

The Bugs' Informer

SOUTHLAND BIOCONTROL NEWS
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Biological control (or 'biocontrol') is the use of living organisms to suppress the population density or impact of a specific pest organism, making it less abundant or less damaging than it would otherwise be.

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Landowners Geoffrey and Val Horrell releasing green thistle beetle with biocontrol contractor Peter Ayson (left)

Springing into action!

In spring 2007 Southland and Otago were the first regions in the country to receive a new biocontrol insect that targets Californian thistle. The green thistle beetle (*Cassida rubiginosa*) is the result of ten long years of effort by the Californian Thistle Action Group (CTAG), CABI Bioscience and Landcare Research.

Both the adults and larvae feed on leaf material causing defoliation and reduction in plant vigour. Although the green thistle beetle prefers Californian thistle it will cause some damage to other thistle species as well. Southland's first release of this insect was made at a site near Hokonui on a warm spring day. Those present were impressed with the beetle's work ethic as the beetles went straight to work as soon as the box was opened.

Southland was fortunate to receive an additional batch of beetles this autumn as the team at Landcare Research managed to rear more green thistle beetles than predicted. The release was carried out at a sheltered site with plenty of thistles in Mandeville. This autumn release is somewhat experimental as green thistle beetles are typically released in spring after they have mated. Fingers crossed that the males and females in this batch survive the winter and find one another when they emerge in spring.



Lindsay Smith, Peter Ayson, and Randall Milne happy to find evidence of hieracium gall midge this summer



Mouse-eared hawkweed



Hawkweed invading grazed tall tussock grassland

Do the racing stripes mean they go faster?

In December 2007 a site near Otautau was selected for the first Southland release of a new insect to aid in the fight against broom. The broom leaf beetle (*Gonioctena olivacea*) is a broom specialist and cannot eat any of our native plants including our native brooms. However, in some instances this insect may feed on tree lucerne, ornamental brooms or lupin species. This non-target attack is deemed acceptable in light of how costly and problematic broom is to control.

The broom leaf beetle was first released in Canterbury in 2006 and by 2007 enough beetles became available for further releases. A batch of fifty male and fifty female beetles was released in a healthy patch of broom near Otautau. Male beetles are orange-red and approximately 2.2-4.1 mm long; females are gold-brown and larger than the males at 3.9-5.0 mm long. Both sexes appear to have black dorsal stripes between the wing cases and the males sometimes have 'racing stripes' on their sides. This release site will be checked again in spring/summer 2008 to see if the population has become established. Environment Southland plans to carry out more releases of this insect next spring.

Good things take time

In 2000 the hieracium gall midge (*Macrolabis pilosellae*) and hieracium gall wasp (*Aulacidea subterminalis*) were released in Southland to control hawkweed (*Hieracium spp.*). The hieracium gall midge will attack mouse-eared hawkweed, king devil hawkweed and field hawkweed while the hieracium gall wasp will only target mouse-eared hawkweed. Feeding damage by the larvae of these insects prompts the formation of galls. Gall production and development reduces the amount of nutrients available to plants causing them to become stunted. Affected plants produce less flowers and seed and vegetative reproduction is reduced.

This February Landcare Research scientist Lindsay Smith, biosecurity officer Randall Milne and biocontrol contractors Peter Ayson and Jesse Bythell spent two long days checking the release sites of these insects in northern Southland. The galls can be difficult to spot and monitoring can involve much time spent on hands and knees peering amongst Hieracium foliage! We are pleased to report that the hieracium gall midge has become established at all of the sites that were checked. However, the hieracium gall wasp has not been so successful and persists at only one of the sites monitored. Hieracium insects are very small and can be slow to build up numbers so it will be a few years yet before these insects can be harvested in Southland and redistributed.

Male broom leaf beetle getting straight to work after being released near Otautau this December





Magpie moth caterpillars may be responsible for ragwort damage at Tiwai

What's eating the ragwort?

In autumn 2007 a new ragwort insect was released at Tiwai Peninsula. The ragwort crown boring moth (*Cochylis atricapitana*) can withstand harsh, windy conditions and will complement the work of the ragwort flea beetle (*Longitarsus jacobaeae*). The larvae of these moths attack the crown and sometimes the leaves and flowers of ragwort plants. So far no sign of the moths has been found while monitoring the release site. Most biocontrol insects will take a year or two to become established at a new site, so monitoring this moth will continue for a while yet.

