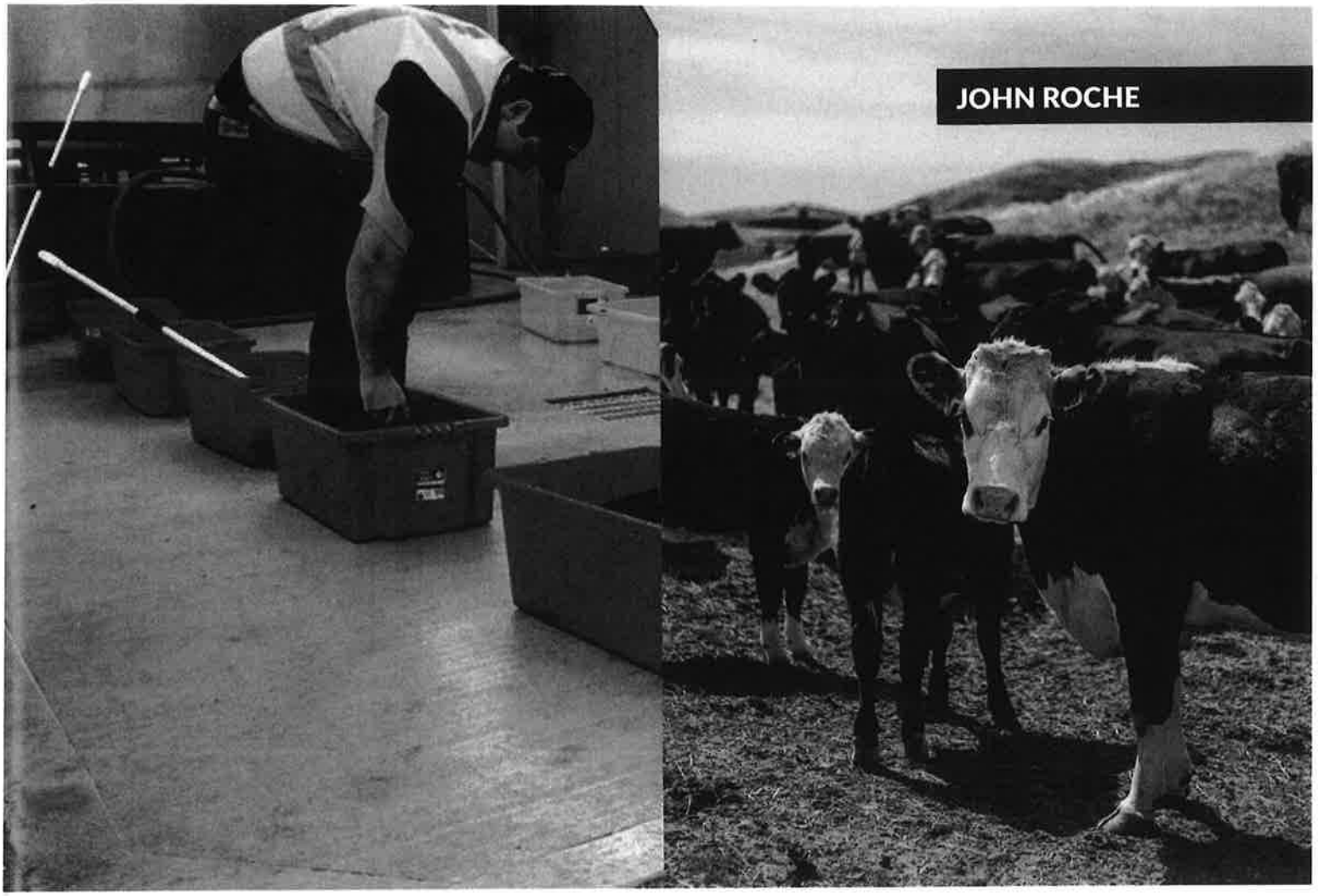

MYCOPLASMA BOVIS AND BIOSECURITY – FROM THE BORDER TO THE FARM

New Zealand's world-first effort to eradicate *Mycoplasma bovis* is making good progress. This article looks at the reasons for this and why a strong biosecurity system is vitally important to Aotearoa.

Eradication making good progress

It is just over three years since *Mycoplasma bovis* (*M. bovis*) was first detected on a New Zealand dairy farm. The resulting biosecurity response, and the effort to eradicate the disease, has been one of the largest and most complex biosecurity challenges this country has faced.

