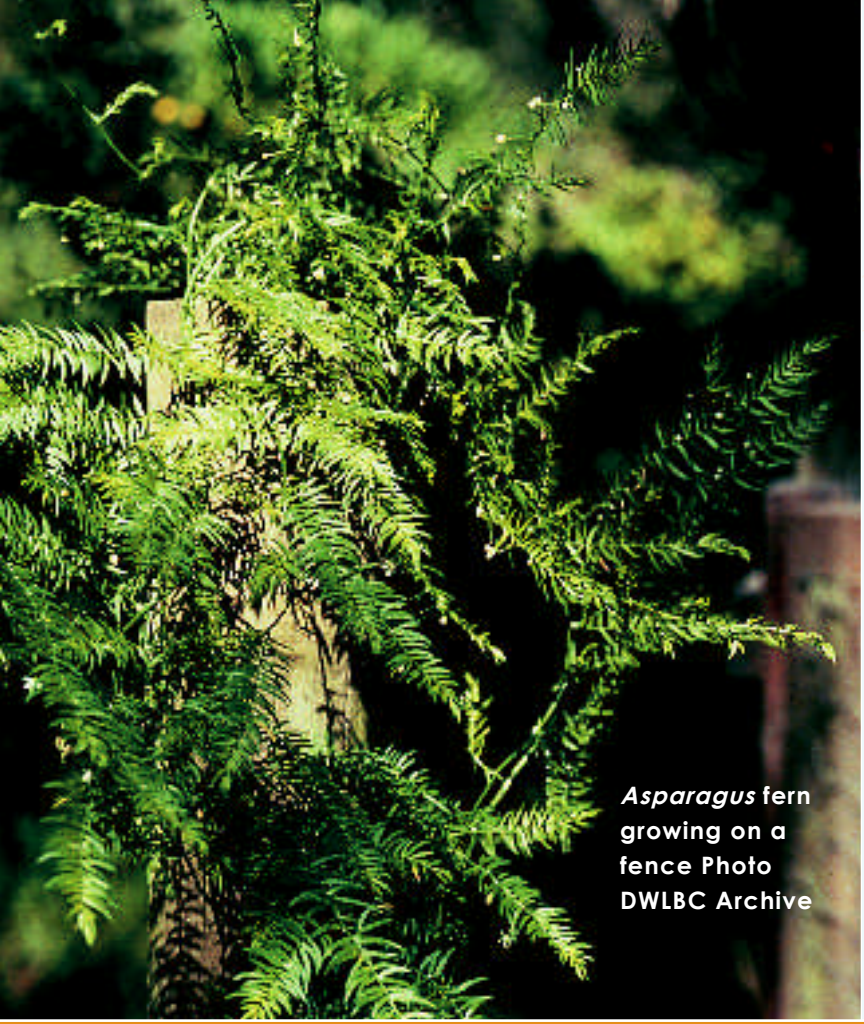
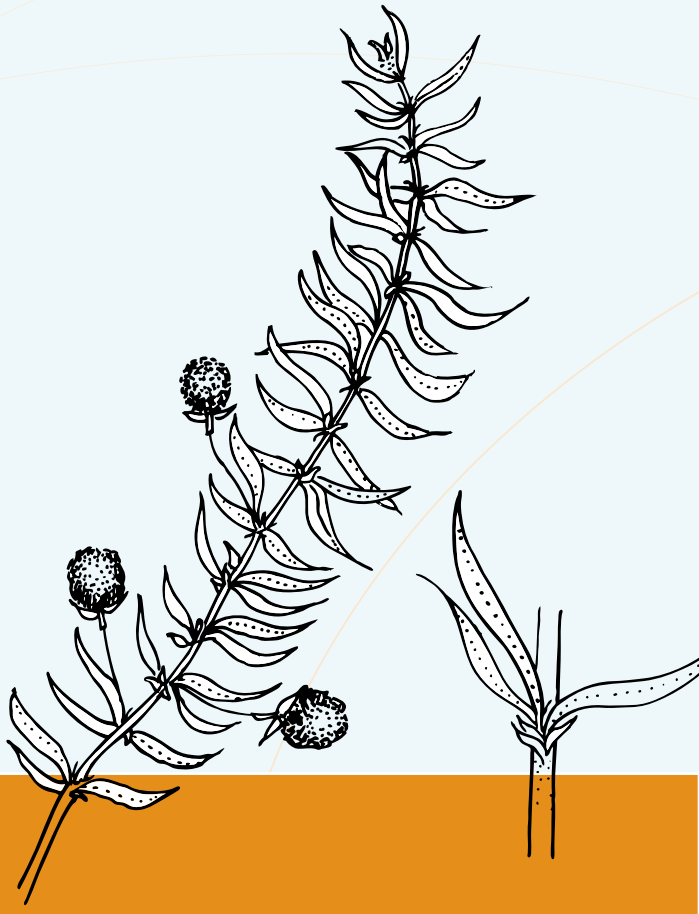


***Asparagus* fern growing on a fence Photo DWLBC Archive**

Asparagus Fern : Flora of NSW



Section 04 : **Asparagus Fern**

Asparagus fern

Asparagus scandens Thunb.

