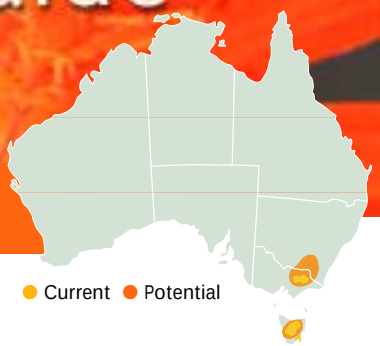
Weed Management Guide

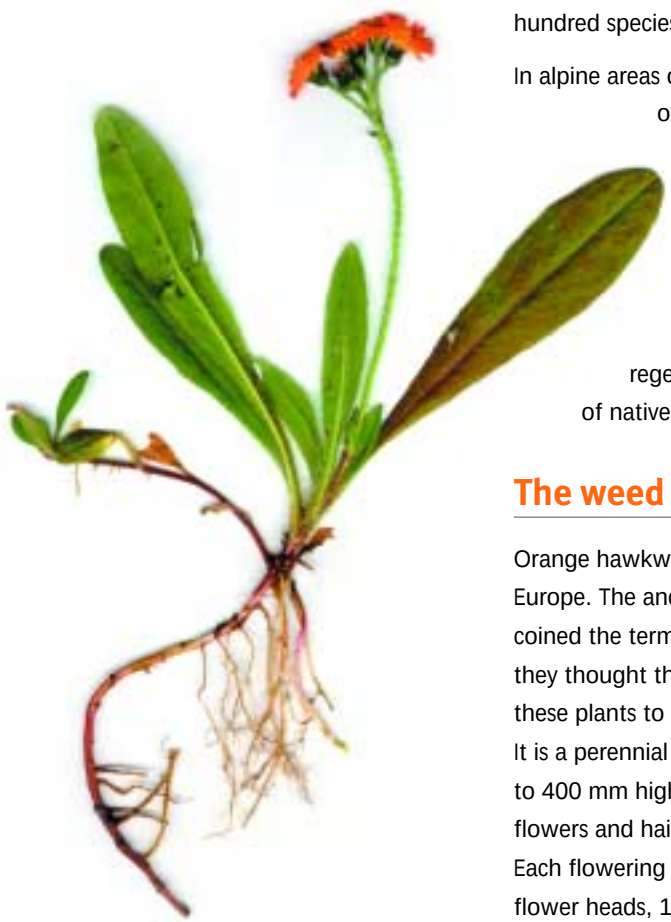
Orange hawkweed –
Hieracium aurantiacum



Orange hawkweed (*Hieracium aurantiacum*)

The problem

Orange hawkweed 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.



Orange hawkweed can reproduce by both seeds and stolons. Plants normally produce between four and eight stolons.
Photo: Andrew Crane, Tas DPIWE

Orange hawkweed is a potential threat in the alpine country and the temperate tablelands of eastern Australia. It was probably introduced to Tasmania as a garden plant early in the 20th century but was not recorded in mainland Australia until much later. Hawkweeds are extremely invasive overseas; ten species have already become weed problems in New Zealand and several hundred species are known worldwide.

In alpine areas orange hawkweed can outcompete native plants and disturb local ecosystems. It fills the spaces between grass tussocks that are necessary for the regeneration and survival of native species.

The weed

Orange hawkweed's native range is in Europe. The ancient Greeks reputedly coined the term 'hawkweed' because they thought that hawks ate the sap of these plants to sharpen their eyesight. It is a perennial plant which grows up to 400 mm high and has bright orange flowers and hairy stems and leaves. Each flowering shoot consists of 5–30 flower heads, 10–20 mm in diameter. The 12–30 tiny black seeds are ribbed and have a tuft of bristles on the flattened end.

The orange flowers, with square-edged petals, make flowering plants easy to identify. Distinguishing features of non-flowering plants include the presence of stolons or 'runners' (stems that lie horizontally on the ground) and numerous short black hairs on the stems and leaves. Leaves usually grow at a slight angle to the ground but under grazing pressure and harsh conditions they lie flat. Orange hawkweed is also known as 'devil's paintbrush', 'red devil' and 'grim-the-collier'.

Key points

- Prevention is the most cost-effective form of weed control. It is vital to keep uninfested areas free of orange hawkweed.
- Experience in New Zealand and North America with other hawkweeds has shown the danger in letting these weeds become established.
- Orange hawkweed spreads by runners over short distances and by seed over larger areas.
- Contact your state or territory weed management agency or local council if you find orange hawkweed. Do not attempt control on your own, as it can spread very easily from both seed and runners.

