

## What's Been Happening in Our Containment Facility? The Old and the New

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### Abstract

Landcare Research, formerly Department of Scientific and Industrial Research (DSIR), has worked on the biological control of weeds for the past 90 years. During this time 63 species of insects have been imported into our containment facility for re-phasing, host testing, pathogen screening and rearing before being released into the New Zealand environment. Some species were imported and not released for various reasons. These included, inherent diseases, population collapse in containment, used for experiments only, regulations allowing host testing only. Table 1 (See the URL below) shows which species have been assessed for establishment, which species were tested for diseases and those which tested positive. Additionally, the table shows which importations were approved for release, when and by which authority, and which importations were never released. Families of insects introduced into our quarantine facility:

Acari=2, Chrysomelidae=16, Curculionidae=9, Tephritidae=5, Tenthredinidae=2, Pyralidae=3, Oecophoridae=3, Tortricidae=3, Nymphalidae=2, Scythrididae=2, Tingidae=2, Cerambycidae=1, Psyllidae=1, Agromyzidae=1, Syrphidae=2, Cecidomyiidae=2, Bruchidae=1, Eupterotidae=1, Crambidae=1, Cynipidae=1, Pterophoridae=2, Arctiidae=1, Cosmopterigidae=1  
Parts of the plant targeted for attack by these potential biological control agents were: stems, 15; leaves, 30; roots, eight; and flowers, one. Nine insect species were released to attack seeds. Six seed-feeding agents, three root feeders, one stem feeder and four foliage feeders, were shown to have an impact on the target plant either in the laboratory or in the field. During 1920 to 2011 most introductions have occurred during the 1980s (16), 1990s (24), and 2000s (23).

There have been 18 weed species (listed below) that these insects have been imported to attack as biological control agents. Of the weed species selected as targets for biological control 11 were environmental (i.e. not productive sector weeds), three solely pastoral while four were both pastoral and environmental weeds. The 18 weed species include: *Cytisus scoparius* (L.) Link, *Jacobaea vulgaris* Gaertn., *Ulex europaeus* L., *Cirsium arvense* (L.) Scop., *Carduus nutans* L., *Cirsium vulgare* (Savi) Ten., *Passiflora tripartite* (Juss.) *mollissima* (Kunth) Holm-Niesen & P.M. Jørg., *Hieracium pillosellae* (L.) F.W.Schultz & Sch.Bip., *Chrysanthemoides monilifera* (L.) Norlindh, *Lonicera japonica* Thunb., *Tradescantia fluminensis* Vell., *Araujia hortorum* E. Fourn, *Calluna vulgaris* (L.) Hull, *Clematis vitalba* L., *Alternanthera philoxeroides* Griseb, *Solanum mauritianum* Scop., *Ageratina riparia* (Regel) R. M. King & H. Rob., and *Hypericum perforatum* L. Twenty-one potential agents were imported but not released and 10 of these were not released because they failed host range testing experiments. Only three species were not released because of disease risk. Up until 1991, 21 species were internally approved for release from quarantine by the director of DSIR. Only one species was refused approval for release in

1991 by an external agency, the Ministry of Agriculture and Fisheries (MAF). From 1991 to 1998 MAF approved the release of 8 species from quarantine before the existence of the Environmental Risk Management Authority New Zealand (ERMA NZ). ERMA NZ (now the Environmental Protection Authority, EPA) was formed and began presiding over releases of exotic organisms in 1998 and has since approved the release of 16 species of biological control agent for seven weed species.

Table 1 can be located and viewed at the following URL:

[http://www.landcareresearch.co.nz/publications/researchpubs/biocontrol\\_spp\\_list\\_hugh\\_gourlay.pdf](http://www.landcareresearch.co.nz/publications/researchpubs/biocontrol_spp_list_hugh_gourlay.pdf)

## References

Cameron, P.J., Hill, R.L., Bain, J., Thomas, W.P. (Eds.) (1989). A review of biological control of invertebrate pests and weeds in New Zealand 1874 to 1987. Technical Communication No. 10.