Other species names:

Myrsiphyllum scandens

Other common names:

Asparagus fern

Climbing asparagus

Climbing fern

Myrsiphyllum

Snakefeather (NZ)

Asparagus fern *Asparagus scandens*, also known as climbing asparagus, is a perennial twining vine. It is a close relative of bridal creeper and bridal veil, which are two serious asparagus weed species in southern Australia. Asparagus fern is an aggressive plant, producing underground tubers which form dense impenetrable mats. It competes with native plants for nutrients, light and space. It is a shade tolerant plant preferring moist sites.

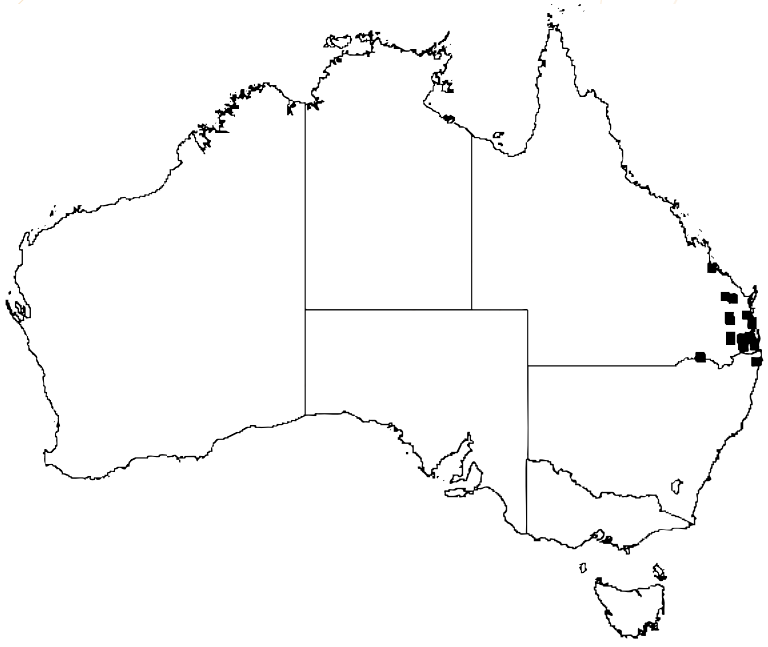
In New Zealand, where Asparagus fern is a serious problem, native seedling regeneration has been prevented and soft barked plants and seedlings strangled or smothered (Timmins & Reid 2000). It is an emerging weed within Australia, and has the potential to seriously impact on Australia's biodiversity.

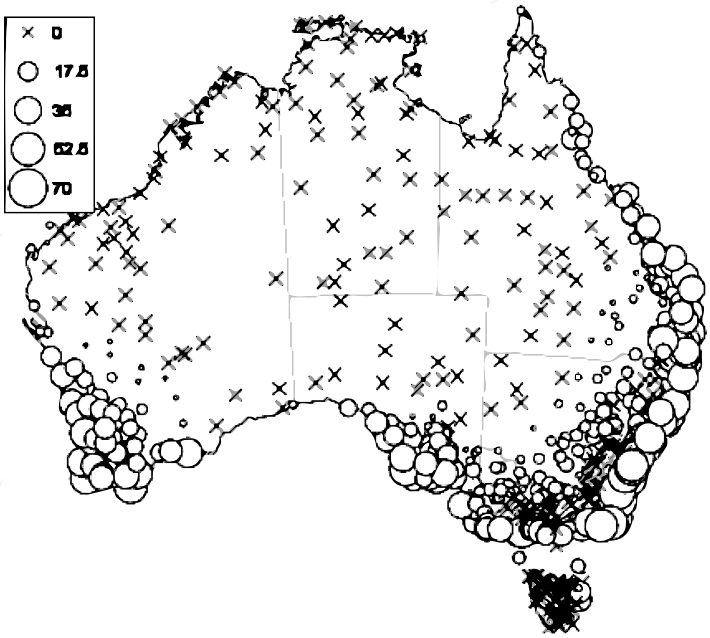
The ability of Asparagus fern to survive drought, frost and fire in Australia is an area that has not been extensively researched, however some inferences can be made. Observations of Asparagus fern in the Adelaide Hills, South Australia suggest that it can survive frosts. This region experiences very cold temperatures and frequent frosts during winter. In addition, the area has a high average rainfall. The weed is mostly found in cool, wet climates, however populations have been found in dry forests suggesting that it can tolerate dry or even drought conditions (Timmins & Reid 2000).