Natural Heritage Trust
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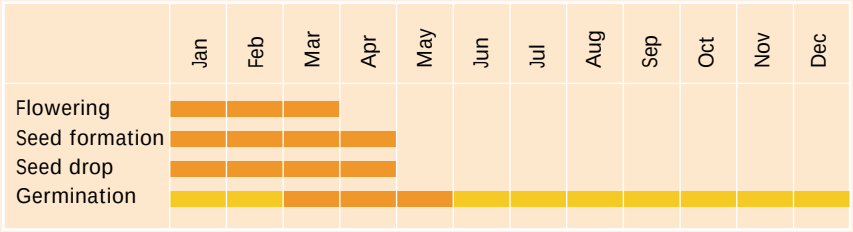
An Australian Government Initiative

Alert List For Environmental Weeds ALERT

Growth calendar



The long days of spring and early summer trigger stem elongation and subsequent flower production. Seed germinates throughout the growing season, especially in autumn. Plants grow rapidly and usually flower within the first growing season, but flowering may be delayed in late germinating plants. Seedlings establish readily on bare areas, usually in spring.

The main stem grows longer and produces a flower head as day length increases during spring.
Photo: Washington State University (USA)

How it spreads

Hawkweeds spread by both runners and seed, with a one square metre mat producing up to 40,000 seeds a year. In New Zealand *H. pilosella*, which is similar in habit and form to orange hawkweed, spreads mainly by runners rather than seed. Runners begin to grow from buds in the rosette leaves when the plants are flowering. Depending on growing conditions, plants produce between four and eight leafy runners that can reach lengths of 100–250 mm. These runners form new rosettes and, once established, the patch continues to expand until it covers the site with a solid mat of rosettes. Under ideal conditions, it can form a colony up to 0.5 m across in its first year. Hawkweeds regrow each year from short, below-ground rhizomes.

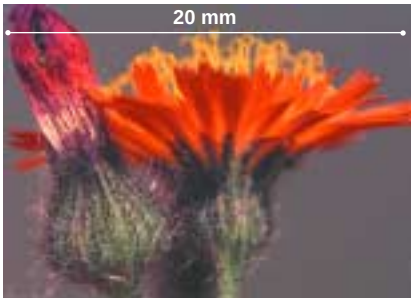
Seeding is important for more widespread dispersal. Minute barbs along ribs on the seeds enable them to stick to hair, fur, feathers, clothing and vehicles, and be carried long distances. Seeds can be dispersed by wind and water, and in dumped garden waste and contaminated soil. They may also be spread by snow clearing and road maintenance machinery, and be carried on ski equipment between resorts within Australia and overseas. Although its entry to Australia is prohibited, orange hawkweed is sometimes found in nurseries (often as seed) and as a component in 'wildflower' seed mixes. It has also been promoted as a herbal plant.

Orange hawkweed tends to grow in disturbed areas such as roadsides.
Photo: Norman Melvin@USDA-NRCS Plants

Where it grows

Hawkweeds grow naturally in temperate and mountain areas. Orange hawkweed is a native of the mountains of northern and central Europe and was introduced as a garden plant at several locations in Tasmania's Central Highlands. It has since become a weed throughout the Central Highlands and Southern Midlands, and around Hobart where the largest infestation occurs (see case study, p.5). At least ten populations are also known from around Falls Creek in Victoria, at 1600 m above sea level.

Orange hawkweed invades disturbed areas (eg roadsides, drains, residential areas), ski-fields, grasslands, pastures and alpine meadows. It has also spread into open woodland in Tasmania and Victoria.



Each flower can produce up to 30 tiny black seeds.
Photo: Hugh D. Wilson, Texas A&M University (USA)

Unripe fruit inside the flower, showing the tuft of bristles on the end of the seed.
Photo: Hugh D. Wilson, Texas A&M University (USA)

Ripe seed heads ready to be dispersed by the wind.
Photo: Kurt Stueber

Why we need to be 'alert' to orange hawkweed

Orange hawkweed can grow over a wide range of temperatures and can tolerate a range of conditions – gravelly or acidic soils, full sun, part shade, frost and snow. Short tussock grasslands in the semi-arid to humid mountain environments with rainfall of 500–1200 mm are at greatest risk.

Orange hawkweed is quite widespread in New Zealand and has the potential to become a major problem there. Other species in this family are also widespread in New Zealand, initially replacing vegetation between native tussock grasses and then displacing the tussocks themselves, particularly in parts of the South Island. Some hawkweeds are also weeds in North America.

Although hawkweeds appear to have a relatively high nutritional value, their capacity to replace other pasture species reduces the overall feed value of grazing areas, and so reduces productivity.

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

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.

of these impacts, it is vital to prevent further introduction of new weed species, such as orange hawkweed, into uninfested natural ecosystems.

It is illegal to grow orange hawkweed throughout Tasmania, Victoria and New South Wales where it is declared a noxious weed. In the past various hawkweed species have been offered for sale in nurseries around Australia, including in Western Australia, Queensland and New South Wales. Notify the vendor or state or territory weed control contacts if you find orange hawkweed for sale.

