# Plant health surveillance and incursion investigation report: January to March 2019

The Ministry for Primary Industries (MPI) Incursion Investigation team and Plant Health and Environment Laboratory (PHEL) investigate and diagnose suspect exotic pests and diseases in the plant and environment sectors. Investigators and scientists are based in Auckland, Wellington, Rotorua and Christchurch. These teams provide field investigation, diagnostic testing and technical expertise to detect and report new pests and diseases affecting plants and the environment. They support surveillance and response functions, including carrying out research and development.

The MPI Incursion Investigators received 489 plant and environment notifications during the 3-month period January to March 2019 (**Figure 1**), a 10 percent increase compared with the same quarter in 2018 (444). Investigators immediately stood down 100 notifications where the presence of biological risk was ruled out. Compared to the same period in 2018, 114 more cases were further investigated to mitigate the biological risk. The complexity and biosecurity risk associated with some notifications meant that some responses were transferred to MPI's Response Group which, with the assistance of the IIs and PHEL, conducts responses to eliminate, reduce or contain the threats and potential impacts of biosecurity incidents.

## Investigations transferred to Response Group

### Fruit-fly interceptions

The early detection of exotic pests such as fruit fly minimises costs associated with managing an established population through to eradication. The value of MPI's targeted surveillance programmes was evidenced by the three fruit-fly detections described here.

A single male Queensland fruit fly (QFF), *Bactrocera tryoni*, (Diptera: Tephritidae) was found in a fruit-fly surveillance trap in a feijoa tree in Devonport, Auckland. The cuelure-baited trap has a phenome attractive to male fruit flies. The fly was identified by a PHEL entomologist and validated by PCR test. A response was initiated to establish whether the fly was part of a breeding population. Investigations involving fruit flies of economic significance are immediately transferred to the Response Group and managed by MPI's response management process.

A single QFF was found in a surveillance trap at a residential property in Northcote, Auckland. Management of this incident was combined with the response activated for the *B. tryoni* caught in Devonport.

In a third case, the duty Incursion Investigator was notified by a PHEL entomologist that a single male tephritid had been found in a cuelure-baited surveillance trap in a citrus tree in Otara, Auckland. This was thought to be a species not present in New Zealand and different to QFF. PHEL identified the fly as *B. facialis* (Diptera: Tephritidae), a fruit-fly species not previously detected in New Zealand and with no English common name. The investigator prepared a rapid risk assessment and the investigation was also incorporated into the QFF response.

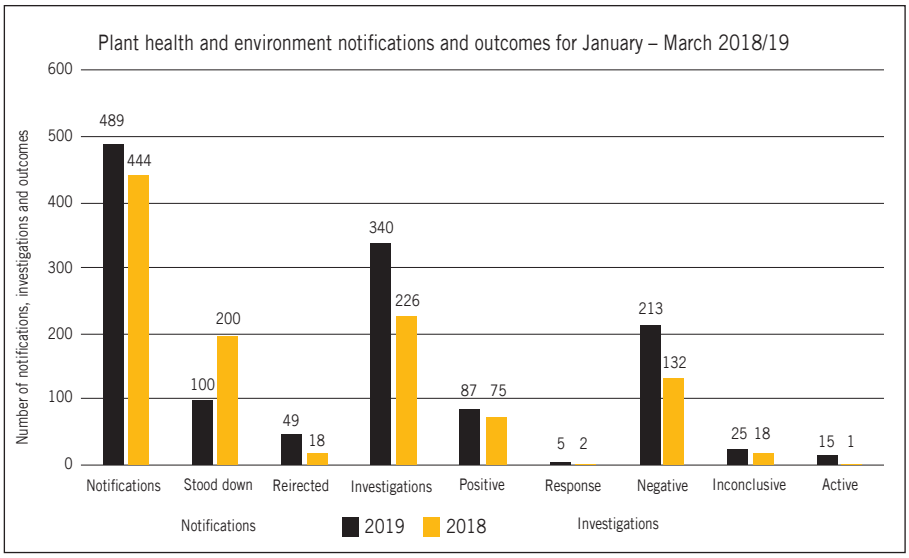


Figure 1: Plant health notifications and investigations and outcomes managed by Incursion Investigators, January to March, 2018 and 2019

## Great willowherb in wetlands, Christchurch

A post on the iNaturalist website described great willowherb (*Epilobium hirsutum*) growing in the Travis wetlands reserve, in the northern suburbs of Christchurch. Great willowherb was first recorded in New Zealand in 2018 when the invasive weed was found growing in Waimakariri District, North Canterbury. This notification was referred to the Response Group to be managed with the earlier detection by MPI's response management process.

## Low-level GM sweetcorn seed contamination, Gisborne

A large-scale producer of corn products for human consumption contacted MPI following a positive test for genetically modified (GM) constructs in powder manufactured from sweetcorn grown in Gisborne from seed imported from the US. Although further testing indicated a very low level of contamination, below the maximum level of 0.1 percent stipulated in MPI import requirements, the investigation was referred to the Response Group to manage any public communication. A response was not initiated because the biological issue was determined to be negligible to low risk as the level of the contamination detected was < 0.1 percent. The seed had been certified as GM-free by the supplier and had undergone the relevant testing before it was imported. New Zealand has zero tolerance for genetically modified organisms (GMOs) outside containment without Environmental Protection Authority (EPA) approval.

## Unwanted organisms and regulated pests

### Low-level GM soybean seed contamination, Hawke's Bay

Another case of low-level GM seed contamination (again below permissible levels) was reported in soybeans grown in Hawke's Bay. Unlike the previous GM case, this incident was managed by the Incursion Investigation team. It was reported during the Christmas break, when many MPI staff were on leave. An Incursion Investigator is on duty every day from 8.30 am to 9.00 pm to manage the exotic pest and disease hotline (0800 80 99 66). In this instance, the II with the co-operation of the grower, an MPI Quarantine Officer (QO) and PHEL enabled the biosecurity issue to be promptly mitigated.

In this case a contract grower for a large frozen vegetable company planted a 10-hectare block of edible soybeans/edamame (*Glycine max*) at his Hastings property. The crop had inconsistent growth and before flowering was sprayed off with glyphosate (Roundup). Some plants survived the herbicide application, causing the grower and the company's field manager to suspect GM Roundup-resistant seed. Samples of healthy and dead plants and seeds were provided for diagnostic tests to determine whether the seeds were GM. The suspected plants in the field were removed mechanically and about 50 kg of plant material was deeply buried on the property by the field manager under the guidance of an II. Samples of the plant DNA and unused seeds were sent to an accredited offshore lab for testing. The live plant material and seeds tested positive for the 34S promoter, the 35S promoter and the EPSPS GM event, indicating that some of the seeds were genetically modified for herbicide resistance.

