

The leaf beetle, *Crioceris* sp. (Coleoptera: Chrysomelidae), a potential biocontrol agent for bridal creeper in Australia

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Summary Bridal creeper, *Asparagus asparagoides* (L.) W.Wright, is an environmental weed deliberately introduced into Australia in the middle of the 19th century as a plant of horticultural merit, but now declared a Weed of National Significance. It has naturalised in many temperate Australian ecosystems, ranging from wet and dry sclerophyll forests to riparian and coastal vegetation systems. It is increasingly becoming a problem in irrigated orchards in New South Wales and Victoria. In many instances it forms dense monocultures, and is regarded as a very serious threat to biodiversity.

A biocontrol project was initiated in 1990, and several potential agents identified in the weed's native South Africa. Two of them, the leafhopper *Zygina* sp. and the rust *Puccinia myrsiphylli* (Thuem.) Wint., were approved for release in 1999 and 2000 respectively (Batchelor and Woodburn 2002 and Morin *et al.* 2002). A third, the leaf beetle *Crioceris* sp., was brought into quarantine in Perth during 1998 to determine its host range.

The genus *Crioceris* contains at least 17 species. The host plants are restricted to the Asparagaceae (Jolivet 1977, Schmitt 1988). The genus includes two species, of Mediterranean origin, that are pests of commercial asparagus in Europe and North America (Schmitt 1988). The species of *Crioceris* that attacks the target plant *A. asparagoides* has only been found on two closely related plants in its native South Africa, *A. densiflorus* and *A. kraussianus* (Witt and Edwards, 2002).

The host test list for *Crioceris* sp. contained both horticultural and Australian native plant species related to the Asparagaceae. Intensive testing, both choice and non-choice, on several cultivars of commercial asparagus, *A. officinalis*, demonstrated that those cultivars on which oviposition occurred were extremely marginal hosts for *Crioceris* sp., and that this valuable crop plant would not be threatened by its release. A report on *Crioceris* sp. host specificity was reviewed by the 21 State and Federal regulatory authorities, and approval for its release was given in May 2002.

Crioceris sp. lays its eggs perpendicularly, either singly or in groups of up to 10, on expanding shoots and cladodes of bridal creeper from autumn to early winter. Both the adults and larvae feed exclusively on the plant's young, expanding tissues. Older shoots/cladodes are not utilised. There are four larval instars. It has one generation/year, and over-summers as an adult inside the pupal cocoon. In South Africa, *Crioceris* sp. is active in the early part of the growing season of *A. asparagoides*. This is the time when the other two biocontrol agents, *Zygina* sp. and *P. myrsiphylli*, are beginning to build in numbers, with their peak period of activity being from mid-winter on. *Crioceris* sp. is expected to cease feeding by mid-winter, therefore we do not expect that there will be competition for resources between these biological control agents.

REFERENCES

- Batchelor, K.L. and Woodburn, T.L. (2002). Population development and impact of the bridal creeper leafhopper *Zygina* sp. in Western Australia. Proceedings of the 13th Australian Weeds Conference, Perth.
- Jolivet, P. (1977). As cited in Schmitt, M. (1988).
- Morin, L., Willis, A.J. and Armstrong, J. (2002). Spread, epidemic development and impact of the bridal creeper rust in Australia: summary of results. Proceedings of the 13th Australian Weeds Conference, Perth.
- Schmitt, M. (1988). The Criocerinae: biology, phylogeny and evolution. In '*Biology of Chrysomelidae*', eds P. Jolivet, E. Petitpierre and T.H. Hsiao, pp. 475-495. (Kluwer Academic Publishers, Dordrecht).
- Witt, A.B.R. and Edwards, P.B. (2002). Aspects of the biology, distribution, and host range of *Crioceris* sp. (Col.: Chrysomelidae: Criocerinae), a potential biological control agent for *Asparagus asparagoides* in Australia. *Biological Control* 23, 56-63.