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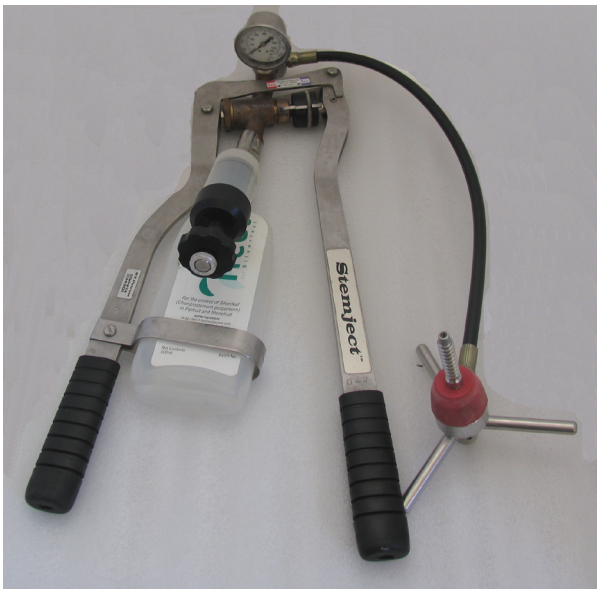
STEM-INJECTED INSECTICIDES TO PROTECT AMENITY TREES

Controlling herbivorous insects on amenity trees in urban settings can pose special challenges for insecticide application. These trees are frequently found in situations where tree size, proximity to sensitive areas, and difficulties of machine access limit the use of traditional ground-based spray applications. Control techniques must be safe, effective, and preferably unobtrusive. The options are either aerial application or vascular pesticide injection involving translocation of the insecticide from near ground-level to the leaves. Stem injection addresses most of these challenges.

Uraba lugens (gum leaf skeletoniser) is an Australian species that is well established in the greater Auckland region with a few records in Waikato and the Bay of Plenty. It causes considerable defoliation to *Eucalyptus* and *Lophostemon* spp. and a few other tree species and is the subject of a biological control programme involving the importation of parasitoids from Australia (see *FH News* 169 January 2007). An additional problem is that the larvae of *U. lugens* have urticating hairs that can cause quite severe skin rashes on some people.

Stem injection trials using a variety of insecticides have been carried out on various species of eucalypts to test how well the insecticides were translocated to the foliage, and to measure the mortality rates of *Uraba lugens* larvae. Stem injections were done by "forced low-volume injection", using either a Stemject or a Sidewinder injector. Each tree was injected at a single point as close to the ground as possible and active ingredient rates were calculated as a function of tree diameter. Rate ratios were kept



Stemject injector

Uraba lugens larvae on *Eucalyptus* leaves in pottle system

Sidewinder stem injector

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CSIRO SCION
THE JOINT FORCES OF CSIRO & SCION

between 0.5 and 5.0 ml/10 mm dbh. At various time intervals after injection, foliage collected from the trees from a height of 5 m was tested in bioassays using *U. lugens* larvae in a "pottle system". The stem of the foliage was held in water in the lower container and separated from the upper container by a dense paper towelling bung. The test larvae were placed on the foliage.

The key findings of this trial were that methamidophos was translocated to leaves at lethal rates within 15 days after injection, maintained lethal concentrations for up to 2 months, and resulted in larval mortality rates above 90%. None of the other insecticides tested delivered consistently satisfactory control of *U. lugens* when applied using stem injections, although when applied at recommended application rates as conventional foliar sprays they did prove effective. Further stem injection work is planned with different insecticides and formulations.

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BROOM TIPPED TO SWEEP THE COUNTRY

Scotch broom (*Cytisus scoparius)* is ranked as one of the worst forest weeds in New Zealand. A climate modelling study by Ensis to project the potential distribution of broom, suggests that forests throughout the entire country could be at risk from broom infestations if its spread is not managed.

Scotch broom is already abundant over large areas of New Zealand and it is still expanding its range. It invades native ecosystems, large areas of wasteland, roadsides, river beds, and plantation forests. Broom has the ability to grow and set seed over a wide altitudinal range, on land of varied topography, and has high drought tolerance. Results of the Ensis study provide a graphic illustration of just how invasive broom could become.

The climate modelling study using CLIMEX software showed almost all of the North Island and the majority of the South Island to be of suitable or optimal climate for broom to thrive. This means the forestry sector needs to consider the management of this weed an integral part of their business plan in order to mitigate its effect on production both now and in the future.

Rapid growth rates make broom a strong competitor of young trees for light, nutrients, and water. A reduction in tree growth rates, particularly in the early years of tree establishment, can have a significant effect on site productivity. There are high costs associated with Scotch broom control, with the application of herbicides both prior to and post planting the most common method employed.

