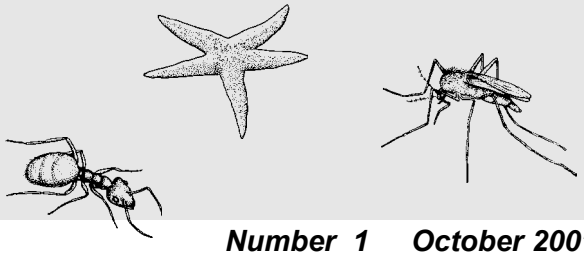
Stowaways



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Contents

Manaaki Whenua
Landcare Research

Wasp Times evolves

The old *Wasp Times* you have grown to love is now *Stowaways.* New name, but the same great articles. This better reflects the changing content of our newsletter and the broader scope of the Invasive Invertebrates Research Programme.

We are not the only country grappling with the problem of how to prevent or deal with invasive species. *Stowaways* will feature articles about invading invertebrates or species with the potential to establish and disrupt native ecosystems both here in New Zealand and elsewhere. Research will not only benefit New Zealand but also other countries facing similar problems with invasive species.

We hope you enjoy the first issue of *Stowaways* and that it gets the same great support we received for *Wasp Times*.

Everyone has a role to play in preventing invaders – check *Learning to help safeguard New Zealand's Biosecurity* for how you can help. See page 13.

Wasp Bait – the Good and the Bad

A wasp control product has been removed from the market but a replacement showing great promise is not too far away.

Bad news! Finitron, the only wasp bait product commercially available for poisoning wasps, has been withdrawn from the market because of concerns about the safety of the toxin sulfluramid, which is contained in Finitron. Not only is this a blow for wasp control, but baits containing sulfluramid were also being developed in a number of countries for control of ants (including Argentine ants).

The good news is that a new product called X-stinguish (made by Adventis) is showing promise. X-stinguish contains a protein bait and the toxin, fipronil. Last summer a long-life bait formulation was produced, and has been sent to a number of countries around the world for testing.

Here in New Zealand, at Nelson Lakes, 300 ha of the Rotoiti Nature Recovery Project's predator control area were treated with X-stinguish.

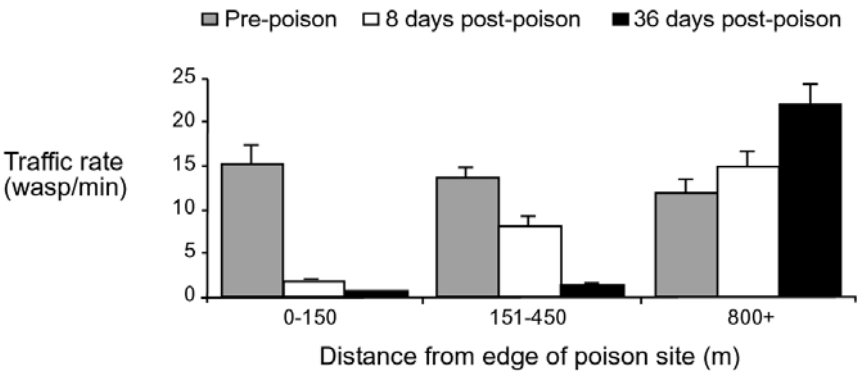

Figure 1: Effect of X-stinguish treatment on wasp colonies

All wasp colonies monitored within the treated site were killed after a single treatment. Not only was the new bait effective inside the treated site, but nests were affected at least 450 m beyond the baited site. The further from the edge of the baited site, the longer it took for the effects of the baiting to show up, indicating that a much smaller amount of bait was taken into nests at greater distances (Figure 1). Even so, although only 300 ha on the lake edge were treated, nests were killed across at least 500 ha.

Once results come in from overseas, and a final bait formulation has been selected and registered, the new bait will be available for use by anyone with wasp problems.

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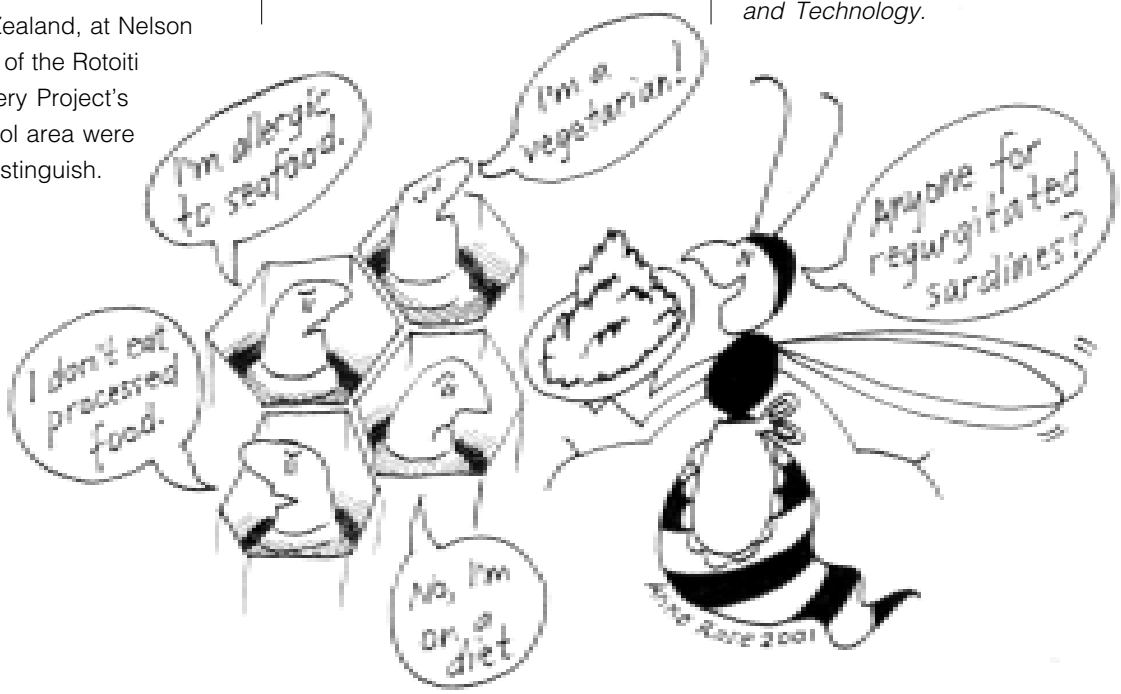
This research was funded by the Foundation for Research, Science and Technology.



