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On-farm biosecurity planning – is there a need and how could it be achieved?

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Executive Summary

The recent outbreak of *Mycoplasma bovis* (*M. bovis*) has shone the biosecurity spotlight directly on the pastoral sector and follows recent serious biosecurity breaches in the horticulture sector with *Pseudomonas syringae* pv. *actinidiae* (*Psa*) devastating kiwifruit orchards in 2010.

Biosecurity in New Zealand is primarily governed through the Biosecurity Act 1993 and is led by the Ministry for Primary Industries (MPI). In 2016 the Government announced a biosecurity initiative managed by Biosecurity New Zealand (MPI) which sought to establish a ten-year plan for managing risk.

MPI, DairyNZ, Federated Farmers and others have developed significant resources to assist farmers in managing biosecurity risk. The industry has long been aware of the risk posed by incursions with KPMG's Agribusiness Agenda ranking biosecurity as the number one priority for the last eight years.

The objective of this report is to develop an understanding of industry demand for farm specific biosecurity plans and to test appetite for a method of delivery. It deals specifically with the development of an active on-farm biosecurity plan; what it needs to cover, who needs to be involved and how farmers and industry can be assured it is specific and fit for purpose.

An online survey of farmers was developed and distributed through social media platforms Facebook and Twitter. The ten-question survey site recorded 101 unique visits and resulted in 49 completed surveys.

Whilst many farmers are acutely aware of the major sources of biosecurity risk to their business, they don't necessarily have a clear picture of their obligations, or where a farm plan sits as part of the wider New Zealand biosecurity ecosystem and many feel responsibility sits with them, as guardians of the land, to manage that risk in isolation.

This report highlights farmer desire for assistance in bringing together the various strands of biosecurity information to develop a farm specific plan and for assistance in assessing whether that plan is fit for purpose. Furthermore, farmers felt it would be beneficial to industry if all farms had an active biosecurity plan.

A conclusion of this report is that a digital approach would enable ease of management for farmers and this aligns with the Biosecurity 2025 ambition to have a digital data commons. Consultation with other food producing industries suggests that any solution should seek to manage risk across the entire pastoral farming sector and develop a digital solution that will provide the ability to share data and manage industry risk collectively.

Managing the national standard of biosecurity plans could be achieved through the use of new micro credentials, or bite-sized qualifications, approved by the New Zealand Qualifications Authority. Primary ITO can develop specific unit standards for a biosecurity micro credential and as such would take responsibility for managing quality and consistency of on-farm biosecurity plans.

A micro credential linked to an on-farm biosecurity plan with the ability to be managed by farmers digitally would provide a fit for purpose solution for industry in terms of managing biosecurity risk and support from milk processors might see it fit seamlessly with existing digital solutions or on-farm schemes.

The New Zealand Government Industry Agreement on Biosecurity Readiness and Response (GIA) forum might provide the best framework to develop digitally enabled on-farm biosecurity plans.

Introduction

The dairy sector contributes \$7.8 billion (3.5%) to New Zealand's total GDP², comprising dairy farming (\$5.96 billion) and dairy processing (\$1.88 billion). Despite volatility in global dairy prices, dairy remains New Zealand's largest goods export sector, at \$13.6 billion in the year to March 2016 and over the previous five years, average export revenue has been \$14.4 billion³.

New Zealand's biosecurity system operates across three layers – external markets, beyond the border, at our border and internally. Regulations, systems and procedures span the three layers and are primarily aimed at prevention, eradication or managing impact.

At a national level the importance of biosecurity was recognised in 2016 with the development of Biosecurity 2025, designed to guide New Zealand's biosecurity system over a decade. Its goal is to provide direction and assist in dealing with challenges such as increasing trade, more complex markets, complicated supply chains and rising tourist numbers.

It sets some ambitious goals including having seventy five percent of adult New Zealanders understanding biosecurity and ninety percent of relevant businesses actively managing pest and disease risks.

