

best practice management guide

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BEST PRACTICE MANAGEMENT GUIDE FOR ENVIRONMENTAL WEEDS

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Bridal creeper, *Asparagus asparagoides*

Taxonomy and status

Botanical name: *Asparagus asparagoides* (L.) W. Wight (synonyms: *Myrsiphyllum asparagoides*, *Asparagus medeoloides*, *Dracaena medeoloides*, *Elachanthera sewelliae*, *Luzuriaga sewelliae* and *Medeola asparagoides*) - Family Asparagaceae (Asparagus family) in the narrow sense or Liliaceae (Lily family) in its broad sense.

Standard common name: bridal creeper. Other common names include bridal veil (also used for *Asparagus declinatus* in SA) or smilax (not to be confused with the indigenous plant genus *Smilax*, which is unrelated).

Relationship to other species in Australia: The only species of *Asparagus* that is native to Australia is *A. racemosus* (syn. *Protasparagus racemosus*, *A. fasciculatus*, *A. acerosus*, *A. brownei*). The species occurs in northern Australia in Queensland, WA and NT and is also native to SE Asia, India and Africa. It is relatively uncommon, but may form tangled masses along watercourses. It is distinguished from bridal creeper by its narrow 'leaves' to 1 mm wide and more tuberous roots.

Bridal creeper should not be confused with related weedy members of the same genus such as *Asparagus densiflorus* (syn. *A. aethiopicus*, *A. sprengeri*; asparagus fern), *A. declinatus* (syn. *A. crispus*; bridal veil), *A. scandens* (asparagus fern) (Figure 1) and *A. plumosus* (syn. *A. setaceus*; climbing asparagus) among others. These species also may occur as escaped garden plants in habitats similar to those invaded by bridal creeper. There are other weedy *Asparagus* family members in Australia.

Legislation: Bridal creeper is listed as one of Australia's 20 *Weeds of National Significance*. Legislation relating to its control exists in Tasmania, South Australia and New South Wales. It is not declared in Victoria or WA. Keep up to date with the latest legislation through local and State/Territory

government weed agencies or on the web at www.weeds.org.au



Figure 1. Foliage of *Asparagus scandens* (left) and *A. asparagoides* (right).
Photo: K. Blood.

Description

Habit/lifeform: Climbing plant. Shoots emerge annually from a perennial root system consisting of a branching rhizome and numerous tubers. The shoots scramble across the ground and climb shrubs and trees. These shoots cease growth at flowering; they normally die in late spring, but may survive longer in areas with sufficient summer rainfall.

Description: Twisting stems grow to as much as 3 m in length and branch extensively. As numerous shoots are produced from a given patch of roots and entwine with each other and the indigenous vegetation, identification of individual plants is almost impossible.

Bridal creeper has shiny green 'leaves' 4-30 mm wide and 10-70 mm long which occur along the length of wiry green stems. Stems emerge annually in autumn from a mat, 0-10 cm deep, of branching rhizomes that bear numerous fleshy tubers. White, 6-petalled flowers, 5-8 mm in diameter (Figure 2), appear in early spring, with green berries turning pink then red/burgundy in late spring-early summer



Bridal creeper foliage.
Photo: K. Batchelor.



Bridal creeper smothering bushland.
Photo: K. Blood.



Bridal creeper foliage and flowers.
Photo: K. Blood.



(Figure 3). Pea-sized berries contain 1-9 seeds that are black when mature. With berry ripening, leaves yellow and fall, and stems begin to dry out and die back.



Figure 2. Flower of *A. asparagoides*.
Photo: K. Blood.

garden plant; its flowers were used in floral arrangements, particularly in wedding bouquets. Within 50 years of introduction, bridal creeper had become naturalised in many areas across most of southern Australia.

Distribution: Widely distributed through southern WA, SA, Vic and parts of NSW, Qld, Lord Howe Island and Tas. It prefers shaded or part-shaded situations. It is also a weed in New Zealand and South America.

