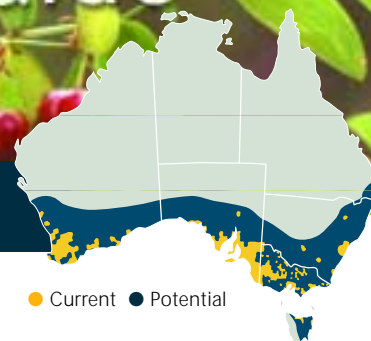


Weed Management Guide

Bridal creeper –
Asparagus asparagoides



Bridal creeper (*Asparagus asparagoides*)

The problem

Bridal creeper is a *Weed of National Significance*. It is regarded as one of the worst weeds in Australia because of its invasiveness, potential for spread, and economic and environmental impacts.

Bridal creeper entered the country as a garden plant and is now a major weed of bushland in southern Australia, where its climbing stems and foliage smother native plants. It forms a thick mat of underground tubers which impedes the root growth of other plants and often prevents seedling establishment. Rare native plants, such as the rice flower *Pimelea spicata*, are threatened with extinction by bridal creeper.

It invades undisturbed habitats and is a major threat to most low shrubs and groundcover plants in mallee, dry sclerophyll forest and heath vegetation. In South Australia and southwestern Western Australia bridal creeper is considered the most important weed threat to biodiversity.

It also causes losses to primary industries (eg by shading citrus and avocado trees and interfering with fruit picking), especially in the Murray River irrigation area.

The weed

Bridal creeper has annual, climbing shoot growth from a perennial root system consisting of many tubers (food storage organs) grouped along a central rhizome (an underground stem with shoot buds).



Bridal creeper is a major weed of bushland in southern Australia, where its climbing vegetation smothers native plants.

Photo: Graeme Pritchard

The underground mat of rhizomes and tubers makes up the bulk of the plant. These tubers provide water, energy and nutrients that enable the plant to survive over summer and allow rapid shoot growth in autumn.

Twisting stems grow up to 3 m in length, with leaves borne in groups on short side branches. Numerous shoots are produced from one patch of roots and entwine with each other and the native vegetation, making it almost impossible to identify individual plants. Bridal creeper produces pea-sized green berries which ripen to red and usually contain two or three black seeds.

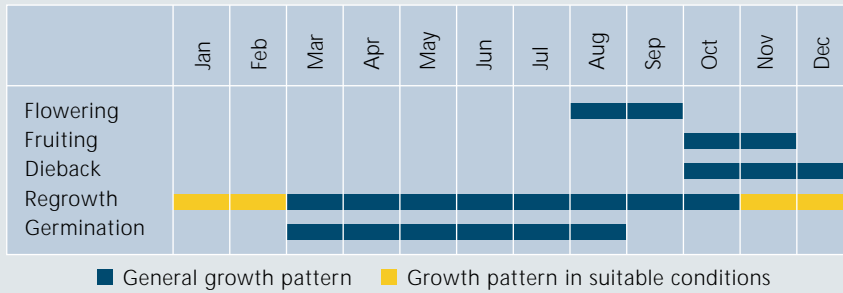
Although one of its common names is 'smilax', it is not related to native species in the genus *Smilax*.

Key points

- Prevent new areas from becoming infested by safely disposing of garden waste.
- Spraying herbicide is the most effective method of controlling bridal creeper.
- Biological control is also having an impact in many areas; local communities can become involved in rearing and releasing the bridal creeper leafhopper and spreading the rust fungus.
- It will take many years for the biocontrol agents to reduce the density of bridal creeper due to the huge reserves stored underground in tubers.



Growth calendar

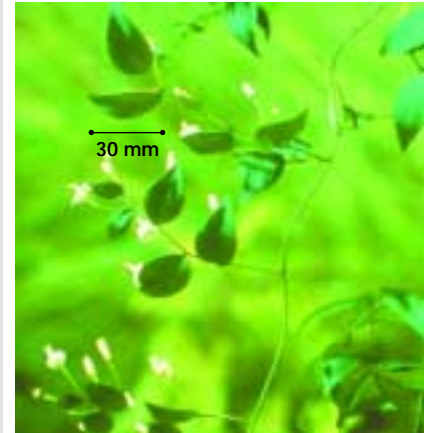


Seeds germinate in autumn and winter in leaf litter and at soil depths of up to 100 mm. Buried seed that does not germinate rots within two years, while seeds on the soil surface may be viable for at least three years. Compared to many other weeds, bridal creeper has a short-lived seedbank.

Shoots of bridal creeper typically emerge from the soil in autumn but earlier emergence can occur in years of high summer rainfall. Shoots may be present year round in areas which normally have summer rains or are under irrigation. Bridal creeper plants take at least three years to reach flowering size, the flowers appearing along the length of the shoots in August and September. The green berries turn red in late spring to early summer.