In 2017 the Dairy Companies Association of New Zealand (DCANZ) joined the GIA, a government initiative with the Primary Industry to reduce the risk posed by pests and diseases that could significantly impact New Zealand's dairy sector.

At an industry level KPMG's Agribusiness Agenda⁴ ranked biosecurity as its number one priority for the last eight years and M. bovis has highlighted weaknesses in our national traceability infrastructure and a sometime casual attitude to its implementation.

Other cattle diseases such as Bovine tuberculosis (TB), Bovine venereal disease (BVD) and Theileriosis have been present in New Zealand farming systems for many years, whilst Velvet leaf and Yellow bristle grass are examples of plant-based biosecurity threats to dairy farming systems.

Pasture pests include Clover root weevil and Argentine stem weevil. A major constraint for pasture biosecurity is the lack of well-defined risk-species pathways, which are particularly afflicted by difficult-to-detect and difficult-to-identify hitchhiker species. This severely limits pre and at-border opportunities for disinfestation measures. Moreover, eradication is often effectively impossible when commonly soil-dwelling life stages are involved.⁵

More broadly our national biosecurity systems have been tested by the introduction of Varroa, Psa, Myrtle rust, Brown marmorated stink bug and Potato mop top virus.

There have been some success stories in eradication of biosecurity threats including, Fall web worm (2004), Painted apple moth (2004), Asian gypsy moth (2005), Red imported fire ant (2009), Queensland fruit fly (2012-15) and the Southern saltmarsh mosquito (2010).⁶

² Gross Domestic Product (GDP) measures the value added in an industry or sector from the production of goods and services.

³ Dairy trade's economic contribution to New Zealand - NZIER 2017.

⁴ Agribusiness Agenda 2018: We need to tell you our stories.

⁵ Goldson et al., 2016.

⁶ Biosecurity System Achievements, 2003-2015, MPI.

In the horticulture sector growers ranked the key areas they'd like Horticulture New Zealand to focus on (in order of priority):

- 1) Biosecurity.
- 2) The cost of compliance.
- 3) Health and safety.
- 4) Access to water.
- 5) Market access.⁷

It is widely accepted that active on-farm biosecurity measures can be helpful in managing overall risk, by quickly identifying threats, controlling their spread or implementing strategies leading to eradication or management.

Aims and Objectives

The objectives of this report are to develop an understanding of:

1. How an on-farm biosecurity plan fits in the wider New Zealand biosecurity ecosystem.
2. The amount and type of biosecurity information available to farmers.
3. The level of translation of that biosecurity information to specific on-farm biosecurity plans.
4. The range of risks to be considered when developing an on-farm biosecurity plan.
5. Farmer demand for biosecurity plans and desire for assistance in developing them.
6. Options to ensure plans are specific to farm, uniform in terms of quality and ensure information can be shared in order to mitigate national biosecurity risk.
7. Other risks that might need to be considered in developing dairy farm specific biosecurity plans.

Methodology

An online survey of farmers was developed and distributed through social media platforms Facebook and Twitter. The ten-question survey site recorded 101 unique visits, resulting in 49 completed surveys which were collated, examined and are discussed in this report.

Informal interviews were conducted with Helen Andrews, New Zealand Pork Director and Michael Brooks, Executive Director at the Poultry Industry Association of New Zealand to understand how other industries manage biosecurity risk.

This report summarises a range of resources available to farmers and reviews appropriate literature to arrive at sensible conclusions and timely recommendations for industry.

⁷ Halliday, A. Keeping up with the growers: A snapshot of New Zealand fruit and vegetable growers' main issues and priorities. A Kellogg Report May 2016.

The role of Government

Biosecurity Act 1993

Biosecurity in New Zealand is primarily governed through the Biosecurity Act 1993 (the Act) and is led by MPI. MPI work with other government agencies, regional government, industry organisations, land owners and the public to manage biosecurity risk. Other supporting legislation includes the National Animal Identification and Tracing Act 2012 (NAIT), Hazardous Substances and New Organisms Act 1996, Health Act 1956 and the Wild Animal Control Act 1977.