Ecosystems invaded: Bridal creeper invades a wide range of habitats in each of the above States including coastal vegetation (Figure 4), wet and dry sclerophyll forests, heathlands, mallee shrublands, creek- and river-banks.

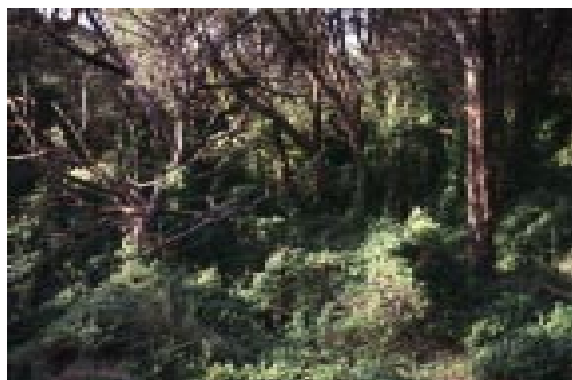


Figure 4. Infestation of *A. asparagoides* in coastal vegetation.
Photo: K. Blood.



Figure 3. Fruit of *A. asparagoides*, note green fruit ripening to burgundy.
Photo: A. Willis

Impacts

Species and ecosystems at risk: Bridal creeper is very competitive. Its shoots form a dense canopy which shades indigenous shrubs, herbs and seedlings. The tuber mat forms a thick barrier just below the soil surface which limits the access of other plants to soil moisture and nutrients. This barrier makes it difficult for seedlings of indigenous plants to establish. Bridal creeper will reduce the number and density of indigenous plants, in turn affecting animals which depend on these plants. Some rare species, such as orchids and *Pimelea spicata* (Figure 5), are threatened with extinction because of competition from bridal creeper.

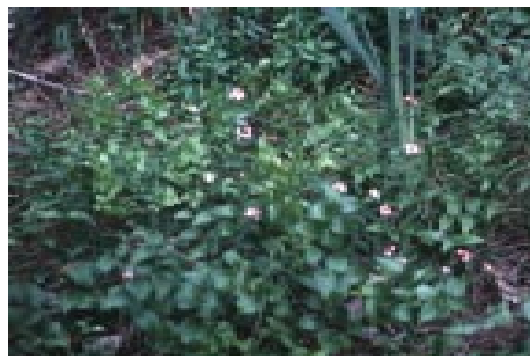


Figure 5. *Pimelea spicata* being smothered by *A. asparagoides*. Photo: A. Willis.

Origin and distribution

Origin: Bridal creeper comes from a range of climatic regions in southern Africa including areas with winter-, summer- and evenly-distributed rainfall.

Introduction: First recorded in Australia in 1857 in a nursery catalogue. By the 1870s bridal creeper was a common



Economic impact: Bridal creeper can cause direct economic losses through smothering planted tree seedlings in forestry areas and in citrus orchards (Figure 6). It does not persist in pastures or most cropping situations due to grazing, cultivation and herbicides. In indigenous vegetation, the economic cost of a loss in biodiversity is immeasurable. Managers of conservation reserves, however, face considerable direct costs in managing infestations. Bridal creeper is time-consuming to treat. Herbicides must be used for effective control of dense infestations, an operation that must be done carefully to avoid damaging indigenous plants.



Figure 6. Bridal creeper smothering citrus orchard.
Photo: J. Altmann.

Dispersal and establishment

Reproductive techniques: Seeds germinate readily and vegetative reproduction commonly occurs from small sections of actively growing root rhizome. There have been no reports of regeneration from tubers alone, which are attached to the rhizome.

Vectors and dispersal mechanisms: Bridal creeper is primarily spread by fruit-feeding birds (both introduced and indigenous) that eat berries and excrete seeds. Rabbits and foxes have also been observed to eat fruit and disperse seeds. Berries may be dispersed by water down watercourses. Other methods of spread include dumping of garden rubbish and movement of seed- or root mass- contaminated soil by machines such as graders along road verges.

