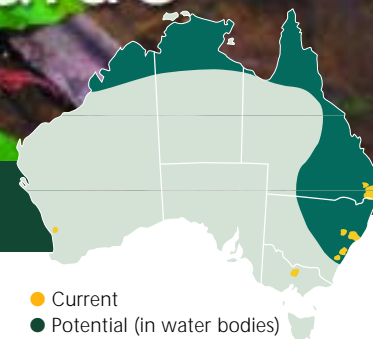


Weed Management Guide

Senegal tea plant –
Gymnocoronis spilanthoides



Senegal tea plant (*Gymnocoronis spilanthoides*)

The problem

Senegal tea plant 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.

Senegal tea plant can float on still or very slow-moving fresh water or grow as a bush on wet, marshy soils. It has been recorded at localised sites in most states. It is mainly spread by the careless disposal of aquarium plants or deliberate cultivation for sale.

Because Senegal tea plant grows very quickly, it can rapidly cover water bodies with a floating mat, excluding other plants and the animals that rely on them. The effects of flooding are made much worse because infestations block drainage channels. Recreational activities, irrigation and navigation may also be affected. Water quality may decline if large amounts of Senegal tea plant die off and rot under water.

The weed

Senegal tea plant can grow as an erect, rounded bush up to 1 m tall, but is more commonly found as a scrambling form extending from the edges of waterways

and forming dense tangled mats in open water. Young stems are 5–10 mm in diameter, increasing to 20 mm with age. Larger stems are hollow between the nodes (the joints between segments of stem) and float on water, and can reach a length of 1.5 m. The leaves are dark green, 50–200 mm long and arranged in opposite pairs along the stem. The edges of the spearhead-shaped leaves are serrated.

The numerous, white, ball-shaped flowers, 15–20 mm in diameter, occur at the ends of stems. The ribbed seeds are yellow–brown and 5 mm in diameter. Thin, fibrous roots can develop at any node that is in contact with moist soil or immersed in water.



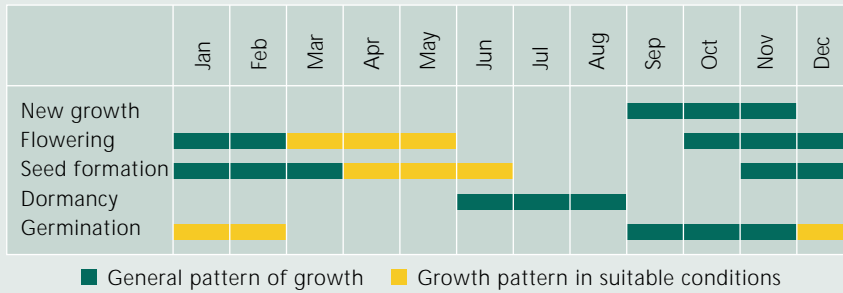
Senegal tea plant is mainly spread through human activities, particularly the careless disposal of aquarium plants in creeks and drains.
Photo: Jim Wilding, Goulburn–Murray Water

Key points

- Senegal tea plant is a highly invasive aquatic weed occurring in scattered infestations around the country.
- It blocks drainage channels and degrades natural wetlands by displacing native plants and animals.
- Preventing its further introduction and spread will require greater public awareness of how to identify it and the risks that it poses.
- Contact your state or territory weed management agency or local council if you find Senegal tea plant. Do not attempt control on your own, as it can spread very easily from dislodged fragments.



Growth calendar



Flowering in Senegal tea plant commences in late spring or early summer and continues until the cooler weather of late autumn. Seed formation occurs about one month after flowering. Plants become dormant during winter and new growth reshoots from the crown and nodes during the following spring.

Most seeds germinate in spring, although some germination may continue into summer. Seedling growth is rapid, and plants quickly reach the surface if submerged in shallow water.

Senegal tea plant is a perennial that lives for at least several years.

How it spreads

Senegal tea plant can reproduce by seeds and vegetation. The seeds are quite heavy and most drop near the parent plant or can be spread by flowing water. Seeds can also be spread in mud attached to animals or machinery. Recent research has shown that seed production in infestations near Brisbane is extremely low, less than 1% of its potential, which indicates that spread of Senegal tea plant by seed is not very important there.