Despite finding no crown boring moth at the Tiwai release site we were surprised and delighted to see that something

had clearly damaged the ragwort. Almost all plants within 200m of the release point had died. It is thought that the dry conditions this spring may have weakened the ragwort plants making them more vulnerable to attack by other insects. At the time of monitoring the caterpillars of the endemic magpie moth (*Nyctemera annulata*) were seen in great abundance feeding on the flowers and leaves of ragwort. In addition larvae were found in the stems of many ragwort plants - these are possibly the maggots of an endemic fly (*Melanagromyza senecionella*). These endemic insects do not feed solely in ragwort but under the right conditions they may cause significant damage.

Gorse spider mite still going strong after 19 years



A colony of gorse spider mites

In 2007 a massive outbreak of gorse spider mite (*Tetranychus lintearius*) was observed amongst gorse at Round Hill. This site was checked again this year and while the outbreak is not as spectacular as last year, a significant number of mites are still present. This insect was first released in Southland back in 1989 and since then has been released at 44 sites around the region. This tiny, colony-forming European gorse specialist produces protective webbing in which to live. Inside the webbing the mites can dine on gorse at their leisure using specially adapted mouthparts to extract cell contents from gorse foliage. A large infestation can reduce gorse growth and may prevent flowering.

Gorse spider mites breed quickest in warmer districts and their webbing is damaged by frequent rainfall – regrettable news for those battling gorse in Southland. In addition, gorse spider mite populations can decrease dramatically due to predation by other insects and sudden mass migration of adults. It can be difficult to follow the success of colonies as they are highly mobile and factors triggering migration are difficult to determine. Gorse

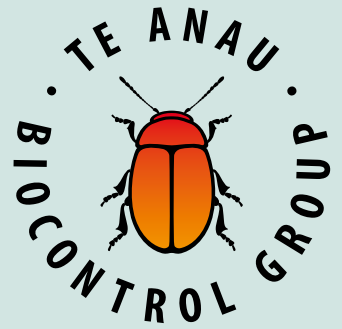
spider mites are so small they can be blown some distance by the wind. It is thought the Round Hill population originated from a release made at Pahia in 1999. Satellite colonies of this insect have established all across the region and continue to work quietly away on gorse. Spider mite damage may not be as sustained or devastating in Southland as other districts but these insects are one more tool to use against gorse.

New biocontrol group

This April a group of Te Anau people interested in the biological control of weeds met to form the Te Anau Biocontrol Group. The Group aims to promote and facilitate the use of biocontrol insects to reduce the impact of invasive weeds on farmland and conservation land in the Te Anau area. In time the Group intends to raise funds to carry out its own releases

of new biocontrol insects as they become available from Landcare Research. While the Group has a Te Anau focus anyone interested in biocontrol is welcome to join.

For more information contact the secretary, Jesse Bythell.
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Thistle gall containing Californian thistle gall fly larvae

Third time lucky

Californian thistle gall fly (*Urophora cardui*) was first brought to New Zealand by the DSIR in 1975. Unfortunately this insect had great difficulty establishing in the wild and populations slowly died out. In 1985 a second attempt was made using gall flies sourced from Canada where they have been successfully used as biocontrol insects for some time (this species is native to Europe). Seven releases were made in Southland between 1997 and 2000, but unfortunately none of the populations at these sites became established. The main problem was caused by stock eating the galls containing the next generation of gall fly larvae. Gall forming biocontrol insects rob their hosts of valuable nutrients thus reducing growth or the plant's ability to flower and seed.

This autumn a third attempt has been made to establish a population of Californian thistle gall flies in Southland. A batch of gall flies were released on Conservation land where there is no threat from browsing stock. Approximately 70 galls (which can contain up to 30 larvae each) were carefully secured to a waratah in a healthy patch of Californian thistle near the upper reaches of the Oreti River. These galls will slowly rot over the winter prompting the larvae to pupate. Adults will emerge in spring and lay a fresh set of eggs in the new Californian thistle shoots. Once this population is well established galls can be collected and redistributed.

