Bridal creeper – squeezing the juice out of the citrus industry

Raelene M. Kwong, Victorian Department of Primary Industries and CRC for Australian Weed Management, PO Box 48, Frankston, Vic 3199, Australia.
E-mail: rae.kwong@dpi.vic.gov.au

Abstract
Bridal creeper, *Asparagus asparagoides* (L.) Druce, is largely regarded as an environmental weed, but to citrus growers, it is one of the worst weeds they have ever faced.

Citrus is an important horticultural industry and export earner for Australia. In 2000–01, the estimated gross value of production was $426 million, with exports valued at around $191 million. A total of 83% of Australia's citrus production occurs in southern Australia, mainly in the Riverland, Riverina and Sunraysia irrigation regions of South Australia, New South Wales and Victoria. Alarmingly, this entire region is under threat from bridal creeper invasion, which could pose a significant concern to Australia's citrus industry.

Bridal creeper has been rapidly invading citrus orchards causing a decline in tree health and fruit quality, interfering with harvesting and tree maintenance operations and increasing production costs. The continual invasion of the weed from infested shelterbelts, roadsides and bushland inflicts ongoing financial pressure on growers, which is estimated to cost growers an extra $2000 per hectare per year.

Following the initiation of a biological control program against bridal creeper in the late 1990s, growers were keen to use bridal creeper leafhoppers and rust within their orchards. Consequently, a pilot project funded by the Murray Valley Citrus Marketing Board and the Victorian Department of Primary Industries commenced in 2000 to determine if the biological control agents could persist within an intensively managed system.

The project demonstrated that the agents could establish within orchards and reach very damaging populations within a few years of release. A grower survey also revealed that pesticides and fungicides were not used as frequently as initially thought, and when they are used, they are mostly applied outside the periods of activity of the leafhopper and rust.

More recently, 'spore water' (a suspension of bridal creeper rust in water – see Overton and Overton, 2006) has been applied to citrus orchards using orchard sprayers, and an aerial application by plane has been trialled to achieve broader-scale delivery of the rust. Research into improving the spore water technique is still in progress.

More information about the biological control of bridal creeper in citrus orchards project can be found in Kwong and Clift (2004).

References

Kwong, R.M., and Clift, S.H. (2004). Biological control of bridal creeper, *Asparagus asparagoides* (L) W.Wight, in citrus orchards. Proceedings of the 14th Australian Weeds Conference, eds B.M Sindel and S.B. Johnson. pp. 329-32. (Weed Society of New South Wales, Sydney).

Overton, B. and Overton, D. (2006). Kangaroo Island leads the way with 'spore water'. *Plant Protection Quarterly* 21, 77-8.

An eight year removal experiment measuring the impact of bridal creeper (*Asparagus asparagoides* (L.) Druce) and the potential benefit from its control

Peter J. Turner[A,B,C] and **John G. Virtue**[A,D]
[A]CRC for Australian Weed Management.
[B]School of Animal Biology, University of Western Australia, Stirling Highway, Crawley, Western Australia 6009, Australia.
[C]CSIRO, Division of Entomology.
[D]Department of Water, Land and Biodiversity Conservation, GPO Box 2834, Adelaide, South Australia 5001, Australia.
E-mail: Peter.John.Turner@csiro.au

Summary
Bridal creeper is a weed with climbing annual shoot growth and extensive, underground storage tubers, and is capable of dominating native vegetation. While its impacts appear obvious, this has been measured in few quantitative studies. In 1996, forty 3 × 3 m plots were established in a mallee remnant north of Adelaide, South Australia, to investigate this issue. Using glyphosate, bridal creeper was removed from half the plots in 1997, with follow-up treatment for the same plots in 1999.

In 2005 there was still no significant difference in the number of native plant species between plots with or without bridal creeper. There was also no significant difference in abundance of individual native species, except for the saltbush *Enchylaena tomentosa* (P <0.01). However, there were consistent increases in cover of the chenopod and native grass understorey in the bridal creeper removed plots, even if not significant for some species. The common chenopods *E. tomentosa* and a combined dataset for *Rhagodia parabolica* and *R. candolleana* had greater shoot biomass where bridal creeper had been controlled (P <0.01 and P <0.05 respectively). An exotic plant, *Oxalis pes-caprae* also had higher cover in plots without bridal creeper compared to untreated plots (P <0.01).

This study has shown that it may take many years for recovery following weed control and additional restoration work may be necessary. Dead tubers were still intact below the surface in the removal plots and their presence may be affecting seedling establishment. Recovery may also have been hindered by higher *O. pes-caprae* density. A third possibility is a lack of suitable environmental conditions in the eight year period for germination and establishment of indigenous species.

Keywords: *Asparagus asparagoides*, environmental weeds, succession, weed substitution.

Introduction

Plant invasions into natural ecosystems are a threat to indigenous biodiversity (Adair and Groves 1998). Exotic plant species that invade and impact on natural ecosystems are commonly referred to as environmental weeds (Humphries *et al*. 1991, Richardson 2001, Richardson *et al*. 2000). Managing environmental weeds requires knowledge of the impacts the weed has on indigenous communities and then