Impact of the rust fungus *Puccinia myrsiphylli* on the below-ground biomass of bridal creeper

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Summary The rust fungus, *Puccinia myrsiphylli* (Thuem.) Wint., released in 2000 for the biological control of bridal creeper (*Asparagus asparagoides* (L.) Druce) in Australia, is the most widespread and effective agent against this environmental Weed of National Significance (Morin *et al.* 2002, 2006a, 2006b).

We used a glasshouse experiment to determine how different levels of artificial defoliation and rust fungus infection affect bridal creeper growth parameters including below-ground biomass and re-growth of shoots. Every fortnight for a total of 20 weeks, plants comprising a standardised number of tubers at the commencement of the experiment were manually defoliated (by 25, 50, 75 and 100%) or sprayed to run-off with a suspension of rust spores in water (10^4 and 10^5 spores mL^{-1}).

Severe rust infection caused early defoliation, depleted bridal creeper's below-ground tuberous root system and impacted adversely on other indices of growth, both above and below-ground. Tuber number, relative growth rate and rhizome length of plants sprayed with the highest density of rust spores were similar to that of the 75% defoliated treatment. Most of the plants sprayed with the highest spore density and a few from the 100% defoliated treatment never re-grew after the last treatment application.

In a complementary field experiment, we also used standardised bridal creeper in pots that were placed into the field, to estimate the rust's impact under field conditions. Control plants in this experiment were maintained disease-free through regular applications of fungicide. Similar reductions in tuber number, rhizome length and re-growth to that of the glasshouse experiment were also recorded from natural rust fungus infection in this field experiment. Together, the results of these experiments demonstrate that the rust fungus has considerable capacity to reduce significantly bridal creeper's growth and, thereby, to help manage the weed's environmental impacts.

Keywords Biological control, rust fungus, *Puccinia myrsiphylli*, bridal creeper, *Asparagus asparagoides*, WoNS.

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