The dairy and beef industries believed that allowing the *M. bovis* infection to spread through the national cattle herd was untenable. The estimated production loss over the first 10 years alone was $1.3 billion, and farmers would have had to make substantial changes to their farm management practices in order to manage and mitigate the impacts of this disease. *M. bovis* causes many stock diseases, most notably mastitis, arthritis, pneumonia, and can cause abortions. On this basis, and with the information at hand that eradication was feasible, the Government in partnership with DairyNZ and Beef + Lamb New Zealand embarked on a phased eradication plan.

Today the eradication effort is well on-track. At the time of writing, there are currently three properties confirmed as infected and still going through the eradication process. Only two of these properties, both beef finishing farms, still have infected cattle on them. The number of farms under movement restrictions while they are tested is at an historic low (28 as at 31 July 2020). While we expect to find a tail of infected herds, in particular during spring calving when these herds are more likely to be found, we are very confident we can eradicate *M. bovis* and free all farms in New Zealand from this disease in the future.

An MPI study in 2015 estimated that a large-scale foot and mouth disease outbreak would have a net cost of $16 billion to New Zealand over eight years in real GDP terms.

The effort to eradicate *M. bovis* has affected farmers around the country. More than 1,900 farms have been put under movement restrictions while they were tested, and 250 herds have been found to be infected and the stock culled. To date, over 1,533,930 cattle have been tested for *M. bovis*, 157,869 have been culled, and $168 million has been paid in compensation to affected farmers.

So, after three years battling this disease, where is the biosecurity system at and what have we learnt about on-farm biosecurity?

The biosecurity system

Biosecurity is vitally important to this country, given the potentially devastating effect of unwanted pests and diseases. New Zealand maintains a list of almost 15,000 unwanted plants, animals, pests and diseases, all of which could damage our economy, or environment, and our way of life.

The entire biosecurity system faces increasing pressures. While the threat posed by tourists coming across the border has temporarily abated due to COVID-19, imported goods and packages continue to grow in volume, and climate change and the pressure from established pests and diseases is increasing.

To keep this huge range of threats at bay we have three interlocking layers of protection:

- Pre-border – to stop threats from ever arriving here
- Border – to find and stop risks when they arrive
- Post-border – to detect, eradicate or manage anything that has already arrived.

This layered approach gives us our best possible defence against biosecurity threats, allowing us to stop as many as possible, and to respond quickly and decisively if they do arrive. Our approach is underpinned by science and innovation, which also have a major role to play in future-proofing New Zealand's biosecurity system.

Biosecurity surveillance programmes

Biosecurity New Zealand, part of the Ministry for Primary Industries (MPI), continually looks for pests and diseases that might have arrived from overseas. Finding them early is vital for a successful response. This is critical in assuring our trade partners that New Zealand's exports are safe, and helps us find any harmful pests or diseases early before they get established.

Alongside formal surveillance programmes, every New Zealander has a role to play in biosecurity. New Zealanders report about 10,000 suspected pests and diseases to MPI every year.

Four other large biosecurity threats

Apart from the *M. bovis* eradication effort, four biosecurity threats are currently our top priority to keep out of New Zealand:

- **Brown marmorated stink bug (BMSB)**
  BMSB is one of Biosecurity New Zealand's highest priority pests. If a breeding population were to establish in New Zealand, it would likely spread throughout the country and cause substantial economic damage. BMSB affects a wide range of crops by disfiguring fruit, in many cases making fresh produce unmarketable. Crops affected include apples, pears, peaches, wine grapes, peas, beans, sweetcorn and maize, capsicum, tomatoes, nectarines, apricots and blueberries, among others.

  Some producers in the US have reported crop losses of up to 95% due to BMSB. Even with a significant increase in applications of broad spectrum insecticides, many growers still suffer high crop loss. BMSB could also become a significant public nuisance. Affected parts of the US and Europe have seen overwintering adults aggregate in large numbers in confined dark spaces, including homes. Also, as its name suggests, BMSB releases a remarkably unpleasant odour when disturbed.
- **Foot and mouth disease (FMD)**
  An MPI study in 2015 estimated that a large-scale foot and mouth disease outbreak would have a net cost of $16 billion to New Zealand over eight years in real GDP terms. The study showed even a single case of foot and mouth disease would result in a first-year GDP loss of $5.8 billion. The losses would arise largely from the loss of export revenue due to the closure of New Zealand's main markets for primary produce, especially meat and dairy products. The report also highlighted the impacts that an outbreak would have on all New Zealanders – not only the agricultural sector – with economic losses affecting everyone across the economy.
- **Queensland fruit fly (QFF)**
  QFF is a native of Australia, where it is considered to be the country's most serious insect pest for fruit and vegetable crops. This distinctive Australian pest also poses a serious threat to our trade with other countries. We have caught it half a dozen times in traps over the past decade and have managed to stop it establishing here each time.