Biocontrol field days

Two field days were held during the last six months to explain biocontrol and demonstrate the kind of results they can achieve. In December people gathered at the confluence of the Mararoa and Whitestone Rivers near Te Anau to see the damage caused by the broom seed beetle (*Bruchidius villosus*) and the broom psyllid (*Arytainilla spartiophila*). Many people took the opportunity to collect psyllids from this site to take home and release on their own properties.

In May a ragwort flea beetle field day was held on Kevin Gilmour's property near Hokonui. People got the chance to hear from Kevin how biocontrol had worked on his property and how it fitted into his farm management. Ragwort flea beetle collection techniques were also demonstrated and arrangements were made to carry out releases.

Field day attendees collecting broom insects to take home



Photo: Bruce Fraser



Ragwort plume moth after release



Ragwort flea beetle

Attacking ragwort from the mountains to the sea

Like all weed species ragwort is very adaptable and may be found growing in a range of places. Luckily there is now an array of biocontrol insects able to tolerate the variety of conditions in which ragwort grows. Over the past twenty four years the ragwort flea beetle (*Longitarsus jacobaeae*) has been battling to keep up with ragwort and impressive results have now been achieved at several sites in Southland. However, getting beetles established at sites near the coast has been very difficult. With the availability of two new insects, ragwort crown boring moth (*Cochylis atricapitana*) and ragwort plume moth (*Platyptilia isodactyla*) it is hoped that ragwort can now be tackled across the entire region.

Current monitoring results show that ragwort flea beetle numbers have significantly increased in Southland this year. This has enabled beetles to be harvested and re-released at several new sites this autumn. There are plans to coordinate more releases for the next season if beetle numbers remain high. Environment Southland aims to establish flea beetle release sites across all parts

of Southland. Over time the beetle populations at release sites will increase and migrate to create a self-sustaining 'background' population. When beetles are flying about and actively searching for their host plant the ragwort will have little chance of avoiding their attention! Both adults and larvae of ragwort flea beetles feed on ragwort plants, but it is the larvae that do the most damage. Larvae target the roots and stems of ragwort plants causing them to die or reducing their ability to flower. Originally from Europe these beetles can withstand long winters and early monitoring indicates that beetles released in the Mavora area have survived their first winter.

This year biocontrol contractors have been busy releasing insects across the region and spreading the word about biocontrol for ragwort. Two new releases of ragwort plume moth were made, one near Hokonui and one near Kennington. The caterpillars of this moth can severely damage the crown and roots of ragwort plants – as few as two or three larvae can kill a plant.

Advantages of biocontrol

- In the longer term biocontrol is more cost-effective than chemical or mechanical control methods
- Biocontrol insects are host specific and result in much less non-target damage than chemical or mechanical control methods
- Biocontrol insects are able to seek out weed infestations and can affect weeds that have not yet been recorded
- Biocontrol insects are not constrained by property boundaries and will target any weeds they find
- Once a self-sustaining population of biocontrol insects is established ongoing maintenance or supervision is not required
- Biocontrol is compatible with organic agriculture and food produced using biocontrol is viewed positively by the consumer market overseas

Biocontrol research

To find out more about the biological control of weeds in New Zealand visit the Landcare Research website:

www.landcareresearch.co.nz

Select the 'Research' menu and then 'Biology and Ecology of Weeds' to navigate to the biocontrol pages.

You can also contact Lynley Hayes at:

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Landcare Research
Manaaki Whenua



Ragwort infestation near Hokonui, 2004



The same site in 2007, after biocontrol insects have reduced the ragwort

Biocontrol in Southland

Biocontrol has been used in Southland since 1984 and so far 25 different biocontrol organisms have been released in the region (23 insects, one mite and one fungus). Today biocontrol work is administered through the Biological Control of Weeds Programme by Environment Southland. This involves monitoring and distributing existing biocontrol insects in Southland and coordinating the release of new insects when they become available.

Biocontrol insects are available free to the public through the Biological Control of Weeds Programme. Availability of insects is determined by insect numbers and the suitability of potential release sites. Biocontrol may be compatible with some herbicide use depending on the insect in question and the timing of herbicide application.

To find out more about biocontrol in Southland or to discuss releasing insects on your property contact Environment Southland:

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