Bridal creeper's root system:
Impacts that remain after control

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INTRODUCTION

Figure 1. Bridal creeper invasion, Fitzgerald River National Park, W.A.

Bridal creeper (*Asparagus asparagoides*):
- is a Weed of National Significance
- invades disturbed and undisturbed habitats in native bushland (Figure 1).

In Western Australia the belowground dry weight of bridal creeper has been estimated at 3.0 ± 0.32 kg m^{-2} (mean ± s.e.), with the biomass concentrated in the top 20 cm of the soil profile (Figure 2).

Figure 2. This *Asparagus* species can form extensive rhizomes and storage tubers which form underground mats.

The residual impacts of the root system of asparagus species – allelopathy or competition?

This project investigated the impacts of bridal creeper's belowground biomass and measured the residual impacts after control as other *Asparagus* species have been shown to have allelopathic impacts. For example:
- aqueous root extracts from live *A. officinalis* and *A. racemosus* have been shown to inhibit seed germination and another species, *A. curillus* also has potential allelopathic compounds in its roots (Hazebroek et al. 1989, Sati and Sharma, 1985)
- the extracts of root residues from *A. officinalis* killed ten years previously were also able to cause significant inhibition of root growth of other plant species even though decaying *A. officinalis* root tissue was found to be 90% lower in weight (Blok and Bollen, 1993)

RESULTS & DISCUSSION

Aqueous root extracts from live bridal creeper inhibited root growth of other seedlings, yet decomposing roots did not (Figure 3).

However, the root to shoot ratio of bluebell creeper decreased when grown in the presence of either live or dead bridal creeper roots (Figure 4).

Figure 3. Lettuce seedlings that germinated in solutions containing live bridal creeper root material (right), decomposing root material (centre) or a control of distilled water (left).

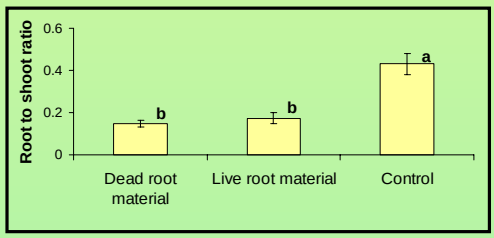

Figure 4. Average (± s.e.) root to shoot ratio of a W.A. native plant, *Billardiera heterophylla*, when grown in pots with or without the presence of bridal creeper roots.

After control, the breakdown of bridal creeper's root system may take many years (Figure 5).

Bridal creeper's root system can impact on the root allocation of other plants even after bridal creeper has been killed. Impacts after control appear to be due to space limitations and not allelopathy. However, given that this root system will take many years to decompose this impact will remain for some time.

Bridal creeper control at new infestations must be a priority so as to prevent the large build up of root biomass. Older infestations will take many years to fully degrade after herbicidal control. However, the biological control agent, the bridal creeper rust, has been shown to reduce bridal creeper's belowground biomass and may accelerate its removal.

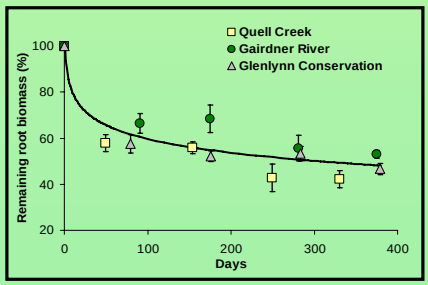

Figure 5. Decomposition of bagged bridal creeper belowground biomass across three W.A. sites (left). In S.A. the belowground biomass was measured at 1.4 ± 0.2 kg m^{-2} nine years after herbicide control (right).

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