The Act gives MPI (and other agencies) broad powers to deal with harmful organisms. In a readiness and response phase they can enter a property, impose movement controls, destroy infected property, and give directions (for example, to destroy risk goods). The Act places restrictions and reporting obligations on the spread of harmful organisms and reporting obligations for, and restrictions on, spreading harmful organisms.

The Act is designed to help government and industry work together to make decisions about preparing for harmful organisms, respond accordingly and develop eradication or management strategies for pests and diseases should they become established.

MPI has provided a significant amount of resource to the primary industries including the dairy sector to assist farmers to understand biosecurity risk with a current focus on M. bovis and Foot and Mouth Disease.

An on-farm biosecurity plan would fit under the MPI umbrella, its role in assisting with surveillance, response, information flow, eradication and control and its position within a wider biosecurity network is demonstrated in Figure 1.

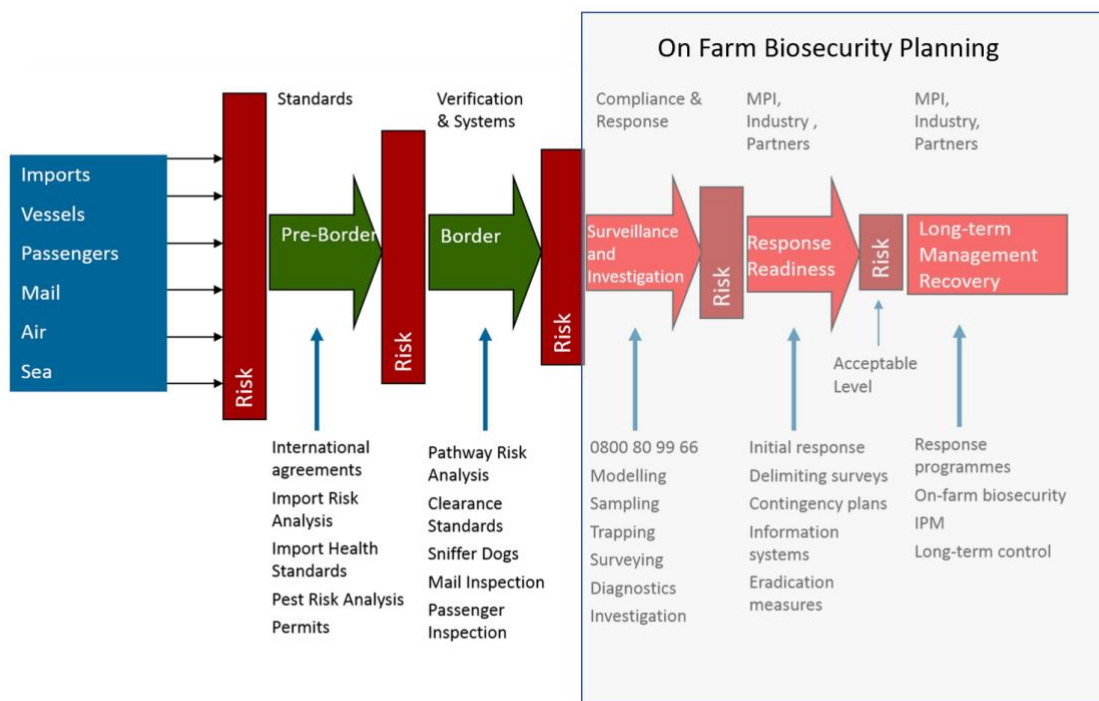


Figure 1. The structure of New Zealand biosecurity depicted by MPI and demonstrating where an on-farm biosecurity plan might fit.

Government Industry Agreement for Biosecurity Readiness and Response (GIA)

The GIA is a New Zealand government initiative partnering with industry by offering direct input into the management of biosecurity risk and engaging with industry as joint decision makers in biosecurity responses.