The website of the exporting company stated that it does not grow GM seed. The New Zealand company had imported 2,040 kg of soybean seed in September 2018. The import documentation said that the seed had been tested before arrival and was negative for GM constructs. About 1,200 kg of seeds from the original consignment remained unplanted. On the recommendation of MPI, and in agreement with the importing company, the seed was destroyed and costs were recovered by the company from the seed exporter. The seed was collected by Interwaste (an approved MPI contractor) and securely transported to the Interwaste treatment plant in Wellington for destruction by steam sterilisation, followed by deep burial. The process was supervised by an MPI QO to certify that no spillage took place and the seed was handled securely. The MPI Plant Imports team was notified for awareness and possible auditing of the import process. Based on the numbers provided by the importer, the contamination level of GM found was below the maximum of 0.1 percent stipulated in MPI import requirements.

### New to New Zealand sawfly, Dunedin

A sawfly larva was found in a gypsy moth surveillance trap placed on a poplar tree in Abbotsford, Dunedin. Using molecular methods the larva was identified by PHEL as the poplar sawfly, *Cladius grandis* (Hymenoptera: Tenthredinidae), a species widely distributed in Europe, Asia and North America. It is not known to cause significant damage every year but sporadic population booms have been reported that result in significant defoliation in the US and Canada. A site inspection was conducted by the II, an SPS Biosecurity contractor and the gypsy moth trap inspector. Larvae were found on two poplar trees at the original detection site and a delimitation survey was initiated the same day. In total, 11 sites were visited up to about 20 km inland from the detection site. At almost all sites larvae were found on leaves (**Figure 2**) or there was chewing damage consistent with the poplar sawfly. Damage on the worst affected trees was patchy and restricted to the end branches, presumably because the younger leaves were more palatable. Defoliation damage was not obvious from a distance and was more noticeable when standing under the tree and looking up into the canopy. The survey did not find any adult sawflies. However, larvae collected were sent to PHEL (Christchurch), where the team successfully reared the first and only adult sawfly (**Figure 3**) seen by those working on this investigation. The specimen was euthanased and placed in the PHEL entomological collection.

Government Industry Agreement (GIA) partners who might be impacted by the new to New Zealand sawfly were notified.

Figure 2: Poplar sawfly (*Cladius grandis*) larvae feeding on a poplar tree leaf, Dunedin (Photo: SIIPH)


Figure 3: Adult poplar sawfly reared at PHEL, Christchurch (Photo: PHEL)

When a risk assessment of the sawfly's impact was completed it was agreed by all that it was a low-impact pest and unlikely to be a significant biosecurity concern to New Zealand. Following an MPI media release about the new sawfly a resident of Mosgiel contacted MPI and provided photos taken in December 2017 of poplar sawfly larvae feeding on poplar leaves at her property. This indicated that the species had already been in the country for at least a year without reports of significant damage. MPI has now produced a fact sheet on the sawfly that is available on its website, and will continue to monitor the sawfly's distribution through the High Risk Site Surveillance programme. Detections outside the Dunedin and Mosgiel area should be reported to MPI via the exotic pest and disease hotline.

### New to New Zealand ambrosia beetle

During the High Risk Site Surveillance programme inspections this quarter, biosecurity contractors SPS Biosecurity reported finding unusual small (~2 mm) live beetles (**Figure 4**) in an oak tree at Blockhouse Bay Reserve, Auckland. The beetles were identified as

the granulated ambrosia beetle (GAB), *Xylosandrus crassiusculus* (Coleoptera: Curculionidae). This species is native to tropical and subtropical east Asia and has been introduced to most warm and humid areas in the world including Africa, the US, Central America, Europe, Christmas Island, Queensland, Papua New Guinea, Palau, New Caledonia and Samoa. GAB is a tree generalist recorded on more than 100 species in 40 plant families. It can become abundant in urban, agricultural and forested areas and is potentially a serious pest of ornamentals and fruit trees. MPI instigated a delimiting survey in which first all potential host trees were inspected within 500 m of the initial detection site, then up to 3 km further out. With the assistance of SPS and SCION, bark beetle traps were also deployed in the nearby suburbs of Titirangi and Glen Eden. From five different sites GAB was recorded on 19 trees from 13 hosts (including four native species). At the Blockhouse Bay Reserve, five trees were felled including two infested with this beetle and three suspect trees with dieback symptoms. The trees were quarantined for destruction and the uprooted ground repaired. MPI is continuing surveillance to establish the extent of GAB distribution and still considering management options. However, investment in research into GAB and its impacts may be the only feasible action in the absence of any control tools.

Figure 4. Granulated ambrosia beetle or GAB (*Xylosandrus crassiusculus*) on *Coprosma robusta* (karamu), Auckland (Photo: PHEL)

## Investigation positive; establishment prevented through urgent measures

These investigations found organisms that were not known to be present in New Zealand, and in circumstances that enabled treatments to be applied and biosecurity mitigation confirmed. They typically involved imported goods and containers.

## Brown marmorated stink bug (BMSB) cases

There were 11 confirmed records of BMSB (*Halyomorpha halys*) (Heteroptera: Pentatomidae) during this quarter. Five were associated with the luggage of international passengers.

A single live BMSB was discovered at a Christchurch transport company's warehouse, on top of a 20-litre chemical container, one of 12 such containers on a partially shrinkwrapped pallet received from a Hamilton manufacturing company. An II visited the site that day and collected the insect, which PHEL confirmed was an unmated non-reproductive adult female. A site inspection was carried out and no further bugs were found. The notifier advised that the only imported container dealt with that day had originated from Australia, and the insect could not be directly linked to any imported goods. Traceback by the II revealed that two Hamilton companies had been involved in transporting the goods to Christchurch. Both companies were contacted and staff interviewed, and it was discovered that one of those companies receives large volumes of goods from overseas. The II considered that the BMSB most likely originated from the Hamilton depot that imported containerised raw materials from the US. In the absence of any further finds at the three sites, the BMSB was considered to be a solitary hitchhiker, likely from the US.

One live BMSB was found by a passenger at the Auckland International Airport domestic terminal. The passenger took a photo, caught the insect and gave it to an Air New Zealand staff member, who passed it on to an MPI quarantine officer. The specimen was identified at PHEL as an adult unmated non-reproductive female BMSB. The single insect could not be associated with any particular flight and was considered a solitary hitchhiker from the luggage of an international traveller.

