

Surveillance

MINISTRY FOR PRIMARY INDUSTRIES REPORTING ON NEW ZEALAND'S BIOSECURITY HEALTH STATUS

VOLUME 42, NO 1, MARCH 2015



INSIDE:

Managing marine biosecurity risks
Surveillance methods for white bryony
Plants and environment investigation reports
Quarterly report of investigations of suspected exotic marine and freshwater
pests and diseases

Ministry for Primary Industries
Manatū Ahu Matua





Surveillance
ISSN 1176-5305

Surveillance is published on behalf of the Director IDC and Response (Veronica Herrera). The articles in this quarterly report do not necessarily reflect government policy.

Editor: Michael Bradstock
Technical Editors: Jonathan Watts,
Lora Peacock

Correspondence and requests to receive *Surveillance* should be addressed to:

Editor
Surveillance
Ministry for Primary Industries
PO Box 2526
Wellington, New Zealand
email: surveillance@mpi.govt.nz

Reproduction: Articles in *Surveillance* may be reproduced (except for commercial use or on advertising or promotional material), provided proper acknowledgement is made to the author and *Surveillance* as source.

Publication: *Surveillance* is published quarterly in March, June, September and December. Distribution via email is free of charge for subscribers in New Zealand and overseas.

Editorial services: Words & Pictures, Wellington
www.wordpict.co.nz

Surveillance is available on the Ministry for Primary Industries website at www.mpi.govt.nz/publications/surveillance/index.htm

Articles from previous issues are also available to subscribers to SciQuest®, a fully indexed and searchable e-library of New Zealand and Australian veterinary and animal science and veterinary continuing education publications, at www.sciquest.org.nz

Surveillance is published as the Ministry for Primary Industries' authoritative source of information on the ongoing biosecurity surveillance activity and the health status of New Zealand's animal and plant populations in both terrestrial and aquatic environments. It reports information of interest both locally and internationally and complements New Zealand's international reporting.

Contents

Editorial

Managing marine biosecurity risks 3

ANIMALS

Quarterly reports: October to December 2014

Quarterly review of diagnostic cases 4

Quarterly report of investigations of suspected exotic diseases 10

Quarterly report of biosecurity responses 17

MARINE AND FRESHWATER

Quarterly reports: October to December 2014

Quarterly report of investigations of suspected exotic marine pests and aquatic diseases 18

PLANTS AND ENVIRONMENT

Reports

Surveillance methods for white bryony in sites with difficult access 20

Quarterly reports: October to December 2014

Plants and environment investigation report 22



EDITORIAL

MANAGING MARINE BIOSECURITY RISKS

During the past two years the Marine High Risk Site Surveillance programme has recorded the first New Zealand occurrences of two non-indigenous sea squirts (Riding *et al.*, 2014; Bingham, 2014b) and reports from alert members of the public have helped to document range extensions of the Mediterranean fanworm (*Sabella spallanzanii*) and the clubbed tunicate or leathery sea squirt, *Styela clava* (Bingham, 2013 & 2014a). These findings reflect the increasing importance of marine species in Response and Surveillance activities and highlight a key risk pathway in aquatic biosecurity.

There's little doubt that the new non-indigenous sea squirts in Northland were introduced by biofouling on international vessels. This is an important means of long-distance transport for non-indigenous marine organisms and at least two-thirds of introduced marine species are likely to have arrived this way. These introductions can have significant environmental and economic impacts (Bell *et al.*, 2011) and the best way to manage the risks is by preventive management.

International efforts to address biofouling risks are still in relatively early stages. In 2011, the International Maritime Organisation (IMO) issued voluntary guidelines for biofouling management, setting out a best-practice approach. Jurisdictions such as Australia (particularly Western Australia) and the US states of Hawai'i and California are also exploring options for regulation of biofouling.

New Zealand played a lead role in developing the IMO biofouling management guidelines, and MPI leveraged off this work to produce vessel biofouling regulations that are aligned with the IMO approach. In May 2014, as a result of these efforts, MPI issued the Craft Risk Management Standard (CRMS) for biofouling on vessels arriving in New Zealand (MPI, 2015).

The CRMS has a four-year voluntary lead-in period, which will allow vessel operators and shipping companies to phase in the necessary compliance practices before enforcement commences on 15 May 2018. During this period, action will continue to be taken on cases of severe biofouling and MPI will be encouraging vessel operators to become compliant as soon as they can. With the release of the CRMS, MPI has issued the world's first border regulation on international vessel biofouling – a significant international achievement, and an important step towards protecting New Zealand's marine values.

Managing these biosecurity risks has been a priority for MPI, but biofouling in our domestic marine space is also an important risk pathway, as evidenced by range extensions of the Mediterranean fanworm and the clubbed tunicate. Fouling develops on any vessel moored in a marine environment and craft that remain laid up for long periods accumulate heavy biofouling. Movement of fouled vessels then spreads non-indigenous marine species and MPI sets out to inform the

public of the best practice for managing this biosecurity risk, which is to:

- regularly haul out or slip vessels for cleaning and antifouling renewal;
- regularly wipe down the hull to limit fouling accumulation to a light slime layer; and
- before setting off to a new location, check that the hull is clean. If it's not, clean before leaving.

The growing awareness of vessel biofouling risks also highlights the surveillance role played by the public. In the marine environment, non-indigenous species can establish and spread quickly, and early detection offers the best chance of successfully responding to an incursion. Members of the public – especially those who spend time around the sea – are often the best placed to quickly notice marine organisms that are new or out of the ordinary.

Ongoing public vigilance and prompt reporting of potential biosecurity risks is a critical part of the biosecurity system. As MPI takes steps to improve the management of international and domestic vessel biofouling risks, let's be sure not to let our guard down.

Daniel Kluza
Senior Adviser (Animals and Aquatic)
Biosecurity Science and Risk Assessment
Ministry for Primary Industries
Daniel.kluza@mpi.govt.nz

REFERENCES

- Bingham P (2013). Quarterly report of investigations of suspected exotic marine and freshwater pests and diseases. *Surveillance* 40(2), 28–31.
- Bingham P (2014a). Quarterly report of investigations of suspected exotic marine and freshwater pests and diseases. *Surveillance* 41(2), 20.
- Bingham P (2014b). Quarterly report of investigations of suspected exotic marine and freshwater pests and diseases. *Surveillance* 41(4), 23–24.
- Bell A, Phillips S, Denny C, Georgiades E, Kluza D (2011). *Risk Analysis: Vessel Biofouling*. Ministry of Agriculture and Forestry, Biosecurity New Zealand. <https://mpigovtnz.cwp.govt.nz/document-vault/2863>. Accessed 20 February 2015.
- Ministry for Primary Industries (2015). *Sea Craft (Vessels)*. <http://www.biosecurity.govt.nz/regs/sea-craft-ports/sea-craft>. Accessed 23 February 2015.
- Riding T, Morrissey D, Wilkens S, Inglis G (2014). Marine surveillance annual report. *Surveillance* 41(3), 59–63.

QUARTERLY REPORT OF DIAGNOSTIC CASES: OCTOBER TO DECEMBER 2014

NEW ZEALAND VETERINARY PATHOLOGY

BOVINE

Over a 24-hour period five calves died from a group of 100 in the Waikato. The calves appeared clinically blind. Histology revealed cerebrocortical oedema with patchy brain haemorrhages. Blood lead levels in an affected animal were 2.0 mg/L (toxic level > 0.35). **Lead toxicity** was diagnosed.

A two-year-old Hereford heifer from a group of 40 in the Nelson area died suddenly after being moved on to new pasture. Vitreous humour nitrate levels were extremely high, at 250 mg/L (toxic level > 25). **Nitrate toxicity** was diagnosed.

A hundred 5-week-old calves out of a group of 350 animals in the Waikato exhibited severe conjunctivitis and keratitis. Culture of conjunctival swabs from affected animals grew *Moraxella bovis* and **infectious bovine keratoconjunctivitis** was diagnosed.

Three animals out of a group of ninety 15-month-old Jersey calves died with evidence of diarrhoea. Previous cultures for *Salmonella* had been negative in these animals. Histology revealed the presence of typical intranuclear inclusion bodies in the vascular endothelium of submucosal blood vessels in the small intestine. Vascular endothelium at other sites also contained intranuclear inclusion bodies. **Bovine adenovirus infection** was diagnosed.

Two dairy herds in south Waikato had multiple spontaneous humeral fractures in two- and three-year-old dairy cattle. Testing of the serum of one animal euthanased after a fracture revealed a low serum copper level of 4.9 µmol/L (reference range 8.0–20.0). In the other herd, low serum copper (6.0 µmol/L) was noted in a live animal. This animal was euthanased and the liver copper levels were found to be below the detection limits of atomic absorption spectrophotometric assay, which is 45 µmol/kg (reference range 95–2000). **Copper deficiency** is thought to have contributed to the bone weakness seen in these cattle.

Two properties in the Waitaki district had similar problems with fractures in heifers. On one property, seven out of 220 animals broke their legs. On another property, five animals were euthanased because of humeral fractures. Two animals from the first property had liver copper levels below 45 µmol/kg and three from the second property had 50 µmol/kg or less. Humeral fractures in young dairy cattle are a growing problem and their incidence appears to be increasing. Not all animals that develop fractures appear to be affected by low copper stores at the time of examination, but many are, as seen here. On many properties multiple young animals are affected and there may be losses associated with these fractures. Other factors that may contribute to the development of bone weakness in young dairy animals have not yet been identified.

Three heifers from a property in the Waikato had warty growths on the vulval mucous membranes. Histopathology of one of the growths revealed that they were **fibropapillomas**, which are caused by a **bovine papilloma virus**.

A group of two-week-old autumn calves exhibited severe diarrhoea. Testing for viral agents and cryptosporidia was unrevealing, but all three animals from which samples were submitted yielded *Salmonella* Typhimurium on culture.

Serratia marsescens continues to occasionally be identified as a cause of relatively mild but chronic mastitis, with sporadic cases occurring on various properties throughout the Waikato.

A calf from a herd in Tauranga had intermittent green diarrhoea and a faecal egg count of 500 strongyle eggs per gram. *Salmonella* Typhimurium was also cultured from the faeces. **Salmonellosis** was diagnosed.

A three-year-old cow from the Hauraki district had multiple masses around the commissure of the nostrils, marked cervical lymphadenopathy and oral ulceration. The cow was

euthanased and MPI was notified by the veterinarian to rule out exotic disease. The head was submitted to NZVP for gross and histological examination. Necropsy revealed a marked granulomatous rhinitis, stomatitis and tonsillitis. Histology showed marked pyogranulomatous inflammation with intralésional club colonies surrounded by Splendore-Hoeppli reaction, consistent with infection by *Actinobacillus* spp.

At slaughter, a large mass was found in the right cardiac ventricle of a three-year-old cow that had been clinically normal with no other gross abnormalities noted. Histology of the mass showed that it was composed of irregular spindle cells arranged in bundles and more disorganised, interwoven sheets. **Intracardiac schwannoma** was diagnosed. These are slow-growing spindle cell tumours that do not metastasise. They are an infrequent incidental finding at slaughter.

Four 15-month-old calves died over the course of four days. Three other clinically affected animals were depressed and anorexic, with evidence of blindness. Haematology and clinical chemistry yielded few specific findings, but blood lead was > 0.7 mg/L (toxic level > 0.35 mg/L). Numerous used car batteries were subsequently found in an area to which the calves had access.

A six-month-old heifer in the Waikato was the runt of the mob, with marked lethargy, a pale appearance and scour. The calf did not have significant findings on faecal egg count, but was moderately anaemic, with a haematocrit of 0.1 (normal range 0.23–0.42) and mildly hypoproteinaemic (58 g/L; normal range 60–86). **Bovine viral diarrhoea** antigen testing was positive and **mucosal disease** was diagnosed.

Samples were submitted from a mob of mixed-age Jersey animals in the Waikato with severe keratoconjunctivitis that did not appear to respond to treatment with a cloxacillin eye ointment. *Moraxella bovis* was isolated from a conjunctival swab.

Infectious bovine keratoconjunctivitis was diagnosed.

A group of 3-4-week-old calves in Wairoa had trouble with scours, with a few deaths. Testing on faeces from four calves revealed that two were **rotavirus**-antigen-positive. **Salmonella Typhimurium** was also isolated from the faeces of all four calves submitted.

A small group of Jersey heifers in the Waikato had scouring and weight loss. Submission of faeces from two resulted in the isolation of **Yersinia pseudotuberculosis**. **Yersiniosis** was diagnosed.

A group of 12 weaner cattle in the Wairoa district were doing poorly despite having been regularly drenched and treated for liver fluke. Haematologic examination revealed that they were anaemic, with evidence of *Theileria* spp. on the smear. PCR identified the species as **Theileria orientalis Ikeda**.

Three dairy heifers in the Manawatu abruptly died themselves off. They exhibited rapid weight loss, swollen submandibular lymph nodes and a profuse serous nasal discharge. Haematology and chemistry were unrevealing, but all three animals were positive on an infectious bovine rhinotracheitis (IBR) antibody ELISA. PCR for IBR on the nasal discharge of two animals was positive for viral nucleic acid. **Infectious bovine rhinotracheitis virus** was considered the likely cause of their clinical signs.

OVINE

A group of Romney cross lambs in the Auckland region exhibited increased skin fragility at crutching. Histology on a sample from one of the lambs revealed that the dermis had increased amounts of mucinous ground substance separating small, disorganised strands of dermal collagen. The history and histology were considered consistent with **dermatosparaxis**, a genetic defect that results in the formation of abnormal dermal collagen. Increased skin fragility and skin distensibility results. Dermatosparaxis has been shown to be present in White Dorper lambs in New Zealand (Vastra *et al.*, 2011). Other reports suggest that Romneys may also be affected, but a genetic mutation has not been shown to be present in this breed.

