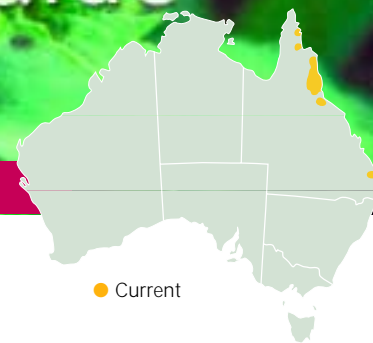


Weed Management Guide

Praxelis – *Praxelis clematidea*



Praxelis (*Praxelis clematidea*)

The problem

Praxelis 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.

Praxelis was first recorded in Tully and Innisfail, Queensland, in 1993 but was probably present there for about 20 years before being positively identified. It is spreading extremely quickly and effectively throughout northern and eastern Queensland – an isolated infestation recently found in Gympie is some 1200 km by road south of the nearest infestation in Townsville.

An invader of both disturbed and relatively undisturbed ecosystems, praxelis could threaten, and significantly increase the costs of managing, such crops as bananas, other fruits and sugar cane. It could infest pastoral grasslands and conservation areas, particularly open eucalypt woodlands. Praxelis is easily mistaken for two species of *Ageratum*, less serious weeds found in similar regions.

There is some evidence that it may be poisonous to stock and humans if ingested.

The weed

Praxelis is an annual or short-lived perennial herb growing 0.2–1.0 m tall.



Praxelis can invade both disturbed and undisturbed ecosystems including grasslands, woodlands and conservation areas.
Photo: Queensland Herbarium

Its leaves are arranged in opposite pairs along the brittle cylindrical stems, which are covered in short soft hairs. The leaves are tear-shaped or 'ovate' to diamond-shaped or 'rhomboid', with a conspicuously toothed margin containing between five and eight teeth. When crushed, they emit a pungent odour similar to cat's urine.

The flowers, which are clusters of numerous (30–50) lilac or bluish coloured 'florets', are 7–10 mm long and occur in groups at the ends of stems. The florets are set into a highly conical (ie cone-shaped) receptacle – this is a key distinguishing feature of this species.

The seeds are black and about 2.5–3.0 mm long. They bear a pale tuft of finely barbed bristles, 3–4 mm long.

Key points

- Prevention is the most cost-effective form of weed control. Keep uninfested areas free of praxelis.
- Praxelis spreads into new areas very quickly. Seed dispersal is aided by machinery and vehicles.
- Disturbed areas such as roadsides, fencelines, railway lines, run-down pastures and plantations are all at risk from infestation.
- Contact your state or territory weed management agency or local council if you find praxelis, especially any infestations outside its known distribution. Any new information on its presence is extremely important.
- Do not attempt control on your own.

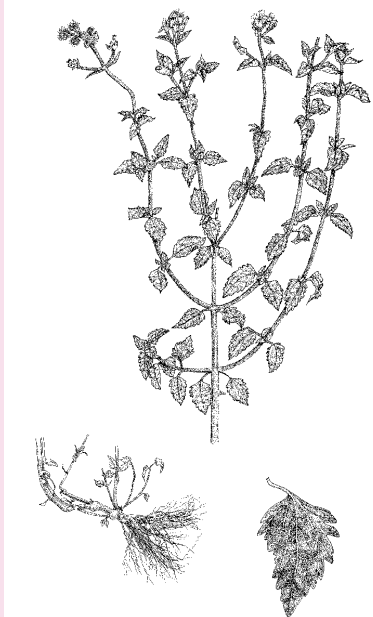
Growth calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering												
Seed formation												
Seed drop												
Germination												

■ General pattern of growth ■ Growth pattern in suitable conditions

In tropical and subtropical regions praxelis mainly flowers during the wetter months between November and May. However, a few flowers may be present on some plants year round.

Seeds are formed and drop from the plant very quickly, mainly throughout summer and autumn. Most germination occurs following rainfall, but it can occur year round under suitable conditions (eg in gardens, irrigated pasture).