Vegetative spread occurs when any part of the stem that includes a node breaks away from the main plant, eg in fast flowing water. When the stem fragment settles on the stream bed it sends out fine roots from the node, and can grow into an entire new plant. This new plant can spread quickly and create a colony by producing roots where nodes come in contact with moist soil. Stem fragments can also be accidentally spread by transport of machinery (eg boats, trailers, lawnmowers) or in animals' hooves.



The dark green leaves are long (up to 200 mm), spearhead-shaped and serrated on the edges. Photo: Graham Prichard, Port Stephens Council, NSW



The importation of Senegal tea plant into Australia is not permitted as, among other reasons, increased genetic diversity could lead to increased seed production ability. Photo: Jim Wilding, Goulburn–Murray Water

Senegal tea plant was introduced into Australia from India by the aquarium industry. It was first recorded as growing in the wild in the Manning River near Taree, New South Wales, in 1980. Several other infestations have been recorded throughout New South Wales, with more recent spread recorded at several sites in and around Brisbane. Infestations were recently recorded from Perth and at Lake Nagambie and Cranbourne South in Victoria.

Where it grows

Senegal tea plant grows in wetlands, particularly degraded waterways. It can flourish in still or slow-moving fresh water, rooted in the bank and floating out into the waterway. It survives and continues growing even when completely inundated. It also grows on wet marshy soils near water.

Senegal tea plant grows very quickly in fertile environments, with growth rates exceeding 150 mm a week.

It is a native of tropical and subtropical regions of the Americas, from Mexico to Argentina, where it has also been recorded as a weed. New Zealand and India are other countries where it has become weedy.

Why we need to be 'alert' to Senegal tea plant

Senegal tea plant poses a significant risk to the health of wetland ecosystems. It can quickly take over wetlands and detract from their environmental value, natural beauty and recreational potential. In New Zealand it has caused flooding by blocking streams and drainage channels.

If not controlled, Senegal tea plant will become a major weed of wetlands around Australia

It could potentially infest wetlands throughout much of Australia. It has a wide climate tolerance and has been found in cultivation well outside its predicted range.

It is also very difficult to control because it can spread by both seed and vegetative reproduction. Even tiny pieces of vegetation can give rise to new colonies. Because it is found mainly in water, the potential impacts of herbicides on non-target plants and animals must also be carefully managed.



Senegal tea plant can grow out from riverbanks and cover the surface of still or slow-moving waterways. Photo: Graham Prichard, Port Stephens Council, NSW

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 Senegal tea plant, into uninfested natural ecosystems.

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>Koelreuteria elegans</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.dwlbcsa.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.

It is illegal to cultivate Senegal tea plant in most states and territories as it is a declared noxious weed. Unfortunately, as with many aquatic weeds, there is evidence that Senegal tea plant has been deliberately planted and farmed on public lands. These activities must be stopped to prevent its introduction and further spread throughout Australia. Notify the vendor or state or territory weed control contacts if you find Senegal tea plant for sale.

Early detection and eradication are also important to prevent the spread of Senegal tea plant. Small infestations can be 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 Senegal tea plant 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. For plants, such as Senegal tea plant, which have low seed production, this new genetic diversity could potentially increase its ability to produce seeds or survive in Australian conditions, and make it more weedy than it already is.

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 Senegal tea plant. 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, including Senegal tea plant, which have recently established in Australia have escaped from ornamental planting in gardens and aquaria. 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 Senegal tea plant and what to do if they find it.

A quick identification aid is that any water plant with white, ball-shaped flowers is likely to be a weed, either Senegal tea plant or the *Weed of National Significance*, alligator weed (*Alternanthera philoxeroides*). Senegal tea plant has serrated leaf edges



The white ball-shaped flowers are a distinctive feature of Senegal tea plant.
Photo: Graham Prichard, Port Stephens Council, NSW

whereas alligator weed has rounded leaf edges.