A group of lambs in the Bay of Plenty were docked but received no clostridial

vaccine. They developed diarrhoea and some were found ataxic, with others exhibiting opisthotonus. Examination of the brain from one lamb revealed focal symmetrical encephalomalacia, a lesion typical of infection by **Clostridium perfringens type D**. **Pulpy kidney** was diagnosed.

AVIAN

A lovebird (*Agapornis* sp.) from a zoological collection in Auckland was euthanased because it appeared unwell. Postmortem revealed multiple irregular white foci less than a millimetre in diameter in the liver. Histology showed a multifocal granulomatous hepatitis with rare intracytoplasmic acid-fast bacilli. **Systemic mycobacteriosis** was diagnosed.

A zebra finch (*Taeniopygia guttata*) from a zoo in Auckland exhibited dyspnoea, tachypnoea, and had a faeces-stained vent. Histology revealed a granulomatous pneumonia with intracellular acid-fast bacilli. Small aggregates of macrophages were also visible on the serosal surface of the intestine. **Mycobacterial pneumonia** was diagnosed.

EQUINE

A four-week-old foal in the Waikato had severe neurological signs. Cytological examination of the cerebrospinal fluid revealed a marked suppurative meningitis with numerous degenerate neutrophils. The foal was euthanased because it had a poor prognosis, and the head and neck were submitted for necropsy and histology. Gross abnormalities included congestion and increased cloudiness of the meninges at the base of the brain. When the cerebellar peduncles were cut, an abscess was found in the base of the cerebellum. Histology revealed a severe **suppurative meningitis with cerebellar abscessation**. **Streptococcus zooepidemicus** was cultured from the lesion.

A seven-year-old station-bred gelding from the Napier region presented to a practice in Palmerston North with moderate chronic disease including mild ataxia, depression, fever, inappetence and an inflammatory blood profile. Nasal discharge was also present and the horse was known to be a habitual headshaker. Biochemistry was unremarkable, but haematology revealed that the horse had a moderate neutrophilia and lymphopaenia. Abdominocentesis, bronchoalveolar wash and transtracheal

wash were unrevealing. Testing of the cerebrospinal fluid (CSF) revealed a mild increase in cellularity (nucleated cell count $17 \times 10^6/L$; reference range $0-8 \times 10^6$), and a high CSF protein level (1.3 g/L; reference range 0.2-0.8). Cytological examination of the CSF showed a mild mononuclear pleocytosis. The horse was positive on antibody ELISA for equine herpesvirus-1 and equine herpesvirus-4. PCR on the CSF was positive for EHV viral nucleic acid (Allen, 2006), but the level of nucleic acid was very low and it was determined to be not a neuropathogenic strain. The horse improved with symptomatic treatment and was discharged to recover at home, but it developed apparent blindness and was euthanased without further follow-up. The horse did not have the classic signs of myeloencephalopathy noted in a previous outbreak in the Waikato. There was little evidence of paresis, paralysis, or urinary incontinence. The positive PCR test was likely the result of latent infection by a non-neuropathogenic strain of **equine herpesvirus**. The underlying cause of this horse's degenerating neurological state was not determined.

CANINE

A three-month-old Golden Retriever puppy from Invercargill had a history of recurrent diarrhoea for the past 3-4 weeks, with colitis and weight loss. Faecal egg counts, *Campylobacter* and *Salmonella* cultures of the faeces were negative but a giardia antigen ELISA returned positive results. **Giardiasis** was diagnosed.

PORCINE

Two out of a group of five 10-week-old Large White gilts in Kaipara died suddenly over two days. There was a previous history of deaths in animals of the same age during the past 10 years. The animals were fed a milk-only diet. Grossly, there was marked pericardial haemorrhage visible. Histologically, there was evidence of degeneration of the aortic tunica media, with tears and marked haemorrhage. There was also marked pericardial haemorrhage present. The liver had mild acute centrilobular congestion and necrosis. These lesions were consistent with aortic rupture followed by pericardial haemorrhage and acute heart failure. Liver copper levels were tested by atomic absorption spectrophotometry and were less than

45 µmol/kg (reference range 75–2300).

Copper deficiency was diagnosed.

Rupture of the aorta or other major cardiac vessels, accompanied by haemopericardium and sudden death, is associated with copper deficiency in swine. A copper-containing enzyme, lysyl oxidase, is responsible for cross-linking of collagen and elastin fibres in blood vessel walls. A copper deficiency leads to inadequate cross-linking and weakness, causing rupture.

REPTILES

A green turtle (*Chelonia mydas*) in a zoological collection in Auckland was observed to be doing poorly and floating near the surface. The animal died despite intensive treatment with supportive therapy and antifungal drugs. Necropsy revealed numerous large dark 1-cm-diameter nodules in the lung. Histology revealed the presence of fungal hyphae in large areas of necrosis and haemorrhage in the lung. Numerous small fibrin thrombi were visible adherent to the endocardium and the tunic intima of the great vessels. A **fungal pneumonia** was diagnosed based on the histology. Further typing of the fungus involved was not performed.

A one-year-old tuatara (*Sphenodon punctatus*) had a grossly abnormal jaw with peeling skin. Histology of a skin sample revealed a band of keratin debris accompanied by numerous fungal hyphae. Moderate numbers of Gram-positive and Gram-negative bacteria were also present. **Mycotic dermatitis** was diagnosed.

GRIBBLES VETERINARY PATHOLOGY

BOVINE

Samples of beef processed at an Auckland abattoir were found to have green discoloration of the muscle. Histopathology of representative areas revealed fibrosis and inflammation consisting mainly of eosinophils; in one area these were seen around a degenerate sarcocyst. **Eosinophilic myositis** was diagnosed. This is thought to be an uncommon manifestation of *Sarcocystis* spp. infection, which may involve a hypersensitivity response. Parasite cyst rupture and muscle trauma might precipitate the lesion.

Four outbreaks of a disease consistent with **sporadic bovine encephalomyelitis**

were diagnosed in Canterbury during October and November. The disease was diagnosed on the basis of histological findings in the brains, one of which was positive to the agent *Chlamydomphila pecorum* by PCR. On one farm 90 of 800 calves were affected and on another, 25 of 270 calves. Some of the calves had pleuritis, peritonitis and pericarditis at postmortem and were initially assumed to be cases of systemic *Pasteurella* infection. Clinically the syndrome was consistent between the farms. Most affected calves had a mild increase in temperature (39.1–39.3°C) and the most severely affected were above 40°C. They were listless, unsteady on their feet, knuckled on their hind feet, had trouble getting up and had mild nasal discharge. A minority of calves had clinical signs of stargazing or blindness. The most severely affected calves died or were euthanased, but once the disease was diagnosed, treatment with tetracyclines resulted in rapid improvement of the rest.

In the last week of November and the first week of December, **polioencephalomalacia** was diagnosed histologically in calves from three Canterbury farms. In Canterbury this disease mainly occurs in calves from December to the end of February. In two of the three cases the calves were presented to the veterinarians as cases of sudden death and in the third the calf was blind and ataxic.

The first case of *Theileria orientalis* **Ikeda** infection in South Island-born animals was diagnosed on a West Coast farm in October 2014. Several cows died early in lactation cows die and at postmortem they were very pale with watery blood. Blood collected at postmortem was positive by PCR for *Theileria orientalis* Ikeda. Ten herdmates were subsequently bled and four of these were also positive by PCR. Cases of *T. orientalis* Ikeda infection have subsequently been diagnosed in South Island-born cows from the Blenheim and Ashburton areas.

A Southland dairy farm had a number of cows becoming recumbent and dying one to two days later. They were treated with metabolic solutions but failed to respond. Necropsy of one cow showed only a thickened oedematous abomasal wall. Histopathological examination of the abomasum revealed areas of full-thickness ulceration of the mucosa,

infiltrated by neutrophils and Gram-positive bacilli consistent with **clostridia**. The underlying intact submucosa was markedly oedematous and heavily infiltrated with neutrophils. The mucosa adjacent to these areas appeared minimally affected apart from large areas of haemorrhage.

Infectious bovine rhinotracheitis (IBR) virus was identified by PCR in a conjunctival swab taken from the eye of a steer with a severe purulent bilateral conjunctivitis. This animal was from a mob of 70 on a Southland farm, where 28 steers showed similar signs.

There were two outbreaks of deaths caused by *Pasteurella multocida* in four-month-old dairy calves on Southland dairy farms in early summer. Over a three-day period on one farm, 11 of 150 calves were found sick and died a few hours later. A fibrinous pleuritis was found on necropsy of one calf and *P. multocida* was cultured from the pleural fluid. The calves had been yarded for drenching a week before. In a similar case, 14 of a mob of 130 four-month-old dairy calves died over a week. Similar findings were seen at necropsy and *P. multocida* was again cultured from the pleural fluid. Another mob in an adjacent paddock of similar size and age were unaffected.

Three adult milking Friesian cows from the Waikato were in poor condition so they were screened for the presence of *Theileria orientalis* Ikeda by haematology and PCR, and by ELISA for John's disease. Two cows were anaemic, with haemoglobin of 58 and 63 g/L (reference range 85–130), and packed cell volumes of 0.18 and 0.05 (reference range 0.24–0.40). *Theileria* organisms seen in the red cells were confirmed as *Theileria orientalis* Ikeda by PCR in both cows. The third cow was not anaemic and *Theileria* organisms were not seen, but a John's ELISA was positive, confirming **John's disease**. The two *Theileria*-affected cows were negative for John's disease.

A mature South Devon bull from southern Hawke's Bay had dyspnoea, as well as profuse bilateral purulent nasal discharge, ocular discharge, conjunctivitis and an elevated rectal temperature of 41.1°C. **Malignant catarrhal fever** caused by infection with ovine herpesvirus 2 was confirmed when the virus was detected by PCR.

A group of nine 10-week-old Friesian calves from southern Hawke's Bay had died in a mob of 70. Postmortem of one dead calf found lesions within the lungs. Culture of purulent material from the lung grew a pure isolate of *Mannheimia haemolytica*, confirming the cause of the **pneumonia**. In another case from Taranaki, a single three-month-old Jersey calf had died and 20 were coughing and ill-thrifty from a mob of 70. At postmortem 75 percent of the lung was consolidated and filled with purulent material. *M. haemolytica* was cultured from the purulent material.

A one-year-old heifer of unspecified breed from the Rangitikei district showed ill-thrift for several months and was much smaller than her herdmates. She was pyrexia, appeared pale clinically and there were increased lung sounds. Haematology revealed a mild anaemia with RBC $4.37 \times 10^{12}/L$ (reference range $5.0-7.7 \times 10^{12}$), haemoglobin of 71 g/L (reference range 80-140) and packed cell volume of 0.21 (reference range 0.24-0.40). There was a leukopenia of $1.7 \times 10^9/L$ (reference range $4-12 \times 10^9$), with too few cells to give an accurate differential. Small numbers of *Theileria* organisms were noted in the smear. A bovine viral diarrhoea (BVD) antigen ELISA test was a high positive, indicating an animal persistently infected with **bovine viral diarrhoea**. This infection had caused immunosuppression, chronic infections and ill-thrift. The anaemia in this animal was therefore most likely a result of chronic disease and inflammation with bone marrow suppression.

An EDTA blood sample tested by PCR was negative for *T. orientalis* Ikeda and *T. orientalis* Buffeli but positive for *Theileria orientalis* Chitose. This strain is usually considered non-pathogenic and is not associated with severe anaemia. Immunosuppression had enabled these organisms to proliferate.

Two sudden deaths occurred in a mob of 23 Friesian yearling bulls being administered Rumensin capsules and a combination oxfendazole and levamisole drench on a Wairarapa farm. The two bulls had received both treatments concurrently, unlike the rest of the mob. Histology on multiple tissues from both bulls showed only small areas of haemorrhage and oedema in the lungs. There were no other lesions to

suggest an underlying disease process. It was considered that the likely cause of death was acute **levamisole toxicity** caused by aspiration of drench while the Rumensin capsule applicator occupied the cranial oesophagus.

In another case of presumptive toxicity, a Wairarapa dairy farmer reported two sudden deaths among his replacement heifers, with another 12 heifers showing acute colic signs and dehydration. Two affected animals had mildly elevated serum urea (15.4 and 14.7 mmol/L; reference range 4.5-10) and GLDH (53 and 137 IU/L; reference range 8-41), suggesting pre-renal azotemia and mild hepatocellular damage respectively. Histological review of tissues from one of the dead heifers revealed mild, non-specific inflammation in liver, lung and small intestine, initially suggesting a response to parasite migration. However, the key finding was the presence of oleander (*Nerium oleander*) leaves in the rumen contents. With laboratory results ruling out other causes of death, **oleander toxicity** was diagnosed. This toxicity results from several cardiac glycosides, notably oleandrin and neriine. Some affected animals have histological lesions in the heart and lungs but animals that die acutely may not have diagnostic lesions (Galey *et al.*, 1996).

Four Jersey cows on a 230-cow Waikato dairy farm developed acute respiratory distress over the course of a month. The cows were being fed grain through the milking shed. Two of the affected cows died despite treatment with non-steroidal anti-inflammatories and oxytetracycline. Necropsy of one dead cow revealed diffuse red mottling of all lung lobes, with expansion of interlobular septae by fibrin and oedema. There was purulent material in the airways of the right cranial lobe. Microscopic examination revealed severe regionally extensive necrosuppurative bronchopneumonia with intralesional plant material and mixed bacteria, consistent with **aspiration pneumonia**. Fine dust from grain feeding, and a history of metabolic disease, were considered risk factors.