  If QFF were to establish here, it would have serious consequences for New Zealand's $6 billon horticultural industry and home growers of fruit and vegetables. To manage the risk of this pest establishing here, our

MPI is currently leading an overhaul of the now 26-year-old Biosecurity Act to make sure that the legislation we have is robust and resilient.

surveillance programme watches for 100 species of fruit fly, including the QFF. More than 7,600 traps are set around the country, where pheromones are used to lure flies.

- **African swine fever (ASF)**
  ASF is a highly contagious virus that affects pigs and is regularly found in parts of Africa, Southern Russia, Georgia, Armenia and Azerbaijan. Europe is currently experiencing an outbreak. The disease was found in China in 2018 and is spreading into South East Asia. Biosecurity New Zealand is taking the threat from ASF extremely seriously. New Zealand has had import restrictions in place for pork products for many years, and we have taken additional measures to ensure this animal disease has not come into this country since the start of the global outbreak last year.

Standing ready to respond

Responding to incursions when they occur is a key part of the biosecurity system. However, the sheer scale of the threats that we face means that, on occasion, pests and diseases will find a way through the net.

Biosecurity New Zealand has a specific Readiness Group that oversees and manages a comprehensive programme of readiness activities. The group is tasked with improving our overall readiness, so that we can respond effectively to a range of situations including biosecurity incursions, food safety, adverse events, animal welfare and trade issues.

The readiness programme encompasses: planning; improving processes; having the right people on board and maintaining good relationships; and access to the best information and processes. This ensures that we are ready to deal with any significant incursions, such as foot and mouth disease or BMSB. As well as the positive progress we have made towards eradicating *M. bovis*, we have recently celebrated eradicating:

- Pea weevil from the Wairarapa, a world first
- Queensland fruit fly from Auckland
- The *Culex sitiens* mosquito from the Kaipara Harbour.

ON-FARM BIOSECURITY

Cleaning and disinfecting is good biosecurity practice

When it comes to what we can do about on-farm biosecurity, there are obvious and easy steps that every farmer and grower can take to minimise the risk of bringing unwanted pests, weeds and diseases onto the farm or spreading them from one farm to another. Here is some advice from MPI's industry partners DairyNZ and Beef + Lamb for New Zealand's cattle farmers:

Clean on – clean off

- Get everyone (staff and visitors) to clean their hands, and clean and disinfect their boots/footwear on arrival and departure
- Have green areas where visitors and contractors can enter, and red areas that are out of bounds to everyone without your permission

Animal movements and NAIT

- Ensure you meet all of your NAIT requirements - tag, register and record every animal
- Know the health status (vaccination, drenching, fly treatments etc) of incoming animals
- Record all animal movements on and off-farm (NAIT, ASD forms)
- Quarantine incoming animals for 7-14 days
- Maintain good boundary fences to guard against unintended animal movements

Animal health management

- Well-fed, vaccinated animals are better able to fight off disease – including the dogs!
- Many diseases can be 'bred out' through genetics
- Have an animal health plan – talk to your vet
- Record everything

People and equipment

- Maintain a register of visitors to the farm, and establish green and red zones for visitors
- Equipment should be cleaned, and if possible disinfected, before entering the farm
- Have the fewest possible entry points to the farm
- Keep yards, woolsheds, dog kennels etc clean and free of vermin

Feed and water

- Know where bought-in feed comes from and what weeds/seeds might come with it
- Never feed ruminants anything from a bag with a warning label that prohibits it
- Do not feed dogs uncooked offal
- Trough water is more likely to be free of liver fluke, leptospirosis etc

Pest control

- Monitor and control animal pests like possums, rats and cats as they can carry diseases like TB, leptospirosis and toxoplasmosis
- Monitor and control weeds and be on the lookout for unusual plants
- Consider joining forces with neighbours on a pest control strategy

Animal waste and carcase management

- Identify and remove carcases as soon as possible to a site inaccessible to livestock and scavenging animals
- Manage effluent run-off from holding areas
- Have a stock rotation policy that doesn't put young stock at risk of high parasite intake

Shared knowledge and understanding

- Ensure all farm staff are a part of the biosecurity plan
- Make sure visitors are informed of their responsibilities while on-farm
- Ensure staff know who to contact and what to do if they encounter a suspected pest or disease
- Make biosecurity practices a part of normal everyday life

Keep boundaries secure

- Maintaining complete and secure boundary fences reduces the risk of unwanted animals contacting your herd, and maintains the animal health 'bubble' of the farm
- Check fences regularly and carry out any maintenance promptly

The effort to eradicate *M. bovis* isn't over and we need every farmer in the country to stay committed to properly maintaining NAIT records and making on-farm biosecurity a top priority.

