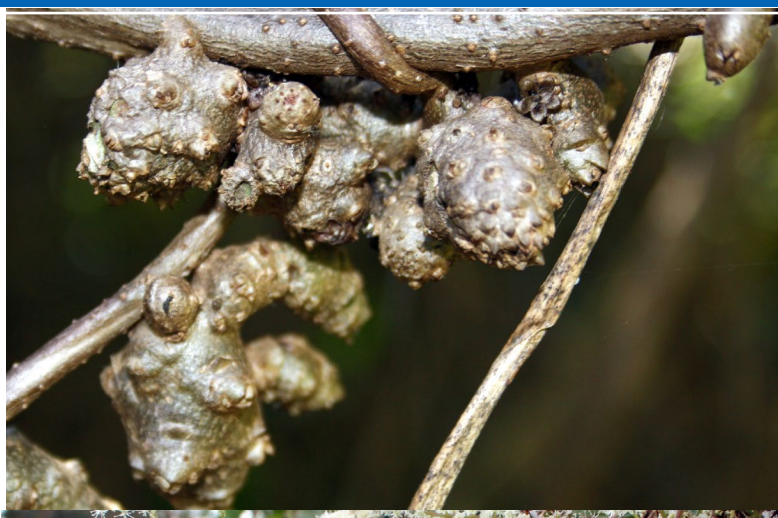
Restricted invasive plant

Madeira vine

Anredera cordifolia



Madeira vine is an invasive, South American vine that blankets and smothers trees, shrubs and understory species. It grows prolifically at rates of up to one metre per week and the weight of the vine can cause canopy collapse of mature native trees. It produces large numbers of subterranean and aerial reproductive tubers that persist in the environment and make effective management difficult.

The impacts of Madeira vine can be so severe that it causes irreversible damage to the invaded ecosystem, leading to its categorisation as a transformer species.

Madeira vine is considered one of Australia's worst environmental weeds and has been listed as a Weed of National Significance.

Legal requirements

Maderia vine is a restricted invasive plant under the *Biosecurity Act 2014*. It must not be given away, sold, or released into the environment without a permit. The Act requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control. This is called a general biosecurity obligation (GBO). This fact sheet gives examples of how you can meet your GBO.

At a local level, each local government must have a biosecurity plan that covers invasive plants and animals 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.

Queensland Government

Description

Madeira vine is also known as potato vine or lambs tail vine. It has fleshy, waxy green, heart-shaped leaves which are usually 4–5 cm in length. The stems are slender and hairless, initially herbaceous but becoming woody with age.

Clusters of 5 mm to 25 cm aerial tubers are produced along the length of the stem. These are light brown or green, and 'warty' in appearance. The vine also produces potato-like subterranean tubers which can grow up to 20 cm in diameter and at depths of up to one metre.

Madeira vine produces dense blankets of creamy flower spikes from December to April. The flower spikes are approximately 10 cm long and are made up of numerous small flowers along a drooping, central stem.