Wasp Colonies Prove to be Worm Proof

Puppies, kittens and young children are prone to them.— tiny, wriggly worms that can infest the gut and compete with the host for food. Often they leave the host feeling lethargic and with a slow growth rate. Could parasitic worms be an answer to the wasp problem?

Entomopathogenic nematodes, i.e. microscopic worms that parasitise and kill insects, are increasingly being used to control a range of insect pests. Last wasp season, researchers from Landcare Research and Adelaide University collaborated to find out whether nematodes are effective against introduced *Vespula* wasps. Two types of nematode were tested — "Heidi" (*Steinernema carpocapsae*), and "Riwaka" (*Heterorhabditis zealandica*). Riwaka proved capable of killing wasp larvae in the laboratory, but Heidi had little effect.

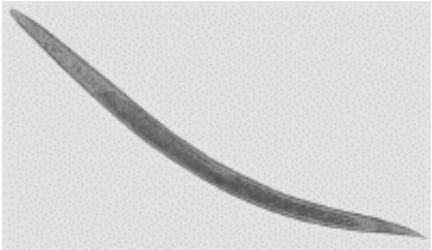
Next we combined nematodes with sardine cat food to form a bait and placed immediately outside the nest. The bait was quickly discovered by the foraging workers, chewed up, carried into the nest and fed to the larvae. However, there was no change in the number of workers leaving or entering the nests.

The nests were dug up and the larvae examined for nematode infection. None was found. These results suggest that either the nematodes were not infecting wasps inside the nest, or that any infected larvae were being swiftly removed before the infection could spread.

Further trials were undertaken to test whether the nematodes were in fact infecting larvae. Nests were dug up just a few hours after the introduction of the nematode baits, before nematode-infected larvae showed any symptoms that would prompt workers to throw them out of the nest. The nests were taken apart, the workers removed and the combs containing the larvae kept in the laboratory for a few days. Since none of the larvae died from nematode infection, we concluded that nematodes had not been successfully introduced into the nest.

Even with protective suits researchers risk being stung when digging wasp nests

Why did this approach work in the laboratory but not in the field? One possible reason is that workers chew the bait containing nematodes into small pieces that they can carry into the nest. Once inside the nest the bait is likely to be chewed further by the nurse workers and then chewed again as it is fed to the larvae. Even though the nematodes are small it is still possible for them to be damaged by this chewing action. In laboratory trials, baits were not used to introduce nematodes to wasps.



*The nematode, Riwaka (*Heterorhabditis zealandica*) killed wasp larvae in the laboratory*

Another possibility is that the temperatures inside the field nests may have been too high for the nematodes to infect successfully. The laboratory trials were carried out at 28°C, but the temperature inside the field nests could have been higher than this. Previous studies have shown that the types of nematodes used in these trials struggle to infect their insect hosts above 30°C, so if it is particularly warm inside a nest the baits may be rendered ineffective. This problem might be overcome by selecting a strain of nematode that is more tolerant of high temperatures.

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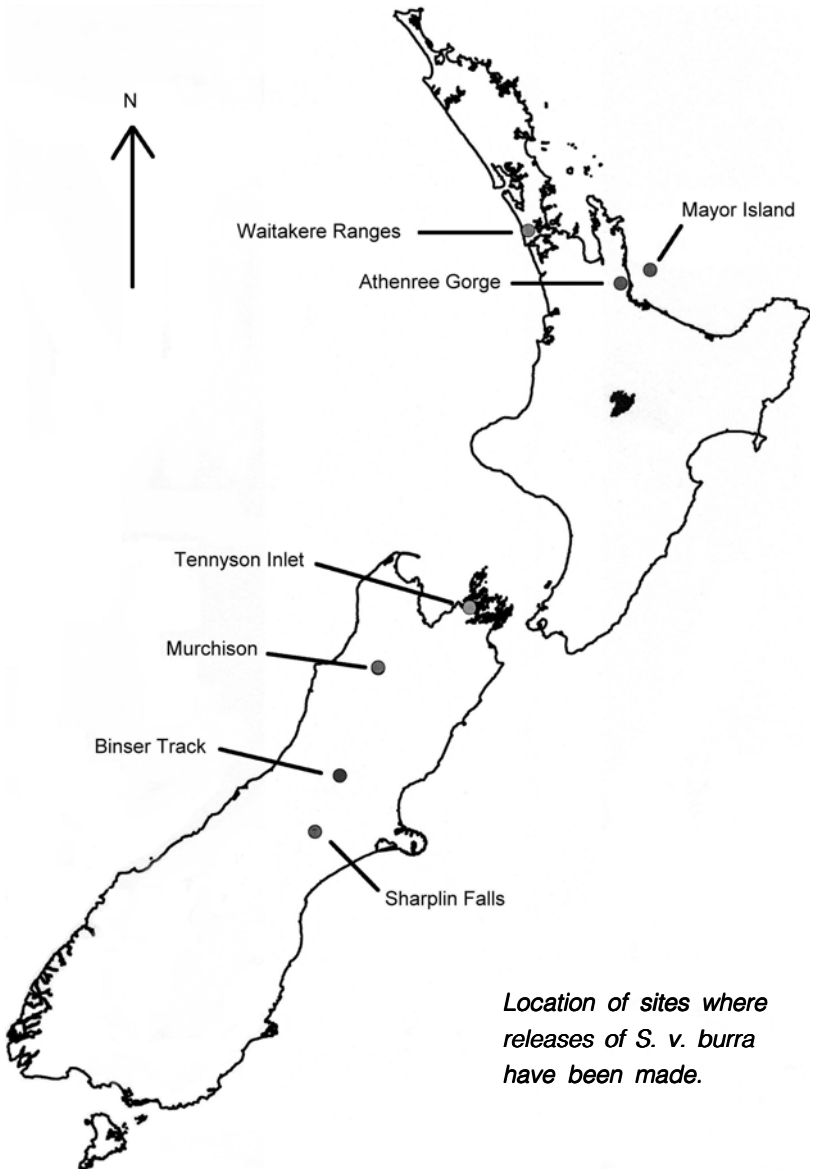
This research was funded by the Foundation for Research, Science and Technology and Adelaide University, SA, Australia.