Two outbreaks of bovine **coccidiosis** were diagnosed during November, one in the Bay of Plenty and the other in the Wairarapa. In the former outbreak, about 25 percent of a mob of 60 six-week-old Friesian calves developed foul-smelling diarrhoea and dehydration. Six calves

died. Post-mortem findings on one calf included red spots on the abomasum and thickening and reddening of the colorectal mucosa. Histology revealed diffuse necrotising enterotyphlocolitis with nests of intralesional coccidial oocysts. Low numbers of coccidial oocysts were seen in faecal samples. No nematode eggs were seen and no bacterial pathogens were cultured. The Wairarapa outbreak involved six-month-old autumn-born Friesian bull calves. Six of these calves developed diarrhoea and stopped growing, while the rest of the mob continued growing at > 1 kg/day. Histology again revealed necrotising and stunting enterocolitis with numerous nests of coccidial oocysts.

OVINE

Pet lambs aged four to six weeks on a Southland deer farm were pastured on deer paddocks and fed milk and meal without a coccidiostat. They developed severe diarrhoea, and deaths occurred. Large numbers of oocysts were seen in the faeces from live lambs. Necropsy of a dead lamb and histopathological examination of sections of colon and small intestine identified significant numbers of coccidial development stages in enterocytes, confirming **acute coccidiosis**.

Twenty dead lambs from a mob of 800 were found in an undeveloped paddock on a Southland deer farm. One live lamb was found recumbent and seizing. No gross lesions were seen at necropsy but the cause was thought to be acute **tutu poisoning**, as tutu (*Coriaria arborea*) was found growing in the area being grazed.

On a sheep farm in Otago, six out of 80 hand-reared lambs weaned on to pasture two weeks earlier were found dead or with signs of photosensitivity affecting mainly the ears and face. Necropsy of one lamb revealed a jaundiced carcass and the urine was very red, suggesting haematuria or haemolysis. Serology and molecular tests for leptospirosis were negative and histological examination of a range of fixed tissues from this lamb revealed only necrosis of individual hepatocytes, retention of bile in the liver, and haemoglobinuric nephrosis of the kidney. There were no lesions in sections of the lung, spleen, abomasum or intestine. The cause of the **photosensitivity and jaundice** exhibited by these lambs was not determined.

Multiple two-month-old Wiltshire lambs from a small flock of 30 in the Bay of Plenty had diffuse, firm swellings in the submandibular region, but were clinically normal and growing as expected. Selenium, iodine and albumin concentrations were all normal in the two worst-affected lambs. The swellings persisted and eventually these two were slaughtered. Bilaterally symmetrical white tissue was present in the submandibular area beneath the jaw. Histopathology of the tissue identified it as thymus consistent with **extrathoracic thymus** hyperplasia. Extrathoracic thymus has been described in lambs in Zimbabwe but is a rare presentation (Kock and Ndikuwera, 1989).

Thirty percent of the lambs from a Wiltshire flock in the Rotorua district were born dead. Serum samples were collected from six surviving lambs at age one month and tested for antibodies by latex agglutination for *Toxoplasma gondii*. Five had titres of 1:2048 and one a titre of 1:256, confirming exposure to *T. gondii*. Titres this high indicate ***Toxoplasma gondii*** infection in late gestation. This could be the result of fetal infection and the lambs seroconverting *in utero*, supplemented by ingesting antibodies in the infected ewes' colostrum.

Two four-month-old mixed-breed lambs from Hawke's Bay were blind and ataxic and were euthanased. Examination of the brain by histopathology revealed neuronal necrosis and neuropil oedema consistent with **polioencephalomalacia**, which was most likely due to thiamine deficiency.

Nearly half (41.8 percent) of a line of 146 lambs from a Wairarapa sheep farm were found to have grossly visible **liver fluke** lesions while being processed at a meatworks in October. The previous lamb kill in September had been even worse affected, with 61 percent having lesions. Representative samples of liver were processed for histopathology in order to estimate lesion age. Typical histological lesions of **fascioliasis** were confirmed and mature flukes were seen in bile ducts. There was extensive dense portal to bridging fibrosis, suggesting the lesions were at least six weeks old and possibly much older, consistent with infection during the usual risk period of January to May.

CAPRINE

A single 12-week-old Saanen doe kid from a mob of 100 in the Manawatu had died and several others were coughing. Post-mortem examination revealed copious gelatinous fibrin in the ventral thorax and bilateral consolidation of the cranioventral lung lobes. Culture of the lungs grew a moderate growth of ***Mannheimia haemolytica***.

LLAMOID

Haemonchosis was diagnosed in a seven-year-old male alpaca from the Fairlie area. The animal had isolated itself and was acting strangely. It had pale mucous membranes and thin, watery blood. Laboratory examination showed it to be markedly anaemic (packed cell volume 0.9; reference range 0.25–0.41). A faecal egg count revealed 16 000 eggs per gram and the larval culture was a pure infestation of ***Haemonchus contortus***.

CANINE

A two-year-old Siberian Husky from the Auckland region had antibiotic-responsive diarrhoea, dehydration and was dull. The dog had developed diarrhoea at a boarding kennel, along with about five other dogs staying at the same facility. Faecal culture and egg-count evaluations were negative but a giardia-specific antigen ELISA was positive, suggesting that these dogs were suffering from **giardiasis**.

A one-year-old Greyhound from the Waikato developed diarrhoea after spending time with a trainer; reportedly other adult greyhounds at the training facility also had diarrhoea. Faecal egg counts revealed 150 strongyle and 600 ascarid eggs/gram and faecal culture produced ***Salmonella* Emek** after serotyping and phage typing at a reference laboratory. The diagnosis was **nematode parasitism**, with either inapparent *Salmonella* carriage or concomitant **salmonellosis**.

A litter of 10 six-week-old Labrador pups from rural Manawatu developed anorexia, vomiting and lethargy over several days. Two pups died. The dam, but not the pups, had been vaccinated against canine parvovirus. Jejunum from one of the dead pups was processed for histopathology. There was marked diffuse necrotising enteritis with villus blunting and fusion and crypt hyperplasia. In places, a necrotic eschar replaced the mucosa. These findings confirmed a

diagnosis of **canine parvoviral enteritis**.

CERVINE

A mature hind on a large Southland deer farm developed an extensive nodular skin disease. It was the only deer affected out of the 700 on this farm. The nodules tended to eventually burst and ulcerate. The deer was killed and multiple nodules, both fixed and fresh, were collected. Histological examination of sections revealed circumscribed foci composed of sheets of macrophages, bizarre giant cells and clumps of neutrophils. This reaction surrounded multiple foci of necrosis. There were eosinophilic intranuclear inclusions found in the nuclei of low numbers of giant cells, suggesting a diagnosis of **cervine herpesvirus** infection. This was confirmed by virus isolation.

A three-year-old red deer stag from Hawke's Bay was found dead 12 hours after having velvet removed under anaesthetic. Sections of lung examined grossly and by histopathology had pulmonary oedema and eosinophilic bronchopneumonia consistent with a **hypersensitivity reaction** to the anaesthetic agents.

FELINE

A 21-month-old Tonkinese cat from Northland had a history of severe skin lacerations following minor trauma. The skin was thin, fragile and highly distensible. Histopathology of skin biopsies revealed a generally thin dermis, with collagen arranged into small whorls as the dermis merged into the subcutis. **Dermatosparaxis** was suspected. This disorder is difficult to diagnose definitively without further testing such as electron microscopy, molecular or biochemical testing.

An 11-year-old spayed female Domestic Shorthair cat from rural Taranaki developed a well-demarcated grape-sized swelling of the third digit of the right hind foot. The swelling persisted for several months but no lameness was reported. Aspiration and cytology revealed inflammatory cells including macrophages, lymphocytes, plasma cells and occasional multinucleated cells. There was one spherical structure suspicious of a fungal organism. Histology confirmed a diagnosis of **cryptococcosis**, showing focally extensive granulomatous cellulitis with intralesional 4–8 µm spherical to

flattened eosinophilic or refractile yeasts surrounded by wide, clear spaces.

PORCINE

There was a late-term abortion in a closed pig-breeding unit in Southland. An aborted piglet was submitted to the laboratory. Histopathological examination of fixed tissues identified a bacterial **placentitis** containing large numbers of cocci, and an acute myocarditis and nephritis. *Streptococcus porcicus* was isolated from the liver of the aborted piglet. This bacterium has been previously identified as a cause of cervical lymphadenitis in adult pigs.

EQUINE

A four-day-old foal from the East Coast suddenly became lethargic and anorexic and died soon after. Significant leukopenia ($1.6 \times 10^9/L$; reference range $6-12 \times 10^9$) was the only change noted on antemortem blood testing. Histology revealed scattered foci of suppurative inflammation in the kidney, liver and lung, with those in the kidney most severe and centred on large colonies of bacteria. Bacterial emboli were prominent in glomerular capillaries. These changes were diagnostic of ***Actinobacillus equuli* septicaemia**, or **sleepy foal disease**. *A. equuli* is a normal inhabitant of the equine respiratory tract, faeces and genitourinary tract. High-mortality septicaemia in foals is due to prematurity, failed passive transfer of immunoglobulin, dam malnutrition, environmental stress and concurrent disease (e.g. parasites). There were also large numbers of coccidial life stages consistent with *Eimeria leuckarti* in the intestinal mucosa.

POULTRY

An adult Red Shaver hen from Auckland lost weight and had malaise for one month, then died. Other birds in the flock were reported to have intermittent diarrhoea and weight loss. Necropsy revealed that the oviduct was markedly distended by firm to caseous yellow malodorous material. **Salpingitis** and sepsis, probably due to *Escherichia coli*, was suspected.

NON-POULTRY AVIAN

A mature white swan was found dead on a Wairarapa farm pond and the owner suspected plant toxicity. No gross lesions were found on necropsy. Histopathology of the gizzard revealed

necrosis and inflammation of the keratin layer, associated with numerous *Candida albicans* organisms; this was consistent with **candidiasis**.

ZOO ANIMAL

A 16-year-old tiger in a Northland zoological collection had a mass on a pinna that had been present for about six months. Serology for FIV and FeLV, and screening haematology and serum biochemistry were unremarkable. Histopathology of the mass was characterised by lobules of large and pleomorphic, round to spindle cells with a high mitotic rate, and frequent multinucleated giant cells. The lesion was suspected to be a **histiocytic sarcoma**.

Four adult Dama wallabies (*Macropus eugenii*) from a group of 12 in a Waikato zoological collection died suddenly; one was observed to be shaking before death. A male and a female from this group were submitted for post-mortem examination. Significant findings in both were diffuse pulmonary reddening and variable consolidation, with small volumes of pericardial and pleural fluid. Histopathology in both revealed acute interstitial pneumonia, non-suppurative encephalitis and non-suppurative myocarditis, with myriad scattered tachyzoites or protozoal tissue cysts consistent with ***Toxoplasma gondii***. Marsupials are highly susceptible to this organism and an outbreak of **toxoplasmosis** was diagnosed.

A six-year-old meerkat (*Suricata suricatta*) from a Waikato zoological collection had progressive hindquarter paresis over three days and was euthanased. A gross lesion to explain the clinical signs was not found at necropsy. Histopathology of the spinal cord revealed areas of lumbar spinal gliosis, necrosis and haemorrhage with infiltrating neutrophils, macrophages and a protozoal tissue cyst consistent with ***Toxoplasma gondii***. Histopathology of the heart identified multifocal non-suppurative myocarditis. An antemortem serum sample had a *Toxoplasma* antibody titre of $> 1:2048$, consistent with a diagnosis of necrotising myelitis and myocarditis caused by **toxoplasmosis**. Another group of four meerkats were blood sampled to see if they had been exposed to infection. All had latex agglutination titres greater than 1:2048, indicating exposure and seroconversion.

Meerkats are particularly susceptible to toxoplasmosis (Juansalles *et al.*, 1997).

REFERENCES

- Allen GP (2006). Antemortem detection of latent infection with neuropathogenic strains of equine herpesvirus-1 in horses. *American Journal of Veterinary Research* 67(8),1401-1405.
- Galey FD *et al.* (1996). Diagnosis of oleander poisoning in livestock. *J Vet Diagn Invest* 8: 358-364.
- Juansalles C *et al.* (1997). Epizootic Disseminated Toxoplasmosis in Captive Slender-Tailed Meerkats (*Suricata suricatta*). *Veterinary Pathology* 34, 1-7.
- Kock ND, Ndiukuwera J (1989). Extrathoracic thymus tissue in lambs in Zimbabwe ('goitre'). *Veterinary Record* 124, 635-636.
- McKenna PJ (2003). An annotated checklist of ecto- and endoparasites of New Zealand reptiles. *Surveillance* 30(3), 18-25.
- Meldrum JB, Ko KW (2003). Effect of calcium disodium EDTA and meso-2,3-dimercaptosuccinic acid on tissue concentrations of lead for use in treatment of calves with experimentally induced lead toxicosis. *American Journal of Veterinary Research* 64, 672-676.
- Sigler L, Hambleton S, Pare JA (2013). Molecular characterization of reptile pathogens currently known as members of the *Chrysosporium* anamorph of *Nannizziopsis vriesii* complex and relationships with some human-associated isolates. *Journal of Clinical Microbiology* 51: 3338-3357.
- Vaatstra BL, Halliday WD, Waropastrakul S (2011). Dermatosparaxis in two White Dorper lambs. *New Zealand Veterinary Journal* 59(5), 258-260.