New infestations of Senegal tea plant

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



Controlling Senegal tea plant around Brisbane

Brisbane City Council is responsible for controlling about a quarter of the 20 or so infestations of Senegal tea plant in the Brisbane area. Infestations up to 1.5 km long were found along degraded sections of urban creeks, such as Ithaca, Lota and Wynnum creek's in the mid 1990s. Most are thought to have been the result of the careless disposal of aquarium plants into Brisbane's waterways. However, a few infestations were probably illegally planted for harvest and subsequent sale to the aquarium plant industry.

The infestations have been targeted for eradication due to their invasiveness and impacts on natural ecosystems. However, the eradication program being conducted by the Council's Vegetation and Pest Services has had mixed results. Several different methods have had to be trialled because the traditional approach for dealing with such weeds was not working. Council staff consider it to be one of the most difficult plants they have ever had to deal with.

However, one aspect of Senegal tea plant's biology is making control easier than it might otherwise be. Council staff have found that the seed has not been contributing to its spread. The pattern of spread can be attributed to vegetative reproduction and deliberate plantings. In fact, in the early years an uninformed landholder had caused a major infestation

by using a whipper-snipper to mow a small patch of a hundred or so plants. The resulting fragments floated downstream and took root, creating several new colonies and making the problem much worse.

Apart from the ease with which it spreads from small fragments, the other main difficulty in dealing with Senegal tea plant is that it is very hard to kill. Herbicides traditionally effective on most other similar plants kill only the upper parts of the plant. Any material that is below the water line is not killed, and can regrow and form new plants. Herbicides are now used only when the creeks and streams are not flowing and the Senegal tea plant is completely above water. Council workers carry 5 L backpack sprayers and treat infestations during weed surveys or other work. This method gives good kill rates. There are several herbicides registered for 'minor off-label use' on permits issued by the Australian Pesticides and Veterinary Medicines Authority.

Other methods of weed control have also been trialled. Hand pulling of small patches did not remove all plant parts, and infestations were able to regenerate and spread further. Mechanical removal of infestations has been used where de-silting operations were also required to clear drains. First, infestations are



Flowering occurs in spring and summer.
Photo: Jim Wilding, Goulburn–Murray Water

sprayed with herbicide to reduce the risk of spreading plant parts. Then, 7–10 days later, all silt and plant material up to a depth of 1 m is removed by heavy machinery and taken away to be spread out and dried. Depending on the local weather, all plant material is dead after about a month of drying and the silt and soil can be reused. This reduces the costs of weed control and allows better drainage for the creek system.

Despite these successes, controlling and hopefully eradicating Senegal tea plant requires an ongoing commitment, particularly if this weed continues to be illegally planted.



The fibrous root system develops at any node in contact with water or moist soil.
Photo: Jim Wilding, Goulburn–Murray Water

Legislation

Senegal tea plant is a declared weed in all states and territories except Victoria and the Northern Territory. Where it is declared, landholders are required by law to control Senegal tea plant or notify state or territory governments or local councils of its presence.

Acknowledgments

Information and guide revision: Tom Anderson (Qld DNRM), Steve Csurhes

(Qld DNRM), Lalith Gunasekera (Vic DPI/Weeds CRC), Sandy Lloyd (WA Agriculture/Weeds CRC), Rod Wood (Brisbane City Council) and John Thorp (National Weeds Management Facilitator).

Maps: Base data used in the compilation of actual and potential distribution maps provided by Australian herbaria via Australia's Virtual Herbarium and Queensland DNRM, respectively.

If you find a plant that may be Senegal tea plant

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 Senegal tea plant are:

- white, ball-shaped flowers, which occur in groups at the ends of stems and appear mainly between October and February, but sometimes until May

- spearhead-shaped leaves with serrated edges, occurring in opposite pairs
- growth forms that include buoyant stems extending out from creekbanks and scrambling or erect bushes in wet, marshy swamplands.

Reporting occurrences

Once identified, new occurrences of Senegal tea plant 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 Senegal tea plant spreads so easily and poses such a serious threat, 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 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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