Wasp Parasitoid Fails to Establish

Stowaways is full of stories of unwanted visitors establishing. So, getting a wanted visitor to establish should be no problem, right? We certainly tried. More than 36 000 parasitoids were released nationwide in an attempt to control *Vespula* wasps biologically. But to no avail.

The parasitoid, *Sphecophaga vesparum burra* was released at seven sites in New Zealand between 1996 and 1998. *S. v. burra* is a close relative of *S. v. vesparum* – a parasitoid trialled earlier in New Zealand to control wasps. Although *S. v. vesparum* established at some sites, mathematical modelling indicates that it will not significantly reduce wasp populations (see *Wasp Times 29* pp. 8–9). However, our research did indicate that relatively small changes in some characteristics of *S. v. vesparum* could lead to a much better result. *S. v. burra* comes from North America rather than Europe, where *S. v. vesparum* originated. We hoped that genetic variability would give a better outcome.



Location of sites where releases of S. v. burra have been made.

S. v. vesparum established at sites where large numbers of parasitoids were released, and where there were high densities of wasps. Therefore, we released most of the new parasitoids at two South Island sites with high wasp densities: Binser Track in Arthur's Pass National Park (13 200 cocoons), and Tennyson Inlet in the Marlborough Sounds (13 560 cocoons). Monitoring revealed that over 5000 adult parasitoids emerged at each site over 4 years.

By 2001, more than 300 nests from the two sites had been dug and inspected for attack by *S. v. burra,* but there was no evidence of establishment. It is possible the parasitoid has established at one of the other release sites, but none of these sites has been checked yet. Back to the drawing board!

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This research was funded by the Foundation for Research and Science Technology, the Department of Conservation and Selwyn District Council.

Paper Wasps are Repeat Offenders

Criminals are sometimes caught when they return to the scene of the crime, and the same mistake could prove the undoing of Asian paper wasps.

Finding an efficient method to reduce populations of Asian paper wasps (*Polistes chinensis*) has proved quite a challenge (see *Wasp Times* 29). One of the problems is that paper wasps take their protein exclusively in the form of live insects, especially caterpillars. The usual fish-based toxic baits used for *Vespula* wasps are ineffectual on this species, but the use of caterpillars loaded with a toxin or pathogen seemed worth a try.

Early attempts to get *Polistes* to take caterpillars failed dismally. Wasps showed no interest in caterpillars when we presented them around an area where paper wasps were foraging. For several hours we observed wasps fly right over our caterpillar-loaded kowhai to forage on other plants. However, we did notice that the wasps were repeatedly visiting the same plants, even though nothing was caught in many cases. Wasps appeared to favour plants where prey had been collected in the past. In natural ecosystems, where insect prey will usually have a clumped distribution, this is a sensible strategy: a forager is more likely to obtain prey on plants that have proved successful in the past than on randomly chosen new plants — a strategy used by fishermen when they keep returning to their favourite spot!

We placed one of our caterpillars on to one of the popular plants, and bingo — it was taken by the first paper wasp to arrive! Heartened by this success, we placed a sprig of our kowhai beside another of the popular shrubs. Within a few minutes, a paper wasp arrived at the shrub and, in the course of its searching, moved to the kowhai sprig and found a caterpillar. From then on, the kowhai sprig became a popular plant and paper wasps would fly directly to it and begin searching for prey. Now that paper wasps were targeting our kowhai sprig, we tested three species of caterpillars. Kowhai moth, cabbage white butterfly, and monarch caterpillars were all taken. Injured and freshly killed caterpillars were as popular as live ones.

These observations bode well for development of a control method for paper wasps. The trick will be to get foraging wasps to visit bait stations in the form of live plants loaded with prey caterpillars. Once they are hooked, replacement caterpillars could be loaded with a toxin or pathogen that would be taken back to the nest.

The next time an Asian paper wasp returns to the crime scene, it could be in for a nasty surprise!

Asian paper wasps were discovered in New Zealand in 1979

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This research was funded by the Norfolk Island Government and the Department of Conservation.

Richard Toft setting a wasp trap

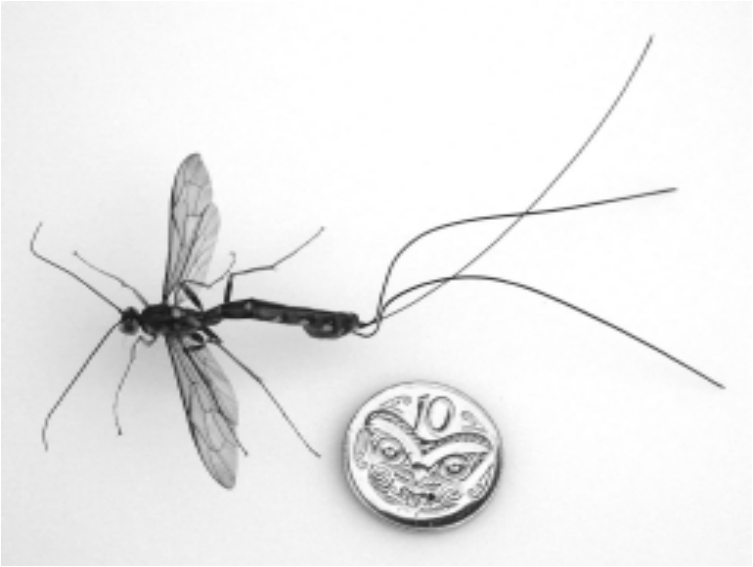
Giant Wasps Cause a Stir

Is it a bird? Is it a plane? No, it's ……*Megarhyssa*!

