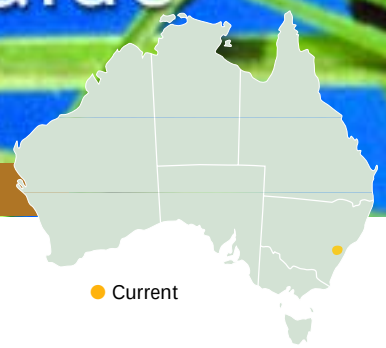
Weed Management Guide

Cyperus – *Cyperus teneristolon*



Cyperus (*Cyperus teneristolon*)

The problem

Cyperus teneristolon 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.

There is no well-established common name for this species in Australia although 'cyperus' has been suggested. As many species share the common name cyperus, it has been decided to refer to the species here by its scientific name to prevent confusion.

C. teneristolon has become a significant weed of crops of the East African highlands, in particular Kenya. As it is a weed in overseas agricultural areas with climatic and environmental conditions similar to those that occur in Australia, it is seen as a potential threat to Australia's environment and agricultural productivity.

C. teneristolon has the potential to become a significant weed of crops in Australia. The population at Yosemite Creek, Katoomba, NSW, is pictured here.
Photo: John Hosking, NSW Agriculture

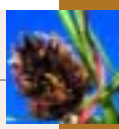
The weed

C. teneristolon is a perennial sedge which grows to 500 mm high. Sedges are evergreen plants with triangular stems that generally grow in damp areas. The species name *teneristolon* refers to the long and delicate stolons (ground-covering stems) that sprout new plants. The main flowering spike is egg-shaped, purple to black in colour, and made up of many tiny flowers (an 'inflorescence'), or spikelets, to 3 mm long with a distinctive point. The shape and colour of the inflorescence distinguishes *C. teneristolon* from all other sedge species. The fruit, produced from the mature flower, is dry, contains one seed and does not split open to release the seed when on the plant.

The leaves are 1–3 mm wide, have roughened margins and are bright green in colour. The roots are fibrous and the plant has an extensive rhizome system (underground stems) which supports its regrowth each season and helps it spread.

C. teneristolon has been observed breaking through special weedproof matting in a revegetation area alongside a creek line, suggesting the plant may potentially be an aggressive invader.

Key points



- Prevention and early intervention are the most cost-effective forms of weed control.
- *Cyperus teneristolon* is a problem overseas in environments similar to parts of Australia. For this reason it needs to be eradicated before it gets a chance to establish.
- It is capable of adapting to a variety of conditions and has the potential to invade creek systems in the Blue Mountains National Park and surrounding agricultural lands.
- Any new outbreaks should be reported to local councils or state or territory weed management agencies. Do not attempt control on your own.

Natural Heritage Trust
Helping Communities Helping Australia
An Australian Government Initiative

Alert List For Environmental Weeds ALERT

Growth calendar

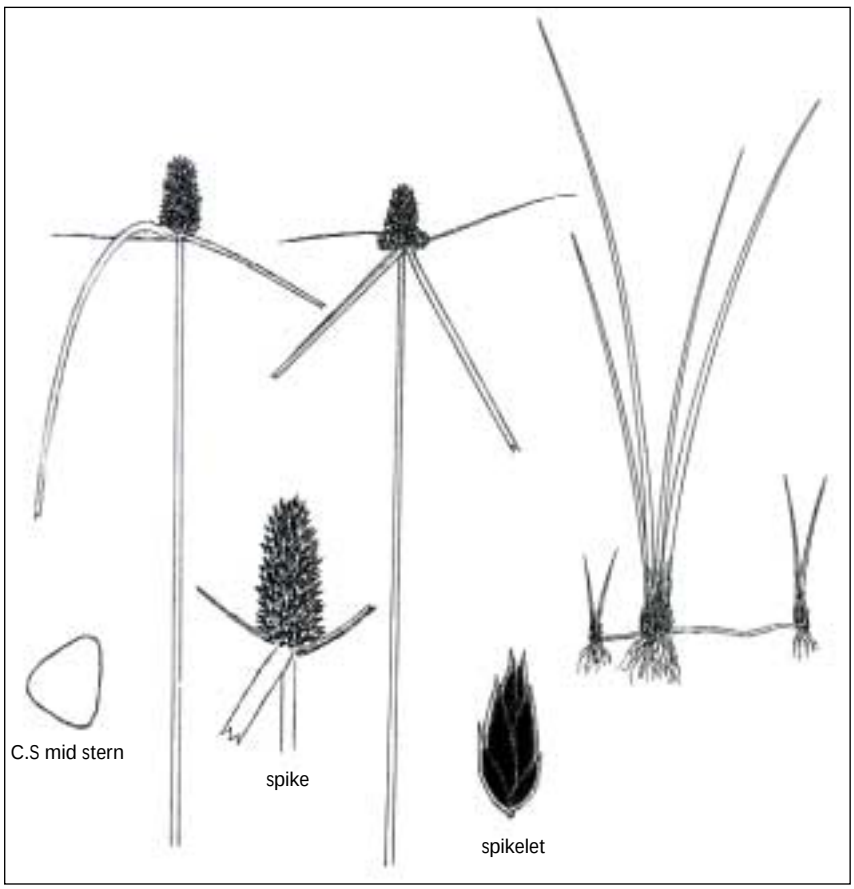
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering	■	■										■
Germination									■	■	■	
Regrowth									■	■	■	

■ General pattern of growth

Not much is known about the life cycle of *C. teneristolon* in Australia. The following information was obtained from its overseas locations, and from casual observations made in its current habitat in the Blue Mountains. Because *C. teneristolon* is a sedge, and from a tropical region, it does not go dormant during the winter, but slows its growth in cool periods. It regrows and germinates during the spring months, and flowers in the summer.