Persistence: The plant is able to persist mainly by way of the 'bud bank', with numerous shoot buds located along the underground rhizomes. Although over 1 000 berries per square metre may be produced, the carryover of viable seeds between years is minimal. Viable seeds can germinate from a depth of 10 cm, though most buried seed germinates and the remainder rot within 2 years. Dry seeds may remain viable for at least three years.

Tolerances: Bridal Creeper is found on most soils and can tolerate a wide range of pH. Fleshy tubers enable tolerance of low light intensities, drought conditions and saline soils. It thrives in nutrient-enhanced soils such as along drainage lines.

Properties

Health risks & other undesirable traits: Stems smother indigenous vegetation and can form an impenetrable 'web' that impedes access to bushland for both management and recreational access. Dense infestations limit the amount of light reaching the soil and 'choke' more desirable indigenous species. The dense shoot system can also interfere with fruit picking in citrus orchards.

Cultural uses: Used as a garden or hanging-basket plant, and in floral arrangements.

Biology and ecology

Biology and ecological notes: An important biological characteristic of bridal creeper is its robust tuber mat – 100% of the live plant weight is below ground when the shoots die back each year and at least 87% of the plant weight is below ground when it is actively growing (Figure 7). The tuber mat is similar to the seed bank of other species in conferring local persistence and an ability to withstand disturbance.

Growth calendar: In winter rainfall areas, seasonal stem growth from the tuber mat begins in March, with the first flowers appearing in August-September. By early November, green berries are beginning to ripen and turn red, whereas the leaves are beginning to yellow and fall. By early December, most shoots have died back. Heavy rainfalls in summer may modify the timing of these growth characteristics.



Figure 7. Above and below ground parts of *A. asparagoides*, note large tuber mat.
Photo: R.H. Groves.



Management

Prevention: It is important to keep uninfested areas clear of bridal creeper. Bridal creeper is still occasionally used in floral displays and gardens. It is important to make sure that no bridal creeper (or any garden refuse) is dumped improperly (see further below under 'Disposal') and to discourage the growing of bridal creeper. Encouraging gardeners to use more appropriate garden plants and to dispose of garden waste responsibly is an important practice and will reduce the sources of many species of weeds. Generally, however, the most important sources of new infestations of bridal creeper are existing patches of the weed in bushland and along roadsides. They provide a source of berries for fruit-eating birds. Preventing the formation of berries is the most effective means of limiting further spread of bridal creeper. In addition, it may be important also to quarantine areas to stop movement of seeds and rhizomes in mud on vehicles and equipment.

Other vectors of the seeds or plant parts should be addressed where practicable. This may include managing pest animals such as foxes and rabbits. Managing birds, particularly introduced birds, may be difficult and inappropriate.

When controlling bridal creeper in indigenous vegetation that is not yet heavily infested, emphasise areas of high berry production to prevent further spread. Such areas will likely be infestations that are able to climb more than 50 cm off the ground, rather than prostrate shoots. However, try to follow-up on any smaller infestation on the boundaries of the major infestations, both so they do not become large and to protect indigenous vegetation against excessive competition. Check tree corridors, significant perch trees used by birds, fence lines and roadsides that may link areas of indigenous vegetation with and without bridal creeper.

Integrated management: When treating bridal creeper in a natural ecosystem, it is essential to consider its management in light of other management issues so that they can be integrated to get the best results. When using these guidelines, it is essential to realise their limitations and to modify them in light of experience and local knowledge. Each situation should be considered individually.

Isolated plants or small infestations: Ensure that you have correctly identified the plant before removal. Isolated plants can be physically removed preferably before they have seeded (*Figure 8*). Small infestations can be treated with herbicides in States where they are registered for bridal creeper control. As infestations become larger, a strategically staged approach for removal is advisable to ensure that treated areas are not reinfested.

