* has been observed growing from seed, which is quite unusual.

Chemical treatment is often the only option available. One herbicide is registered for control of *T. laurifolia* and *T. grandiflora* in Queensland (see case study above).

Only small plants can be successfully controlled using physical removal because large mature plants normally have very large tuber systems that are virtually impossible to remove completely. Cutting the vines at ground level will provide some temporary relief for a smothered tree but plants will regenerate from tubers, so follow-up control will be required.

Replace specimens of *T. laurifolia* and *T. grandiflora* in gardens, using local native species where possible. There is a native species of *Thunbergia*, *T. arnhemica*, which occurs in northern Queensland, the Northern Territory and Western Australia.

Take care when disposing of *Thunbergia* species because garden waste is a frequent source of new weed infestations. Contact your local council for specific advice before attempting to dispose of this plant.

### Legislation

In Queensland both *T. laurifolia* and *T. grandiflora* are declared weeds, meaning that any infestations are subject to eradication, and landholders must take reasonable steps to keep land free of these weed species. Additionally, two species of *Thunbergia*, *T. annua* and *T. fragrans*, not yet found in Queensland, are also declared as weeds. These four species have similar status in Western Australia.

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



In dense infestations injecting the tubers is not practical as they are numerous and large, often the size of a 4WD vehicle.

Photo: Ken Murray, Cairns City Council



# If you find a plant that may be laurel clock vine

## 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 *T. laurifolia* are:

- white trumpet-shaped flowers with five blue-mauve petals produced from September to December
- oval-shaped leaves which narrow to a pointed tip. The leaves, mostly 70–180 mm long and 25–60 mm

wide, grow in opposite pairs along the stem on stalks up to 60 mm long. The shape of the leaves is the main feature which distinguishes *T. laurifolia* from *T. grandiflora*.

- its habit of growing over features such as trellises, buildings and fences. In bushland it climbs over and eventually smothers quite large trees.

### Reporting occurrences

Once identified, new occurrences of *T. laurifolia* should be reported to the relevant state or territory weed manage-

ment agency or local council, who will offer advice and assistance on its control. Because *T. laurifolia* is so difficult to control and poses such a serious threat, 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 from the extensive tuber system 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	<a href="http://www.anbg.gov.au/cpbr/herbarium/index.html">www.anbg.gov.au/cpbr/herbarium/index.html</a>
National Herbarium of New South Wales	Mrs Macquaries Rd Sydney, NSW, 2000	(02) 9231 8111	<a href="http://www.rbg Syd.nsw.gov.au">www.rbg Syd.nsw.gov.au</a>
National Herbarium of Victoria	Private Bag 2000 Birdwood Avenue South Yarra, Vic, 3141	(03) 9252 2300	<a href="http://www.rbg.vic.gov.au/biodiversity/herbarium.html">www.rbg.vic.gov.au/biodiversity/herbarium.html</a>
Northern Territory Herbarium	PO Box 496 Palmerston, NT, 0831	(08) 8999 4516	<a href="http://www.nt.gov.au/ipe/pwcnt/">http://www.nt.gov.au/ipe/pwcnt/</a>
Queensland Herbarium	c/- Brisbane Botanic Gardens Mt Coot-tha Rd Toowong, Qld, 4066	(07) 3896 9326	<a href="http://www.env.qld.gov.au/environment/science/herbarium">www.env.qld.gov.au/environment/science/herbarium</a>
South Australian Plant Biodiversity Centre	PO Box 2732 Kent Town, SA, 5071	(08) 8222 9311	<a href="http://www.flora.sa.gov.au/index.html">www.flora.sa.gov.au/index.html</a>
Tasmanian Herbarium	Private Bag 4 Hobart, Tas, 7000	(03) 6226 2635	<a href="http://www.tmag.tas.gov.au/Herbarium/Herbarium2.htm">www.tmag.tas.gov.au/Herbarium/Herbarium2.htm</a>
Western Australian Herbarium	Locked Bag 104 Bentley DC, WA, 6983	(08) 9334 0500	<a href="http://science.calm.wa.gov.au/herbarium/">http://science.calm.wa.gov.au/herbarium/</a>

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