How it spreads

C. teneristolon is thought to have been introduced into the Australian natural environment by the dumping of garden plants at the Blue Mountains refuse tip. However, no source plant has ever been found. *C. teneristolon* is capable of spreading vegetatively, by its rhizome and stolon systems, and by seed. Its invasion of Yosemite Creek downstream from its source may have been via the movement of seed carried in the water. The whole spike will fall as one unit and eventually release the fruit (a nut) and the enclosed seed.



The roots of *C. teneristolon* are fibrous and the plant has an extensive rhizome system (underground stems) which supports its regrowth each season and helps it spread. Image not to scale.
Photo: Van Klaphake

The stolons spread the plant by clambering across the ground and forming new populations nearby. Rhizomes sprout new growth similarly, producing detached clumps. It is also possible for the stolons and rhizomes to break off and propagate in downstream locations, making the risk of spread even greater.

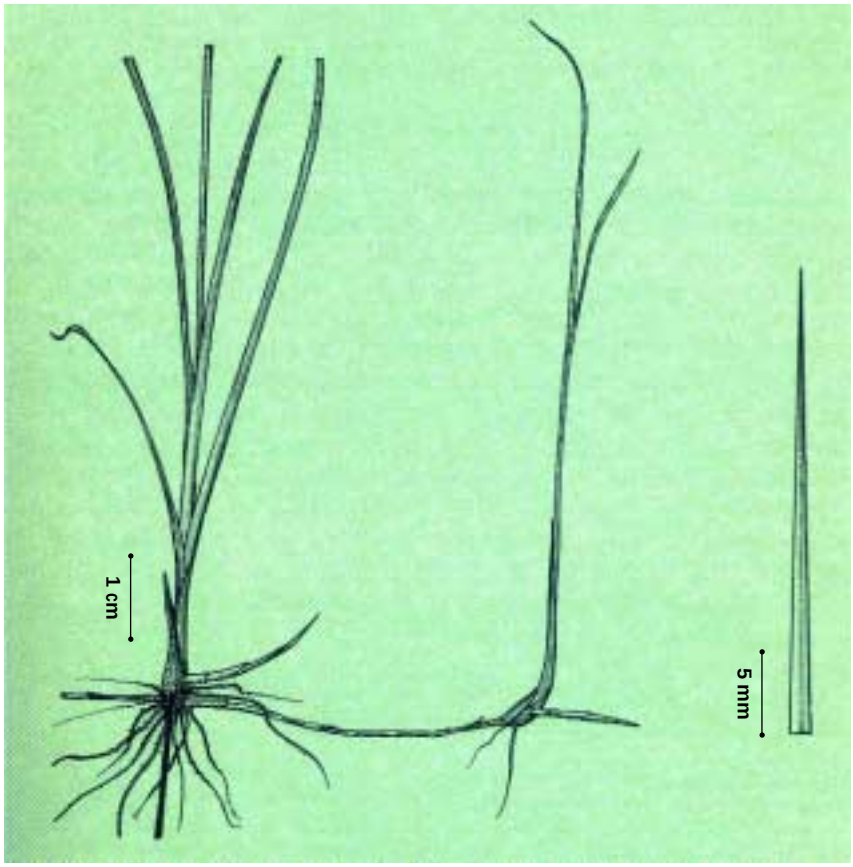
Where it grows

The only known occurrence of *C. teneristolon* in Australia invades a 2 km section of the Yosemite Creek in the Minnehaha Reserve of the Blue Mountains, New South Wales. It was first recognised as naturalised in Australia in February 2000, believed to be sourced from a refuse tip upstream of the current infestation.

C. teneristolon is native to Ethiopia and neighbouring countries, extending to South Africa. The Ethiopian climate is monsoonal, and temperatures range between approximately 20°C in the highlands and 40°C in the far eastern section of the country, where near-desert conditions exist. Most of the country is characterised by a high plateau (from 1500 m) and mountain ranges (up to 2440 m). Both native and naturalised populations of *C. teneristolon* suggest that it prefers highland areas with soils that are sandy and poor in nutrients.

The stolons and rhizomes of *C. teneristolon* can break off and propagate in downstream locations

It has become a localised weed of crops in the semi-arid Kenyan and Tanzanian highlands, but has also invaded damp rocky outcrop areas of Natal, South Africa. The plant is therefore capable of adapting to varied environmental conditions but shows a preference for damp open areas or rock outcrops. This is very similar to its current habitat in the Blue Mountains. *C. teneristolon* grows beneath an overstorey of eucalypt along Yosemite Creek but will also grow in full-sun environments.



