An insecticidal exclusion method for studying biological control impacts on ragwort (*Senecio jacobaea* L.) and Paterson’s curse (*Echium plantagineum* L.)

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Summary Ragwort (*Senecio jacobaea* L.) is an important weed of European origin, occurring in humid temperate regions of south eastern Australia, particularly on cattle-grazed pastures in steep terrain in southern Victoria and Tasmania. It has been a target of biological control in Australia since the 1920s. During the last 25 years five insect species have been introduced to Australia as biological control agents for ragwort including the flea beetle *Longitarsus flavicornis* (Stephens) and the moths, *Cochylis atricapitana* (Stephens) and *Platypilia isodactyla* (Zeller). Paterson’s curse (*Echium plantagineum* L.) is also a serious pasture weed in temperate and southern Australian grassland climate regions (Stern *et al.* no date), though over a considerably broader geographic range than ragwort and as far north as southern Queensland. Six biological control agents have been released against it in Australia including a flea beetle *Longitarsus echii* (Koch) and the weevil *Mogulones larvatus* (Schultz).

An effective small-scale insecticidal method of excluding these agents from their hosts in the field, for the purpose of studying agent impacts, has been developed by a combination of trial and error and potted plant experiments. The method involves treating experimental units with small volumes of insecticide with a watering can or pneumatic garden sprayer. Thiocloprid is effective when applied at intervals of two to three weeks during oviposition periods of any of the above insects. Thiamethoxam applied at similar intervals is effective against the coleopteran insects but only partially effective against the lepidopteran ones. Our experience with dimethoate is that at application rates high enough to control *M. larvatus*, it appears to have phytotoxic effects, especially during dry autumn periods.

We are currently using this method in long-term biological control impact studies on ragwort and Paterson’s curse and envisage it has potential for similar applications.

Keywords Biological control, *Senecio jacobaea*, *Cochylis atricapitana*, *Longitarsus flavicornis*, *Platypilia isodactyla*, *Echium plantagineum*, *Longitarsus echii*, *Mogulones larvatus*, insecticidal exclusion, pesticide exclusion.

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REFERENCE