At the time of writing this report the Dairy Companies Association of New Zealand (DCANZ), representing New Zealand milk processors was a member of the GIA but DairyNZ, the levy funded body supporting dairy farmers was not. DairyNZ, Beef + Lamb New Zealand⁸ and Federated Farmers⁹ are consulting with their levy payers/members on GIA membership, however the GIA framework has been used by the pastoral sector to manage specific biosecurity threats.¹⁰

The scope of the GIA sits within the Response Readiness phase, shown in Figure 1, as opposed to the pre-boarder, boarder or long-term management phases of biosecurity, so activities it undertakes should be strongly related to informing, or being informed by, on-farm biosecurity plans. This framework might be well suited to facilitate digital enablement of farm biosecurity plans because it covers not only the pastoral sector but could provide food producers across New Zealand with an integrated biosecurity solution.

Biosecurity 2025 – how can it inform an on-farm biosecurity plan?

In 2016 the Government announced a new biosecurity initiative, Biosecurity 2025, which is managed by Biosecurity New Zealand (MPI) and sought to establish a ten-year plan for managing risk. In its Direction Statement,¹¹ some of the key risks identified were the increase in mail parcels, sea containers, passengers arriving by air and climate change as demonstrated in Figure 2.



Figure 2. Challenges to New Zealand's Biosecurity.

⁸ Beef and Lamb New Zealand is a levy funded body representing beef and lamb farmers in New Zealand.

⁹ Federated Farmers is a member based independent rural advocacy organisation in New Zealand.

¹⁰ Mycoplasma bovis - a year in reflection. Federated Farmers website.

¹¹ Biosecurity 2025 Direction Statement for New Zealand's biosecurity system.

It set up working groups with five strategic goals and tasked them to engage with stakeholders and map a pathway to leading to more robust outcomes. The five areas of focus were;

- 1) A biosecurity team of 4.7 million
- 2) A toolbox for tomorrow
- 3) Smart free-flowing information
- 4) Effective leadership and governance
- 5) Tomorrow's skills and assets

Strategic Direction 1 aspires to have ninety percent of relevant businesses actively managing pest and disease risk associated with the business and being committed to biosecurity actions through the completion of key planning and strategy documents and/or adopting industry approved biosecurity management practices,¹² as shown in Figure 3. Another relevant outcome is that people and businesses know their part in the biosecurity system.

¹² Biosecurity 2025 Strategic Direction 1 - A biosecurity team of 4.7 million.