Larger infestations: Currently, careful use of herbicides and fire are the best means of treating infestations. Herbicides may be applied most effectively after a prescribed fire in autumn, when regrowth is vigorous. In the absence of fire, herbicides can still be effective (*Figure 9*).

In SA, where it is registered, metsulfuron methyl should be applied in autumn-early winter with care to avoid contact with desirable plants or soil near tree root zones. This herbicide is best applied with a hand-sprayer so that it can be directed only to the weed and without run-off from the leaves.



Figure 8. Small plant of *A. asparagoides* removed by hand including all underground rhizomes and tubers. Photo: K. Blood.

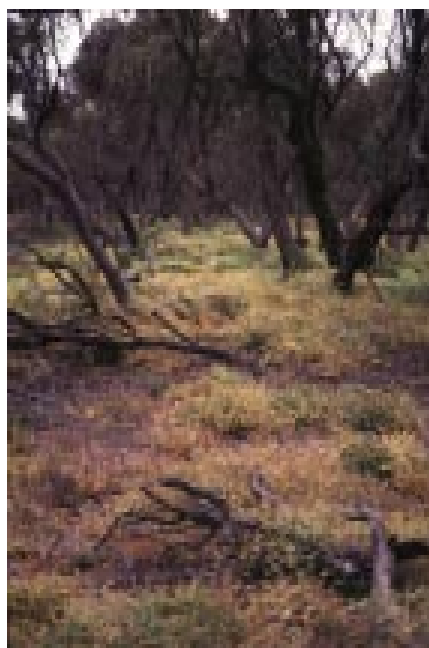


Figure 9. *A. asparagoides* dying back 3 weeks after herbicide application. Photo: K. Blood.

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



Herbicide information: When using chemicals always read the label and follow all instructions carefully. Consult a specialist for advice on registered chemicals in your particular State or Territory. Herbicide information is available at the National Registration Authority web site at www.affa.gov.au/nra/pubcris.html

Fire: Fires in late summer and early autumn can remove all understorey vegetation, thereby improving access to bridal creeper infestations for spraying. In winter-rainfall areas, bridal creeper often emerges before the first rains of the season, so that herbicides may be applied prior to the regeneration of indigenous vegetation. Be careful in using metsulfuron methyl after fire, however, because fire raises soil pH which increases persistence of the herbicide; indigenous seedlings may be killed. Ensure that permission is gained from appropriate fire management authorities before lighting fires.

Mechanical treatment: Mechanical removal is difficult and only successful if the root system, particularly the rhizome, is removed. 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.

Biological control: The first biological control agent for bridal creeper, a leaf hopper, was released in 1999. Although it is too early to determine the effects of the leaf hopper (Figure 10) and the rust, scientists are confident that they will contribute to sustained control of bridal creeper infestations, particularly in combination with other treatments. A rust fungus (*Puccinia myrsiphylli*), was released in 2000 (Figure 11). Two other insects are still under investigation.



Figure 10. The bridal creeper leafhopper.
Photo: R. Roush



Figure 11. The rust fungus (*Puccinia myrsiphylli*) on a bridal creeper leaf. Photo: L. Morin.

Disposal: If the plant is being removed from gardens or natural ecosystems, dispose of it through local government kerbside collection or tip facilities. Care should be taken with disposal because of the ready ability of root material to spread infestations. Root material should ideally be dried before being bagged for disposal. Fruiting shoot material should be bagged immediately, to avoid being dropped or dispersed by birds. Cover trailers and ensure local tip facilities are following Australian standards for composting and transfer station or tip management best practice guidelines. Encourage gardeners to avoid dumping garden waste over back fences or in bushland areas. This plant material should not be incorporated into garden mulch material unless completely killed. Seeds should not be incorporated.