Biosecurity the top priority for industry

The recent 2020 KPMG Agribusiness Agenda showed that agribusiness leaders continue to rate maintaining a world class biosecurity system to protect our economy from new pest and disease incursions as their top priority.

Working closely with industry is a vital part of how we make the biosecurity system work. Through our *Government Industry Agreement on Biosecurity Readiness and Response* (GIA) partnerships, we work with primary sector industry bodies to prepare for and effectively respond to biosecurity risks. Under the partnership, industry bodies have a direct say in managing risk and sharing response decision-making and costs with Biosecurity New Zealand.

A key part of the system that we have tested throughout *M. bovis* is government and industry working together to deal with a biosecurity threat. The *M. bovis* Eradication Programme is a joint effort between MPI and its industry partners, DairyNZ and Beef + Lamb New Zealand, with each party involved in the funding, governing and the operation of the programme. This joint approach has proven to be successful, and brings more voices to the table on how to deal with biosecurity challenges.

Refreshing the framework

MPI is currently leading an overhaul of the now 26-year-old Biosecurity Act to make sure that the legislation we have is robust and resilient in the face of all of these challenges.

We have been working extensively with Treaty partners and stakeholders (such as industry representatives, regional councils, environmental and not-for-profit groups) to establish a clear understanding of the challenges across the system and how these impact on all of these players.

We will be testing our early thinking on possible options with these same groups later this year, with a view to consulting publicly on issues and options in 2021. At this stage we anticipate commencing consultation in March 2021, but this will be subject to government priorities at that time.

On-farm biosecurity

The final level of biosecurity controls happens on-farm. We need farmers and growers around the country to make biosecurity their top priority, so we can control the pests and diseases that we already have in New Zealand and spot and stop any potential new incursions.

When it comes to the cattle sectors, *M. bovis* has shown us the enormous scale of cattle movements in New Zealand, as calves go to rearing facilities and onto paddocks, rising cattle move to different classes of land, and dairy cattle move from milking platforms to grazing blocks, and back, and between farms. It is this movement of cattle that presents the greatest biosecurity and disease risk to individual farmers and the industry.

Before *M. bovis*, the full importance of the National Animal Identification & Tracing (NAIT) system was poorly understood. The system was clunky to use, many farmers ignored important steps, and little was done to enforce compliance. That has changed, and there can be no doubt that NAIT compliance is a top priority for everyone involved in the system. There are now more than 30 full-time compliance staff at MPI, the legislation has been changed to fix flaws in the system, and we have seen a large increase in the number of farmers doing their bit to ensure full compliance and lifetime traceability for all cattle. For those farmers who still fail to comply, infringements (and in the worst cases prosecutions) are making it clear to them that this behaviour is no longer acceptable. Farmers have also made it clear that they do not want bad behaviour tolerated.

What's next?

While we are making excellent progress, the effort to eradicate *M. bovis* isn't over and we need every farmer in the country to stay committed to properly maintaining NAIT records and making on-farm biosecurity a top priority. That will allow us to get rid of this disease as quickly as we can, and leave the system strong and ready to respond to any further diseases or pests we might face.

The *M. bovis* programme is investing up to $30 million in research to support the eradication effort. While the key goal is to accelerate the eradication of *M. bovis*, other aims are to leave New Zealand's biosecurity system stronger, and to reduce the impact of the disease and the Eradication Programme.

While we never know what the next challenge might be, the system and the people behind it stand ready to take it on and protect what New Zealanders care about most – our natural environment and precious taonga, and our vital primary industries.

Acknowledgements

Thanks are due to Beef + Lamb New Zealand and DairyNZ for their invaluable advice about best practice on-farm biosecurity.

Dr John Roche is the Chief Science Adviser for the Ministry for Primary Industries and the Chair of the Mycoplasma bovis Strategic Science Advisory Group. Email: mbovis.govt.nz.