The risk of spreading Scotch broom to new areas is high because of the potential for human-, vehicle-, and machine-assisted dispersal in plantation forests. Infestations can be particularly severe during site preparation for second and third rotation planting as seed in the seed bank is stimulated to germinate.

It is recommended that forest managers reduce the spread of the weed, particularly into areas that are geographically isolated and are currently uninfested, by:

- The regular monitoring and removal of Scotch broom along transport corridors.
- The control of plants before they become reproductively mature and set seed (2–5 years of age).
- The implementation of vigilant hygiene practices when people, vehicles, and machinery move between infested and uninfested areas.

Ultimately the uptake of new management practices by the industry will be required to mitigate the threat posed by this weed. Research on these practices is being funded by the Site Management Coop and the Foundation for Research, Science and Technology.

Karina Potter

NEW RECORDS

New distribution record for New Zealand – Insect: *Nambouria xanthops* (Pteromalidae); **Region:** Hawke's Bay; **Host:** *Eucalyptus nicholii*; **Coll:** B Rogan, 29/05/2007; **Ident:** J Bain, 30/05/2007; **Comments:** This Australian species was first found in New Zealand in 1999 and has been recorded from nearly 20 species of *Eucalyptus*. It is common on *E. nicholii* and *E. cinerea* and has previously been recorded from Northland, Auckland, Waikato, Coromandel, Bay of Plenty, Gisborne, and Mid Canterbury.

New distribution record for New Zealand – Insect: *Leucaspis podocarpi* (Diaspididae); **Region:** MacKenzie; **Host:** *Podocarpus hallii*; **Coll:** B Doherty, 02/06/2007; **Ident:** R Henderson, 14/06/2007; **Comments:** This native scale is quite widespread on *Podocarpus* spp..

New distribution record for New Zealand – Insect: *Parasassietia nigra* (Coccidae); **Region:** Buller; **Host:** *Olearia ilicifolia* hybrid; **Coll:** B Doherty, 20/05/2007; **Ident:** R Henderson, 08/06/2007; **Comments:** This cosmopolitan scale insect was first reported from New Zealand in 1879 and is sporadically distributed throughout the country. It is not considered to be a serious pest here.

New host record for New Zealand – Insect: *Parasassetia nigra* (Coccidae); **Region:** Buller; **Host:** *Olearia ilicifolia* hybrid; **Coll:** B Doherty, 20/05/2007; **Ident:** R Henderson, 08/06/2007; **Comments:** See above. This is only the second record from a New Zealand native plant.

New distribution for New Zealand – Fungus: *Cryptosporiopsis hoheriae***; Region:** Hawke's Bay**; Host:** *Hoheria angustifolia*; **Coll:** B Rogan, 01/06/2007; **Ident:** M Dick, 25/06/2007; **Comments:** This fungus has previously been recorded from Auckland, Waikato, Bay of Plenty, Wanganui, Wellington, and Mid Canterbury.

New distribution record for New Zealand – Fungus: *Volutella buxi***; Region:** Hawke's Bay **Host:** *Buxux sempervirens*; **Coll:** B Rogan, 29/05/2007; **Ident:** M Dick, 12/06/2007; **Comments:** This fungus was first recorded in New Zealand in 1999 and causes minor leaf necrosis and shoot dieback of the host.

New distribution record for New Zealand – Fungus: *Trimmatostroma betulinum***; Region:** MacKenzie**; Host:** *Betula papyrifera*; **Coll:** B Doherty, 03/06/2007; **Ident:** E Orton, 07/06/2007; **Comments**: This fungus was first reported from New Zealand in 2003. It has previously been recorded from Taupo (on *Betula pendula*) and Mid Canterbury (on *Salix cinerea*). It is found on dead twigs and is not known to be pathogenic. Overseas it has also been recorded inhabiting rock surfaces, causing deterioration of marble, quartz, and limestone

New host record for New Zealand – Fungus: *Trimmatostroma betulinum***; Region:** MacKenzie**; Host:** *Betula papyrifera*; **Coll:** B Doherty, 03/06/2007; **Ident:** E Orton, 07/06/2007; **Comments:**.See above.

New host record for New Zealand – Fungus: *Colletotrichum acutatum***; Region:** Bay of Plenty**; Host:** *Liriodendron tulipifera*; **Coll:** B Rogan, 22/03/2007; **Ident:** E Orton & M Power, 19/06/2007; **Comments:** This pathogen has not been known to cause branch failures on large trees before.

New host record for New Zealand – Fungus: *Cryptosporiopsis hoheriae***; Region:** Hawke's Bay**; Host:** *Hoheria angustifolia*; **Coll:** B Rogan, 01/06/2007; **Ident:** M Dick, 25/06/2007; **Comments:** This fungus has previously been recorded from *Hoheria populnea, H. sexstylosa, H. lyalli, Plagianthus betulinus,* and *Lagunaria patersoni*.

John Bain

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