Creating a movement

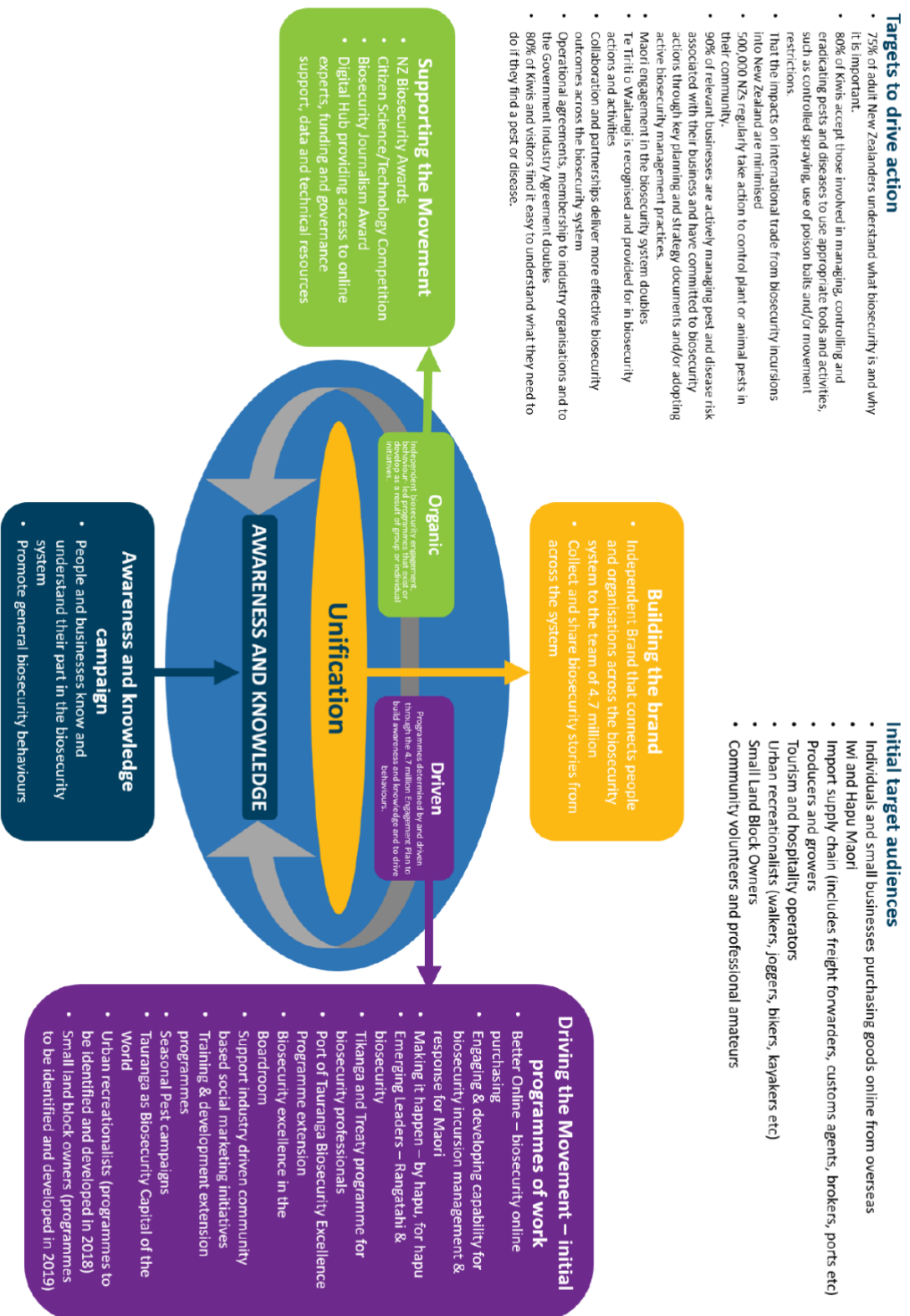


Figure 3. Creating a movement, Biosecurity 2025 Strategic Direction 1 Engagement Plan – December 2018.

Strategic Direction 2 contemplates science, current tools and future opportunities along with issues of social license and use of science and technology to develop an integrated Biosecurity Science Plan and to strengthen scientific collaboration.¹³

Strategic Direction 3 proposes that a collaborative model/system “adopts a trust and consent-based approach to data-sharing, in which data becomes a pooled community resource provided and accessed by a diverse group of participants. The contributors develop rules for use of the data which facilitate sharing and transparency. This approach is called a ‘data commons’. It can start with sharing and coordinating the standards for a few key datasets, and then gain momentum over time as potential participants see the demonstrated value of inclusion. The approach aims to build data-sharing communities, remove duplication of effort in the system, enable all participants to analyse data, and enable data reuse by building trust.”¹⁴

Strategic Direction 4 is a high-level document and deals with governance and leadership. The document references the importance of Māori in the governance system and other significant organisations but says nothing (beyond mention of GIA members) of industry organisations such as DairyNZ and is silent about the leadership roles of organisations such as Federated Farmers or Primary ITO. At a micro level it references the role of farm contractors and farms, “Service providers (e.g., farm contractors) take responsibility and lead biosecurity care and actions,” and, “Individual businesses (farms, orchards, aquaculture, importers, etc.) build biosecurity into their business to become ‘business as usual’, regularly monitored and actively considered.”¹⁵

Strategic Direction 5 focusses on how to ensure we have a capable and sustainable biosecurity workforce and world-class infrastructure to assist New Zealand in its biosecurity objectives. The dairy sector will need capable people to assist in the development and maintenance of world leading technology, systems and processes. It references the role of ITO’s in developing understanding through on-job learning, a “core set of skills and understandings incorporated in on-the-job training.”¹⁶

Industry

Dairy Processors

Dairy processor focus appears to be largely directed at communicating messages related to topical biosecurity threats and in recent times this focus has been on *M. bovis*. Communications generally point suppliers to MPI or DairyNZ but will often have processor specific messages incorporated. Dairy Processors, through DCANZ, are however the only dairy industry representatives on the GIA.