MPI was notified that a single live suspect BMSB had been found by a traveller from Ontario, Canada, where this species is a nuisance pest. On arrival the passenger had been informed by the airline that her checked-in luggage was delayed. The suitcase was delivered by courier the following day, to her friend's house in Katikati. Upon opening the suitcase a suspect BMSB was found inside the extender section that had been zipped closed for the flight. The traveller's friend, an insect enthusiast, recognised the insect as a BMSB and submitted photos to the iNaturalist website. Others on the website suggested calling MPI and the Incursion Investigator was notified the following morning. A PHEL entomologist provisionally identified BMSB from the iNaturalist images. The BMSB had been placed in the freezer overnight and after searching the traveller's clothing, suitcase and the room, the suitcase was opened and no more BMSB were found. A Tauranga QO collected the insect and also inspected the area and luggage, and again no more BMSB were found. PHEL confirmed that the insect was an unmated, non-reproductive female. It is believed the insect was an isolated hitchhiker in the traveller's suitcase.

A live suspect BMSB was found inside the plastic lining of a carton that contained plastic caps airfreighted from the US. Notifying staff from the business had caught and killed the bug, and cling-wrapped the carton pending further examination. A photo suggested BMSB and the specimen was submitted to PHEL, where an entomologist confirmed a female BMSB. On instruction from the Incursion Investigator, company staff unpacked the carton in an enclosed room and inspected all the contents and packaging, and no further bugs were found. The carton and packing material were burnt as a precaution.

MPI was notified that a member of the public had found a suspect BMSB inside his Glenfield house after it flew through an open door on a warm Auckland evening. From the photos provided to PHEL, an entomologist identified the insect as a suspect BMSB and notified the duty Incursion Investigator. The insect was collected and after interviewing the property owner, a site inspection was conducted but no further BMSB were found. The insect could not to be linked to any recently imported goods, which heightened the significance of the notification since the pathway and origin of the insect could not be established. There are many Transitional Facilities such as car importers' premises located near the Auckland property. A BMSB

detector dog and handler inspected the site and the Transitional Facilities closest to the Glenfield property and no BMSB were detected. Because the origin of this BMSB was unknown, additional surveillance was organised by the investigator. Ten BMSB surveillance traps were deployed for 12 weeks and inspected weekly and again no BMSB were trapped. It was concluded that the single BMSB found might be a hitchhiker coming from one of the nearby businesses that import goods from countries where it is established. During this investigation MPI worked closely with allied GIA partners and stakeholders, who were reassured by the additional surveillance undertaken that this was an isolated find.

A live suspect BMSB was found inside a residential property after visitors arrived from Seattle, US. The insect was immediately captured and placed in the freezer. Photos provided to PHEL indicated BMSB. An Incursion Investigator and a PHEL entomologist visited the property and inspected the luggage. Five live BMSB (two male, three female) were found inside a suitcase with clothing. The US visitors advised that the suitcase had been opened twice since arrival to rearrange clothes and remove two sealed boxes. The boxes had already been opened and no BMSB were found. PHEL confirmed that the original BMSB sample was a male. A BMSB detector dog and handler inspected the property and no further BMSB were found. The handler observed that the dog reacted to the visitor's handbag, but when the investigator inspected the contents no BMSB were found. Nevertheless, the handbag was sealed in a plastic bag and placed in the freezer for 48 hours as a precaution. All clothing inside the suitcase was thoroughly inspected, removed, sealed in plastic bags and frozen for 48 hours. The Investigator inspected the empty suitcase and thoroughly sprayed all compartments with residual insecticide. The car associated with the BMSB find and the property of the friend who loaned the car were also inspected and no further BMSB were found.

BMSB was reported, confirmed and dealt with by investigators in five other instances: female BMSB in the luggage of a US traveller; male BMSB on the wall of a Christchurch transport company facility; two cases of male BMSBs in goods from Italy and a dead BMSB in a car from Japan. Typically, with BMSB investigations, notifiers and staff are provided with BMSB fact sheets and posters for their education and awareness.

During the summer months Incursion Investigators also receive many notifications of suspect BMSB that are identified as stink bugs (Hemiptera: Pentatomidae) already established in New Zealand. Species commonly reported include *Cermatulus nasalis, Dictyotus caenosus, Monteithiella humeralis* and *Nezara viridula.*

## Yellow-spotted stink bug cases

The yellow-spotted stink bug, *Erthesina fullo* (Hemiptera: Pentatomidae) (YSBB), is a regulated pest and is polyphagous, meaning that it could impact many plant species of economic importance if it became established in New Zealand. It is often mistaken for BMSB and both are significant pests that are managed by Incursion Investigators in a similar way. YSSB are often reported in cars imported from Japan and during this quarter there were two cases of live and one of dead YSSB from Japan, plus a dead YSSB was found in a Hamilton warehouse. Where fumigation is possible methyl bromide is the standard treatment for vehicles or goods associated with live YSSB and BMSB.

## Exotic ants in a vehicle imported from Japan

Live ants were found inside a car recently imported from Japan, while it was undergoing a compliance inspection. Specimens were collected by a local QO and submitted to Christchurch PHEL entomologists, who identified them as *Camponotus vitiosus* (Hymenoptera: Formicidae), an exotic carpenter ant. All *Camponotus* species are Unwanted Organisms under the Biosecurity Act 1993 because they pose a biosecurity risk to New Zealand's primary industries, particularly the forestry industry. The car was contained and transported to a local treatment provider and fumigated with methyl bromide and the colony was exterminated.

## Glow-in-the-dark mushrooms for sale on Trademe

An MPI Compliance Investigator reported a Trademe listing selling *Panellus stipticus* (Agaricales: Mycenaceae), an Unwanted Organism under the Biosecurity Act 1993. Commonly known as the bitter oyster or luminescent panellus, this is a bioluminescent fungus found in Asia, Australia, Europe and North America. As it is popular in terraria, the spores of *P. stipticus* are sold as a part of a "mushroom growing kit" on some ecommerce platforms. The Incursion Investigator reported the listing to Trademe, who immediately removed it. The Trademe seller, a large UK-based business, was contacted and advised not to re-list the product as it could place New Zealand buyers at risk of breaching the Biosecurity Act. The seller agreed not to list *P. stipticus* on Trademe again. No mushroom growing kits had been sold in New Zealand from the site before the auction was removed.