Praxelis leaves are tear-shaped or 'ovate' to diamond-shaped or 'rhomboid', with a conspicuously toothed margin containing between five and eight teeth.

Photo: John Swarbrick

How it spreads

Praxelis mainly spreads by seeds. It can produce large numbers of seeds in as little as three or four months after germinating. The seeds possess a 'pappus', a tuft of barbed bristles that can help them spread by wind or water, or by attaching themselves to animal fur and feathers, clothing or machinery. Long distance dispersal is mainly attributed to seed attached to vehicles or carried as accidental contaminants of building supplies and landscaping materials. Praxelis is also capable of vegetative growth, in which roots and new plantlets form along branches in contact with the soil.

Praxelis is thought to have first entered Australia in a batch of contaminated seed from Brazil between 1965 and 1975. It is believed to have been part of the same seed batch that also included Siam weed, *Chromolaena odorata* – a closely related species also on the *Alert List for Environmental Weeds* – because the two species were first found growing in very close association in the Tully region. Although it was recognised by landholders in the area as a weed, it was not formally identified as praxelis until 1993 during the initial investigations into the Siam weed infestation (for more information on Siam weed, see the companion guide in this series).

Infestations have been recorded along the coast of northern Queensland from Townsville to Cairns, and on the Atherton Tablelands at Kuranda, Mareeba, Herberton and Malanda. Other scattered infestations exist in remote parts of Cape York Peninsula and the Torres Strait islands, originating from seeds in building and landscaping materials brought in from infested regions. In 2002 an infestation was discovered just north of Gympie, some 1200 km by road from Townsville and only 160 km north of Brisbane.

Where it grows

A native of South America (southern Brazil, Venezuela, Bolivia, northern Argentina), praxelis invades a range of habitats. It is particularly suited to disturbed areas such as roadsides, railway lines and fencelines, and rapidly colonises bare earth following fire. Able to survive on a range of soil types, it invades crops, grasslands and, particularly, over-grazed pastures. It can become the dominant herbaceous plant in open eucalypt woodlands, and grows vigorously along riverbanks. It tolerates partial shade to full sun but does not cope well under heavy shade.

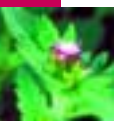
Praxelis is well established in areas that have more than 900 mm annual rainfall and is expected to survive in areas with

annual rainfall in the range 500–700 mm. In these drier areas praxelis behaves more like an annual, setting seed and dying off until the next rainy season, when germination takes place. It will probably only exist in cultivated areas or along waterways in areas where annual rainfall is less than 500 mm.

Why we need to be 'alert' to praxelis

Praxelis is capable of quickly spreading large distances. Because it was not positively identified early, and is extremely similar to two less serious weeds (*Ageratum* species), it has been allowed to spread virtually unimpeded during its first 20 years in Australia. In that time it could easily have spread into new areas where it may not yet have been identified, as shown by the discovery of an infestation in Gympie in 2002.

It is a close relative of Siam weed, *Chromolaena odorata*, which is regarded as one of the worst weeds of the tropics. These two plants share similar characteristics (eg rapid growth and early seed production, high numbers of easily dispersed seeds, adaptability to wide range of climates and habitats).



Praxelis is also showing its weedy potential in Hong Kong and mainland China, where it appears set to become a significant weed of dryland agriculture. It can survive some exposure to frost and in China it grows above the frost line as an annual.

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 praxelis, into uninfested natural ecosystems.

Early detection and eradication are also important to prevent infestations of praxelis. 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

Quarantine laws require that before the Australian Quarantine and Inspection Service (AQIS) could consider applications to import praxelis, a comprehensive weed risk assessment would need to be conducted by Plant Biosecurity Australia. Considering its potential impacts on agriculture and the environment, it is unlikely that permission to import this plant would be granted.

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 praxelis. 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

Because there is a high probability that praxelis exists outside known infestations, it is extremely important that the general public be made aware of the potential impacts of praxelis and how to identify it and distinguish it from similar weeds (see box on p.5). Assistance from landholders, natural resource managers and interested community groups will be vital in compiling up-to-date maps of known infestations, alerting authorities to new infestations and helping to prevent the spread of praxelis.

