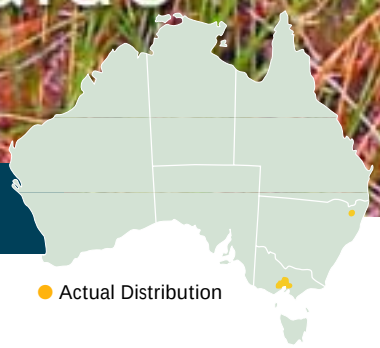
Weed Management Guide

Cane needle grass – *Nassella hyalina*



Cane needle grass (*Nassella hyalina*)

The problem

Cane needle grass 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.

Cane needle grass is drought tolerant and forms dense, competitive infestations. It is closely related to serrated tussock, a Weed of National Significance, which costs southeastern Australia's grazing industries more than $40 million annually in control expenditure and lost production. Several species of *Nassella* have proven difficult to control and have continued to spread since their introduction into Australia, and are now environmental and agricultural weeds.

In addition to loss of production and environmental damage, the sharp seeds of *Nassella* species can damage sheep skins and carcasses and contaminate fleeces.

The weed

Cane needle grass is a perennial tussock-forming grass in the spear grass group. It was given its name because its flower stem stands erect, like a cane.

Cane needle grass is drought tolerant and forms dense, competitive infestations.
Photo: David McLaren

Cane needle grass leaves are flat or rolled slightly inwards and up to 200 mm long. The leaves possess a small (0.2–2 mm) inrolled 'ligule' with a few short hairs. The ligule is the small flap at the junction of the leaf blade and the leaf sheath. It can be located by tracing a leaf down to where it joins the sheath and bending the leaf back at this point.

The seeds of cane needle grass are 4–5 mm long and have 35–40 mm long bristle-like tails, or 'awns'. The awn is connected to the seed body by a crown, or 'corona', of hard tissue 1–2 mm in length. The corona is divided at its end into numerous 'fingers' or hair-like projections.

Key points

- Prevention and early intervention are the most cost-effective forms of weed control.
- Cane needle grass forms dense infestations which exclude other more desirable species.
- It has very sharp seeds which are easily spread by attachment to clothing, fur and machinery.
- Major infestations occur around the outer western suburbs of Melbourne and central Victoria. It has also been recorded in New South Wales.
- Contact your state or territory weed management agency or local council if you find cane needle grass. Do not attempt control on your own.

Natural Heritage Trust
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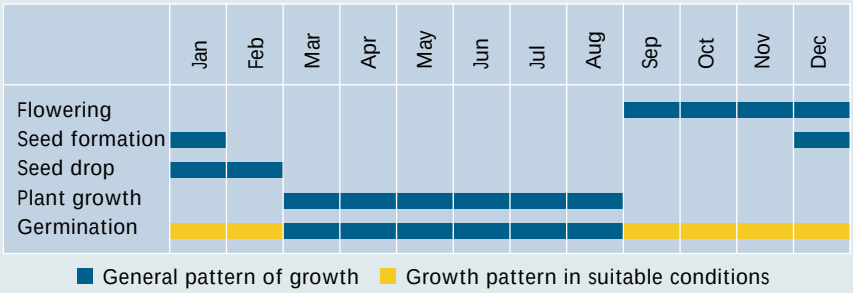
Growth calendar



Cane needle grass flowers from mid-spring until early summer. Seed is formed and drops during summer. Most vegetative plant growth and seed germination occur from autumn to winter, although some germination may occur year round under suitable conditions.

How it spreads

Cane needle grass spreads by seeds. Although the exact amount of seed produced is not known, both of the closely related species, serrated tussock (*N. trichotoma*) and Chilean needle grass (*N. neesiana*), can produce tens of thousands of seeds per plant per year.

The seeds of cane needle grass are very sharp and clinging and readily attach themselves to clothing, fur and equipment. Seeds can also be spread when soil is moved.

Most seeds are produced in flower heads at the ends of stems; however, cane needle grass has an unusual feature in that it also produces hidden seeds, or 'cleistogenes', which are formed in the stems. These hidden seeds enable the plant to reproduce despite grazing, slashing and fire.

Cane needle grass also has an unusual seed dispersal mechanism. After seed drop, the second last stem node (join) becomes fragile and can be broken by passing animals, wind and water. The hidden seeds that are contained within the above-ground sections of the stems are thus dispersed.