There can be large differences in fruit production between years and sites. Early autumn rains allow a longer growing season, which favours high fruit production. The amount of fruit set is significantly greater where shoots are able to grow vertically by climbing up shrubs and trees, and less where the plants are heavily shaded, suffer water stress or where there is a high level of competition between shoots (ie older, dense infestations).

Leaves turn yellow and fall and stems die back in late spring – early summer as temperatures rise and soils become dry.



Bridal creeper tolerates a wide range of soil and climatic conditions and, unlike many other weeds, can establish in undisturbed areas.
Photo: Weeds CRC

very popular in floral arrangements, especially bridal bouquets, and as a plant for hanging baskets.

Where it grows

Bridal creeper is widespread in southwestern Western Australia, southern South Australia and eastern Victoria. Although it is spreading through New South Wales and Tasmania, it could still be eradicated there with a sustained effort.

As well as a wide range of natural habitats, bridal creeper grows well in citrus orchards and pine plantations. It can grow in most soils but is most common close to the coast where it invades woodlands and other open coastal vegetation. It is particularly vigorous in alkaline sandy soils and thrives in areas high in nutrients such as drainage lines. Roadsides next to farms are favoured sites because of increased nutrient levels from fertilised paddocks. Bridal creeper is frost tolerant and its perennial root system enables it to survive summer drought.

Potential distribution

Bridal creeper could potentially extend its current distribution into southeastern Queensland. It could also spread further and increase its density in regions where it is present but not widespread, eg the central north and far southeast coasts of Western Australia and northern and southwestern Victoria.

How it spreads

Bridal creeper plants can produce more than 1000 berries per square metre. Birds feed on the berries and later excrete the seeds at perch sites, usually within 100 m of source plants. However, seed dispersed by birds has helped spread the weed along roadsides and into native vegetation patches further afield. Rabbits and foxes also eat fruit and disperse seeds.

The plant can spread as the root system slowly expands in area. Movement of soil containing roots (eg by grading) can spread plants further. Dumping of garden rubbish containing bridal creeper seeds or roots also spreads the weed.

Bridal creeper was first recorded in a nursery catalogue in 1857. With its dainty white flowers and stems covered with heart-shaped green leaves, it proved



Bridal creeper produces bright red berries, which are eaten by birds and foxes, enabling it to be spread over long distances.
Photo: Colin G. Wilson



Physical removal is not effective unless all the rhizomes are dug up and destroyed.
Photo: Kate Blood

What to do about it

Bridal creeper has a number of features which make it difficult to control – its tuber reserves provide a buffer against adverse seasons, it has a wide germination range and, unlike some other weeds, it can invade undisturbed sites.

But there are also weaknesses in its biology – it has a relatively short-lived seedbank, seed production only occurs on early emerging stems, and the seed output in old infestations is small.

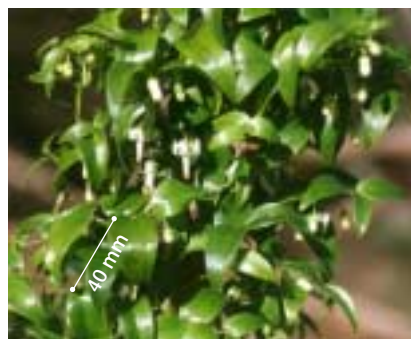
It is vital to keep uninfested areas free of bridal creeper

Gardeners must be discouraged from planting bridal creeper, and encouraged to replace existing plants with desirable species and safely dispose of garden waste. Mapping is important to determine what area of bridal creeper is present in a region; where infestations are located (particularly in relation to areas of significant native vegetation); which infestations are eradicable; which infestations are likely to be major seed sources; and where buffer/control zones should be located.

New infestations of bridal creeper are often associated with the tallest trees, reflecting preferred bird perching sites.

When searching for bridal creeper, check tree corridors and taller trees on the edges of native vegetation. Weed surveys should extend several hundred metres from source infestations to ensure most of the bird dispersed seeds/seedlings are picked up, and buffer zones for bridal creeper should be 500 m wide around the edge of an infestation.

Within the buffer zone the aim is to limit further spread. The conventional approach is to focus on the small patches at the edge of an infestation, working back towards the centre. However, an alternative approach is to target the larger climbing infestations that produce the most seed and are thus most attractive to birds. A two-pronged attack may be best but research is needed to confirm this.



The many shoots entwine with each other and the native vegetation, making it almost impossible to identify individual plants.
Photo: Colin G. Wilson

Herbicides

Herbicides have been the most effective method of control. However, because bridal creeper often grows in areas of native vegetation, it is particularly important to avoid contact with desirable plants or soil near tree root zones.