## Insects in chickpeas from Turkey

Staff at a kindergarten in Tauranga notified MPI after finding live insects in chickpeas imported from Turkey. A local distributor had sent the chickpeas to the kindergarten for use as food. The Incursion Investigator sent a specimen to PHEL, where it was identified as the cowpea weevil, *Callosobruchus maculatus*) (Coleoptera: Chrysomelidae), an Unwanted Organism under the Biosecurity Act 1993. The Incursion Investigator traced the chickpeas back to their source and facilitated a nationwide withdrawal of the affected batch. The chickpeas were consolidated at the importer's warehouse and frozen for 7 days at -18°C in accordance with the MPI Biosecurity Treatments Standard. No weevils were found after this treatment. Freezing was used because the chickpeas were organic and required chemical-free treatment to maintain their organic status. This investigation was referred to the MPI Intelligence Team for their awareness, as there have been several other investigations involving the same product, same importer and the same pest.

## Borer in wooden chopping boards from India

A Dunedin resident purchased a small chopping board made of mango wood from a retail chain store and gave it to a friend for Christmas. A few weeks later the friend noticed larvae emerging from

the board. The friend returned the board to the retailer and notified MPI. Photos of the emerged insects were provided to the Incursion Investigator and the specimen submitted to MPI. The infested board was taken from the store for destructive sampling by PHEL Christchurch. An entomologist extracted 13 larvae that were identified by molecular sequencing as *Heterobostrychus aequalis* (Coleoptera: Bostrichidae), also known as the oriental wood borer or lesser auger beetle. This is a regulated pest under the Biosecurity Act 1993 and not recorded as present in New Zealand. All the remaining stock was withdrawn from sale and destroyed by the retailer under guidance of the Incursion Investigator. A positive outcome of this investigation resulted in the retailer seeking assistance from MPI to find an approved offshore treatment provider to ensure imported wooden goods are properly treated to protect the consumer and New Zealand's biosecurity.

## Investigation positive; urgent measures limit harm

These investigations resulted in detection of organisms that were not known to be present in New Zealand and in circumstances where treatments could be applied to all retrievable items, usually recent imports. There may be some residual risk associated with items that cannot be retrieved.

## Live insects on gherkin jar lid

Live insect pupae were found under the lid of a jar containing gherkins imported from India. The pupae were under the lip but not inside the jar. Photos were shown to a PHEL entomologist, who identified them as pupae of a phorid fly (Diptera: Phoridae), commonly known as scuttle flies. New Zealand has both native and introduced scuttle fly species. The maggots feed on a wide range of decaying organic matter and are a common contaminant of imported goods. These pupae were suspected to be *Megaselia scalaris*, a species established in New Zealand and commonly intercepted on imported goods. The investigator described a likely scenario to explain the presence of the pupae. The jar had been stored near something that the maggots of *M. scalaris* were feeding on, and when ready to pupate, they crawled up into the lid of the jar. This species does not pose a biosecurity threat to New Zealand and no further action was considered necessary.

## Seeds in wool packaging material from the UK

"Eco-friendly" packaging material with goods imported from the UK by Victoria University of Wellington was found to contain viable seeds. The material, which had been designed and marketed in the UK as an alternative to polystyrene, consisted of sheep's wool enclosed in compostable plastic film. It was intended to be composted after use, which would increase the risk of seed germination and plant establishment in New Zealand. Testing by PHEL showed some seeds were viable. MPI's Border Intelligence team was advised of this pathway risk, resulting in a determination that the packaging was an unauthorised good under the Biosecurity Act 1993, as it contravened MPI's Animal Fibre Import Health Standard. In addition to viable plant seeds, the wool was uncarded, presenting additional biosecurity risks. Carding is a mechanical process that disentangles, cleans and intermixes fibres for subsequent processing, at the same time removing foreign objects such as seeds. This case highlighted a risk pathway and resulted in the Animal Imports team working constructively with the importer/brokers to obtain compliance with the IHS for imported natural fibre.

## Seed contamination in imported brushwood from China

The notifier found a single seed inside a packet of brushwood (*Baeckea frutescens*) imported from China. Imported brushwood is required to be clean and free of seeds in accordance with MPI's Dried and Preserved Import Health Standard. The Incursion Investigator contacted the importer, who provided paperwork confirming that the brushwood had been heat-treated to MPI standards prior to arrival in New Zealand. The heat treatment manages any residual risk of seed presence by rendering it non-viable. When the seed was sent to PHEL for quarantine destruction a botanist identified the seed as being from a fruit belonging to the family Ericaceae (heaths). The fruits may be berries, capsules or drupes, depending on the species. The Ericaceae include azaleas, rhododendrons, blueberries and ericas, and are distributed worldwide.

## Live wood borer in toy from $2 shop

Live borer were found feeding on bamboo parts of a small toy purchased from an Auckland $2 shop. The investigation found no sign of borer when similar items were examined at five other shops owned by the importer. It was therefore concluded that the borer damage was restricted to one particular product. All the risk stock was returned to the distribution warehouse. The total volume of returned stock was not great, and treatment by freezing was arranged. Specimens of adult borer sent to MPI were identified as *Dinoderus minutus* (Coleoptera: Bostrichidae), an exotic but low-risk bamboo borer that has previously been intercepted on similar items. The item was imported as a "low-risk wood product" that did not require inspection by MPI. Notification of such detections by the public via the exotic pest and disease hotline demonstrates the value of New Zealand's multi-layered biosecurity system.

## Borer in bamboo handle of butterfly net from China

The notifier noticed holes in the bamboo handle of a butterfly net purchased from a budget retailer and phoned MPI. The item was frozen for 24 hours and photos were provided of suspected borer beetles and the damaged handle. Specimens were sent to PHEL, who identified a *Dinoderus* species not recorded in New Zealand. The owner of the shop asked for the items to be destroyed and this was carried out by an MPI-approved treatment provider, who autoclaved the risk goods. The retailer had purchased the items from a website based in New Zealand. Through the site, the Incursion Investigator was able to contact the importer, who advised that the last import of the product was more than 11 months ago and that they no longer stocked the item. Once again, notification by a member of the public enabled the issue to be managed by the Incursion Investigator.

## Live borer in wooden sculpture from Bali

Live borer beetles were observed emerging from a wooden sculpture purchased in Bali during an overseas holiday. The notifier advised the sculpture had little value to them and

the product was burnt to mitigate the risk. This was an isolated incident and no further action was considered necessary.