C. teneristolon is a perennial sedge with triangular stems that generally grows in damp areas. Photo: Food and Agriculture Organisation of the United Nations

Why we need to be 'alert' to *C. teneristolon*

As it is a weed of both semi-arid agricultural crops and damp grasslands, the potential for its distribution in Australia is wide. *C. teneristolon* has spread 2 km from its source since discovery, and may continue to threaten native ecosystems downstream if not managed. In Australia it has only been reported as occurring in relatively isolated patches. However, widespread invasion has been observed overseas. References to the weed in the report 'Kenyan Agricultural Research for Plant Protection' describe *C. teneristolon* as widespread and naturalised within the country's agricultural and natural areas, necessitating herbicide control.

The location of *C. teneristolon* in the greater Blue Mountains National Park should make it a priority for control while it is still at a manageable level. Manual removal has been undertaken in revegetation areas with some success, but its

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

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.

presence near a creek line does present a threat to downstream areas. Care needs to be taken to avoid any damage to native vegetation.

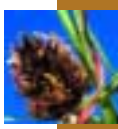
What to do about it

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 the escalation of these impacts, it is vital to prevent the further introduction and establishment of new weed species, such as *C. teneristolon*.

Small infestations may be eradicated if they are detected early, but an ongoing commitment is needed to ensure new infestations do not establish. In Kenya this weed has been successfully controlled using herbicides, but no herbicide is registered to control *C. teneristolon* in Australia.

The shape and colour of the flower spikelets (inflorescence) distinguishes *C. teneristolon* from all other sedge species.
Photo: John Hosking, NSW Agriculture



Quarantine to prevent further introductions

No importation of *C. teneristolon* 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 *C. teneristolon*. 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

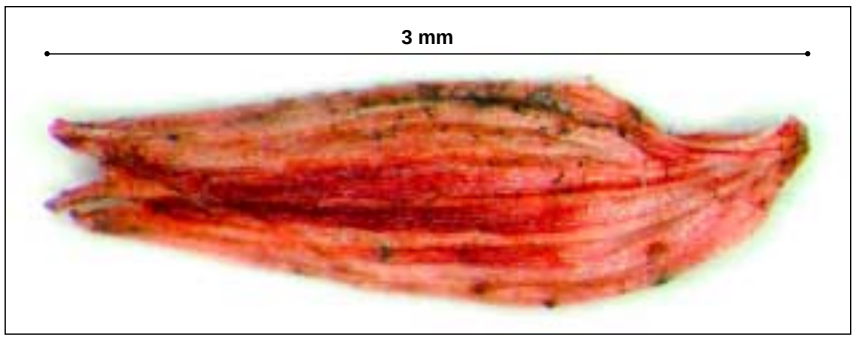
Some 65% of weeds which have recently established in Australia, including *C. teneristolon*, have escaped from plantings in gardens and parks. The detrimental impacts of these weeds far outweigh any potential horticultural benefits. The public should be made more aware of these impacts, and of other issues such as how to identify *C. teneristolon* and what to do if they find it.

C. teneristolon can be identified by its purple to black egg-shaped flower spikes that are made up of many tiny individual flower spikelets in an inflorescence. It has slender stolons that connect the individual plants together and its leaves are 1-3 mm wide. *C. teneristolon* has an extensive underground rhizome system which supports its growth each season and helps it spread.

New infestations of *C. teneristolon*

Because *C. teneristolon* has naturalised in only one known location, it can still be eradicated. Any new outbreaks should be reported immediately to your state or territory weed management agency or local council. Do not try to control *C. teneristolon* without their expert assistance. Control effort that is poorly performed or not followed up can actually help spread a weed and worsen the problem.

The flower of *C. teneristolon* is an egg-shaped purple to black-coloured spike consisting of many tiny spikelets.
Photo: NCW Beadle Herbarium, University of New England, NSW



Many of these tiny spikelets (inflorescence) make up the main flower spike of *C. teneristolon.*
Photo: NCW Beadle Herbarium, University of New England, NSW

Legislation

There is no legislation to control *C. teneristolon* 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

Information and guide revision: Tanya McLean (Bushcare Coordinator for the Blue Mountains), John Hosking (NSW Agriculture/Weeds CRC), Jeremy Bruhl (University of New England).

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 cyperus

Quick reference guide

Identification

If you suspect a plant to be *C. teneristolon*, 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. Features to aid in the identification of *C. teneristolon* include:

- purple to black egg-shaped flower heads
- slender stolons connecting the plants together
- leaves 1–3 mm wide.

Reporting occurrences

Once identified, new occurrences of *C. teneristolon* should be reported to the relevant state or territory weed management agency or local council, who can offer advice and assistance on its control. Because *C. teneristolon* represents a potentially serious environmental and economic threat to Australia, 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 may be required for some years.

Collecting specimens

State or territory herbaria can also identify plants from good specimens. These organisations can provide advice as to how to best 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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