Isolated plants can be treated with a recommended herbicide applied by spot spraying. As infestations become larger, a strategically staged approach for removal is advisable to ensure that treated areas are not reinfested.

Off-target impacts have been a concern where herbicide has not been applied carefully. The best way to apply it is with a hand sprayer, but it can also be wiped directly on the leaves. Using a herbicide coloured with dye helps show where it has been used and limits spillage and wastage.

Biological control

In South Africa bridal creeper is an uncommon plant that is kept in check by its natural enemies.

Three of these enemies have been released in Australia: the bridal creeper leafhopper (*Zygina* sp.), rust fungus (*Puccinia myrsiphyllii*) and leaf beetle (*Crioceris* sp.).

The bridal creeper leafhopper has been released at more than 700 sites throughout southern Australia since 1999. The adult insect is white, 2–3 mm long and lives on the underside of



The bridal creeper leafhopper (*Zygina* sp.) has been released at more than 700 sites throughout southern Australia.
Photo: CSIRO

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 |
| 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 |
| Australia wide | Australian Pesticides and Veterinary Medicines Authority | (02) 6272 5852 | contact@apvma.gov.au | www.apvma.gov.au |

For up-to-date information on which herbicides are registered to control bridal creeper and the best application methods and dosages, contact your state or territory weed management agency or local council. This information varies from state to state and from time to time. Contact details are listed above, including contacts for the Australian Pesticides and Veterinary Medicines Authority, which hosts the PUBCRIS database. This database contains information on all herbicides that are registered for use on weeds in each Australian state and territory.

When 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.

bridal creeper leaves. Both the adult and juvenile stages feed on the leaves of the weed, causing them to turn white and, in severe cases, fall off. The plant will continue to grow but with much less vigour. Continual damage over several years will reduce new tuber production, making it less competitive.

Rearing the leafhopper is easy and many schools and community groups have become involved in breeding up populations for local release. It can produce several generations a year and females are highly reproductive, so populations can quickly increase.

The bridal creeper rust fungus was released in 2000 and more than 700 releases have been made across Australia. The rust fungus attacks leaves and stems, reducing the amount of green plant material. It can produce many generations a year, resulting in large amounts of wind-dispersed spores. It produces an over-summering spore to survive the summer absence of bridal creeper. It should spread within and between bridal creeper infestations efficiently but spread will be faster with more regional releases of the rust.

The release technique for the rust is a simple process that entails shaking



The bridal creeper rust fungus attacks leaves and stems, reducing the amount of green plant material.
Photo: John Virtue

some of the spores onto the leaves, spraying them with water, covering them overnight with a plastic bag, then removing the plastic bag the next day.

The techniques to redistribute the leafhopper and the rust fungus are described in detail on the CSIRO website, which also has a map of release site locations <www.ento.csiro.au/bridalcreeper>.

The bridal creeper leaf beetle (*Crioceris* sp.) was first released in 2002 in Western Australia. The grubs of the beetle can cause major damage to bridal creeper by stripping the shoots and leaves that enable the plant to climb. Stopping it climbing will stop it fruiting and spreading



Physical removal of established bridal creeper infestations is made virtually impossible by the extensive mats of tubers.
Photo: Kathryn Batchelor

to new areas. Trial releases in other regions are continuing.

It will take many years for the biocontrol agents to reduce the density of bridal creeper due to the huge reserves stored underground in tubers.

Other control methods

Physical removal is not effective unless all the rhizomes are dug up and destroyed. This may be possible for new, small infestations or as a follow-up after several years of herbicide control of a larger infestation. Slashing the stems and leaves may prevent fruit production and slowly deplete root reserves but it will not eradicate an infestation.



Fire can help in larger infestations. Fires in late summer and early autumn can remove all understorey vegetation and improve access for later spraying. In winter-rainfall areas, bridal creeper often emerges before the first autumn rains so herbicides may be applied before post-fire regeneration of native vegetation. As well as improving the effectiveness of herbicide application, fire may help to destroy bridal creeper seed and the dense tuber mat.

However, use of fire requires permission from government authorities and its frequent use may endanger the survival of many native plant populations.

Grazing

Grazing can provide some control of bridal creeper. Tamar wallabies on Garden Island in Western Australia have successfully kept it at low levels there, and sheep grazing may be an option to control it under trees in remnant vegetation, woodlots and shelterbelts.

Control in horticulture

In citrus and avocado orchards it is difficult to spray bridal creeper entwined in the leaves of trees. Pruning lower limbs to provide access underneath trees, a practice known as 'skirting', enables spot spraying with a recommended herbicide.