## Robust crazy ants in yacht from the Pacific Islands

Several months after returning from a sailing trip to the Pacific Islands, a solo yachtsman noticed small, unusual ants inside his yacht. He had visited Rarotonga last before returning to New Zealand. The ants were collected by a local MPI Quarantine Officer and delivered to PHEL, where an entomologist identified an exotic and regulated ant species, the robust crazy ant *Nylanderia bourbonica* (Hymenoptera: Formicidae). This species is one of the most common tramp ants in the tropics and subtropics and has been reported in Rarotonga. Thought to originate from Southeast Asia, the species has been spread by commerce throughout the Indo-Pacific region and other tropical areas.

The yacht had berthed at Opua for MPI and Customs clearance in December 2018, then travelled to Marsden Cove. In late February 2019 the yacht was taken out into a dry dock for maintenance work and while it was there the ants were discovered. Since arriving in New Zealand, the yachtsman had taken personal effects between the yacht and his nearby home, and could have inadvertently transported the exotic ants. He had noticed many ants at his property but was uncertain whether they were local or exotic species. A local pest control company was contracted to treat the yacht and the property to ensure eradication of the robust crazy ants. No more exotic ants were trapped. A follow-up treatment of the yacht in May 2019 was undertaken to ensure eradication, and the dry dock has been added to the National Invasive Ant Surveillance (NIAS) programme for 2020.

## Other biosecurity pests

During this period Incursion Investigators dealt with many other organisms that posed a biological risk. These included redback and other live spiders from Australia; bees from China; an exotic beetle in Christmas decorations from China; an oriental cockroach, *Blatta orientalis* (Blattodea: Blattidae) from Sydney; and booklice in noodles from China. Pests of stored products reported included the sawtoothed grain beetle, *Oryzaephilus surinamensis* (Coleoptera: Silvanidae) and flat grain beetle, *Cryptolestes pusillus* (Coleoptera: Laemophloeidae) in rice from Thailand. Many of the stored-product pests (also known as pantry pests) reported are cosmopolitan and found on a number of hosts. They can breed in virtually any edible stored product including seeds, nuts, grains, flour and dried herbs. People usually unwittingly purchase the infested stored products with the pests in the egg stage, which are invisible in the product until they emerge as adults and can infest other food products.

## Seeds entering New Zealand through ecommerce

### Non-compliant seeds from England

The e-commerce pathway is a concern and continues to create work for Incursion Investigators. For example *Heptacodium jasminoides* (seven-sons tree) seeds were purchased online by a customer who thought they were from a New Zealand distributor. When the seeds arrived the customer realised they had come from England and had not been inspected. The customer contacted MPI to ask about the legal documentation required to import seeds, and was shown the relevant section from the Import Health Standard – 155.02.05 Seeds for Sowing. The same information was sent to the exporter to explain the correct procedure. The seeds were submitted to MPI for inspection and were destroyed as non-compliant. MPI's Intelligence & Targeting Team was notified and has placed the exporter on its watch-list.

MPI is often contacted by concerned Facebook users who believe other users may be trying to illegally import seeds and plants. All notifications are investigated and the user is advised that they may be in breach of the Biosecurity Act 1993 and MPI's import health standards (IHSs). Where possible, a letter is sent to the exporter explaining the IHS requirements for importing seeds to New Zealand and the MPI Intelligence & Targeting Team is notified for awareness and auditing purposes.

MPI is concerned by the increasing numbers of notifications that involve buying, intending to buy and planting seeds purchased through e-commerce platforms. Cases this quarter involving purchases from countries such as China, the US, Spain and Canada included "blue strawberry" seeds that grew red strawberries; seeds that were declared as tools and a small phone case (presumably to thwart the international mail inspection process); aquatic plants of the family Nelumbonaceae; floating aquatic plants, and "moss seeds" (unlikely, since mosses reproduce using spores, not seeds); the seed of a cashew plant; roses, potted vegetable seeds and lotus plants; unknown seeds declared as toys and kitchenware; palm seeds that had been planted into pots; fennel seeds; corn kernels, soya beans, tomato seeds and *Austromyrtus dulcis* (Midgen berry); marimo moss balls; cacti seeds and poppy seeds. This list is not exhaustive and demonstrates the magnitude of the problem. In cases where non-compliant plants were being grown, they were removed and destroyed as quarantine waste.

## Cases transferred from MPI responsibility

In these cases, notifications are redirected to agencies that have management responsibility for the particular pest concerned. They include pest plants listed in the National Plant Pest Accord (NPPA) that are Unwanted Organisms and banned from sale, propagation and distribution throughout New Zealand.

## Suspect *Hydrilla* weed, Wairarapa

A case of the highly invasive aquatic weed *Hydrilla verticillata* (Hydrocharitaceae) found under a bridge near Gladstone, in Wairarapa, was reported by an MPI Quarantine Officer. *Hydrilla* is one of nine species currently managed as part of the National Interest Pest Responses, an MPI programme that responds to organisms presenting significant risks to New Zealand's biodiversity. An employee of the National Institute of Water and Atmospheric Research (NIWA) identified the plant from photos provided by the QO as *Egeria densa* (Brazilian waterweed) and not *H. verticillata* (although from the same family). *Egeria densa* is listed in the NPPA and the case was referred to the local council for follow-up.

## Investigation positive; no action taken

These investigations resulted in detections of organisms that were not previously known to be present in New Zealand, but no action was taken. Typically, they include cases where a risk assessment indicates that a new to New Zealand organism (or a newly described indigenous organism) has become well established and is considered unlikely to damage economic, environmental, social and cultural values. Alternatively, the organism may already be established and under management by MPI and/or local authorities.

Many of the investigations dealt with in this category involve pests that were already dead or could be frozen to mitigate any biological risk. Examples are insects arriving in imported goods and stored food products such as moths, cockroaches, beetles, scorpions and grasshoppers.

## New to New Zealand mite found on a beetle from Australia

*Acarophenax rackae* (Acariformes: Acarophenacidae), a new to New Zealand mite, was found on a beetle, *Tribolium confusum* (Coleoptera: Tenebrionidae) presumably imported from Australia in wheat for milling. The mite is not a plant pest, but a parasite of *T. confusum* and therefore deemed not to be a biological risk. The beetle is a common stored-product pest found in New Zealand. The mite likely came from Australia, where other species from the same genus have been reported. Although *A. rackae* is not actually known from Australia, this family of mites is little studied and no species have been reported from New Zealand.