Early detection and eradication are also important to prevent the spread of orange hawkweed. 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

No importation of hawkweeds into Australia is 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 orange hawkweed. 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.

Meadow hawkweed *Hieracium caespitosum* invading pasture in eastern United States.
Photo: Washington State University (USA)

Raising community awareness

Some 65% of weeds, including orange hawkweed, 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 orange hawkweed and what to do if they find it.

During the flowering season (November–March), orange hawkweed has distinctive orange flowers with square-edged petals. If not flowering, the presence of runners and short black hairs on stems and leaves will help identify this species.

...case study

The spread and control of orange hawkweed around Hobart

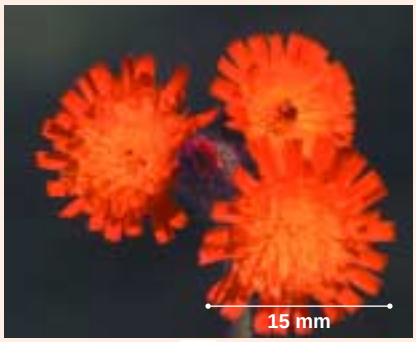
The largest infestation of orange hawkweed in Australia occurs on the outskirts of Hobart in the suburb of Fern Tree. This wet eucalypt forest area, at the foot of Mount Wellington, is much higher, cooler and wetter than Hobart, with an annual mean daily maximum temperature of 11.6ºC and an average rainfall of more than 1300 mm. The soil is relatively shallow and free draining.

Orange hawkweed escaped from a garden planting some time before 1963. It has since become well established on roadsides, public open spaces, walking tracks and private gardens. Roadside maintenance has probably also helped spread the plant in this area, and almost certainly explains the small population discovered on the roadside at Snug, approximately 30 km south of Hobart and 20 km from the nearest known hawkweed population.

A recent mapping project undertaken by Hobart City Council found that the Fern Tree population was moving downslope as a result of wind and water dispersal, with very obvious fan-shaped spread along watercourses.

Most affected landholders have been keen to undertake control work as they have quickly recognised orange hawkweed as a serious garden pest and an environmental threat. However, some members of the community value it for its toughness. Public education is an essential component of hawkweed control.

Control has been relatively easy where tried, provided the site is managed appropriately to allow herbicides to work and to prevent the movement of seeds and stolons. It is very important to prevent mowing/slashing – and presumably grazing – for at least two weeks after spraying. The best time for herbicide application is spring, but because plants are difficult to locate, spot-spraying can be ineffective.



Flower heads contain 5–30 orange flowers with square-edged petals.
Photo: Hugh D. Wilson, Texas A&M University (USA)

Small infestations can also be eradicated by digging out the shallow-rooted rosettes, but this should only be attempted by someone experienced as plants quickly regrow from fragments if any pieces of runners or roots are left behind.

Areas that contain vigorously growing grasses appear to be less susceptible to the spread of hawkweed. At the Fern Tree infestation, grass growth is subdued in winter, thus reducing the amount of competition.

The general growth habit of orange hawkweed.
Photo: NL Britton and A Brown @USDA-NRCS Plants.

New infestations of orange hawkweed

Because there are relatively few orange hawkweed infestations, and it can potentially be eradicated before it becomes established, any new outbreaks should be immediately reported to your state or territory weed management agency or local council. Do not try to control orange hawkweed 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

Hawkweeds (*Hieracium* spp.) are listed as prohibited plants by AQIS to prevent their entry to Australia. They are listed as noxious weeds in New South Wales, Victoria and Tasmania, where landholders may be required to control them, and are on the list of plants prohibited entry into Western Australia. Check with your local council or state or territory government agency about the latest requirements for hawkweed control.

Acknowledgments

Information and guide revision: Andrew Crane (Tas DPIWE), Lindsay Smith (Landcare Research NZ), John Morgan (La Trobe University), Richard Carter (NSW Agriculture/Weeds CRC), Sandy Lloyd (Agriculture WA/Weeds CRC) and John Thorp (National Weeds Management Facilitator).

Map: Base data used in the compilation of actual and potential distribution maps provided by Australia herbaria via Australia's Virtual Herbarium and the Bureau of Rural Sciences respectively.

If you find a plant that may be orange hawkweed

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 orange hawkweed are:

- bright orange daisy-type flowers, 10–20 mm in diameter, that have square-ended petals and grow in clusters of 5–30 flower heads
- leaves, 100–150 mm long, that are dark green on the upper surface and light green underneath, and form rosettes close to the ground
- stems that contain milky sap and are covered in short, stiff hairs.

Reporting occurrences

Once identified, new occurrences of orange hawkweed 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 orange hawkweed spreads so easily 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 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/

ISBN 1-920932-25-9

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