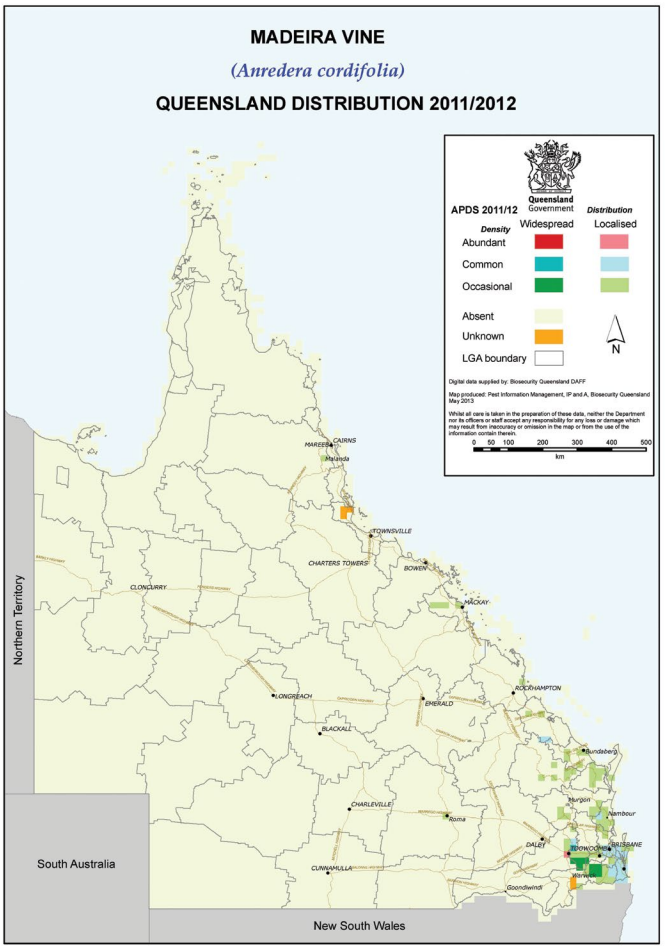
Distribution and habitat

Madeira vine is common in urban areas where it has been introduced as a garden plant. It typically invades riparian vegetation, the edges of rainforests, tall open forests and damp sclerophyll forests.

In Queensland, Madeira vine infestations are most highly concentrated in the coastal and hinterland regions of south east Queensland. However it has also invaded regions of central Queensland and is found as far north as Cairns and the Atherton Tablelands (see Map 1).

Potential distribution modelling suggests the possibility of significant range increases in Queensland if spread is not actively contained (see Map 2).

Map 1. Distribution of Madeira vine in Queensland



Control

Managing Madeira vine

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

Management strategies

Successful management of Madeira vine requires exhaustion of the tuber bank. Tubers can remain viable for up to 15 years and can be easily spread through poor green waste management or via gravity and water movement from ridges and watersheds or during floods.

A management plan should be carefully designed and include a commitment to regular, long-term follow-up control. The disturbance caused by control work stimulates particularly vigorous vine growth and if management isn't carried out appropriately may lead to an even greater problem. Plan to:

1. Prevent Madeira vine spread

Identify isolated plants or sparse populations and control these first. Also consider the topography of the landscape and prioritise isolated infestations on high ground or at the top of catchments.

2. Reduce established infestations

Weed strategically, protecting the better quality native vegetation first e.g. treat Madeira vine infesting trees that are still living. Where possible, work from the edge of the infestation toward the core – the exception may be where you need to protect isolated areas of high biodiversity value.

3. Follow-up, rehabilitate and monitor

The size of the area targeted at each stage should be manageable enough to enable thorough follow-up control two to three times a year. Ensure activities do not spread the tubers.

Monitor the site to ensure effective native plant regeneration (highly degraded sites may require active replanting) and early detection of invasion by other weed species.

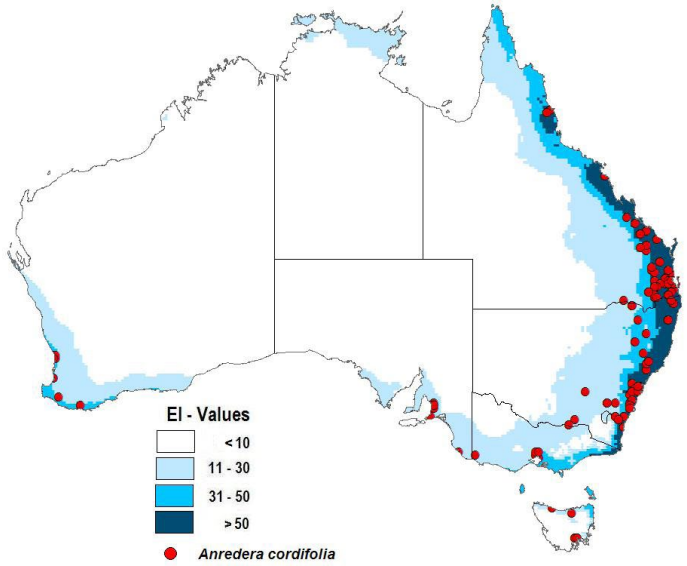
Physical control

Physical control of Madeira vine is difficult because of the extent of underground tubers and ease of fragmentation of the vine and root system. However, it may be practical for smaller or immature infestation sites or as a follow-up to remove persistent tubers.