Community awareness: Bush regenerating groups should be made aware of the invasive potential of bridal creeper, particularly given its biological features such as its dispersal by birds, its extensive root system and the potential for rhizomes to spread the weed, if not eradicated completely. Consider running activities as part of national Weedbuster Week in October each year to increase local community awareness of the problem or during August to remind people to spray at this time. See the Weedbuster week web site at www.weedbusterweek.info.au for more information.

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



Management calendar: Prescribed fires in autumn (April-May) to remove above-ground biomass, followed by the careful application of herbicides when shoots are actively regrowing. Bridal creeper is most susceptible to glyphosate (eg., Roundup) when flowering (ie., roughly August to September), but metsulfuron methyl is effective throughout winter, once adequate biomass is available for spraying.

Replacement plants: Revegetation is always likely to be more expensive and labour intensive than protecting native vegetation and allowing it to regrow. However, after controlling dense infestations of bridal creeper, little indigenous vegetation may remain and it may be necessary to revegetate with appropriate indigenous species. Revegetation after controlling bridal creeper will also help control new weeds that might otherwise fill the space vacated by bridal creeper.

Revegetate with indigenous species from the local region and consider plants of a similar climbing habit. It is best to seek the advice of local flora and revegetation experts for suitable indigenous plants of local provenance. *Billardiera* spp. (apple berries), *Clematis* spp., *Eustrephus latifolius* (wombat berry), *Geitonoplesium cymosum*, *Hardenbergia comptoniana* and *Muehlenbeckia adpressa* are examples of indigenous climbers that often occur in areas infested by bridal creeper in different regions of southern Australia. Use only species that are indigenous to the local region. It may be necessary to include fruit-producing indigenous plants in revegetation programs. *Rhagodia candolleana* is an example of a fruit-producing species native to coastal areas of the eastern States. Some larger shrubs, such as *Leucopogon propinquus* in WA, are able to grow through the canopy of bridal creeper, whereas smaller shrubs and forbs are more at risk from smothering.

WeedWatch: Legislation prevents the sale of bridal creeper in a number of areas. If the plant is being sold in such areas then the garden centre or nursery and local weed management authority should be informed. Let garden centre staff know how weedy it is, and about the damage it is doing locally. Encourage them to provide safer alternatives.

Where plants are found in the bush they should be reported to those managing the area so that infestations can be treated where feasible. If the infestation is very localised and comprises small plants only, carefully dig out and dispose of the material responsibly (see 'disposal' above). If you are uncertain about identification, send a specimen to the State or Territory Herbarium with details on where and when it was found and the contact details of the person who sent the specimen (see the *White Pages* or the *Weed Navigator* for address details of herbaria).

Further Reading

Cooke, D. and Choate, J. (1995) Weeds of conservation concern: Seminar and workshop papers, 5th-6th April, 1995. Department of Environment & Natural Resources, Animal & Plant Control Commission, Adelaide, SA.

Parsons, W.T. and Cuthbertson, E.G. (1992) Noxious weeds of Australia. Inkata Press, Melbourne.

Raymond, K. (1996) The ecology of bridal creeper in south-eastern Australia. *Plant Protection Quarterly* **11** (2): 47.

Scott, J.K. and Beasley, P. (1996) Annotated bibliography of the weed *Asparagus asparagoides* (L.) W. Wight (bridal creeper). Technical Series No. 1. Cooperative Research Centre for Weed Management Systems, Wembley, WA.

There are a number of management guides on different weeds being published by the Weeds CRC (see contact details below). Other CRC weed publications include the *Weed Navigator* (lists many weed publications, information resources and contacts in Australia and New Zealand), workshop proceedings, field and management guides, brochures and posters.

Further contacts: Consult weed management officers in local councils and regional National Park offices. Many people interested in environmental weeds communicate regularly through the *Enviroweeds* email discussion group established in Australia. If you would like to join this group free of charge, send this message <subscribe> to the following email address: enviroweeds@majordomo.nre.vic.gov.au

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