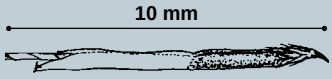
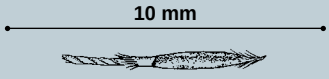
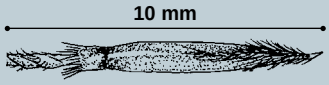
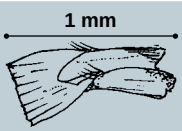
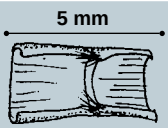
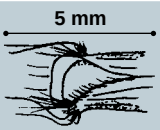
Where it grows

Cane needle grass is native to Argentina, southern Brazil and Uruguay, where it grows mainly on fertile soils in a range of environments including woodlands. Stipoid grasses (such as the *Nassella* species) generally invade sites that are already highly degraded with a history of disturbance, especially land with higher fertility soil that has been used for grazing or farming.

Cane needle grass has very sharp seeds which can damage the skins of sheep and can easily attach to clothing, fur and machinery for dispersal

In Victoria it has invaded open woodlands and native and introduced grasslands, including areas dominated by other *Nassella* species. Major infestations occur around the outer western suburbs of Melbourne and in central Victoria. Cane needle grass was reported in New South Wales on the northern tablelands in 1951, but the only other

Grasses Identification

Species	***Nassella charruana*** lobed needle grass	***Nassella hyalina*** cane needle grass	***Nassella leucotricha*** Texas needle grass
Status	introduced, an Alert List weed	introduced, an Alert List weed	introduced
Form	tussock	tussock	tussock
Seed (note in these images that the outer casing of the seed, the 'glume', has been removed to reveal seed detail)			
'Corona', the collar at seed base	present	present	present
'Awn', the bristle-like seed tail	45–85 mm double bent firmly fixed to seed coat	35–40 mm twisted and bent	35–60 mm long, bent twice with 10–20 mm to first bend
'Cleistogenes', or stem seeds	absent	present	present
'Ligule', the flap at the leaf base	 few short hairs	 few short hairs	 many short hairs
Overall dimensions	0.5–1.0 m and 0.3–0.5 m across	to 1 m high, to 0.3 m across	1–1.5 m high, 0.2–0.5 m across

Identifying cane needle grass

Cane needle grass is hard to identify because of its similarity to native spear grasses (*Austrostipa* species) and other *Nassella* species. They all have sharp seeds with a long curved or bent awn and hairy tip. However, *Nassella* species have strongly overlapping margins of the 'lemma' (the seed coat), which make it difficult to open the mature seeds. Also, the seeds of most *Nassella* species (except serrated tussock) possess a corona, a raised crown at the joining of the seed body and the tail (the awn). The corona is absent in *Austrostipa* species.

In cane needle grass the seed produced from normal flowering heads, excluding the corona, is almost 6 mm in length. The corona is relatively short, about 1–2 mm long. The awn is quite short for this group of grasses – less than 40 mm. Cane needle grass can also produce 'cleistogenes', hidden seeds in the segmented stems. See the grasses identification table below for assistance in distinguishing cane needle grass from other species.

records in that state refer to its cultivation in botanic gardens.

While some reports describe it as palatable to stock and suitable as reasonable fodder, it is also described as quite sparse with only intermediate feed value. At one infestation in the outer western suburbs of Melbourne, stock have been observed grazing cane needle grass when the existing pasture is of low quality, but they tend to avoid it when more palatable pasture species are present.

Why we need to be 'alert' to cane needle grass

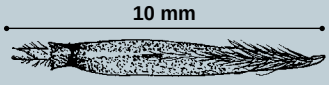
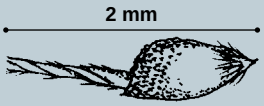
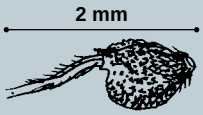
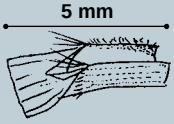
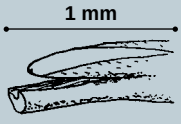
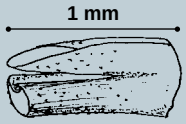
Cane needle grass threatens a number of conservation reserves west of Melbourne. It appears to be spreading, especially in wetter areas within open native grasslands. It has the potential to affect the biodiversity of riverbank vegetation and grassland, especially in areas that remain wet for long periods.