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.

New infestations of praxelis

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

Legislation

There is no legislation to control praxelis but, as part of the *Alert List for Environmental Weeds*, it is marked for eradication and should not be imported into Australia or further spread.

Acknowledgments

Information and guide revision: Barbara Waterhouse (AQIS/Weeds CRC), Rachel McFadyen (Weeds CRC), Ailsa Holland (Queensland Herbarium) 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 blue flowers of praxelis are made up of 30–50 florets set into a cone-shaped receptacle. Photo: C.G. Wilson

Look-alike species

Praxelis is very similar to two related weed species, *Ageratum conyzoides* and *Ageratum houstonianum*, which are also found in northern Australia. These species are commonly known as 'blue top' and 'billy goat weed', and are often mistaken for each other. Both are found as environmental weeds, especially on roadsides and disturbed areas. *A. houstonianum* has also been used as an ornamental plant and has escaped from gardens.

Local authorities and landholders in northern Queensland initially believed that the weed now known to be praxelis was either a herbicide-resistant or hybrid form of *A. conyzoides* because it was much harder to kill with herbicides than previous experience with *A. conyzoides*. Collection of specimens and verification from several herbaria revealed that it was, in fact, a different plant altogether, *Praxelis clematidea*.

The differences between praxelis and *A. conyzoides* are subtle, even to the trained eye. Both have blue flowers, although those on *A. conyzoides* are often a less intense blue and may also be white or pale lilac. Both are covered with hairs, although the hairs on praxelis are longer and more conspicuous. The main difference is that praxelis has a conical receptacle for its 'florets', the dense cluster of small flowers that make up the flower head, whereas *A. conyzoides* has a flat or slightly dome-shaped receptacle. Also, the ring of 'bracts', modified leaves that surround and support the flower head, is

deciduous and drops off praxelis flowers, whereas in *A. conyzoides* the bracts are persistent. The leaves of praxelis have a more pungent odour when crushed, and are more triangular and more sharply toothed than those of *A. conyzoides*, which are more rounded near the tip and have smooth teeth along the edges. Finally, the 'pappus' on praxelis seeds consists of many more bristles (15–40) than *A. conyzoides*, which has only about 5 bristles.

The flower colour and size of *A. houstonianum* is usually much closer to that of praxelis than *A. conyzoides*, especially in those parts of northern Queensland where the three species occur together (eg Atherton Tablelands).



When crushed, praxelis emits a pungent odour similar to cat's urine.
Photo: C.G. Wilson



Mature seed heads bear a pale tuft of finely barbed bristles, 3–4 mm long.
Photo: Barbara Waterhouse

Differences between *Praxelis clematidea* and *Ageratum conyzoides*

	<i>Praxelis clematidea</i>	<i>Ageratum conyzoides</i>
Habitat	Roadsides, crops, pastures and undisturbed bushland	Mainly disturbed sites such as roadsides
Flower	Intense blue	Pale blue, also white or pale lilac
Flower receptacle	Conical, with pointed apex	Flat or slightly dome-shaped
Bracts	Deciduous	Persistent
Hairiness	Stems covered in short hairs	Hairs on stems are shorter and less conspicuous
Leaf odour when crushed	Pungent, similar to tom-cat spray	Less pungent
Leaf	Tear-shaped to triangular, sharp serrated edges	More rounded, especially at the tip, smooth serrations
Pappus	15–40 bristles	5 bristles

If you find a plant that may be praxelis

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 praxelis are:

- stems covered in soft downy hairs
- blue flowers made up of 30–50 florets set into a cone-shaped receptacle
- small black seeds, with a tuft of 15–40 bristles on one end.

Note that praxelis is very similar to the common but less serious weeds of

northern Queensland roadsides, *Ageratum conyzoides* and *A. houstonianum*. For more information, see the box on p.5.

Reporting occurrences

Once identified, new occurrences of praxelis 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 praxelis 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.



Praxelis stems are covered in soft downy hairs. Photo: C.G Wilson

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.rbg Syd.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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