QUARTERLY REPORT OF INVESTIGATIONS OF SUSPECTED EXOTIC DISEASES

BVD-2 EXCLUDED

A veterinarian phoned the MPI exotic pest and disease hotline to report deaths in Canterbury dairy cows, associated with haemorrhage from the eyes, nose and vulva. Over 2–3 months up to 15 mixed-aged cows in a herd of 600–700 were reported to have died. Stock were in thin condition and the vet considered management issues might be a complicating factor. It is likely that at least some deaths were associated with metabolic conditions, particularly hypomagnesaemia, rather than the haemorrhagic syndrome. Recently-ill cows were still milking when illness was reported and their condition rapidly deteriorated within 2–3 days. Haemorrhage seemed to be a terminal event that did not occur in all cows. The herd was fed on a mixture of palm kernel, grass silage and barley. Generally, differential diagnoses for haemorrhage in animals include conditions that affect clotting factors (e.g., vitamin K-dependent factors), factors leading to decreased production or increased consumption of platelets, and factors causing direct damage to blood vessels.

Causes of haemorrhage and death in multiple cows include exotic agents such as anthrax (*Bacillus anthracis*) and bovine viral diarrhoea type 2 (BVD-2). Endemic agents include causes of liver disease (which reduces clotting factors) such as sporodesmin toxicity (facial eczema), brassicas, bracken fern (ptaquiloside toxicity with radiomimetic effects) and other toxins. The region did not have facial eczema and no brassicas had been fed to the cows, so these differentials were ruled out. Anthrax was excluded on epidemiological grounds because it had never been reported in the Canterbury region, there was no digging in the area and the cows died over a number of months. BVDV-2 was excluded by the MPI Animal Health Laboratory (AHL) Wallaceville, using PCR. This outbreak was considered to be most likely due to an unknown toxin. The farm is being monitored for future cases and possible follow-up. As exotic disease had been ruled out the investigation was stood down.

Exotic disease investigations are managed and reported by MPI Investigation and Diagnostic Centre (IDC) and Response, Wallaceville. The following is a summary of investigations of suspected exotic disease during the period from October to December 2014.

A Gribbles veterinary pathologist called the MPI exotic pest and disease hotline to report an adult dairy cow with severe anaemia and thrombocytopenia. No *Theileria* organisms were visible and molecular assays for *Theileria* were negative. Samples were submitted to the Animal Health Laboratory to exclude exotic agents such as bovine viral diarrhoea type 2 (BVD-2) and exotic haemoparasites. Molecular assays excluded the presence of BVD-2, *Mycoplasma haemobos*, *M. wenyonii* and *Anaplasma phagocytophila*. Bone marrow suppression due to ingestion of bracken fern (*Pteridium aquilinum*) was excluded after inspection of the pasture by the local veterinarian. No further cattle were affected and a presumptive diagnosis of a leukaemic process was made. Exotic disease was excluded and the investigation stood down.

A veterinarian phoned the MPI exotic pest and disease hotline to report haemorrhagic diarrhoea in six mature dairy cows from a group of 900. The cows appeared to have frank haemorrhage coming from the anus and bloodwork was unremarkable except for mild inflammatory changes. Post-mortem examination of two cows found marked thickening and oedema of the large intestinal wall. No ulcerations were apparent to explain the source of the haemorrhage. Haemorrhagic enteritis can be caused by the exotic agent bovine viral diarrhoea virus type 2 (BVDV-2) and by common bacterial agents such as *Salmonella* spp., which are found in New Zealand. No faecal cultures were obtained so diagnostics were limited to blood and histopathology samples. Blood samples from one affected cow tested negative for pestiviruses (BVDV-1 and -2). Histopathology showed the large intestinal mucosa was thickened, with ulceration and loss of enterocytes, and many developing life stages of coccidia

were present. Clinically significant coccidial infection is uncommon in adult cows. In this case there may have been a predisposing bacterial aetiology but the lack of samples prevented exploration of this theory. The outbreak subsided after about 10 days. Since an endemic differential was established as the probable cause, the investigation was stood down.

LUMPY SKIN DISEASE RULED OUT

A veterinarian called the MPI exotic pest and disease hotline to report skin disease in four mixed-breed milking heifers on a dairy farm in the Waikato. The heifers had multifocal nodular thickening and variable crusting of the epidermis of the head, neck and udder. Lesions were 2–10 mm in diameter and occasionally ulcerated. The lesions grossly resembled those caused by lumpy skin disease virus (LSDV), an exotic disease of economic and trade importance. Other causes of lumpy skin in cattle include pseudo-lumpy skin disease caused by bovine herpesvirus type 2 (BHV-2), demodicosis, ringworm and hypersensitivity reactions such as urticaria. Affected animals were in two separate herds that shared the same rotary shed. Animals had just come into milk but there had been no other changes in feed or chemical/drug exposure and they were feeding exclusively on grass. Lesions did not respond to treatment with topical glucocorticoids or systemic antibiotics. Blood samples of affected and unaffected heifers were taken and biopsies of lesions were taken from the most severely affected animal. The biopsies showed the presence of an eosinophilic dermatitis consistent with parasitism or allergy, and several sections of mites (*Demodex* spp.) were found in an expanded hair follicle. Bloods were negative for LSDV and BHV-2. Bovine

demodiosis is a self-limiting disease thought to be more common in stressed, young cattle such as those coming into first lactation. The case was followed up by the veterinarian and at last report the lesions were resolving without treatment. The investigation was closed.

MYCOPLASMA BOVIS EXCLUDED

A veterinarian called the MPI exotic pest and disease hotline to report a two-month-old Jersey heifer calf with a head tilt. The calf had been affected for 12 days before notification. A CT scan carried out on the calf had identified a unilateral otitis media. One differential for otitis media in a calf is *Mycoplasma bovis*, an agent not considered to be present in New Zealand. A PCR carried out on lesional material extracted by surgical excision was negative for *M. bovis* so this agent was not responsible for the signs observed. Microbiological culture was unrewarding, with mixed agents detected, perhaps indicating contamination from an otitis externa.

A New Zealand Veterinary Pathology pathologist called the AHL (Wallaceville) to enquire about *Mycoplasma* testing for an outbreak of severe conjunctivitis in calves that had had close contact with goat kids on the same property. The outbreak had affected about 30 percent of the 350, 2–3-month-old calves on a calf-rearing property in the Waikato. An MPI Incursion Investigator managed further sampling and testing associated with the outbreak, given the potential for the involvement of a new or emerging agent associated with cross-transfer from goats. Swabs were collected into a *Mycoplasma* transport medium from calves showing early signs of conjunctivitis and submitted to the AHL (Wallaceville). Culture was performed for *Moraxella bovis*, there was PCR testing for generic mycoplasmal material, and a specific PCR was performed to rule out *Mycoplasma bovis*, an exotic pathogen. Testing for *Mycoplasma bovis* was negative. Sequencing of the product of the generic PCR reaction resulted in a mixed signal. Mycoplasmal cultures were performed so that products could be sequenced and identified to species level. *Mycoplasma bovoculi* was isolated and sequenced from two separate animals. This organism has previously been isolated in New Zealand, in 2002 and 2006, during previous exotic

disease investigations, and is known to have a synergistic relationship with *Moraxella bovis* in causing conjunctivitis. *Moraxella bovis* is recognised as a cause of keratoconjunctivitis in cattle. Both species are known to be endemic in New Zealand. A new, exotic or emerging agent was excluded and the investigation was closed.

VETCH-LIKE DISEASE INVESTIGATED

A veterinary pathologist called the MPI exotic pest and disease hotline to report two recently calved six-year-old dairy cows with unusual and distinct histopathology lesions, similar to previous South Island cases seen in 2012 (Bingham, 2012). The veterinarian explained that a further six-year-old cow had subsequently died and described gross post-mortem findings including petechiation of serosal surfaces, particularly over the heart and omentum in two animals, while gross findings in the third animal were unremarkable. The deaths occurred on a dairy farm in the Waikato over a week in late July. The cows had been on kale, silage and palm kernel extract for most of the dry period and moved to pasture before calving about 2–3 weeks before the deaths began. Histopathology for these cases was similar to previous reports and characteristic of a type IV hypersensitivity reaction, with multisystemic granulomatous and eosinophilic inflammation that was most severe in the heart, kidneys and liver. Overseas, hairy vetch toxicity (caused by *Vicia villosa*) and citrus pulp intoxication have been associated with similar lesions, although these have not been reported in New Zealand. It is thought that other plant toxins or proteins, such as those present in brassicas, could present as allergens and induce a type IV reaction. No definitive aetiology was found in this case or other similar cases, and interest in this syndrome continues.

A veterinarian called the MPI exotic pest and disease hotline to report a four-year-old dry cow that was recumbent with a subnormal temperature, swelling of the head and muzzle, exophthalmos and petechial haemorrhages involving the vulval and buccal mucosal membranes. The cow was one of 120 dry cows being fed on a rape crop. The rest of the mob were clinically healthy. The veterinarian

described gross post-mortem findings including petechiation of peritoneal serosal surfaces, particularly over the abomasum. There was haemorrhage into the abomasal lumen and a blood clot in the duodenum. Gross findings were otherwise unremarkable. Histopathology identified extensive haemorrhage affecting skeletal muscle, myocardium and intestine, and round cell infiltrates in the spleen, heart, bladder, abomasum and duodenum. The cells were difficult to categorise and were thought most likely to be reactive lymphocytes, although leukaemic change could not be excluded. Round cell infiltration included both lymphocytes and eosinophils in the portal regions of the liver. The liver was also affected by more chronic lesions, considered potentially toxic in origin, which included biliary proliferation and vacuolation of mid-zonal and periportal hepatocytes. Histopathology of fetal samples was unremarkable. Exotic disease including bovine viral diarrhoea type II and anthrax were excluded on clinical, epidemiological and histopathological grounds. The case had some clinical and histopathological similarities to previous type IV hypersensitivity cases (vetch-like toxicity) seen particularly in the South Island (Bingham, 2012), although in the present case the infiltrates lacked eosinophils and kidneys remained unaffected. Although no definitive aetiology was identified, a suspected toxic or leukemic process was considered most likely. Exotic disease was excluded and the investigation was stood down.

ANTHRAX RULED OUT

An MPI Verifications Service veterinarian reported enlarged spleens seen at post-mortem examination of rising-two-year-old steers undergoing routine slaughter at a meatworks on the West Coast. The 11 steers were the remainder of a mob of about 40 that had been grazed together and had been slaughtered over the previous few days. No abnormalities were detected at ante- or post-mortem inspection in the earlier groups slaughtered. The affected steers had passed ante-mortem inspection earlier that day. At post-mortem inspection enlargement of the spleens was variable across the group, at 10–30 percent. No other post-mortem abnormalities were detected. Fresh and fixed samples of spleen were collected

and submitted to the IDC (Wallaceville). Anthrax was excluded on clinical and epidemiological grounds. Histology identified precursor erythrocytes and megakaryocytes expanding the red pulp. These findings were consistent with extramedullary haematopoiesis in response to increased turnover of red blood cells. *Theileria orientalis* Ikeda was identified using molecular techniques and was considered the cause of a normal physiological response in the animals. The steers had been born on the West Coast, moved as calves to the Nelson area for around a year, and had been returned for finishing on the West Coast nine months before slaughter. The New Zealand cattle tick, *Haemaphysalis longicornis*, and *T. orientalis* Ikeda are both known to be present in the Nelson area. This case demonstrated the potential for *T. orientalis* Ikeda infection to have long-term impacts. Exotic disease was excluded and the investigation was closed.

ANAPLASMOSIS RULED OUT

A veterinary pathologist called the MPI exotic pest and disease hotline to report that a four-year-old beef cow had a non-regenerative anaemia (HCT 0.16; normal range 24–48). Occasional structures associated with red blood cells could not be identified. The animal had an inflammatory leucogram with elevated fibrinogen (14 g/L; reference range 2–6), protein was low (albumin 17 g/L; reference range 27.8–45.3) and GGT was elevated (81 IU/L; reference range 9–39). Whole blood tested negative by PCR for *Theileria orientalis* Ikeda. Bovine haemoplasmas were excluded. Blood was negative by PCR using both a generic *Mycoplasma* PCR and a haemotropic PCR. The low albumin and non-regenerative anaemia suggest that the aetiology for the anaemia was most likely related to a chronic disease rather than caused by a haemoparasite (which generally causes a regenerative anaemia). Investigation so far has not detected any specific cause of anaemia (BVD antigen negative; no evidence of parasitism; normal blood copper, zinc and selenium).

EXOTIC CAUSES OF ABORTION IN SHEEP EXCLUDED

A veterinary pathologist called the MPI exotic pest and disease hotline to report some unusual abortions in two-tooth

and mixed-age ewes, consisting of a bacterial-type placentitis and abortion with no apparent cause. The farm was a large sheep station in the North Island, and owing to its extent the number of abortions was not known and only a small number of aborted fetuses were found (probably fewer than 1 percent of actual). Based on histopathology and gross lesions, differential diagnoses included the exotic agents *Coxiella burnetti* (the agent of Q fever), *Brucella melitensis*, *Chlamydophila abortus* and the endemic but incompletely understood agent *Helicobacter rappini*. More common rule-outs such as infection with *Toxoplasma gondii* and *Campylobacter* spp. were not evident on histopathology and were thought unlikely. Lung and placenta from one aborted fetus and lung from a second aborted fetus were tested by PCR for all the above exotic agents and *Helicobacter* spp. All samples were negative for all agents. No diagnosis was achieved but exotic causes of the abortions were ruled out.

EQUINE INFLUENZA RULED OUT

MPI was notified by a private veterinary practitioner of respiratory disease in a seven-month-old Miniature pony imported from the US. The weanling had been released from post-export quarantine two days previously. The veterinarian reported that the clinical signs suggested pneumonic lesions rather than an upper respiratory condition. Clinical signs observed were severe dyspnoea, a respiratory rate of 60/minute and a dry cough. In addition there were indications from ultrasound of consolidation of the ventral part of the lungs and a pleural effusion. No abnormalities were detected from blood biochemistry and a complete blood count. Equine influenza was excluded following a negative PCR from a deep nasal swab. Exotic disease was ruled out and the case was stood down.