A very large wasp with a gigantic "sting" is causing alarm to a growing number of horrified Nelson residents. Believing it is the latest and most vile of invasive insects, they have been brought to the Landcare Research wasp team for identification — often treated with copious amounts of fly spray first.

This wasp, however, is harmless to people and is here by invitation. *Megarhyssa nortoni* is a giant ichneumon wasp from the United States. The adult *Megarhyssa* has a body length that varies from about 15 to 45 mm, but the female ovipositor can be twice as long as the body. So, overall the animal can reach lengths in excess of 130 mm. The body is coloured black, reddish brown, and yellow, and has a distinctive series of round, yellow spots down the side of the abdomen.

Megarhyssa was first released in New Zealand in 1964 as a biological control agent for the sirex wood wasp (*Sirex noctilio*), a major pest of pine plantations. Female sirex wasps lay their eggs into pine trees and introduce a special wood-digesting fungus at the same time. The sirex larvae then bore through the wood, which is digested with the aid of the fungus. It is the smell of this fungus that attracts the female *Megarhyssa* to an infected tree. She uses her long ovipositor to bore through the wood until she encounters a sirex larva. The larva is first paralysed with a sting, and then has an egg laid on it. The emerging *Megarhyssa* larva feeds at its leisure on the helpless borer.



Megarhyssa nortoni *introduced to protect pine plantations*

Other parasitic wasps are also at work on sirex in New Zealand, including two species of the smaller *Rhyssa* ichneumons. One of these is self-introduced, and both are black with white spots. There is also a rarely encountered native giant ichneumon called *Certonotus fractinervis*. This species is a parasite of the native elephant weevil, which infests beech trunks. It is distinguished from *Megarhyssa* by having a series of elongate yellow markings down the middle of the abdomen and by a large white area at the end of the antennae. The Forest Research Institute released *Megarhyssa* in the Nelson region in the 1970s. If the surge in public enquiries about this species is a guide, then Nelson populations of this friendly giant have really blossomed since 1990. Sirex wood wasp was once a major pest of pine plantations in New Zealand; it is now kept in check through better forest management and the activities of biocontrol agents like *Megarhyssa*.

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S.O.S. - Study of Stings

Many New Zealanders have felt the painful effects of a close encounter with wasps. That burning sensation, followed closely by the fear that more pain is about to be inflicted by the relatives of the wasp you have just squashed. New Zealand has the highest recorded wasp densities in the world. Potentially, this exposes New Zealanders to a higher degree of risk from wasp stings. Yet, to date, there has been little study of the health risks from these invaders.

It's Official

Reports indicate that bees and wasps are hospitalizing people — 468 cases of bee sting and 153 cases of wasp sting during the period 1967 to 1976. That represents three-quarters of all admissions for bites and stings. There were 11 sting-related deaths recorded in New Zealand from 1967 to 1983. Anaphylactic reaction to bee stings caused seven deaths, and two were a result of multiple wasp stings. Based on data from USA, we estimate that 4% of New Zealanders are hypersensitive to bee and wasp stings (particularly asthmatics).

We have initiated a joint research project between the Wellington School of Medicine (University of Otago) and Landcare Research to investigate the morbidity and mortality from bee and wasp stings in New Zealand. We hope this research will contribute to greater community awareness of bees and wasps through health education and the provision of better information about sting avoidance and emergency management.

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This research is funded by a University of Otago Research Grant.

Wasps are a driving hazard. This summer a sign has appeared at Glenhope, in the Nelson Lakes region, that warns motorists they are entering a high-density wasp area.

The sign was erected by consultants Montgomery Watson NZ Ltd, in response to concerns by locals about the impact of Transit NZ's major realignment of the Nelson–West Coast highway through the Glenhope area.

Residents were concerned that wasp nests would be torn apart during reconstruction of the road and cause hordes of angry wasps to take to the air to defend their nests. No one wanted to see motorists stung as they drove through the area and residents suggested signs be erected to warn motorists that they were entering a hazardous area.

As far as we know, no one has been stung while driving that stretch of road — you won't be stung if the windows are up! Isn't it nice that someone out there cares.

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New Zealand's first invasive invertebrate road sign

Clean and Green

The early morning rumble of low flying aircraft awakens suburban Auckland. Tonnes of toxic spray were dumped over heavily populated areas of the city. This was no covert action of war, but a well-publicised operation to eradicate Asian Gypsy moth. A measure that was undertaken in this instance to avert serious economic impact should the moth have become established in our exotic, plantation forests. The substantial investment made by the country in adopting such a severe border control tactic highlights the costs and risks involved in the ongoing battle against unwanted invasive invertebrates.

But does the New Zealand public share the same concerns over the potential invasion of unwanted invertebrates that would impact on our natural environment? Results from some recent research go a long way to providing an answer. The study engaged in a series of focus group discussions. Groups varied from farmers in Canterbury, to commercial users of natural resources on the West Coast, to parents from a kohanga reo in Northland. The idea was to identify the range of opinions, rather than to assess the extent of views held.

Results suggest that "clean and green" is the commonly held view of our natural environment. Native bush, tussock grasslands, wetlands, the coast and, surprisingly, even mangrove "swamps", were widely recognised habitats valued for many reasons. Whether a habitat could be categorised as natural, however, seemed of less importance than whether it was perceived as a valued part of the environment. Values commonly cited included recreation, the potential for escape from the urban environment, the value to wildlife and ecology, and, most frequently, simply that the environment is part of what New Zealand is. Special characteristics of New Zealand's natural environment commonly mentioned were its safety and its relatively pest-free status, compared with the participants' perceptions and experiences of other countries.