Trials with biocontrol agents began in citrus orchards in 2001.

Disposal

If the plant is being removed from gardens, dispose of it through local government kerbside collection or tip facilities. Fruiting shoot material should be bagged immediately to avoid it being dropped or dispersed by birds. Root material (which can survive being dried for long periods) and seeds should not be composted or mulched.

Follow-up

Follow-up actions are required after treatment. If fire is used, regrowth should be treated carefully with herbicide to limit



Bridal creeper causes losses in citrus orchards by shading trees and interfering with fruit picking. Photo: Rae Kwong, DPI Vic

above-ground growth and further reduce the stored root reserves. Infestations should be monitored regularly and over several years because of the probability of regrowth from remnants of the root system. Regularly check for new incursions, carefully removing them or treating them with herbicide, as necessary. For new or small infestations hand digging of roots may be an appropriate follow-up technique.

Legislation

Bridal creeper is a declared noxious weed in South Australia, New South Wales and Tasmania, meaning that landholders in these states are required to control it. It is not declared in Victoria although it is a major weed there. Bridal creeper is listed as a prohibited plant in Western Australia, meaning that it cannot be brought into the state.

Acknowledgments

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Maps: Australian Weeds Committee.

...case study

Strategic management of bridal creeper on Kangaroo Island

At the eastern end of South Australia's Kangaroo Island bridal creeper is causing devastation. It has smothered the understorey of many roadside verges and is even killing small trees. It is also extending into the island's national parks.

A targeted control program involving landholders, community groups, national park rangers and weeds officers is underway to tackle the problem, and is being partly funded through the Commonwealth Government's Natural Heritage Trust.

Mapping and identifying control areas has been an integral part of the strategy, says Beverley Overton of the Kangaroo Island Bridal Creeper Control Committee.

While herbicides continue to be the main method of control, field trials of the bridal creeper leafhopper and rust fungus, which have both been released on the island since 2000, are taking place. Although the leafhopper has not had a major impact, the rust fungus is doing exceptionally well in several locations.

Contractors have been spraying infestations with herbicide and property

owners are gradually taking over treated areas to ensure they remain weed free.

In 2003 contractors will also be collecting and spraying rust fungus as an experiment. Spread of the fungus by wind is very variable so the committee hopes to obtain better establishment by spraying it with water, particularly in inaccessible locations such as along creek lines.

After eight years the control program has achieved significant results. Three years after spraying, infestations 2 m high and 2 m deep have been reduced to a few tendrils.



How to control bridal creeper

Quick reference guide

Prevent new outbreaks

Do not plant bridal creeper in your garden; replace existing plants with desirable species and safely dispose of garden waste. Keep 500 m buffer zones for bridal creeper around the edge of an infestation.

A strategic approach

Because of extensive storage reserves in the root tissues, the most effective means of managing bridal creeper involves integrating a range of treatment techniques.

On a regional scale mapping is important to determine the area of bridal creeper that is present, where infestations are located and which ones are likely to be

major seed sources, and where buffer/control zones should be located.

New outbreaks

New outbreaks are often associated with the tallest trees, where seeds have been spread by birds. Isolated plants can be treated with a recommended herbicide applied by spot spraying. As infestations become larger, a strategically staged approach for removal is advisable to ensure that treated areas are not reinfested.

Follow-up

Follow-up actions are required after treatment. After fire treat regrowth carefully with herbicide to limit above-ground growth and further reduce the stored root reserves. Monitor infestations regularly and over several years because



The best way to apply herbicide on bridal creeper is with a hand sprayer.
Photo: Kate Blood

of the probability of regrowth from remnants of the root system. Regularly check for new outbreaks. It may be possible to hand dig roots in new or small infestations.

Control options

| Type of infestation | Herbicide | Physical | Fire | Mechanical | Biological |
|---------------------------------------|---|---|---|---|--|
| Isolated plants or small infestations | Once plant is correctly identified, treat with registered herbicide. | Remove isolated plants before seeding. Be sure to remove all underground rhizomes and tubers. | Not suitable. | Not suitable. | Not suitable. |
| Larger infestations | Apply after a prescribed fire in autumn when growth is most vigorous. Avoid contact with desirable plants or soil near tree root zones. | Not suitable. | Use a prescribed burn in autumn followed by application of herbicide. | Slashing the stems and foliage may prevent fruit production and deplete root reserves, but must be continued over several years in the absence of other treatments. | Community groups can become involved in rearing the bridal creeper leafhopper and distributing the rust fungus. See CSIRO website (details on p.4) for more information. |
| Orchards | Spot spray with recommended herbicide. | Prune lower limbs to provide access under trees. | Not suitable. | Not suitable. | Trials began in citrus orchards in 2001. |

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