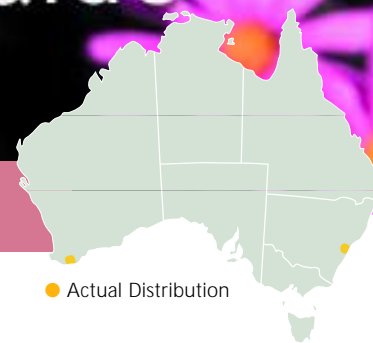


Weed Management Guide

Holly leaved senecio –
Senecio glastifolius



● Actual Distribution

Holly leaved senecio (*Senecio glastifolius*)

The problem

Holly leaved senecio 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.

Holly leaved senecio is native to the Cape region of South Africa. It is uncertain when the plant was introduced into Australia, but it was first recognised as naturalised in 1986 in the Albany district of Western Australia. Planted as an ornamental, its source was from a home garden adjacent to the Mt Adelaide and Mt Clarence nature reserve. Holly leaved senecio is now also found 20 km from the original infestation.

Holly leaved senecio is also a serious environmental weed in New Zealand where it has spread rapidly over the last 20 years. The plant is particularly invasive in open damp areas, and has the ability to dominate understorey vegetation in these conditions.

The weed

Holly leaved senecio is a member of the daisy family. It is a stout medium-lived perennial (sometimes annual) with stems 1.0–1.5 m, occasionally to 2 m, tall. The stems, which may branch in older plants, can be 80 mm in diameter at the base of large plants. All stems produce flowers on widely spaced branches.

The leaf's length is approximately 1.5 times its width and it is widest just above the leaf centre. Leaves are serrated and often coarsely toothed near the leaf stalk, which can make them rather prickly to touch. The leaves are 100–150 mm long at the base of the plants, decreasing to 30–50 mm near the top of the stems, where they are less serrate. The leaves are a distinctive feature of the holly leaved senecio and make it relatively easy to identify, even when young.

The flowers of holly leaved senecio can range from two to three per plant to several hundred. They are actually combined inflorescences, which are many tiny flowers situated in the central part of the composite flower. The inflorescences have supplementary bracts (a modified tiny leaf around the flower like a bud) 3.0–5.5 mm long, are yellow in the centre, and are surrounded by mauve petals, making the holly leaved senecio an eye-catching plant.

The developing seed heads (derived from the inflorescences) turn into white fluffy balls by the time the seed has formed and ripened. In warm and wet conditions holly leaved senecio will germinate within two weeks.

Holly leaved senecio can be confused with wild cineraria (*Senecio elegans*) at a distance, but up close the two plants are quite different. Wild cineraria is also from South Africa, but is a softer looking annual plant with leaves and stems that are more succulent and hairy than those of holly leaved senecio.



Holly leaved senecio is particularly invasive in open damp areas, and has the ability to dominate understorey vegetation in these conditions.
Photo: Jack Crow

Key points

- Like many of our serious environmental weeds, holly leaved senecio was originally introduced as a garden plant.
- Holly leaved senecio could be confused with wild cineraria (*Senecio elegans*).
- It is a prolific seeder and its spread is promoted by fire.
- It has already spread through significant areas of the natural environment near Albany, Western Australia.
- Any new outbreaks should be reported to local councils or state or territory weed management agencies. Do not attempt control on your own.

Growth calendar

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

■ General pattern of growth

Holly leaved senecio flowers in late spring. After the flower matures it leaves white fluffy balls of seed, which are apparent in summer and early autumn. The plant germinates in wetter conditions from early autumn through winter, and regrowth of existing plants occurs during the same seasons. Holly leaved senecio generally does not experience a period of dormancy, although in drought conditions it may not grow at all over summer.



The leaves of holly leaved senecio are highly serrated and can be prickly to touch. They are different to other senecio species.
Photo: The National Botanical Institute of South Africa



Holly leaved senecio invading *Allocasuarina* open woodland in Western Australia.
Photo: Rod Randall and Greg Keighery, Department of Conservation and Land Management (CALM)

How it spreads

The flowers of holly leaved senecio are pollinated by bees. It reproduces from cuttings, fallen branches and wind-dispersed seed. While the primary mechanism of spread is seed dispersal, it is able to take root from fallen branches. Wind dispersal of the seed allows it to spread some distance from the original infestation, and seeds may remain viable in the soil for extended periods of time. Germination of holly leaved senecio seed is encouraged by fire. The occurrence of fire followed by

good rains has proved to substantially promote its spread throughout its current range in Western Australia. It is believed that slashing fire breaks or disturbing the soil in the vicinity of the plant or its seedbank also assists the spread of seeds.

Where it grows

In South Africa the natural range of holly leaved senecio is restricted to a narrow coastal strip of the eastern Cape. However, even in this area it has become a weed in disturbed sites and agricultural land. It occurs naturally in shrubland and

near waterways. The plant occurs more often in open, wet areas in its native habitat, and has a tendency to become particularly weedy in similar environmental conditions overseas.

Holly leaved senecio favours open areas, such as open woodland, shrubland, hillsides, coastal dunes, roadsides and near waterways

Holly leaved senecio has spread widely throughout New Zealand in the last 20 years, and shows continuing evidence of rapid spread. It is found mainly on the North Island, particularly around Wellington and south of Wanganui, but also near Motueka on the South Island. It grows frequently on hillsides, coastal dunes and disturbed areas such as roadsides, and a major motorway near Wellington is heavily infested. It is subject to control efforts by the New Zealand Department of Conservation and volunteers from community groups.