The greatest risk to the natural environment was considered to be human pressure for development and access. Participants were also concerned about alien imports and that increased international traffic was putting greater pressure on New Zealand's border control. However, few had given consideration to the threats posed by invasive invertebrates to New Zealand's natural environment.

Even prompting with photos of ants, tussock moth larvae and mosquitoes triggered little response. Participants struggled to imagine what the impacts might be overall, and admitted that gross changes would have to occur in an environment they cared about, before they would notice any detrimental impacts on it.

Participants were proud of New Zealand's natural environment, considering it to be unique, untouched, safe, and possessing integrity. Such sentiments were widely, even universally, expressed, indicating that an important component of New Zealand's identity is provided by the natural environment. The qualities, such as uniqueness, that made New Zealand's natural environment special were also seen to make it vulnerable to alien invertebrate pests, and any invasion by such pests would threaten those highly valued qualities.

Tussock grassland is valued as part of New Zealand's natural environment

Improved border control was considered to be a wiser use of scarce resources than having to attempt eradication once an invertebrate had become established. Greater provision of information was suggested — to show people the risks of importing alien organisms.

And we agree.

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This research was funded by the Foundation for Research, Science and Technology. A full report is available from Landcare Research (contact Margaret Kilvington).

Native forest ecosystems are often invaded by alien invertebrates such as social wasps, bees and ants

The Bodysnatchers

The yellow flower wasp (*Radumeris tasmaniensis*) is a native of Australia and Papua New Guinea. In February 2000, this Scoliid wasp was found to be established in three isolated coastal localities in Northland. As a parasite of scarab beetles, this unwanted import may be a threat to native beetle species. Little is currently known about it or its effects in New Zealand, so MAF and DOC are co-ordinating an investigation to determine its distribution and hosts.

This wasp is not believed to sting humans. However, as when handling any wasp species, care should be taken.

Left: Female Wasp, Right: Male Wasp

For more information on this species see:
www.maf.govt.nz/MAFnet/issues/pest/wasp/index.htm

Eradicating Argentine Ants

The Argentine ant (*Linepithema humile*) is a highly invasive South American species that has spread to many countries. It's nasty, it's on the "100 of the world's worst" list (www.issg.org/database) and it's on the move in New Zealand. We'd like to stop it in its tracks, and get rid of it. But is eradication feasible? Results of three poison trials last summer look very promising.

Since it was first discovered in Auckland in 1990, this stowaway has been found to be widespread but patchy throughout the city. In 1999 of a population of Argentine ants was discovered in a 10-ha block of native vegetation on Tiritiri Matangi Island, an important predator-free island reserve near Auckland. With the Department of Conservation and with local volunteers, we forced our way through tight vegetation and regenerating bush, squirting small daubs of an experimental protein bait every three metres throughout the affected area.

The bait, developed by the Western Australian Department of Agriculture and containing the insecticide fipronil, was also trialled against Argentine ants at Port Nelson and Mt Maunganui. Even though bait distribution was easier in these open, urban, industrial environments, it was still painstaking work. But results were dramatic.

In heavily infested areas, ants were all over the baits within minutes. The endless march of worker ants along the verges of footpaths, gardens, roads and even through tea-rooms was halted overnight. Some ants have survived, however, and follow-up treatments will be required to poison every last queen. The task next summer in all three areas will be to locate and treat the surviving colonies.

Richard Harris putting out ant bait on Tiritiri Matangi Island

Several existing bait products will reduce ant numbers. But, in areas of high conservation value such as offshore islands, or at ports where there is concern about exporting unwanted ant species to other places, the real outcome we need is eradication. With populations of this unwelcome guest now known from Kaitaia to Christchurch, we must remain vigilant if we are to prevent the spread and colonisation of Argentine ants to other localities.

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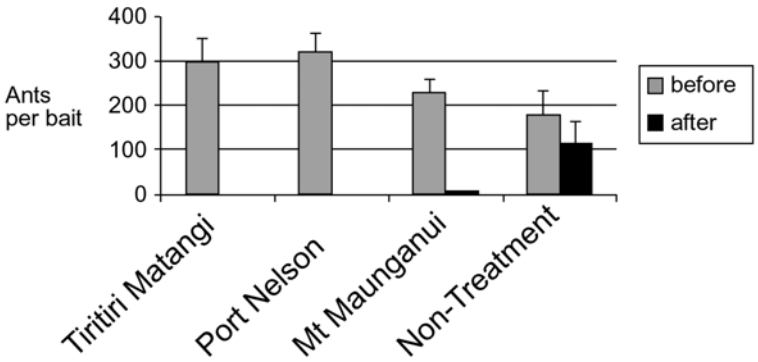
This research was funded by the Foundation for Research, Science and Technology, the Department of Conservation, Port Nelson, and Environment Bay of Plenty.



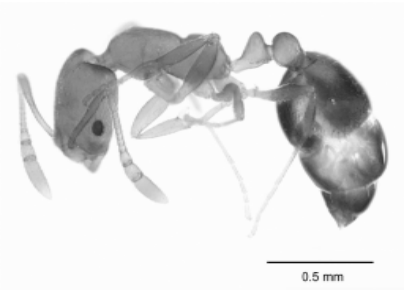
Number of ants present before and after baiting at four study sites

*Blat*ant *Breaches of the Border*

During the course of our work over past months we have stumbled on a number of unwanted ant immigrants that have made it to our shores, and some of them appear to have established.

Out of Africa

Landcare Research staff searching for Argentine ants in Port Nelson discovered a colony of small (2 mm) two-toned ants living in a shingle pile next to the container service area. The colony was identified as a species of *Monomorium* (salomonis group) probably originally from Africa. It had not been recorded in New Zealand before.