Cutting and pulling the vines from the canopy is not generally recommended because it results in a rain of viable tubers and may be dangerous if dead and dying branches are pulled down with the vine. However, this may be necessary where there is extreme stress on the host plant. In this case, tarpaulins should first be laid on the ground to collect as many of the aerial tubers as possible.

Tubers and vegetative material must be disposed of appropriately as they will shoot in contact with moist soil. Ideally tubers and vines should be composted on-site to reduce the risk of further spread. Compost sites should be

Map 2. Current and potential distribuiton of Madeira vine in Australia – CLIMEX



established away from other vegetation where they can be easily and frequently foliar sprayed. Alternately, double bag the plants and tubers in non-biodegradable plastic bags and dispose of them in landfill waste. **Do not** dispose of Madeira vine in council green waste bins as this may spread the weed.

Biological control

The leaf feeding beetle Plectonycha correntina was first released in Queensland in 2011. Both the adult and larval stages feed on the leaves of Madeira vine and it is expected that large reductions in leaf area will reduce the plant's ability to produce energy and cause it to deplete the resources stored in its tubers. Significant defoliation should also promote canopy recovery in host plants. Releases of the insect have occurred in New South Wales and Queensland and at many of these sites the beetle has established and significant leaf feeding damage has been observed.

Herbicide control

Herbicides can be effective if they are carefully chosen and selectively applied. The main application techniques are scrape and paint and foliar spray, although basal barking and cut stump are also used.

A range of selective, non-selective; residual and non-residual herbicides are available for spot spraying madeira vine regrowth and seedlings. There are pros and cons associated with each of these that must be considered on a site by site basis:

• Non-selective and non-residual herbicides

These are herbicides like glyphosate which will affect most plant species they come in contact with but don't remain active in the soil. In most instances glyphosate is the preferred herbicide for madeira vine management because there are few restrictions on who can use it and where it can be used (frog friendly versions like Roundup® Biactive are available for areas adjacent to waterways). However, care must be taken to avoid contact with desirable species as in-discriminate spraying will open up bare ground for opportunistic weed invasion.

• Selective and residual herbicides

Residual herbicides are more effective at controlling Madeira vine tubers – enabling more rapid management of infestations; and selective herbicides, if used correctly, allow non-susceptible species to persist, providing competition to future weed invasion.

For example, research indicates that foliar sprays of triclopyr (300 g/L) + picloram (100 g/L) ± aminopyralid (e.g. Grazon Extra®), even at sub-label mix rates of 20–40 mL/10 L of water is particularly effective for the management of regrowth, juveniles and tubers. At these rates non-susceptible species like grasses, ferns, rushes and sedges should be unaffected. However, it may impact other woody plants and vines, particularly in the immature stages and the use these herbicides should be avoided at more sensitive sites. In degraded and heavily infested sites where native species recolonisation from adjacent areas or active revegetation will be required, these selective and residual herbicides should provide a better control option.

Application techniques

Scrape-paint application

This approach is suitable for medium to large basal stem sizes and provides the safest management option in sensitive environments. It is however extremely labour intensive as every vine must be treated individually.

Scrape 10–20 cm sections of the vine down to the white fibrous layer and immediately paint the exposed areas with concentrated herbicide (see Table 1 for recommended chemicals and rates). Repeat the process as high up the stem as can be reached, and where possible, scrape areas on both sides of the stem. Be careful not to ring bark the stem as this will halt the spread of the herbicide.

Foliar spray

Traditionally, foliar spray has been used as a secondary treatment to manage prostrate growth and seedlings once the primary stems have been treated using scrape and paint techniques. However, some practitioners now recommend the use of foliar spray as a stand alone treatment. This approach has been developed to increase the cost effectiveness of management but does carry the risk of off-target damage. Decisions on the applicability of this management approach should be made on a site-by-site basis, considering the vegetation composition and sensitivity of the site, as well as the skills of those applying the herbicide.