In Australia, holly leaved senecio now occurs throughout much of the 260 ha of jarrah (*Eucalyptus marginata*), blackbutt (*Eucalyptus pilularis*) and marri (*Corymbia haematoxylon*) woodlands, and in *Allocasuarina* open woodlands, within the City of Albany, Western Australia. The most affected area is the Mt Adelaide and Mt Clarence nature reserve, where the original infestation was found, but it is also common in the Mt Melville and Lower King reserves.



It was also recorded in 1991 and 1999 on the central coast of New South Wales, at Bundeena.

Why we need to be 'alert' to holly leaved senecio

The prolific seeding capability of holly leaved senecio and its already proven invasiveness in Western Australia and New Zealand indicate that we need to be aware of this plant to prevent its further spread in Australia. It is currently posing a threat to the global biodiversity hotspots of the Stirling and Fitzgerald River national parks. Its relative, *Senecio elegans*, looks very much like holly leaved senecio, and is already an environmental weed in Western Australia and California. Several other senecio species such as *Senecio jacobea*, or ragwort, are also serious weeds in Australia.

Fire can promote the spread of holly leaved senecio. Preventative management is required after fire to avoid reinfestation from the soil seedbank

Its response to fire presents a particular problem in parks and nature reserves. Fires, which can be frequent in these bushland areas, in combination with an established seedbank can promote the spread of the plant. After fire, holly leaved senecio requires preventative management to control reinfestation.

Being a garden plant, it is quite likely to be available in nurseries, and seeds can be sourced over the internet. With much of southern Australia's climate being similar to that of South Africa, the potential for holly leaved senecio's spread throughout Western Australia, South Australia, Victoria and Tasmania is significant.



The flowers of holly leaved senecio have yellow centres surrounded by mauve petals.
Photo: Pitta Joffe, The National Botanical Institute of South Africa

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>Koeleruteria 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 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 holly leaved senecio, into natural ecosystems.

Early detection and eradication are also important to prevent infestations of holly leaved senecio. 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 either subspecies of holly leaved senecio 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 holly leaved senecio. Call 1800 803 006 or see the Australian Quarantine 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

Some 65% of weeds, including holly leaved senecio, 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 of other issues such as how to identify holly leaved senecio and what to do if they find it.

Identifying features of holly leaved senecio include flowers with purple petals and yellow centres, and coarsely serrated, prickly leaves that are smaller at the top of the plant than at the bottom.

New infestations of holly leaved senecio

Holly leaved senecio may potentially be eradicated before it becomes a problem in other locations in Western Australia. Any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control holly leaved senecio without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread the weed and worsen the problem.



Holly leaved senecio grows frequently near waterways and on hillsides, coastal dunes and disturbed areas.

Photo: Jack Crow



Control of holly leaved senecio in Albany, Western Australia



After hand-pulling, holly leaved senecio must be removed from the site, to avoid a recurrence of the infestation in the following year.

Photo: John Moore, Albany Herbiguide

Holly leaved senecio was first hand removed in casuarina woodland between Mt Adelaide and Mt Clarence, Western Australia, in 1998 by the Friends of Mt Adelaide and Mt Clarence Nature Reserve. As it was unknown that flowers could continue to form seeds after being pulled, the weeds were not removed from the site, stimulating a recurrence of the infestation in the following year. In 1999 holly leaved senecio was again hand pulled in acacia woodland, with some of the plants being up to 2.5 m tall. The plants were removed from the site, and this is thought to have helped reduce the seedbank. In the same year

the Cooperative Research Centre for Australian Weed Management (Weeds CRC) ran a series of herbicide trials, using a backpack sprayer, during the spring. The herbicide was observed to be effective in destroying many of the plants, and caused little damage to native species.

Weeds CRC, in conjunction with the Western Australian Department of Agriculture, also held a state launch for 'Weedbuster Week' at the Mt Adelaide and Mt Clarence reserve, attracting a large number of people to hand pull holly leaved senecio. This was followed

up with applications of herbicide. This method of control was considered to be quite effective but further work is required. Herbicide use in this instance was allowed by special permit. At present only a minor use herbicide is registered for use on holly leaved senecio in Western Australia.

Spot fires in the reserve since 1999 stimulated further germination of holly leaved senecio, which have been hand pulled as much as possible. Green Corps labour was also used during this time. It was observed that where there is good cover of natural vegetation, holly leaved senecio plants have not been present in large numbers. However, slashing of fire breaks and beneath powerlines did cause a spread of seed, particularly where the soil was disturbed. New plants are seen germinating every year. Further outbreaks should be followed up each year with hand pulling and spraying, particularly in the first year following fire.

Holly leaved senecio can be controlled using a combination of hand pulling and spraying. Annual follow up is important to control seedlings that have germinated from the soil seedbank, particularly after fire

The treatment of holly leaved senecio described here is based on the limited information that is available on control of this species. Any control of holly leaved senecio should be undertaken cooperatively with your state or territory weed management agency or local council.

Legislation

There is no legislation to control holly leaved senecio 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.

Acknowledgments

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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 holly leaved senecio

Quick reference guide

Identification

If you find a plant that may be holly leaved senecio, 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 holly leaved senecio include:

- leaves coarsely serrated and prickly to touch; lower leaves are much larger than those at the top of the plant
- yellow centre of inflorescences surrounded by purple petals

- supplementary bracts (bud-like) 3.0–5.5 mm long.



Holly leaved senecio is a short-lived perennial bush. Photo: Pitta Joffe, The National Botanical Institute of South Africa

Reporting occurrences

Once identified, new occurrences of holly leaved senecio 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 holly leaved senecio is easily spread, its control is a matter that 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 as to 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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