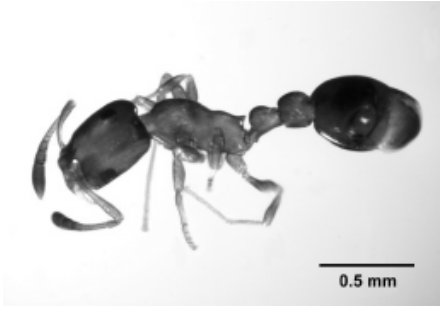


Monomorium spp. - *discovered in Nelson, 2001*

Nelson winters may have been too cold for it to survive here, but we didn't wait to find out. The single colony was exterminated.

Aliens III

Issue 29 of *Wasp Times* reported finding the ant *Cardiocondyla minutior* at Mt Maunganui. This ant has recently been found at sites up to 5 km away. It is unlikely this species will impact on our native environment. They are now firmly established, and there is no plan to eradicate the species.



Cardiocondyla minutior *-established at Mt. Maunganui*

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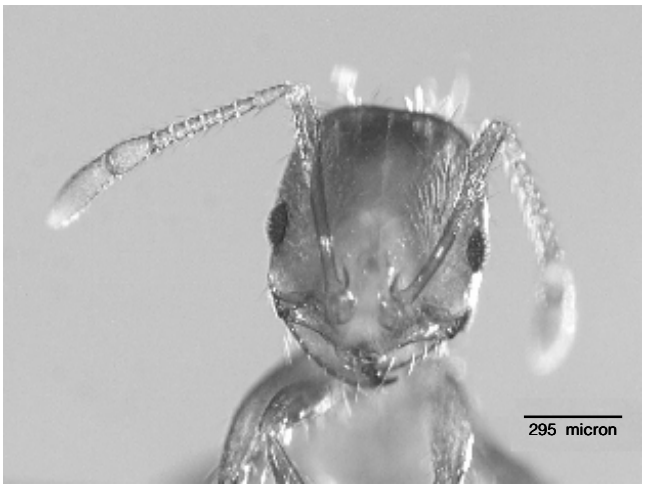
Gone with the wind?

In early March this year, a gardener found a nest of the red imported fire ant (*Solenopsis invicta*) at Auckland Airport. This has since been destroyed and a major search for further colonies initiated by MAF. So far no more have been found. However, there is a possibility that reproductive castes may have flown from the nest before it was found, and these ants may be preparing new nests.

These small but aggressive, reddish-brown ants have a painful sting. Symptoms include intense burning and itching, which usually subsides over the first hour, but which may return over the next few days.



Red Imported Fire Ant (Solenopsis invicta) - *a colony was discovered in a garden at Auckland airport in 2001*

A blister forms at the site of the sting within 5 to 24 hours. This is followed by the formation of a white pustule.

The fire ant has a very distinctive nest — they often form mounds of fine granular soil with an entrance to the side. Mounds are highly variable in size, but in some cases can reach nearly a metre in height and width. Size and shape depend on soil type and vegetation. The red imported fire ant is considered to be the worst ant pest in the world. It has the potential to become a significant environmental, economic and human health hazard should it ever become established here.

MAF will continue surveillance for at least the next 2 years.

For more information on this species check the MAF website:
http://www.maf.govt.nz/biosecurity/pests-deseases/animal/red-imported-fire-ants/index.htm

Feature Pest

In Australia, the southern saltmarsh mosquito is thought to be the main carrier of the Ross River virus (see Fact File). This mosquito was first recorded in New Zealand in December 1998, when specimens were collected near Napier, in Hawke's Bay. To date, there have been no confirmed cases of the virus acquired in New Zealand.

The Ministry of Health quickly responded to prevent its spread and initiated a survey to determine the mosquito's distribution. In February 1999, the Ministry was directed to continue containment measures (phase one).

By April 1999, the Government had agreed to phase two — eradication. The application of treatments was due to continue until April 2001, at which time the programme would move to phase three — surveillance, to ensure the mosquito could be declared eradicated (i.e. no adults or larvae present for 2 years).

Although the campaign to control the mosquitoes has been going well, the southern saltmarsh mosquito has been detected at a number of other sites. In July 2000, mosquito larvae samples were collected at Wherowhero Lagoon, Muriwai, near Gisborne. Later in October 2000, larvae were identified at a site at Porangahau, in southern Hawke's Bay. In November 2000, a positive site was detected at Mahia, in northern Hawke's Bay, and in February 2001, several mosquito larvae were collected from Kaipara Harbour.

Southern Saltmarsh Mosquito (Aedes camptorhynchus)
Source: New Zealand BioSecure

The Ministry of Health considered a range of options to put to the Government on how to deal with the southern saltmarsh mosquitoes, including:

- stop all activity
- shift the focus to a secondary disease prevention response, which includes surveillance for both the mosquito and Ross River virus in humans
- contain/control the mosquitoes at all sites
- eradicate the mosquito from the Gisborne and Hawke's Bay sites and contain/control the mosquito in the Kaipara Harbour sites
- eradicate the mosquito from all known sites.

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This information is based on an article that appeared in the 1 May 2001 issue of the Ministry of Agriculture and Forestry's publication, Biosecurity.

Editor's note:

Associate Biosecurity Minister Marian Hobbs announced funding of $6 million over 4 years to combat the southern saltmarsh mosquito. The money will be used to eradicate the exotic mosquito in Napier, Gisborne, Mahia and Porongahau and to contain and control the spread of the mosquito in the Kaipara and Mangawhai areas. It will also enable enhanced disease protection measures in Auckland and Northland.

Phase two (application of control agents) of the southern saltmarsh mosquito from the Napier sites identified in the 1998 incursion, has been completed. Phase three, surveillance , is now underway.

www.landcare.cri.nz/science/wasps/

Information on wasps and ants

Mosquitoes — opening the door for viruses

Aedes notoscriptus - *now common in many parts of New Zealand*

Fact File - *Aedes notoscriptus*

Widespread in Australia, Indonesia, New Caledonia, Papua New Guinea, and the Oriental region. Now common in many parts of New Zealand. Potential vector of Murray Valley encephalitis, myxomatosis viruses, and canine heartworm. Possible vector of New Caledonian filariasis, bovine onchoceraciasis, and the Eubenangee and fowlpox arboviruses.