Current and predicted distribution

Asparagus fern has been identified by Keighery (1996) as a potentially serious weed of the summer rainfall areas of Australia. It is recognised as invasive in New South Wales, occasionally naturalised in the Sydney region, and southern Victoria (Harden 1993). It is naturalised in northern mainland Tasmania and on Flinders Island where it invades along the edges of native vegetation (Timmins & Reid 2000). In Western Australia, infestations have recently been found at Denmark and Albany; in Agonis and Banksia woodland around Wilson Inlet and Frenchman's Bay (Brown et al. 2002). In South Australia, infestations are located in several sites on the Fleurieu Peninsula and within a reserve near the town on Millicent in the South East. A larger infestation is centred around several suburbs in the Adelaide Hills.

Map 1 : Current known distribution of Asparagus fern (Scott & Batchelor, 2006)





Map 2: Potential distribution of Asparagus Fern (Scott & Batchelor, 2006)

Section 04

The weed has a wide tolerance range, it grows in disturbed and undisturbed forests, in deep shade and in wet and dry open forest. Given the weed's ability to adapt to varying conditions, action must be initiated now to prevent further spread.

Introduction into Australia

The exact date that Asparagus fern was introduced into Australia is unknown. Considering the date of introduction of bridal creeper and bridal veil it could be assumed that Asparagus fern was introduced at around the same time, i.e. the late 19th century. Its fern like appearance and attractive flowers suggest it was brought here as an ornamental plant. This is a classic example of a garden plant that has jumped the fence and invaded native vegetation.

Dispersal methods

Birds eat the orange fruits of the Asparagus fern and disperse the small seeds. Its bi-coloured display of orange fruits against green foliage and its often-vertical growth pattern allows birds to easily pick them. Blackbirds are probably the main dispersers of seed. Other large birds, such as Currawongs, Magpies, Ravens and Wattlebirds are also thought to ingest the fruits. Seeds are most commonly dispersed a short distance, up to 200m, however long distance dispersal events over several kilometres may also occur. Foxes and possibly rabbits may also be potential dispersers.

Other methods of dispersal include water-aided dispersal with movement of seeds down creeks, streams, ditches and drains. Earth-moving machinery such as backhoes and graders are responsible for digging up tubers and depositing them in other sites where they shoot from the rhizome. Seeds can also be transported in mud caught on vehicles and shoes.

The most prominent disperser of Asparagus fern remains humans. The dumping of garden rubbish into the bush and roadside vegetation, sales at markets and nurseries and the exchange of plants by well intentioned gardeners all contribute to the continued dispersal of this attractive but invasive plant.

Legal status of the weed

Tasmania is the only state to have declared Asparagus fern at the time of writing this publication.

Description and life cycle

Unlike other temperate asparagus weeds, Asparagus fern does not die back during the hot summer months. It continues to grow throughout the year culminating in it flowering and fruiting during late winter and early spring. See Appendix 2.

Flowers	Appearance and characteristics
 Flower : Photo DWLBC	• small, white to pinkish, 6 petalled, borne singly and are 5-7mm in diameter. • flowers are produced from August to October. • male and female flowers live on separate plants.
Berries and Seed	**Appearance and characteristics**

Berries containing seeds: Photo DWLBC

- fleshy, globular berries, 5-7mm in diameter, are produced from late October
- berries change from a green colour when first produced to an orange-red when ripe
- stems that receive higher amounts of light tend to produce more fruit than stems in darker areas
- ripe fruit can remain on the plant from one season to the next (Timmins & Reid 2000)
- fruit production is not as abundant as for bridal creeper and bridal veil.
- Fruits mostly have one seed, 2-3mm in diameter and a shiny black colour.

Cladodes (Leaves)	Appearance and characteristics

Cladodes (leaves): Photo DWLBC

- Leaves are deep green and scale like, are 5-15mm long and 0.5-1.5mm wide.
- Asparagus fern leaves are broader than that of bridal veil but narrower than bridal creeper.

Root system	Appearance and characteristics
 **Fibrous root system : Photo DWLBC**	• Underground tuber root mass forms a mat from the short branching rhizome. A key difference between Asparagus fern and bridal creeper or bridal veil is that tubers are narrow and infrequently arranged along the length of the root system. • Tubers vary between 5 – 10 mm wide and 10 – 50 mm in length. • in mature plants, the roots contribute 87-92% of the total mass. Source: Blood 2001; Muyt 2001; Timmins & Reid 2000

Growth rate

Studies in New Zealand (Timmins & Reid 2000) have found that the growth rate of new Asparagus fern shoots is variable. Thirty new shoots were tagged on well-established plants at a site near Wellington and their length was regularly measured over a 10-month period. Only a third of the stems increased in length. However their lengths differed considerably, between 70-1020 mm. The remaining shoots were either found to be shorter or the same length. The rest were lost or dead (Timmins & Reid 2000). It was also observed that new Asparagus fern shoots are easily damaged when handled and this may explain why some shoots do not increase in length.