## New to New Zealand bacteria on tomato, Waikanae

Tomato-pith necrosis is a disease of minor significance that was first recorded in NZ during 1981 and is caused by *Pseudomonas corrugata*. This determination was based on then current biochemical and pathogenicity tests, and was consistent with the known cause of this disease overseas. However, in 2002 the taxonomic status of *P. corrugata* was revised and a new species, *P. mediterranea*, was proposed for some of the isolates found to cause pith necrosis on tomato and peppers in southern Europe. A recent home-garden submission to PHEL of a tomato sample with pith necrosis has been confirmed as an undescribed species closely related to another *Pseudomonas* species recently reported from Japan. *Pseudomonas corrugata* isolates in the International Collection of Microorganisms from Plants (ICMP) collection held by Manaaki Whenua Landcare Research, were sequenced to determine whether they represented *P. corrugata* or if some of them could be either of the abovementioned two species. The sequences were consistent with *P. corrugata*. It is important to note there is no evidence suggesting that a new disease-causing organism has recently arrived or that there has been a change of disease status (incidence, severity) of tomato-pith necrosis in New Zealand. Rather, PHEL's diagnostic work clarifies the taxonomic status of the *Pseudomonas* species that causes this disease.

## Investigation for high-impact pests: negative

Of the 340 notifications investigated this quarter, in 213 cases (**Figure 1, page 24**) high-impact pests or diseases were proven not to be present or the pest was already recorded as present in New Zealand. While these investigations are negative for a biological risk they still require the same work as investigations where significant organisms are found.

## Live borer in wooden table from Vietnam

Live wood-boring beetles were found emerging from a large dining table originating from Vietnam. The table had been partly disassembled and shrinkwrapped at the time of notification. The investigation determined that the table had been purchased about 10 months earlier and imported 12 months before that. As the table was in a small residential apartment accessible only by lift, the importer permitted the table to be cut into smaller pieces to facilitate rapid removal and treatment. Specimens of emerged beetles received following treatment were identified as *Lyctus brunneus* (Coleoptera: Bostrichidae), a species already established in New Zealand. A review of import documentation for the consignment that included the table showed the goods had been imported in accordance with MPI requirements and included a methyl bromide fumigation certificate from a reputable contractor. The consignment included 27 tables and other wooden goods. All stock from the implicated consignment had been sold but MPI has not received any reports of borer infestation relating to those goods.

## Suspect live borer in wooden shovel handles from China

Borer holes, frass and other material thought possibly to be dead adult borers was found in and associated with a wooden shovel handle imported from China and purchased from a hardware store. Although no live beetles were found, the presence of live borer larvae was suspected. The manager of the national hardware chain was contacted and confirmed that the goods had been distributed to 13 stores nationally. At the request of the Incursion Investigator, store managers supervised examination of their stock of wooden shovel handles and no further signs of borer were found. The investigation determined that there was a low risk of live borer. Examination of import documentation for the relevant consignment showed the importation had been in accordance with MPI requirements that included treatment certificates for the wooden goods. No further action was considered necessary.

## Other borer cases

Three other investigations were dealt with by Incursion Investigators where exotic borer, all from the same family (Coleoptera: Bostrichidae), were confirmed by PHEL. They were: furniture from India (African powder post beetle, *Lyctus africanus*); furniture from Vietnam (lesser auger beetle, *Heterobostrychus aequalis*) and wooden parasols from China (bamboo borer, *Dinoderus minutus*).

## Suspect potato wart, Dunedin

A Dunedin gardener reported suspected potato wart (*Synchytrium endobioticum*) on home-grown Jersey Benne and Agria potatoes. The potatoes had been grown from certified seed purchased from a garden retail store in Dunedin. Potato samples with unusual, wart-like symptoms (**Figure 5**) were submitted to PHEL for examination and diagnostic testing. PHEL ruled out potato wart and concluded the swellings were caused by powdery scab, *Spongospora subterranea*. This was confirmed by

morphological examinations and a real-time PCR test for potato wart and potato scab. The notifier was advised of the diagnostic result and advised to retire the potato plot owing to the persistence of *S. subterranea* in soil and its high and rapid reproductive potential, which makes powdery scab difficult to manage and eliminate. This investigation was one of three involving suspected potato wart symptoms during this quarter, all of which were negative.

Figure 5: Unusual wart-like symptoms on potato caused by powdery scab, *Spongospora subterranea*

## Suspect exotic termites at a residential property

A member of the public contacted MPI because he suspected his home was infested with exotic termites. The house had been constructed in the 1980s with cedar cladding and the notifier had recently noticed large amounts of frass near wooden framing and shingles. The frass was provided to PHEL for examination. An Incursion Investigator visited the site to look for termite evidence, specifically live termites and mud-like earthen packing on the surface produced by termites inside the woodwork, but neither was found. Specimens that were collected were identified by PHEL as big-headed ants, *Pheidole megacephala* (Hymenoptera: Formicidae). This species is established in New Zealand, and colonies are noted for excavating large amounts of sand and soil from underneath paving. The ants are a nuisance but do not pose a biosecurity risk.

## Suspect exotic freshwater jellyfish in a Christchurch lake

Small freshwater jellyfish were found in Lake Roto Kohatu, Christchurch, and considered a potential biosecurity issue. NIWA confirmed the jellyfish were medusae of *Craspedacusta sowerbyi* (Coelenterata: Limnomedusae) a freshwater jellyfish known in New Zealand since the 1950s. It is harmless to humans and large animals and feeds only on small zooplankton species. Studies have concluded its ecological impact is minor. *Craspedacusta sowerbyi* was first discovered at Kew Gardens, London, in 1880 and later shown to have originated from China. It now has a worldwide distribution and is sporadically collected from mainland New Zealand.

## Suspect fruit-fly maggots on clothing after a flight to Melbourne

An aircraft passenger arriving in Melbourne from Auckland discovered suspect fruit-fly maggots on clothing that had been stowed in the overhead locker. Although the flight and seat details were provided, the notification was received by email without the notifier's name or contact details. MPI border staff were advised and the plane was inspected and sprayed with insecticide following its return to Auckland. The seats and lockers were checked and there was no sign of fruit fly or a host. In the absence of a specimen and the notifier's details no further action could be taken.

## Caterpillar in mandarin from the US

A live caterpillar was found inside a mandarin imported from the United States. The notifier had squashed the caterpillar, stating that enough remained intact for identification but when the sample was sent to PHEL it could not be identified morphologically. Molecular sequencing identified the caterpillar as the orange fruit borer, *Isotenes miserana* (Lepidoptera: Tortricidae). This species is established in New Zealand and may have been a local contaminant.