Arboviral diseases (arthropod borne viruses, including Dengue Fever, Yellow Fever, Ross River Virus) are a significant health problem world-wide. There are over 100 arboviruses that cause disease in humans, and many of these viruses are transmitted by mosquitoes. As mosquitoes invade new areas the potential for the arbovirus to reach them also increases.

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Fact File - Ross River Virus

Ross River Virus is a non-fatal viral infection. All cases reported in New Zealand to date have been acquired overseas. People infected by Ross River virus may suffer pain and tenderness in muscles and joints, fever, chills, sweating, headache and tiredness. A rash may also occur on the trunk and limbs for a short time. The symptoms subside eventually and leave few or no after-effects.

The only way people can catch Ross River virus is through being bitten by a virus-carrying mosquito. To avoid being bitten, screen open doors and windows, use insect sprays or mosquito coils indoors, and wear long clothing and insect repellent when outdoors. As the Southern Saltmarsh Mosquito is an aggressive daytime biter, take precautions during the day as well as at night.

MAF Exotic Disease & Pest Emergency Hotline
To report a suspected exotic disease, pest animals or plants please phone
0800 809 966

Learning to Help Safeguard New Zealand's Biosecurity

When a nest of scorpions was disturbed last year near Napier, it took 3 weeks for MAF to be alerted (*See Raiders of the Lost Ark, this issue*). And now New Zealand border officials are on heightened alert when processing passengers and freight from the United Kingdom — currently confronting its worst foot-and-mouth disease crisis for decades. These cases highlight the need to teach the public about the dangers of exotic pests and diseases.

MAF Biosecurity undertakes a range of education initiatives at home and abroad, to involve the community actively in New Zealand's biosecurity programme. Educating people about biosecurity plays a major role in safeguarding both biodiversity and the productive sectors. Given good information, people better understand the consequences of their physical environment and are more likely to comply with biosecurity requirements.

MAF Biosecurity has a suite of initiatives to increase public awareness, including:

- the development of a comprehensive Biosecurity Awareness Programme
- an Exotic Disease and Pest Emergency Hotline to allow the public to make rapid contact when reporting a suspected exotic disease or pest
- the newsletter *Biosecurity* — the main vehicle for communication and consultation with those who are interested in biosecurity

- a range of communication tools from a website to printed materials, public displays, and TV commercials.

All New Zealanders should be made aware of the need to remain vigilant against harmful organisms. Unwanted pests and diseases pose a threat to agriculture, horticulture, forestry, the natural environment and human health. Every one of us has a stake in this.

Barry O'Neil
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This information is from an article that appeared in the 1 May 2001 issue of BioSecurity.

BIOSECURE

There are several key questions in our fight to prevent invasive species from establishing in New Zealand and damaging our environment. How many species have already invaded New Zealand? Which are capable of breaching our borders in the future? What are the chances they will establish? Landcare researchers are developing a model called BIOSECURE that will help managers determine the high risk species New Zealand particularly needs to guard against and to deal with rapidly if they do invade this country.

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Raiders of the Lost Ark

Scorpions scuttling around abandoned tombs. Market stalls arrayed with dried, black scorpions. Such exotic images surely do not belong in New Zealand? Yet…

While unpacking a consignment of empty wine bottles imported from Europe, a Hawke's Bay employee saw a number of 2-cm long critters scuttling about in the packaging. When he tried to brush one of them off the pallet, it turned and raised its tail at him in a true scorpion-like defence pose. Although it has not been confirmed, the description has convinced MAF that these particular stowaways were indeed scorpions. The species of scorpion could be one of eight types found in Europe, none of which are particularly dangerous as far as scorpions go.

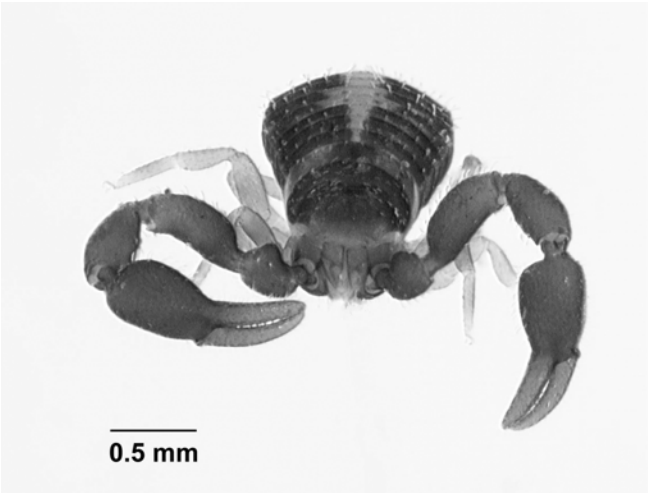
The employee did not realise the significance of the incident as he didn't know that New Zealand is free of such pests. Quite by chance he told an entomologist friend some 3 weeks later, who immediately contacted MAF. As soon as they were notified, Ministry staff searched the Hawke's Bay site. Not surprisingly considering the time delay, they found their quarry had scarpered.

Bottles from the same import consignment were distributed to four other premises in the Hawke's Bay region. As a precaution, the Ministry contacted these people and had the pallets unpacked. No further scorpions were found.

The Ministry is continuing surveillance around the sighting area and, with the owners, is exploring the appropriate insecticide treatment options for the premises.