Handheld equipment (handgun and hose or knapsack) is useful to spot spray prostrate stems, seedlings and regrowth.

Some selective herbicides can be used to treat vines climbing over non-susceptible (or weedy) host plants; however extreme care must be taken.

Further information

Further information is available from your local government office, or by contacting Biosecurity Queensland on 13 25 23 or visit www.biosecurity.qld.gov.au.

Table 1. Herbicides for the control of Madeira vine

Method	Herbicide	Rate	Registration status	Comments
Basal bark (scrape and paint)	Picloram 44.7 g/L + aminopyralid 4.47 g/L (e.g. Vigilant II® herbicide gel)	Neat – 3–5mm layer of gel applied to scraped surface	Registered Australia wide (rhizomatous plants)	Appropriate for medium sized to well established vines with tubers. Apply herbicide to scraped section of vine within 15 seconds.
	Glyphosate 360 g/L (e.g. Ken-up Aqautic 360, Roundup® Biactive, Weedmaster Duo®)	667 mL/1 L water (1:1.5)	PERMIT 11463	
Basal bark	Fluroxypyr[S] 333 g/L (e.g. Starane Advanced®)	21 mL / 1 L diesel/ kerosene	Registered	Appropriate for medium sized to well established vines with tubers. Always treat vines away from the host tree.
	Fluroxypyr[S] 200 g/L (e.g. Flagship® 200, FMC Fluroxypyr 200 Herbicide)	35 mL/1 L diesel	PERMIT 11463	
Cut stump	Picloram[R] 44.7 g/L + aminopyralid 4.47 g/L (e.g. Vigilant II® herbicide gel)	Neat – 3–5mm layer of gel applied to scraped surface	Registered (rhizomatous plants)	Appropriate for young vines without aerial tubers; or vines with immature tubers. Only use for mature vines where prompt follow-up treatment of new growth arising from fallen tubers is possible. Where possible, apply in spring before new tubers proliferate. Apply herbicide to the cut surface of stem within 15 seconds.
	Glyphosate 360 g/L (e.g. Ken-up Aquatic 360, Weedmaster Duo®)	500 mL/1 L water (1:2)	PERMIT 11463	
Foliar application	Fluroxypyr[S] 200 g/L (e.g. Flagship® 200, FMC Fluroxypyr 200 Herbicide)	50 mL/10 L water	Registered	Appropriate for madeira vine treatment in disturbed areas of native vegetation or spot spraying of seedlings and prostrate growth. Apply to healthy actively growing vines only. Apply only when supporting plant and understory is dead or weedy. Apply early autumn (March–April). Do not spray beyond the point of runoff.
	Fluroxypyr[S] 333 g/L (e.g. Starane Advanced®)	21 mL/10 L water	Registered	
	Fluroxypyr[S] 400 g/L (e.g. Nufarm Comet 400, Decoy 400)	25 mL/10 L water	Registered	
	Glyphosate 360 g/L (e.g. Ken-up Aquatic 360, Weedmaster Duo®)	100 mL/10 L water	PERMIT 11463	
	Metsulfuron-methyl[SR] 600 g/kg (Associate, Ken-Met 600)	1–5 g/10 L water + non-ionic surfactant	PERMIT 82307	
	Glyphosate 360 g/L + Metsulfuron-methyl[SR] 600 g/kg	200 mL glyphosate + 1.5g metsulfuron-methyl /10 L water	PERMIT 82307	
	Triclopyr 300 g/L + Picloram 100 g/L +/- Aminopyralid 8 g/L[SR] e.g. Grazon Extra® or Triclopyr 300 g/L + Picloram 100 g/L (e.g Farmoz Fightback®, Nufarm Conqueror®)	35–50 mL/10 L water	PERMIT 11463	

[S]Selective herbicide
[R]Residual herbicide

Prior to using the herbicides listed under PER11463 you must read or have read to you and understand the conditions of the permit. To obtain a copy of this permit visit www.apvma.gov.au

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

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