## Dead fruit-fly larva in mango from Peru

MPI was sent photos of a dead suspect tephritid (fruit fly) larva inside a mango purchased from a fruit shop in Glen Innes, Auckland. Images indicated that the larva was long dead. An Incursion Investigator collected the larva and a pupa and submitted them to PHEL, where an entomologist used molecular sequencing to identify them as *Anastrepha* sp., although the exact species could not be determined. The Incursion Investigator visited the fruit shop and purchased several more mangoes, which were dissected and contained no pests. The Incursion Investigator then traced the mango consignment back to the supplier and double-checked all import documents and treatment certificates. The mangoes had been hot-water treated and undergone containerised cold disinfestation during transit from Peru to New Zealand, meeting all border-clearance requirements. The fact that the larva was dead would seem to indicate that this treatment had been effective, and no further action was recommended.

## Live insect found in suitcase from Australia

A single live insect was found in a suitcase at a Wellington home after flights from Sydney and Auckland. A photo provided to MPI was determined to most likely be the burnt pine longhorn beetle, *Arhopalus tristis* (Coleoptera: Cerambycidae). The specimen was destroyed, mitigating the possibility that it might be an exotic *Arhopalus* species. *Arhopalus tristis* is a wood-boring beetle present in New Zealand and the adults exhibit dispersal flights during autumn, which coincided with the detection.

## Unusual insect from Japan

A live, unusual-looking orange insect with numerous black spots was found in a vehicle compliance workshop in Auckland. The workshop deals with vehicles imported from Japan and staff suspected the insect might be an exotic species. However, a photo of the insect was identified by a PHEL entomologist as the Hadda beetle or 28-spotted ladybird, *Henosepilachna vigintioctopunctata* (Coleoptera: Coccinellidae), a species present in New Zealand. As standard practice, the notifier was asked to euthanase the specimen by freezing and to notify MPI of any other unusual insect finds.

## Radiata pine dieback on golf course

Auckland Council notified PHEL of suspect radiata pine (Monterey pine) dieback reported by a greenkeeper on the Waiheke Golf Course. Three *Phytophthora* spp. were isolated from the soil, wood and root samples collected. They were *P. cinnamomi* and two species in the *P. cryptogea* species complex. *Phytophthora cinnamomi* and *P. cryptogea* have been reported as causal organisms

of pine tree decline in New Zealand. *Sphaeropsis sapinea* (formerly *Diplodia sapinea*) was isolated from the wood sample. *Sphaeropsis sapinea* is a known pathogen of pine trees worldwide and is present in New Zealand, where it causes tip blight of pines, typically in trees that are under stress. All the pathogens isolated from the samples have been recorded in New Zealand.

## Suspect fruit fly, Auckland

A live suspect fruit fly was collected from the windowsill of an Auckland residence. However, from a photo provided to MPI it was identified as a member of the family Pallopteridae (flutter-wing flies), which are present in New Zealand. Fortunately New Zealand is free of economically significant fruit-fly species and for that reason all notifications of suspected fruit flies are treated as important.

## New to New Zealand fungi found on rushes

*Stagonospora pseudoperfecta*, a new to New Zealand fungus was found on *Juncus* sp. (rush). The sample was collected during an HRSS inspection in Auckland and *S. pseudoperfecta* was isolated by PHEL. This fungus was described in 2015 from Japan but very little is known about its biology. It is saprophytic, not pathogenic, so the biological risk was considered low and no further action was warranted.

## New to New Zealand fungus on *Agonis flexuosa*

*Pseudosydowia eucalypti*, a new to New Zealand fungus, was found on *Agonis flexuosa* (peppermint myrtle) during a HRSS inspection at the Tauranga seaport. This fungus is a weak pathogen that may cause leaf spots on *Eucalyptus* spp. and other members of the family Myrtaceae. It is not considered a biological risk and no further action was warranted.

## New to New Zealand moth found on river peppermint

*Macarostola ida* (Lepidoptera: Gracillariidae), a new to New Zealand leaf-mining moth, was found on river peppermint (*Eucalyptus elata*) trees in Cornwall Park, Auckland. PHEL and Manaaki Whenua Landcare Research entomologists visited the site and collected more specimens. Later that month the PHEL entomologist visited Waiatarua Reserve, some distance from the original detection and an area where a number of *Eucalyptus* species are grown. Adult moths, larvae and pupae were collected from three different *Eucalyptus* species, indicating that the moth was not host-specific and that it was established outside the original detection site. Similar leaf-mining damage was seen on four tree species that were provisionally identified as *E. youmanii*, two other *Eucalyptus* species and Sydney red gum (*Angophora costata*). A scientist from Scion advised MPI that insect larvae and damaged leaves with leaf-mining similar to that caused by *M. ida*, had been collected from a forestry block at Waiomio, Northland. The larvae were contained in Scion's secure facilities and one adult *M. ida* emerged. This species is native to Australia, where it is the most widely distributed species of the genus, occurring from the Atherton Tablelands in Queensland to Victoria and also in southwestern Australia. *Macarostola* spp. are known to spend their first two instars in the mines, where they are sap-feeders. They then leave the mine and form a shelter by rolling the tip of a narrow leaf. The MPI Risk Assessment Team concluded that *M. ida* was unlikely to be a pest of New Zealand native plants, considering the moth was not recorded as an economic forestry pest and was recorded from two sites about 170 km apart. The Department of Conservation and GIA signatories were notified and no further action was recommended.

## Pohutukawa decline in Parliament grounds

MPI was notified about possible dieback disease of pohutukawa trees (*Metrosideros excelsa*) in front of Parliament Buildings, Wellington. The disease was patchy and spread over a small group of trees. SPS Biosecurity was contracted to collect samples for diagnostics. PHEL mycologists detected only one fungus-like organism in the soil, *Pythium anandrum* (Oomycetes). Species of *Pythium* and related genera are commonly found in soil and water samples and can be weak root pathogens of a number of woody hosts. *Pythium anandrum* has previously been found in New Zealand from *Lupinus* sp., *Rhododendron indicum*, *Sequoia* sp. and *Viburnum* sp. but there is no information available about the pathogenicity of *Pythium* on *Metrosideros* spp. Overseas it has been associated with a wide range of hosts, including oak and pine trees, on which they may cause disease. No new to New Zealand organisms were found, and since *Pythium* is a weak pathogen it was unlikely to have caused the dieback. The investigation supported by the site inspection and diagnostics concluded that the dieback likely resulted from abiotic causes. MPI's Ministerial representative was advised of the outcome.