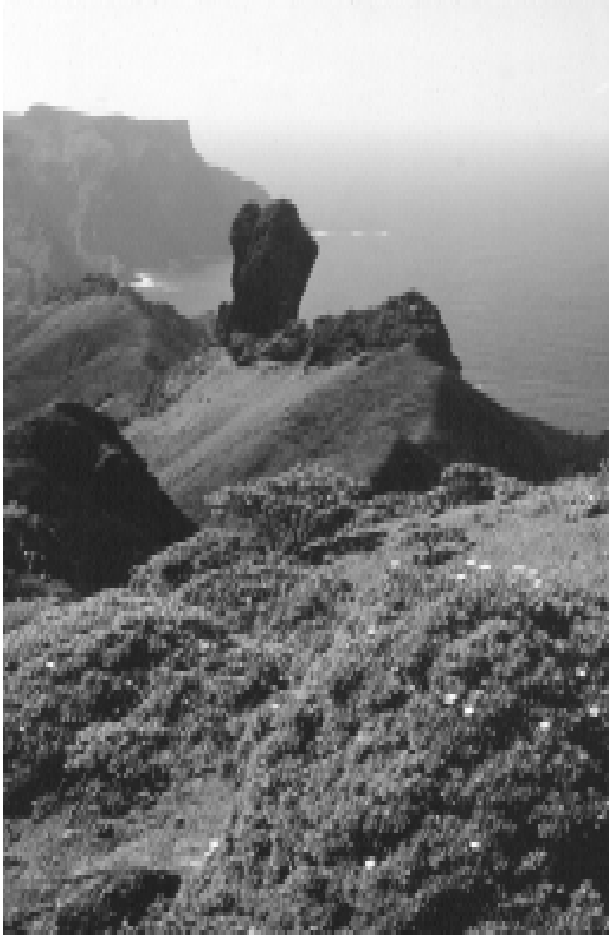
Derek Belton
Programme Manager, MAF

This information is based on a MAF press release 23 June 2000.



Native pseudoscorpions are often confused with scorpions, but belong to a different order. New Zealand has no native scorpions.

Biological Control – A Success Story



St. Helena: a tropical island invaded by a scale insect

St Helena: "A tropical island of unspoilt peace and beauty". That's what the travel brochure says. But, in the 1990s, this South Atlantic island was the scene of an historic battle to save St Helena's national tree, the rare endemic gumwood *Commidendrum robustum*.

Originally, St Helena was well wooded between 400–600 metres above sea level, gumwood being the dominant species. Goats, habitat clearance and firewood collection had whittled away the forest cover until native vegetation covered less than 1% of the land area. By 1991, only 2500 gumwood trees remained.

Then, disaster struck. A South American scale insect, *Orthezia insignis*, was found attacking the gumwood trees. By 1993, severe infestations had killed over 100 trees. Tests later showed that the three other members of the endemic genus *Commidendrum* were also at risk from the scale insect. The steep terrain, persistent south-east trade winds, and the risk to endemic insects ruled out use of insecticides to control the infestations. The islanders called in the scientists.

Simon Fowler of CAB International suggested biological control using the beetle, *Hyperaspis pantherina*. *H. pantherina* quickly established and spread once it was released on St. Helena. The number of beetles increased, coinciding with an at least 30× decrease in scale-insect density.

Since 1995, no further problems have been reported with the scale insect on St Helena.

The introduction of the beetle was so successful that further culturing of *H. pantherina* on the island was discontinued in 1995 as there were insufficient *O. insignis* to support it.

Extensive blackening from sooty moulds on surviving gumwoods indicated that introduction of the beetle was only just in the nick of time. If the number of dying trees had continued to increase exponentially, this rare endemic plant would have been wiped out by 1995. Projects are now underway on St Helena to revegetate other parts of the island.

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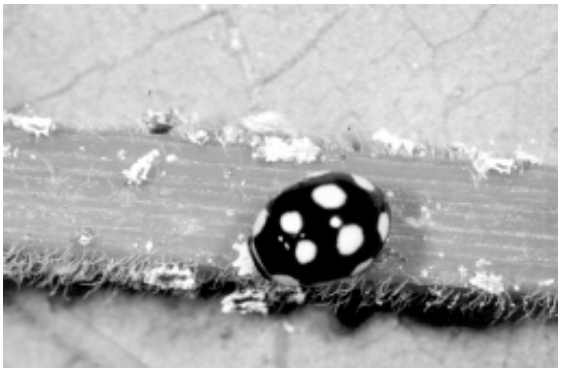
This project, carried out for the St Helena Agriculture & Forestry Department, was funded by the UK Government's Overseas Development Administration. Simon Fowler now works for Landcare Research in Auckland. fowlers@landcare.cri.nz.



An Adult beetle (Hyperaspis pantherina) *attacking a scale insect pest* (Orthezia insignis)

Recent Publications

Argentine Ants. Let's stop the Invasion. Forest and Bird Fact Sheet. Available as a pdf file from website www.landcare.cri.nz/science/wasps/

Beggs, J.R. 2000: Impact and control of introduced Vespula wasps in New Zealand. *In:* Austin, A.D.; Downs, M., *eds*, Hymenoptera – Evolution, Biodiversity and Biochemical Control. Collingwood, Victoria, CSIRO Publishing. 468pp.

Beggs, J.R. 2001: The ecological consequences of social wasps (*Vespula* spp.) invading an ecosystem that has an abundant carbohydrate resource. *Biological Conservation 99:* 17–28.

Harris, R. J.; Etheridge, N. 2001: Comparison of baits containing fipronil and sulfluramid for the control of wasps (*Vespula* spp.). *New Zealand Journal of Zoology 28:* 39–48.

Harris, R. J.; Rees, J. S. 2000: Aerial poisoning of wasps. *Science for Conservation 162.* Wellington, Department of Conservation.

Harris, R. J. 2001: The potential impact of the Argentine Ant (*Linepithema humile*) in New Zealand and options for its control. Unpublished Landcare Research Contract Report LC0001/103 to Department of Conservation.

Kilvington, M.; Wilkinson, R. 2001: Public perceptions of threats posed by invasive invertebrates to the natural environment. Unpublished Landcare Research contract report LC0001/092. May 2001.

Website

More information on wasps and ants is available on our website www.landcare.cri.nz/science/wasps/

Stowaways is available on this site too.

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