EIA/EVA RULED OUT

A veterinarian called the MPI exotic pest and disease hotline to report illness on a horse farm with previously unexplained disease. Two of 30 horses were affected. The most recently affected horse was a one-year-old gelding with clear nasal discharge, swollen lymph nodes and joints and shifting-leg lameness. Two days previously a two-year old filly on

the farm had been euthanased owing to unknown systemic disease that was later diagnosed as cardiac fibrosis at postmortem. Six months previously four horses had been affected and three had died from severe neurological disease with a concomitant hepatopathy. Based on histology, the neurological signs were thought to be primary rather than secondary to the hepatopathy. A toxic cause was presumed but never found. There was no recent travel history but exotic disease was considered possible, based on the unusual presentation and presence of two ill horses. Exotic diseases including equine infectious anaemia and equine viral arteritis were considered possible causes of the oedema and systemic illness. Equine influenza was initially thought to be a possible cause, but lack of transmission to adjacent horses and lack of a cough made it unlikely. Endemic differentials included infection with *Streptococcus equi*, including internal infection (“bastard strangles”) and plant or fungal toxins. Later, bloodwork indicated that a severe acute hepatopathy was present, with markedly elevated liver enzymes. At that point a primary toxicity was considered most likely. The foal tested negative at the MPI Animal Health Laboratory for EIA, EVA and equine influenza, and negative for *Streptococcus equi* by nasal swab at a commercial laboratory. Liver enzymes and oedema gradually resolved with supportive care. A collaborative team comprising Massey University clinicians and toxicologists and an MPI pathologist met at the farm to investigate possible toxins. No toxic sources fitting clinical signs were identified and the cause of recent and past illness on the farm remains unknown. Exotic disease was ruled out and the case was stood down.

A Gribbles veterinary pathologist reported a horse for surveillance of equine infectious anaemia (EIA) via the MPI exotic pest and disease hotline. The horse was a New Zealand-born 12-year-old Thoroughbred with petechial haemorrhages around the nostrils, borderline anaemia (HCT 0.32; reference range 0.31–0.41) and a thrombocytopenia. A serum sample was submitted to the MPI Animal Health Laboratory and tested by serology for EIA using AGID. Given that more than 10 days had elapsed from the appearance of first clinical signs, a single test was considered sufficient to detect any titre

occurring as the result of exposure. Equine infectious anaemia was excluded. The exact cause of the clinical signs observed was not determined.

BABESIA CABELLI EXCLUDED

A Wallaceville scientist reported a positive serological test (IFAT) titre (1:320) to *Babesia caballi* during routine export testing of a 24-month-old Thoroughbred horse. A second serum collected nine days later was also positive at the same dilution. Clinically there was no evidence of recent exposure either during the period the horse was examined in quarantine or for the three months prior. The paired sera were sent to the OIE reference laboratory in the US, and determined to be negative by IFAT and cELISA. EDTA blood was negative to *Babesia caballi* by PCR. On the basis of these investigations the serological reaction was determined to be a false positive.

At the same time as this investigation, another 24-month-old Thoroughbred from an unrelated property had a negative IFAT titre of 1:80 during export testing; this is higher than commonly observed for New Zealand horses tested. To exclude the possibility of a rising titre the horse was re-tested about two weeks later. The titre remained stable and negative at 1:80. Thus there was no evidence from the two investigations that *Babesia caballi* was present in New Zealand's horse population.

EQUINE HERPES MYELOENCEPHALOPATHY EXCLUDED

A veterinarian notified MPI of a Thoroughbred mare showing neurological signs. The mare was on a stud farm in the Waikato region and there were concerns this case could be an extension of the recent outbreak of equine herpes myeloencephalopathy (EHM). The mare was mildly ataxic and had periods of recumbency. Nasal swabs and EDTA whole blood were negative for EHV-1 on PCR so EHM was unlikely to be the cause of the clinical signs observed. The mare was of low value and was euthanased rather than undergoing further treatment. No further follow-up was possible.

BRUCELLA CANIS EXCLUDED

A veterinarian reported a 2.5-year-old breeding dog imported from Hawaii 18 months previously with a history of aspermia and a recent epididymal abscess. Semen collected from the dog was negative for *Brucella canis* on PCR and was excluded as a cause of the clinical signs observed. The cause of the condition was not determined.

A Massey University veterinarian contacted MPI via the exotic pest and disease hotline after admitting a two-year-old German Shepherd bitch that had been mated three weeks earlier and was now unwell. The dog was pyrexia, with a vaginal discharge and neurological signs including proprioceptive deficits and exophthalmos affecting the right eye. Serum and vaginal swabs were submitted to the Animal Health Laboratory at Wallaceville. *Brucella canis* was excluded after serum tested negative in the *B. canis* rapid slide agglutination test. Three days later the dog was euthanased after she failed to respond to intensive therapy including antibiotic and antifungal medication. Gross post-mortem findings were unremarkable apart from opacity of the meninges, particularly at the base of the brain. Histological findings included polyradiculoneuritis characterised by pyogranulomatous inflammation affecting multiple cranial, spinal and peripheral nerves and trigeminal ganglionitis. Polyradiculoneuritis is an uncommon condition, the cause of which is poorly understood although it is believed to have an immune-mediated component. Exotic disease was excluded and no further action was required.

IBD RULED OUT

A poultry veterinarian called the MPI exotic pest and disease hotline to report bursal disease in a large number of five-week-old Shaver brown chickens from a commercial operation. One hundred out of 500 birds had died, of which seven were examined. Some birds were thought to have smothered but some were evidently ill before death. Three birds had variable bursal enlargement with luminal casts and the other four had bursal atrophy. Birds were dehydrated, with urate nephrosis present (indicative of dehydration). Only one pen of birds was affected, which meant infectious disease was less likely. However, the presence of prominent bursal lesions was suggestive

of infectious bursal disease (IBD), an exotic viral disease in the *Avibirnavirus* genus. IBD causes immunosuppression of young birds via inflammation of the bursa and depletion of lymphocytes. Histopathology was equivocal for IBD, with lymphocyte depletion prominent but a lack of evident bursitis. IBD PCR by the MPI Animal Health Laboratory was negative for bursas from three affected birds and pooled thymus and kidney. The cause was not determined but infectious disease was ruled out and the investigation was stood down.

AVIAN INFLUENZA RULED OUT

A veterinarian notified MPI that one out of 30 chickens was positive on ELISA for avian influenza (AI). The test had been carried out as part of routine export requirements. All birds were healthy, were housed indoors and had never been exposed to birds outside. The poultry facility operated under high biosecurity conditions and introduction of AI virus through fomites was considered a negligible risk.

A further blood sample was collected from the ELISA-positive bird and the cohort consisting of six birds from the same housed unit that had been previously tested. Cloacal swabs were also collected from these birds. Blood samples from all birds were negative on ELISA when retested at the AHL (Wallaceville) and swabs were negative for AI virus using PCR. The initial ELISA-positive result was determined to be a false positive and AI was excluded on laboratory, clinical and epidemiological grounds.

A Department of Conservation officer called the MPI exotic pest and disease hotline to report a mass mortality event involving 16 black-backed gulls (*Larus dominicanus*) found dead and dying on Waikanae Beach. Possible causes were considered to include exotic infectious agents such as avian influenza and Newcastle disease (avian paramyxovirus-1), and endemic agents such as botulism, trauma and poisoning. Two gulls were tested for avian influenza and Newcastle disease and were negative. No cause of death was apparent on autopsy or histopathology, enabling rule-out of trauma and most endemic bacterial agents. Botulism is more often found in stagnant bodies of water and was considered unlikely, but testing was

not performed. Poisoning was considered a possibility but was not confirmed. There were no other outbreaks of mortality and the investigation was closed.

VIRAL ENCEPHALITIS IN BLACK STILT INVESTIGATED

A veterinary pathologist contacted MPI to report suspect viral encephalitis of unknown cause in kaki/black stilt (*Himantopus novaeseelandiae*) chicks. Each year for about the past decade, several chicks per cohort have been affected by a neurological condition that histologically resembles a viral encephalitis. Chicks become ataxic, with drooping wings and a head-tilt and other central nervous signs. Severely affected chicks die. There is no known cause and bacterial cultures of affected brains have been negative. Brains of three affected chicks and one unaffected chick, and livers of two of those affected chicks, were tested for *Flavivirus* by PCR and viral culture. All tests were negative except for a suspicious *Flavivirus* PCR of the brain of one affected chick. Sequencing isolated a short segment consistent with an apparently novel *Flavivirus* but further typing was not possible. Black stilts are a critically endangered native New Zealand bird. In 1981 they hit a population low of just 23 birds. Since then the population has grown, thanks in part to the DOC captive-rearing programme at Twizel. As of 2010 the total population was 85 adults. Further work will include sampling of this year's chicks. Since flaviviruses are mosquito- and tick-borne, recommendations will be made regarding mosquito control at the chick-rearing premises.

TULAREMIA RULED OUT

A veterinary pathologist called the MPI exotic pest and disease hotline to report possible tularemia in an 11-month-old female meat rabbit. Tularemia is an exotic zoonotic disease of rabbits and other lagomorphs, caused by the pathogen *Francisella tularensis*. The rabbit had a short history of weight loss prior to death. At postmortem, pale nodular swellings were found in the spleen. Histologically there were confluent areas of necrosis surrounded by neutrophils, macrophages and plasma cells in the mesenteric lymph node, spleen, intestine and pancreas. Small numbers of Gram-negative bacteria were

present in necrotic foci in the spleen. PCR for *F. tularensis* was negative. Culture of the spleen yielded a heavy growth of *Yersinia pseudotuberculosis*, a common endemic pathogen that usually appears histologically as areas of necrosis containing large, lake-like aggregates of bacteria. The reason for the atypical histological presentation of these lesions was not apparent. Tularemia was ruled out and an endemic pathogen confirmed, so the investigation was stood down.

EFB AND IAPV EXCLUDED

A beekeeper called the MPI exotic pest and disease hotline to report a single hive with brood discoloration consistent with a potential aetiology of European foulbrood (EFB). About half of the uncapped brood was no longer the typical white-to-cream colour, but had a yellow discoloration. The beekeeper collected brood samples and carried out a 24-hour "sticky board" test. Samples were submitted to MPI's Animal Health and Plant & Environment Laboratories for exclusion of exotic disease. Examination of the sticky board identified two adult females of *Varroa destructor* (varroa) and seven adult females of *Melittiphis alvearius*, a pollen mite. Molecular testing for the exotic agents EFB and Israeli acute paralysis virus were negative. Over the following 2–3 days the brood continued to deteriorate and took on the typical dark colour, odour and "roping" of contents typically seen with American foulbrood (AFB). A PCR assay for AFB gave a strong positive result, confirming the updated assessment of the developing brood changes found in this hive. Exotic disease was excluded and the investigation was stood down.

TRACHEAL MITES EXCLUDED

An AsureQuality Apiary Advisory Officer called the MPI exotic pest and disease hotline after receiving samples from a small commercial beekeeper who reported dead and weak bees around the hive entrances of about 12 hives at two apiary sites. A further 30 hives at both sites were unaffected and healthy. Affected bees were submitted to the MPI Animal Health Laboratory (Wallaceville) and the MPI Plant & Environment Laboratory (Tamaki) for exclusion of exotic disease. Tracheal mite (*Acarapis woodii*) dissection and external mite washings were negative.

Acarapis externus, a common external mite on honey bees that is not associated with disease, was identified in the external washes. Molecular testing for *Nosema ceranae* was negative. Further questioning indicated that the syndrome was likely caused by spray-drift of an herbicide used on gorse bushes in the area. Exotic disease was excluded and the investigation was stood down.

An apiary manager called the MPI exotic pest and disease hotline to report an unusual mortality event in beehives in the Wairarapa. Ten to 15 percent of about 7000 hives were affected by a syndrome characterised by increased mortality of adult bees. Weaker hives were more affected by this syndrome. Brood were not affected. Differential diagnoses included the exotic diseases tracheal mite and European foulbrood, although the latter was considered unlikely as brood appeared unaffected. Endemic causes of adult mortality included *Nosema ceranae* and deformed wing virus (DWV). Exotic diseases and *Nosema ceranae* were ruled out by the MPI Animal Health and the Plant Health and Environment laboratories. All nine pottles of bees taken from representative sections of different apiaries were positive for DWV. This was unexpected in the light of early and effective treatment for varroa mite, which is considered the main vector of viral spread. Although DWV may have played a role in the decline, it was not thought to be sufficient to explain the severity of the syndrome. Instead, this case was determined to be part of a larger syndrome affecting multiple parts of the North Island. The cause of this widespread decline is unknown, though climatic factors over autumn and winter are thought to have played a role. Investigation of the wider North Island bee mortality is ongoing under another MPI investigation. This is focused on the Coromandel Peninsula, but will hopefully elucidate causes of this widespread syndrome. Exotic causes in this case were excluded and the investigation was stood down.

SMALL HIVE BEETLE RULED OUT

A member of a beekeeping club emailed MPI after finding an insect resembling a small hive beetle (*Aethina tumida*) burrowing in debris from a recently-cleaned-out hive. The Northland apiary had a total of 10 hives and only one

beetle was found. The notifier took photos before disposing of the beetle and sent them to the MPI Plant Health and Environment Laboratory for identification. Owing to the importance of small hive beetle and the lack of a sample for identification, an apiary officer was dispatched to the apiary and a thorough search for small hive beetle was performed. One single possible larva was discovered but it was not thought to be consistent with the typical disease pattern of small hive beetle infestation. Nevertheless, the larva was sent to the MPI Plant Health and Environment Laboratory for identification. From photographs, the beetle was identified as a scarab beetle (Coleoptera: Scarabaeidae) and the larva was identified as a lesser wax moth, *Achroia grisella* (Lepidoptera: Pyralidae). Small hive beetle was ruled out and the investigation was stood down.