## Fungus on feijoa trees

A Northland feijoa grower noticed that his newer feijoa cultivars were affected more badly by anthracnose compared with older feijoa cultivars. Anthracnose is a disease caused by the fungus *Colletotrichum theobromicola*, which has been present on feijoa trees in New Zealand since at least 2004. The notifier asked if any feijoa plant material had been recently imported, but aside from the importation of feijoas from their native habitat in Brazil 30–40 years ago there have been no such imports. There is an MPI-funded Sustainable Farming Fund project underway that aims to develop a protective programme to manage and control the disease, and Plant and Food Research Ltd is providing research support. The project, in collaboration with the New Zealand Feijoa Growers Association, involves identifying existing disease-tolerant cultivars, developing a protective fungicide spray programme and developing best orchard cultural practices to prevent inoculum build-up and reduce infection.

## Suspected new to New Zealand mite found on poroporo

A PHEL entomologist identified *Brevipalpus papayensis* (Acariformes: Tenuipalpidae), thought to be a new to New Zealand mite, on poroporo (*Solanum laciniatum*). The mite was originally described from papaya (*Carica papaya*) in Hawai'i and previously also recorded from *Camellia sinensis* (tea), *Citrus sinensis* (sweet orange) and *Citrus x latifolia* (Persian lime) in Australia, Costa Rica, Hawai'i and Indonesia. Three old specimens deposited in the PHEL Tamaki entomology collection (PANZ) and labelled "*Brevipalpus phoenicis*" were found to be *B. papayensis*, demonstrating

that this species has been in New Zealand since 1966. It was collected from a grass in Levin, from *Plumeria* sp. (frangipani) in Whangarei and *Galium aparine* (cleavers) in Auckland. This is the first formal record of this mite from New Zealand, and a new host record on poroporo. The biology of this mite has not been investigated but it is unlikely to be a significant pest of New Zealand native plants and crops since it has been in the country for at least 50 years and is obviously well established.

## Suspect chestnut bleeding canker disease

A possible chestnut blight disease was reported by an arborist from the Waipa District Council. Photos were sent to PHEL mycologists, who were able to rule out chestnut blight. SPS Biosecurity was contracted to collect samples for diagnostics at PHEL, since the bleeding symptoms could be caused by a range of pathogens including *Phytophthora* spp. (some of which are present in NZ), the honey fungus *Armillaria* and the bacterium *Pseudomonas syringae* pv. *aesculi* (the cause of chestnut bleeding canker, which is not present in New Zealand). The samples tested had signs of bacterial infection and SPS staff noted a foam exuding from the affected area, with a smell of fermentation. However, *Pseudomonas syringae* pv. *aesculi* was not found and tests were also negative for *Phytophthora* and *Armillaria*. While seven bacterial species were isolated from the wood samples, none of them were plant pathogens and the bleeding was likely caused by a secondary invasion of non-pathogenic bacteria. Two pathogenic fungi known to be present in New Zealand, *Fusarium solani* and *Diaporthe amygdali*, were isolated from soil and root samples, but were not likely to be associated with the symptoms seen on the chestnut tree.

## Live insects in Californian raisins

Live insects were found in a box of Californian raisins purchased from a Wellington supermarket. The MPI Food Compliance team received the initial report and arranged a review of imported stock and the import pathway for the supermarket chain. Photos of the insects causing the infestation were identified by a PHEL entomologist as an *Oryzaephilus* sp. that is commonly intercepted on imported products. Two species of this genus are present in New Zealand: the saw-toothed grain beetle (*O. surinamensis*) and the merchant grain beetle (*O. mercator*). The notifier was informed of the identification and advised to destroy the goods.

## Insects in Italian pasta

Live insects were found in pasta imported from Italy. An experienced food industry worker familiar with stored product pests thought the insects were unusual and notified MPI. The insects were identified as *Sitophilus oryzae* (Coleoptera: Curculionidae), a common widespread stored product pest established in New Zealand. This was one of many cases investigated in this quarter that involved pests of stored products, including moths, beetles, weevils, meal moths, mealworms and flour beetles.

## Other insect reports

Apart from the three fruit-fly interceptions already discussed, there were 24 reports of suspect fruit fly this quarter. These fruit fly look-alikes, once examined by an entomologist, turned out to be local hover flies, vinegar flies, soldier flies, flesh flies and parasitoid and potter wasps. Other insect cases investigated this quarter also turned out to be species already established in New Zealand, including moths, ants, bees, tobacco beetle, drug store beetle, longhorn beetle, the native mason wasp, millipedes and dry-wood termites.

## Inconclusive investigations

Of the 340 cases investigated, 73 percent had clear outcomes and 25 were inconclusive (**Figure 1**) with no further investigation warranted. Fifteen investigations were still in progress at the end of this reporting period.

## Suspect new to New Zealand jewel bug

An iNaturalist post (https://inaturalist.nz/observations/19141902) regarding the sighting of a potentially new to New Zealand jewel bug in Albert Park, Auckland, was reported to MPI. The observer who posted the sighting was only able to take a photo, as the specimen flew away. He tentatively identified the beetle as *Melobasis fulgurans* (Coleoptera: Buprestidae) and PHEL has been working to confirm that identification. In 2006 a dead specimen of *M. fulgurans* was found on a footpath in Balmoral, Auckland. PHEL and an Incursion Investigator have done site visits but have been unsuccessful in obtaining a specimen. However, HRSS inspectors will continue to survey the area. Without a specimen, the investigation was inconclusive but MPI will reconsider that outcome should a specimen be found and submitted to PHEL for identification.

## Spiders inside an air-conditioning unit from Malaysia

Painters found spiders coming out of an air-conditioning unit at a commercial work site. The unit had been imported from Malaysia and stored in unsealed cardboard boxes in an Auckland warehouse before being unpacked and taken to the commercial site for installation. The spiders were only discovered 3 weeks after it arrived at the site. Upon closer inspection spiders were also found inside the unit's drain pump. Altogether 27 spiders were found, but half of them were dead. It is likely that when the unit was assembled the spiders were disturbed and started emerging. The photos showed orbweb spiders (Araneidae), which are harmless to humans. Given the number of spiders in the small area, the fact that half of them were dead and there was a likelihood of local infestation, no further action was warranted. Specimens were not received and the photos provided were of immature spiders, hence the inconclusive outcome.

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