Controlling infestations

The main methods for controlling Asparagus fern are digging out the above and below ground parts of the plant, cutting the foliage and herbicide application. Choosing an appropriate control method depends on a number of factors including:

- size and density of the infestation,
- accessibility,
- time and resources available,
- type of environment invaded,
- features of the landscape (e.g. proximity to waterways or cliffs).

Keeping Asparagus fern out of uninfested areas

Nurseries and informal markets must be stopped from selling Asparagus fern and gardeners should be discouraged from planting it on their properties. Safe disposal of Asparagus fern should be encouraged and an emphasis placed on substituting existing plants with non-invasive species.

Find out what you are dealing with

Mapping is a crucial component in order to determine:

- the total area invaded by Asparagus fern,
- areas of vegetation that are under threat from invasion,
- which areas are eradicable,
- infestations that are most likely to be major seed sources,
- where to locate buffer zones.

Asparagus fern infestations are often found under taller trees, power lines and fence lines or anywhere that birds are likely to perch. Therefore it is essential to check the following:

- tree corridors, roadside vegetation and taller trees on the verge of native vegetation areas.
- always search up to several hundred metres further from where the last plant was found to ensure that all bird dispersed seedlings are located.

Allow at least a 500 m wide buffer zone around the edge of an Asparagus fern infestation. It is imperative that this buffer zone be kept free of any Asparagus fern seedlings to limit any further spread. Work back from the buffer zone towards the centre of the infestation.

Physical removal

Physical removal involves carefully excavating around and under the tuberous root mass before levering it out with hand tools. This control method is only effective if all of the tuberous root mass, including the rhizomes, are dug up and removed from site. Digging, or grubbing, only effective for isolated infestations or after several years of herbicide treatment on larger infestations. The act of digging out the tubers can create considerable soil disturbance allowing Asparagus fern and other weed seeds that have been lying dormant to germinate. Once the plant has been grubbed it is best to replace the soil and leaf litter to prevent erosion.

Grub plants during autumn and winter, while soils are still moist and before fruit forms. Dug material should be immediately placed in a strong bag and taken off site. Material can be transferred into a black plastic bag and left out in the sun to, 'cook' the tubers and rhizomes. This process takes about 2-3 months after which time the bag can be disposed of in the kerbside waste collection or taken to the rubbish tip for deep burial. Do not compost or mulch root material as root fragments can reshoot.

Slashing or pulling off the foliage will prevent fruit production, and may slowly deplete the tubers of energy over time, but it is unlikely to eradicate an infestation. In order to prevent seed set, the foliage should be slashed in July, which is before the plant flowers.

Herbicide treatment

Herbicide application is the most effective control mechanism for larger infestations. Care must be taken when applying herbicide in native vegetation areas to avoid off-target damage. Selective herbicide gives better results and it is best to spray during winter and spring when the plant is actively growing. Plants up to 60cm high can be sprayed until the plant is wet but not dripping. Plants that are taller than 60cm should be cut back to a height of 30-60cm and then sprayed. This reduces the amount of herbicide needed, ensures spraying is done in a controlled manner, and minimises the damage to native species. The cut material will die without further treatment. The best herbicide mix available is Glyphosate (Roundup®) at a rate of 1% (100ml in 10L of water) + Pulse® for small plants (Brown et al.). Follow up is essential to ensure plants do not reshoot from the rhizome.

There is currently no herbicide registered for exclusive use on Asparagus fern. It is important that the product label is read carefully before using any herbicide. Any deviation from the label's instructions requires an off-label-use permit issued by the Australian Pesticides and Veterinary Medicines Authority (APVMA). The APVMA can be accessed via their website at http://www.apvma.gov.au/index.html.

Follow-up and monitoring

Follow-up work and monitoring of controlled areas is extremely important. Areas that have been grubbed should be monitored carefully for regrowth. New plants can arise from fragmented rhizomes or from a seed bank that may have been disturbed by machinery or hand digging. It may take several years for an area that has been grubbed to be free from Asparagus fern. Plants that have been sprayed with herbicide should be monitored post-spraying to ensure that control efforts have been effective.

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Appendix

Growth Calender - Asparagus Fern

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering								■	■	■		
Fruiting									■	■	■	
Dieback												
Regrowth	■	■	■	■	■	■	■	■	■	■	■	■
Germination			■	■	■	■	■	■				
General Growth Pattern		■	■	■	■	■	■	■	■	■	■	■
Growth pattern in suitable conditions				■	■	■	■	■	■	■	■	■

Adapted from Weed CRC Bridal Creeper Weed Managment Guide