An apiary officer notified MPI of unidentified beetles in a central North Island beehive, part of a large commercial operation consisting of 2500 hives. Further examination of other hives showed that a high proportion these were infested with the beetle. Photos provided by the beekeeper were not thought to be consistent with small hive beetle, the agent of concern. Identification by an MPI entomologist confirmed the beetle was *Epuraea* sp. (Coleoptera: Nitidulidae), which is native to New Zealand, and small hive beetle was excluded.

HAEMOPARASITES IN NATIVE GRAND SKINK INVESTIGATED

A veterinary pathologist called the MPI exotic pest and disease hotline to report a blood parasite resembling *Haemogregarina* sp. in the blood of a native New Zealand grand skink (*Oligosoma grande*). The skink was one of 12 grand and Otago skinks that presented with neuromuscular disease including dorsoventral flattening and flaccid pelvic limbs. These were among a total of 100 wild-caught animals being kept at two zoological facilities in temporary housing at a regional field centre. The haemoparasite was found during blood testing of sick individuals, but the parasites were found in only one of the 12 sick lizards. Infectious causes of the dorsoventral flattening were investigated but appeared unlikely. Histopathology

of an affected individual showed mild generalised myodegeneration, which was considered more indicative of a husbandry or nutritional issue than an infectious disease. Radiographs were within normal limits. The disease was mostly chronic and non-progressive, and affected individuals continued to eat and behave normally apart from having altered posture. Haemogregarine blood parasites have been described historically in several species of native reptiles and are thought to be incidental findings in most cases (McKenna, 2003). This appears to be the first case reported of *Haemogregarina* in grand skinks. Since infectious aetiologies of the dorsoventral flattening disease were ruled out, and since the blood parasite appeared to be incidental, this investigation was stood down.

MORTALITIES IN YELLOW-EYED PENGUIN INVESTIGATED

About 50 adult yellow-eyed penguins located around the Otago Peninsula died over a three-week period from the end of January to mid-February 2014. A number of postmortems were conducted on dead birds but there were no significant lesions to indicate the cause of death. Multiple tissues were collected at the time of postmortem but no significant pathogens were detected from testing with a range of microbiological, virological and molecular methods. Intensive environmental testing and testing of tissues failed to detect a toxin that could explain the event. The cause of the mortality event in these birds was inconclusive. The dieoff did not continue after this event.

CANV IN TUATARAS INVESTIGATED

A zoo veterinarian emailed MPI about two 1-year-old juvenile wild-caught tuataras with small skin lesions. The main lesion of concern was a patch of thickened skin over the lateral side of one animal. The other had a smaller, milder area of thickening that was not considered to be of concern on its own. Biopsy with full diagnostics for the pathogenic fungal agent *Paranannizziopsis australiensis* (PA, formerly known as the *Chrysosporium* anamorph of *Nannizziopsis vriesii*, or CANV) was considered, based on previous investigations that have

concluded that CANV exists in captive tuataras in certain zoos but not in the wild. During the pre-surgery physical examination, mild traction on the lesion resulted in removal of the patch of thickened skin and revealed healthy epidermis underneath. Histology of the scab showed invasion by fungal hyphae. Culture of the scab at the MPI Animal Health Laboratory yielded a mixed growth of various fungi but ruled out the presence of *P. australiensis*, which is unique to New Zealand (Sigler *et al.*, 2013). Its distribution in the tuatara population has so far been limited to a single captive population (Anonymous, 2014) and surveillance of captive populations has been carried out in the past. So far, no wild tuataras have tested positive for the agent and this case is consistent with previous findings.

NOVEL BAT VIRUSES INVESTIGATED

The virus hunters team at the Institute of Environmental Science & Research (ESR) notified MPI that they had identified a collection of viruses in faecal samples taken from a healthy population of native insectivorous bats. These bats have been isolated from other bat populations for 1–16 million years, making them an interesting study population. This project is a part of the ongoing pathogen discovery work at ESR. MPI scientists reviewed the methodology and findings described in the draft paper and no concerns were identified. The majority of viruses found were from the insect food that the bats had foraged upon. The types of virus associated with bats are largely host-specific in nature, and genetic relationships to other viruses placed the NZ virus candidates on separate and remote genetic branches of the viral families. The sequences did not match any pathogenic viruses.

RISK GOODS INVESTIGATED

A beekeeper called the MPI exotic pest and disease hotline to report the importation of wax sheets that had not received biosecurity clearance. The sheets were associated with an observational hive (apiscope) imported from France to be used as an educational tool in schools. The apiscope and wax sheets were incorrectly declared at the border as “furniture”. The beekeeper set up the apiscope for a local school and used two sheets of the French wax as foundation for a bee colony. After a comb

of brood and bees had been installed the beekeeper realised that the French wax could harbour diseases if it had not been treated properly before export, so he immediately sealed the apiscope as a precaution. The importer was contacted and it was determined that the wax had not been treated as required by the Import Health Standard. Therefore the unused wax, the apiscope and associated brood and bees constituted a potential biosecurity risk and the beekeeper was required to destroy the wax and bees and incinerate the remains. The apiscope was cleaned and treated to kill any pathogens. As the bees had not been able to escape, there was no risk to other hives on the property. No surveillance was necessary as the biosecurity risk had been mitigated by the destruction of the bees and wax. MPI border services were notified of the interception to help improve the border declaration processes.

REFERENCES

Anonymous (2014). Quarterly report of diagnostic cases: October to December 2013 *Surveillance* 41(1), 24–33.

Bingham, P (2012) BVD type 2 excluded. Quarterly report of investigations of suspected exotic diseases. *Surveillance* 39(4), 18–23.

McKenna PJ (2003). An annotated checklist of ecto- and endoparasites of New Zealand reptiles. *Surveillance* 30(3), 18–25

Sigler L, Hambleton S, Pare JA (2013). Molecular characterization of reptile pathogens currently known as members of the *Chrysosporium* anamorph of *Nannizziopsis vriesii* complex and relationships with some human-associated isolates. *Journal of Clinical Microbiology* 51: 3338–3357.

Paul Bingham

Manager

Surveillance and Incursion Investigation
(Animals and Marine)

Ministry for Primary Industries

PO Box 40 742

Upper Hutt

Paul.bingham@mpi.govt.nz

QUARTERLY REPORT OF BIOSECURITY RESPONSES

The Response Group managed 39 high-priority responses and four low-priority responses (i.e., where full responses were not initiated) during the October–December 2014 reporting period. The Response Group initiated seven new responses, closed two responses and stood down one low-priority response.

Figure 1 shows the number of responses managed during the 12 months to the end of the current reporting period and **Figure 2** shows the breakdown by sector most affected by the organism or risk goods.

The Ministry for Primary Industries (MPI) Response Group sits within the Operations Branch and is responsible for managing the biosecurity risk posed by new exotic and emerging pests and diseases detected within New Zealand. Responses are initiated to organisms or risk goods that may affect New Zealand’s primary industries or the marine, freshwater aquatic or terrestrial environments.

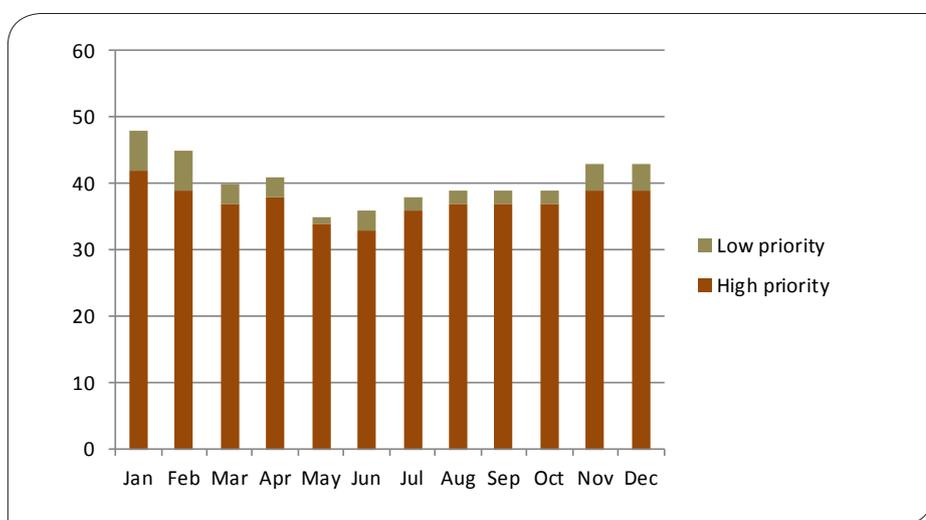


Figure 1: Biosecurity responses, January–December 2014

The Response Group also manages the eradication programmes for nine national interest pests that have been in New Zealand for several years. These remain unchanged from the previous reporting period.

Frances Velvin
 Senior Adviser
 Plants and Environment Response
 Ministry for Primary Industries
Frances.Velvin@mpi.govt.nz

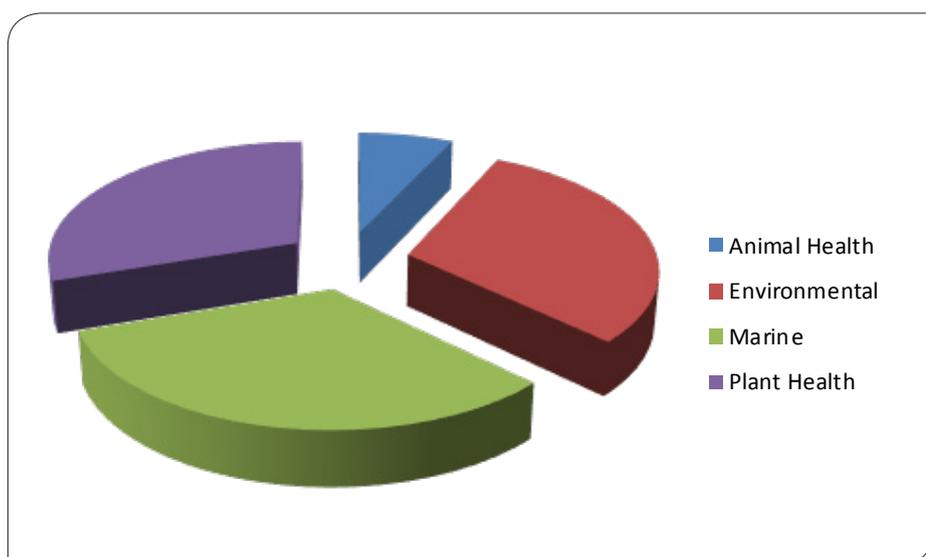


Figure 2: Sector breakdown for responses, October–December 2014

QUARTERLY REPORT OF INVESTIGATIONS OF SUSPECTED EXOTIC MARINE PESTS AND AQUATIC DISEASES

COXIELLA BURNETII IN GREENLIP MUSSEL RULED OUT

MPI was notified of a possible detection of *Coxiella burnetii* by researchers surveying the microbial community of mussel shell bioreactor, which was being used to treat acid mine drainage from a South Island coal mine. The finding did not fit with the epidemiology of this agent, which is a disease of livestock. The “detection” was based on a metagenomic survey of the microbial community and was not a specific test for *C. burnetii*. An investigation was carried out into the data and analytical methods used. Unfortunately the automated system (MG-RAST) that the researchers had used to identify the microbes present in their sample relied on an obsolete database version that contained retracted sequences belonging to a known contaminant in a genome sequencing project for *C. burnetii* strain RSA 334. The mislabelled contaminant sequences in the obsolete database, and the matching sequences from the bioreactor sample, actually belong to a type of Archaea. Manual analysis of the data revealed no evidence for the presence of *C. burnetii* or other Coxiellaceae in the sample. Hence the identification was entirely due to a database curation error. The investigation was stood down.

LESIONS IN BROWN TROUT INVESTIGATED

A fisherman caught a trout in poor condition, which had an external caseated abscess that seemed to extend into the body cavity. The fisherman brought the trout into a vetlab in Waimate. The veterinarian who received the fish called the MPI pest and disease hotline to report the find. Since the fish had already been partially dissected, the veterinarian preserved some tissue containing half of the lesion and some unaffected tissue in 10 percent formalin. These tissue samples were submitted to the Animal Health Laboratory and were tested for the exotic pathogens *Aphanomyces invadens* and *Aeromonas salmonicida* (aetiologic agents for

Exotic marine pest and aquatic disease investigations are managed and reported by MPI's Investigation and Diagnostic Centre and Response, Wallaceville. The following is a summary of investigations of suspected exotic marine diseases and pests during the period from October to December 2014.

epizootic ulcerative syndrome and furunculosis respectively). These differentials were ruled out by PCR and bacteriology. The lesion was found to have been caused by *Mycobacterium chelonae*, a common fish pathogen worldwide though usually seen in warmer waters. Since no biosecurity risk was identified the investigation was closed.

BROWN STAINING IN PAUA INVESTIGATED

A member of the public called the exotic pest and disease hotline to report some possibly diseased paua that he had recently caught. The black-footed paua gut opening and adjacent shell area was stained brown and the shell was also lumpy and deformed. Histology showed alga-like cells in the tissue and it seemed that the brown stain was due to a problem with the epithelial cells of the mantle, causing a change in the deposition of the silvery calcium component of the nacre and the brown protein matrix. As a result, the animal does not lay down enough calcium, or produces an excessive amount of protein. In this case, the presence of alga-like cells in the tissues under the epithelium is suggestive of a cause. If further specimens become available it would be useful to identify the alga-like cells. However, there does not appear to be a biosecurity issue associated with this syndrome, so the investigation was stood down until more material becomes available.