Although it is not currently seen as a threat to agriculture, cane needle grass could have an impact on agricultural production.

Based on climatic suitability, the potential distribution of cane needle grass in Australia has been estimated at 900,000 ha, with substantial areas of Victoria and New South Wales at risk. However, its potential to damage the natural environment is largely unknown as it has not been adequately mapped.

There are at least 11 species of South American grasses naturalised in south-eastern Australia, collectively known as the 'South American stipoid grasses', which represent a significant threat to Australia's ecosystems.

As well as serrated tussock and Chilean needle grass, which are both listed as Weeds of National Significance (meaning that they are regarded as among the worst weeds in the country), two other species of *Nassella* are naturalised in Australia: the *Alert List* species lobed needle grass (*N. charruana*) and Texas needle grass (*N. leucotricha*). Another related species, Uruguayan rice grass (*Piptochaetium montevidense*), is also on the *Alert List for Environmental Weeds*.

Nassella neesiana Chilean needle grass	***Nassella trichotoma*** serrated tussock	***Piptochaetium montevidense*** Uruguayan rice grass	***Austrostipa* species** spear grasses
introduced, Weed of National Significance	introduced, Weed of National Significance	introduced, an Alert List weed	native
tussock	tussock	tussock	single stems
			
present	absent	present	absent
60–90 mm double bent	25–35 mm straight or double bent firmly fixed to seed coat	10 mm straight readily detached from seed coat	greater than 20 mm straight
present	absent	absent	absent
 few long hairs	 hairless	 hairless	 generally few short hairs
1–1.5 m high and 0.3–0.6 m across	to 1.0 m high and to 0.6 m across	to 0.5 m high and to 0.2 m across	unknown

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.

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 cane needle grass, into uninfested natural ecosystems.

Early detection and eradication are also important to prevent infestations of cane needle grass. 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 cane needle grass, 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 cane needle grass. Call 1800 803 006 or see the 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

It is not known exactly how cane needle grass was first introduced into Australia. Some 65% of weeds which have recently established in Australia have escaped from plantings in gardens and parks. A comparatively small percentage of weeds first arrived as agricultural species (7%) or seed contaminants (2%).

Cane needle grass appears to be spreading, especially in wetter areas within open native grasslands. It has the potential to affect the biodiversity of riverbank vegetation and grassland.
Photo: David McLaren

The detrimental impacts of weeds when they escape cultivation invariably outweigh the horticultural benefits. The public should be made more aware of these impacts, and other issues such as how to identify cane needle grass and what to do if they find it. For help in identification, see the box on page 3 and the grasses identification table on pages 2–3.

The seeds of cane needle grass have bristlelike tails, or 'awns'. The awn is connected to the seed body by a crown, or 'corona', of hard tissue. The corona is divided at its end into numerous 'fingers' or hair-like projections.
Photo: David McLaren

New infestations of cane needle grass

Because there are relatively few cane needle grass 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 cane needle grass without their 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 cane needle grass

No formal observations or trials investigating control methods have been conducted on cane needle grass, but where it occurs in native grasslands there are some general principles that apply. Some herbicides commonly used for control of other *Nassella* species (eg serrated tussock and Chilean needle grass) have devastating effects on native vegetation and can lead to major weed invasion. Removing other ground cover with herbicides gives the *Nassella* species a potential competitive advantage because of their large seedbank. Nonetheless, herbicide use can be successful if effective competition from native grass species has been established to overcome the large seedbank of *Nassella* species.

Legislation

There is currently no legislation to control cane needle grass 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: David McLaren (DPI Vic/Weeds CRC), Neville Walsh (Vic Herbarium) and John Thorp (National Weeds Management Facilitator), David Cooke (APCC).

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

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* ssp. *formosana*	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

If you find a plant that may be cane needle grass

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 cane needle grass are:

- a crown, or 'corona', of hard tissue 1–2 mm in length at the end of the seed near the seed tail (the 'awn')
- an awn that is 35–40 mm long
- hidden seeds, known as 'cleistogenes', found in the joints of the stems
- a small inrolled 'ligule' (a small flap found at the junction of the leaf sheath and blade), up to 2 mm in length, with a few short hairs.

For more information on how to identify *Nassella* grasses, see the information box on page 3 and the grasses identification table on pages 2–3.

Reporting occurrences

Once identified, new occurrences of cane needle grass 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 cane needle grass 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 from the seedbank 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/

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