FISH MORTALITY INVESTIGATED

A member of the public reported a large number of dead fish in Raumanga Stream, Whangarei, which were visible from the Lower Tarawera Rd bridge. The fish appeared to be small bait fish, described as “sprats” by the caller. MPI

contacted the Northland Regional Council (NRC) to see if they knew of any recent environmental issue in the stream such as pollution or low dissolved oxygen. The NRC inspected the area and reported that the fish appeared to be a marine species (jack mackerel or similar). It was considered unusual for them to be so far upstream and it was proposed that they might have been dumped there. The NRC also reported that a similar fish mortality had occurred in the area about a year ago. Monitoring at the time had found low dissolved oxygen levels in the stream, which was most likely the cause. The MPI fisheries office in Whangarei was also contacted and the duty fisheries officer said that dumping of unwanted by-catch in freshwater streams was not uncommon. The cause of the fish mortality was thought most likely to be low dissolved oxygen; otherwise the fish were dumped unwanted by-catch. The investigation was stood down.

MORE MEDITERRANEAN FANWORM

There were two new records of Mediterranean fanworm during the reporting period. In the first case, a marina manager contacted MPI via the exotic pest and disease hotline to report a vessel that had been hauled out for cleaning and had substantial hull fouling. It was suspected that the Mediterranean fan worm (*Sabella spallanzanii*) was present. The manager had contained the debris from the dry dock and an Incursion Investigator inspected the hull. Samples were collected and sent to the Marine Invasives Taxonomic Service (MITS) for identification and assessment of reproductive status.

The vessel had been shipped from the Caribbean (Martinique) in a dry dock on a transport yacht and had been antifouled three weeks prior to shipment. The hull

was inspected on arrival in Auckland in February 2013 and berthed in Waitemata Harbour until late May 2013. No further inspection or cleaning occurred during this time. The vessel sailed via Napier (where it was berthed for five days at the yacht club) to Wellington, arriving on 18 July 2013. The vessel owner subsequently disinfected, cleaned and applied antifouling paint to the vessel. *Sabella* is an unwanted organism that is currently established in Auckland and Lyttelton and has been found on vessels in Northland and the Coromandel. The specimens were confirmed to be *S. spallanzanii*. The likely infection source was while the vessel was berthed in the Waitamata harbour. A response has been initiated.

In the second case, during an ongoing response to the clubbed tunicate, *Styela clava*, surveillance activities conducted by the Marlborough District Council (MDC) found a sabellid resembling the Mediterranean fanworm, *Sabella spallanzanii*, and this was confirmed by MITS. As this species is established in several locations around NZ, national eradication is no longer feasible but the MPI response team is supporting regional councils managing local incursions. The investigation was therefore referred to the response team and the investigation closed.

EXOTIC JELLYFISH RULED OUT

A member of the public called the MPI exotic pest and diseases hotline to report some large jellyfish washed up at a popular beach in Napier. An MPI officer took photos of the jellyfish and these were sent to the Marine Invasives Taxonomic Service for identification. A taxonomist identified the jellyfish as a large hydromedusa, *Aequorea forskalea*, a fairly common and cosmopolitan species often seen in NZ during years of higher sea temperatures. There is no biosecurity risk associated with the animal so the investigation was closed.

BROWN MUSSELS RULED OUT

The Northland Regional Council (NRC) was conducting hull inspections in the Opuā marina and found some small golden-brown mussels around the waterline of a vessel that had come to New Zealand from the tropical

Pacific. They did not appear to be the native *Perna* or *Mytilus* species so they were submitted to the Marine Invasives Taxonomic Service (MITS) for identification and to rule out the brown mussel, *Perna perna*, which is exotic to NZ. *P. perna* can be very similar to *Mytilus* sp. in colour and shape, and they can only be reliably distinguished by dissection. Specimens were dissected at MITS and were all confirmed as *Mytilus* sp. (most likely *M. galloprovincialis*, which is established in New Zealand). The NRC was informed of the results and the investigation was stood down.

MARINE FOULING INVESTIGATED

A marina operator contacted MPI after noticing an unusual growth on three vessels that had been hauled out of the same marina area in Whitiāngā. The growth was quite small but had not been seen in the area before. It could not be identified from photos emailed to the investigator, so a sample was submitted to the Marine Invasives Taxonomic Service, where it was identified as the non-indigenous bryozoan *Watersipora subatra* (previously known as *W. subtorquata*). This species has been in New Zealand for many years, is widespread and can be a nuisance fouling species. It has been reported to be relatively resistant to copper-based antifouling, so it can settle and then enable other species to colonise. While it may not have been seen in Whitiāngā before, domestic vessel traffic from other ports where *W. subatra* is present could have easily spread it to Whitiāngā. This information was provided to the marina operator and the investigation was stood down.

Paul Bingham
Team Manager
Surveillance and Incursion Investigation
(Animals and Marine)
Ministry for Primary Industries
Paul.bingham@mpi.govt.nz

PLANTS AND ENVIRONMENT

SURVEILLANCE METHODS FOR WHITE BRYONY IN SITES WITH DIFFICULT ACCESS

Successful eradication of weeds is often a challenge, especially if they are widely distributed by birds, grow in difficult terrain and are hidden from view (**Figure 1**).



Figure 1: A wide view of the hard-to access terrain

Initial results may be encouraging, but achieving eradication relies on removing that last 1 percent of the population. Historically, eradication attempts have relied on techniques such as unassisted ground surveillance, which can be less effective on a widely distributed yet sparse population. White bryony (*Bryonia cretica* ssp. *dioica*) a creeping, smothering vine, is a prime example (**Figure 2**).



Figure 2: White bryony growing in the wild – Rangitikei river canyon, 2012

Declared an Unwanted Organism in 2001, it is present in three areas around New Zealand: the Rangitikei River in the Manawatu, and Aria and Mokauiti in the Waikato. We don't know how it arrived in NZ, but eradication is being attempted at all sites.

White bryony is a soft, green, cucumber-like vine that climbs up to 6 m by means of its curled tendrils. It produces clusters of small creamy-white flowers in spring and summer, with male and female flowers on separate plants. Female flowers are followed by 8 mm berries in bunches of 3–8 that ripen to light red from January to April. The shoots die back in autumn to a perennial tuber.

White bryony smothers and shades out whatever it grows on. It is dispersed by birds and the tubers are hard to find. The fruit and tubers contain toxic alkaloids. It favours hedges, fence lines, rank grass, native forest, scrub, paddocks and exotic plantations. Plants are usually found under places where birds perch.

As the population has been significantly reduced since work began in 2007, innovative techniques aimed at achieving eradication have been researched. Abseiling is being used for access to control 6.5 km of previously unmanaged cliff face in the Rangitikei River canyon (**Figure 3**), meaning eradication is now a realistic goal. We hope to further improve the cost-efficiency of abseiling by using an unmanned aerial vehicle (UAV) fitted with a high-resolution camera (**Figure 4**).



Figure 3: A closer view of one of the cliff faces where abseiling has been used for access

The aim is to fly the UAV through the canyon and photograph the whole cliff face, then analyse the high-resolution GPS-referenced images. This will enable abseiling to be more targeted to locations where white bryony still occurs. Confidence in this method will increase when supplemented by historical data.

Trials also indicate that detector dogs might be trained to locate inconspicuous plants in hard-to-access terrain (**Figure 5**). This could work particularly well with white bryony because of the



Figure 4: The type of unmanned aerial vehicle (UAV) planned to be used for photographing the canyon



Figure 5: A detector dog in training searching for and detecting the target organism in the field

plant's very pungent scent. Rafting has also been used to survey the riverbed and floodplains in the Rangitikei River canyon, drifting and searching and pulling up on land when necessary to search specific sites.

These innovative techniques have the potential to increase the likelihood of success and efficiency of other weed eradications and may help to broaden the way future eradication attempts are approached.

Brad Chandler
Senior Adviser – Plants and Environment Response
Investigation, Diagnostic Centres and Response
Ministry for Primary Industries
Brad.Chandler@mpi.govt.nz

PLANTS AND ENVIRONMENT INVESTIGATION REPORT: OCTOBER TO DECEMBER 2014

BLACK WIDOW SPIDERS FOUND

There were two interceptions of black widow spiders during the reporting period. In the first case, irrigation equipment imported from the US was unloaded from a container in Christchurch and the empty container transported to the rural town of Darfield, 48 km away. A spider was subsequently found in the container and reported to MPI. It was identified as a juvenile female black widow (*Latrodectus* sp.). Significant webbing was present in the container. The irrigation equipment was tent-fumigated with methyl bromide and released and the investigation was closed.

In the second case, MPI received notification of an unusual red spider seen on a car recently imported from the US. From photographs, MPI entomologists tentatively identified it as the exotic red-backed jumping spider. MPI staff visited the site and inspected the car but no further spiders were found. A residual insecticide (permethrin) was applied to the vehicle and surrounding surfaces to kill any live spiders that might be present. A dead spider was subsequently found under the car and reported to be different from the one initially photographed (which had been destroyed). This specimen was identified by MPI as *Latrodectus mactans* (southern black widow), a spider absent from New Zealand and an MPI-regulated pest. While the insecticide treatment was considered adequate to kill any other spiders present, MPI contacted the notifier weekly for three weeks to confirm no more had been seen.

RISK ANTS RULED OUT

Live worker ants and brood were found in a parcel of clothing purchased from China via the internet. Before notifying MPI the owner placed the clothing outside, where ants carrying brood were seen running under wooden decking. MPI arranged for the clothes to be placed in a freezer while specimens were submitted for identification. Two species were found, *Ochetellus glaber* and *Monomorium pharaonis*. Both species

The Ministry for Primary Industries (MPI) Investigation and Diagnostic Centres and Response Directorate (IDC & R) is responsible for surveillance, incursion investigation, diagnostics and response by managing investigations of notifications of suspected exotic pests and diseases that may affect New Zealand's primary industries.

are already present in New Zealand. The investigation was closed.

NEW STRAWBERRY MITE PEST RULED OUT

A strawberry grower contacted MPI regarding suspect mites on strawberry plants. The grower had been visited by an Australian mite expert who believed the symptoms were likely caused by a species of tarsonemid mite not considered to be already present in New Zealand. Samples were requested and identified as cyclamen mites, *Phytonemus pallidus* (Acari: Tarsonemidae), a species established in NZ and considered a sporadic and minor pest of strawberries. The investigation was closed.

TERMITES RULED OUT

A Dunedin pest control operator reported a picnic table with suspect termites. The table originated from overseas and had been purchased from a hardware store. MPI visited the property and found the table had been dismantled and bagged. Some of the framing timbers were severely rotted. Although termites were absent, lepidopteran larvae were present, apparently feeding on the rotted timber. Collected specimens were later identified as *Barea exarcha* (Lepidoptera: Oecophoridae), a species present in New Zealand. As the table was only six years old, rotted timber samples were obtained for assessment of the fungi involved. The causal fungus appeared to be *Trametes* sp., a bracket fungus. DNA sequence data from the ITS region of the sampled fungus was 98.8 percent similar to *T. hirsuta*, a common cause of white rot in dead native trees including beech.

KIWIFRUIT DISEASE RULED OUT

Unusual disease symptoms were reported from the foliage of a single kiwifruit plant in a Te Puke orchard, with stunted, variegated foliage on one of two leaders and tip dieback. Although these symptoms resembled herbicide damage, no link to herbicide use was initially apparent. Kiwifruit Vine Health collected samples for testing by MPI, while the grower ensured containment of potential dispersal risks associated with the plant. Tests isolated no organisms capable of causing the observed symptoms but foliage submitted to Hill Laboratories for herbicide residue analysis contained glyphosate at 0.067 mg/kg. These results and photographs of the observed symptoms were sent to an AgResearch scientist, who confirmed the symptoms were consistent with previous cases of herbicide damage on kiwifruit and that the glyphosate residues were within the concentration range of other suspected cases. The investigation was closed.

NEW LEAF BEETLE ESTABLISHED

Landcare Research received photographs from a member of the public of an insect believed to be the new to New Zealand leaf beetle, *Cassida compuncta*. A tentative identification was made with the assistance of an Australian expert. The insect was found on roadside weeds (Convolvulaceae) near Opotiki, Bay of Plenty. The notifier had first noticed the beetles two or three years previously. MPI arranged collection of specimens and, using high-definition microscope photographs shared with the Australian taxonomic authority, confirmed the beetle was *Cassida compuncta*

(Coleoptera: Chrysomelidae). This is an Australian species described as feeding on *Ipomoea cairica* (pouwhiwhi/coastal morning glory) and probably other *Ipomoea* species. *I. cairica* is indigenous to both New Zealand and Australia. Although one literature source cites *C. compuncta* as a significant pest of sweet potato in Fiji, this record is not substantiated by other lists of Fijian crop pests and is considered dubious. Using molecular techniques, host material collected from the Opotiki site was identified as *Calystegia silvatica*, *C. sepium*, or a hybrid of both. On the basis of these findings an MPI response was initiated. However, after consultation with Horticulture NZ, the Department of Conservation and others, the decision was made to stand down the response. This was based on the present known distribution of the beetle, the likelihood that it was already present elsewhere in New Zealand, the lack of cost-effective methods to limit its distribution, the low probability of a successful outcome should eradication be attempted, and the comparatively low risk of its having significant negative impacts.

TERMITE ESTABLISHMENT PREVENTED

Termites and ants were found in a bundle of western red cedar timber imported from Canada into a Whangarei Transitional Facility. The insects were identified as the termite, *Zootermopsis augusticollis*, and the ant, *Leptothorax* sp. Both species are high-risk unwanted species. The termites were alate and de-alate life stages, suggesting the timber had become infested after an adult dispersive flight event in Canada and there was no active termite colony present. The entire consignment was treated with permigas (permethrin) as an initial containment measure. The timber was closely examined and sorted, resulting in methyl bromide fumigation of risk timber and border clearance of the remainder. This appears to have been the first report of termites in imported western red cedar.

NEW MOTH FOUND

A moth caught in an Albany light trap was identified as a new to New Zealand species, *Chloroclystis metallospora* (Lepidoptera: Geometridae) by a Landcare Research lepidopteran

taxonomist. This was confirmed by MPI using molecular diagnostics. Although no literature lists its host preferences, *C. metallospora* is not recorded as a pest species or as having other economic significance. Three of the 30 *Chloroclystis* species are considered minor pests of cultivated plants. Larvae of moths in this group (subfamily Larentiinae, tribe Eupitheciini) typically feed on flowers and vary from polyphagous to host specific. The taxonomist also advised that most of the polyphagous species could be reared on pohutukawa flowers. Interestingly, the light trap also contained large numbers of the diamondback moth, *Plutella xylostella* (Lepidoptera: Plutellidae), suggesting a windborne natural migration event from Australia, where *C. metallospora* is native. It is unclear to what extent this detection reflects an established population of *C. metallospora* in NZ, but a lack of specific surveillance tools means it is impractical to initiate wider surveillance for this species.

EXOTIC ANTS RULED OUT

A member of the public found unusual red ants in a recently built greenhouse among potting mix and mulch. As these items had been recently purchased from the Warehouse and Bunnings, and were thought to have been imported, it was considered the ants might have originated from overseas. The ants were confirmed as the striated ant, *Huberia striata*, a species established in New Zealand and not a biosecurity risk.

WASPS FOUND

Large brightly coloured live wasps were reported by a Wellington car dealer from a car recently imported from Japan. Photographs received were of *Polistes jokahamae*, a species not present in New Zealand but considered an establishment risk. The car originated from a vessel that had subsequently left NZ. MPI visited sites that the imported cars had been distributed to and inspected all 182 vehicles. Two female workers of *P. rothneyi* (a species not present in New Zealand) were identified from collected specimens. The queens of *Polistes* species are reportedly unable to re-establish a nest if the original nest has been destroyed. No further reports were received of the wasps.

UNUSUAL-LOOKING INSECT FOUND

An unusual-looking insect was found in an Auckland house after the unpacking of an imported television set. It was described as small and “dragon-like”, with a tail/stinger, long red legs, a long black-and-grey-striped body and small wings. MPI identified the specimen as the white-spotted ichneumon fly, *Echthromorpha intracatoria*, a parasite of butterfly pupae and already present in New Zealand.

MĀHOE DISEASE RULED OUT

Nelson City Council staff reported unusual bark damage on māhoe trees in a Nelson bush reserve. Māhoe or whiteywood (*Melicytus ramiflorus*) is a native tree common throughout New Zealand. The damage was suspected to be caused by gypsy moth and appeared restricted to the bark and subcortical zone. The damage was described as ringbarking of the trunk and main branches, and was present from the base to the top of the tree. Photographs supplied by the notifier suggested birds, mammals or large insects as possible causal agents. After showing the photographs to various specialists for comment it was concluded that the damage was likely caused by foraging kaka birds. Subsequent discussion with the notifier suggested this was a plausible conclusion.

NEW STRAWBERRY DISEASE RULED OUT

Actively growing mould was observed on Australian branded strawberries purchased at a supermarket. Mould was restricted to the undersides of leaves on the strawberry fruits. Two species of filamentous fungi were isolated from submitted samples. One was *Botrytis cinerea*, common in New Zealand. The other was a *Pestalotiopsis* species, so further testing was undertaken to rule out *P. longiseta*, an exotic strawberry pathogen. While the isolate did morphologically resemble *P. longiseta*, this species was ruled out by sequencing of the ITS and EF1a genes but identification could not be confirmed owing to the limited availability of reference sequence data for the genus *Pestalotiopsis*. However, it was concluded that this species was closely related to *P. glandicola*, a post-harvest pathogen

of fruit that is already present in New Zealand.

ABSCONDING ANTS CONTAINED

An importer of Australian margarine found live ants inside a container after it arrived at the distribution centre. The container was sealed and returned to the Transitional Facility. Treatment by freezing to -18°C was undertaken as the usual methyl bromide fumigation treatment would have rendered the margarine unsaleable. The margarine was then unloaded under supervision, but no ants or ant nests were found. This result suggested either that the ants had absconded with the nest during the cooling process, or that the few ants observed were vagrant workers without a nest. The container had been unloaded on paved ground, a poor habitat for an ant colony to become established. A nearby narrow strip of gravel would have offered some potential for the establishment of a nest but more attractive habitat with plants was about 30 metres away, reducing the likelihood of transfer. However, all risk zones were searched on a warm day but no ants were seen. The area was generally inhospitable for ants and it was considered unlikely that a nest could become established there, but as an added precaution this and an adjacent property will be included in the 2016 National Invasive Ant Surveillance programme.

EXOTIC ANTS DETECTED

Many red ants were found when a sea container of bottled soft drinks was opened after arrival from South Africa. The container had been in New Zealand for about 10 days and in the warehouse for two. MPI border staff visited the site to further inspect the container, collect samples and administer treatment as necessary. The ant was identified as an unspecific *Monomorium* sp. that is not present in New Zealand and is frequently intercepted at the border. The container was fumigated with methyl bromide and the subsequent unloading was supervised by MPI staff. No live ants were found. The container stood at a transport depot for at least six days before delivery. Information about the conditions at the transport depot was obtained. The risk of dispersal and establishment at this site was considered to be insignificant and the investigation was closed.

SCORPION FOUND AT TOURIST HOT SPOT

An off-duty MPI staff member found a dead scorpion in the doorway of a Wanaka public toilet. It is legal to import scorpions provided they are dead, e.g., dried or preserved. However, this one appeared likely to be only recently dead, as judged by the pungent odour emanating from the body, which was still in good condition. DNA sequence data focusing on the COI gene region suggested the scorpion was similar to those found in southeastern Queensland, Australia. The closest matches (99.5 percent) were with specimens from inland forests of the Sunshine Coast, but also perhaps from forests north to Hervey Bay. This specimen was considered to be *Hormurus caudicula* (syn. *H. waigiensis*) or an undescribed taxon. The human health risk associated with this species is considered moderate, its sting being similar to that of a bee or wasp. Scorpions are nocturnal and fluoresce under UV light, so MPI staff conducted 12 person-hours of night surveillance at the Wanaka site using a UV light, but found no scorpions. No explanation could be found for how the scorpion came to be in Wanaka, how long it had been there, or whether there is a resident population, though Wanaka is a popular tourist destination in both summer and winter. At the time of the MPI visit, tourists were seen in the vicinity of the toilet block and on the adjacent lakefront, reserve and playground. Also, adjacent to the toilet block is a parking area used by camper vans and other hire vehicles, and a bus stop for local and intercity buses and shuttle services. The area is used daily to discharge passengers and their luggage, with some passengers having recently entered New Zealand at international airports. Adventive dispersal of scorpions in luggage has been reported elsewhere, and although not proven in this case, is the pathway of entry implicated in previous post-border scorpion detections. The investigation was closed.

ESTABLISHMENT OF LIVE SPIDERS PREVENTED

While unwrapping paintings purchased in Bali and shipped to New Zealand, the importer found several live spiders and spiderwebs. The paintings and packaging were inspected more closely and specimens captured for identification.

The packaging material was frozen for 48 hours as a precaution. Collected spiders were all immature life stages and consequently unable to be identified to species, but were determined to be of the genus *Psilochorus* (daddy-long-legs spiders). The paintings were fumigated with methyl bromide as a precaution and the investigation was closed.

NEW CROP PEST RULED OUT

Dead weevils and suspect eggs were found in a box of fresh tamarind pods purchased from a supermarket and imported from Thailand. Samples obtained by MPI contained two larvae that were identified as the carob moth, *Ectomyelois ceratoniae*, an unwanted species not present in New Zealand that attacks a range of fruit and nut crops. However, the larvae were sufficiently discoloured and desiccated to suggest they were likely dead before they were imported. The samples contained no eggs, but larval frass could have been mistaken for them. Importation procedures for tamarind indicate that so-called “fresh” tamarind is typically steamed before it arrives and this treatment is consistent with the larvae being dead. The investigation was closed.

HIGH-IMPACT PEAR DISEASE RULED OUT

A Plant and Food Research plant pathologist reported suspicious symptoms on a Ya pear imported from China and purchased at a supermarket. The scientist suspected bull's-eye rot disease, caused by a species of *Neofabraea*, possibly *N. perennans* or *N. malicorticis*. Neither species is present in New Zealand but both are serious diseases of pipfruits and trees in other countries. MPI tests, including two independent PCR tests and sequencing of the Ya fruit samples, were negative for any *Neofabraea* species. The first PCR test used a specific multiplex PCR that differentiates all the four *Neofabraea* species that cause bull's-eye rot. The second test was a more general PCR test with universal primers for the *Neofabraea* genus. In addition, pure laboratory cultures were made of the diseased pear fruit tissue. No fungal structures were found in the symptomatic tissue when it was examined under a light microscope, and no fungal growth was seen on the

culture plates. The investigation was closed

NEW STRAWBERRY BLIGHT DISEASE RULED OUT

Circular brown lesions were seen on strawberries bought from a Tauranga supermarket. When cut, the lesions appeared to penetrate to the fruit's core. As the strawberries were imported from Australia there was concern that this might be a new blight disease not already present in New Zealand. Testing of symptomatic tissue found no phytopathogenic bacteria, but a common grey mould, *Botrytis cinerea*, which could have caused the post-harvest rot symptoms, was found. Accordingly there was no biosecurity issue and the investigation was closed.

ORANGE DISEASE RULED OUT

A live insect was reportedly found in an Australian orange. The fruit's exterior was described as unblemished but extensive black rot and an insect was evident inside. Tracing revealed that the fruit had been bought from a small fruit and vegetable retailer, who in turn had purchased it from the importer two weeks earlier. Although a live insect had been reported as present, no live insect was found in the submitted fruit. However, the mould fungus *Cladosporium cladosporioides* was identified. This fungus commonly infects stored oranges and is known to infect the calyx before the fruit matures, resulting in the black internal rot seen in this case. *Alternaria citri*, another fungus that causes internal fruit rot in New Zealand, was not found in this sample.

NO NPPA NON-COMPLIANCE

An MPI employee reported finding National Plant Pest Accord (NPPA) plants listed for sale in *The New Zealand Nursery Register*, a published directory of more than 3500 companies in the garden trade. The Biosecurity Act (1993) prohibits the sale, propagation or distribution of NPPA plants in New Zealand. As the nurseries involved were located in Palmerston North and Auckland, Horizons Regional Council and Auckland Council biosecurity officers were contacted to determine when the nurseries were last surveyed under the NPPA and asked to investigate the apparent non-compliance. However,

the resulting investigation found that no nurseries had banned plant species for sale: they had simply not updated their published product lists. The investigation was closed.

Mark Bullians

Manager

Surveillance and Incursion Investigation
(Plants and Environment)

Ministry for Primary Industries

Mark.bullians@mpi.govt.nz



Veterinary Diagnostic Laboratories

GRIBBLES VETERINARY PATHOLOGY

- **AUCKLAND**
Courier: 37–41 Carbine Road, Mount Wellington, Auckland 1060
Postal: PO Box 12049, Penrose, Auckland 1642
Tel: 09 574 4701 Fax: 09 574 5304
- **HAMILTON**
Courier: 57 Sunshine Ave, Hamilton 3240
Postal: PO Box 195, Hamilton 3240
Tel: 07 850 0777 Fax: 07 850 0770
- **PALMERSTON NORTH**
Courier: 840 Tremaine Avenue, Palmerston North 4440
Postal: PO Box 536, Palmerston North 4440
Tel: 06 356 7100 Fax: 06 357 1904
- **CHRISTCHURCH**
Courier: 7 Halkett Street, Christchurch 8140
Postal: PO Box 3866, Christchurch 8140
Tel: 03 379 9484 Fax: 03 379 9485
- **DUNEDIN**
Courier: Invermay Research Centre, Block A, Puddle Alley, Mosgiel, Dunedin 9053
Postal: PO Box 371, Dunedin 9053
Tel: 03 489 4600 Fax: 03 489 8576

To report suspected exotic land, freshwater and marine pests, or exotic diseases in plants or animals, call:

0800 80 99 66

Investigation and Diagnostic Centre –
Wallaceville
66 Ward Street
Upper Hutt
Tel: 04 526 5600

Investigation and Diagnostic Centre –
Tamaki
231 Morrin Road
St Johns
Auckland
Tel: 09 909 3568

Investigation and Diagnostic Centre –
Christchurch
14 Sir William Pickering Drive
Christchurch
Tel: 03 943 3209

NEW ZEALAND VETERINARY PATHOLOGY

- **AUCKLAND**
Courier: NZCCM, Gate 2, Auckland Zoo, Motions Road, Western Springs, Auckland 1022
Postal: PO Box 44 422, Point Chevalier, Auckland 1246
- **HAMILTON**
Courier: Cnr Anglesea and Knox Streets, Hamilton
Postal: PO Box 944, Hamilton
Tel: 07 839 1470 Fax: 07 839 1471
- **PALMERSTON NORTH**
Courier: IVABS Building, 1st Floor, Massey University, Tennant Drive, Palmerston North
Postal: PO Box 325, Palmerston North
Tel: 06 353 3983 Fax: 06 353 3986