Many processors assist their farmers with environmental and quality schemes;

- Fonterra, through its sustainability programme and team of sustainability managers, is helping farmers manage the development of farm environment plans and the use of digital solutions such as the online Dairy Diary and tools such as Agrigate mean there are digital options for farmers that could extend to facilitate biosecurity planning.
- Synlait’s solution is its Lead with Pride programme which focusses on four pillars; Environment, Animal health & welfare, Milk quality and Social responsibility, each of which is linked to biosecurity at some level.

¹³ Biosecurity 2025 Strategic Direction 2 - A toolbox for tomorrow.

¹⁴ Biosecurity 2025 Strategic Direction 3 - Smart, free-flowing information.

¹⁵ Biosecurity 2025 Strategic Direction 4 - Effective leadership and governance.

¹⁶ Biosecurity 2025 Strategic Direction 5 - Tomorrow’s skills and assets.

- Miraka has developed Te Ara Miraka to ensure its activities are sustainable and have a minimal impact on the environment.

Danish legislation since 2008 has required that larger farms develop and implement a farm specific biosecurity plan. However, a year from introduction of this requirement, none of the participating farmers had developed a biosecurity plan.¹⁷ Interest and support from processors, both milk and meat could play a key role in ensuring the scaling and success of a biosecurity scheme. European farmers agreed or strongly agreed that their milk buyer (72.2%) and their vet (57.7%) thought it was important that they implemented biosecurity measures on their farm.¹⁸

It may be possible for processors to lead, or strongly support farmers in the development of on-farm biosecurity plans linked with existing initiatives. From a supply chain transparency perspective it makes sense that processors might be supportive of development, monitoring and updating of biosecurity plans for dairy farms.

The issue of common data and the desirability of a standardised user platform for ease of use by all pastoral farmers might mean the investment is best led by others, such as the GIA, but supported by processors.

DairyNZ

As a levy funded industry organisation DairyNZ has developed significant resources to inform the dairy sector about biosecurity risk including a four-page [Biosecurity WOF](#) covering stock movements, access to farm, farm infrastructure and biosecurity awareness and provides a high level overview of critical risk areas. Additionally, DairyNZ has developed the following resources;

- [Protecting Your Farm](#) - a work sheet covering key areas of biosecurity risk.
- [Visitor Biosecurity](#) sign – a basic visual for visitors to farm with contact details for the farm.
- [Biosecurity at mating](#) information page.
- [Pre-purchase check list](#) for buying livestock (developed with industry partners).
- [Bio secure loading facilities](#) and slink pick up point guidelines.
- [Biosecurity guidelines for graziers](#) (M. bovis focus).
- [Guidelines](#) on identifying pest and weed species.
- [Guidelines](#) for on-farm cleaning and disinfectant.
- [Guidelines](#) for treating calf milk.
- [Podcasts](#) related to biosecurity.
- [M. bovis](#) information page.
- [Guidelines](#) for Johne's disease.
- [Tuberculosis](#) (TB) information page.
- [Leptospirosis](#) information page.
- [BVD](#) information page.

DairyNZ has also produced a [series of documents](#) designed to engage levy payers in a proposal to join other primary sector groups in signing the [Government Industry Agreement for Biosecurity Readiness and Response Deed](#) (the GIA).

¹⁷ Kristensen et al., Danish dairy farmers' perception of biosecurity.

¹⁸ Richens et al., Application of multiple behaviour change models to identify determinants of farmers' biosecurity attitudes and behaviours.

Federated Farmers

Federated Farmers is an independent rural advocacy organisation aiming to “add value to the business of farming for our members and encouraging sustainability through good management practice.”¹⁹ It has a dedicated M. bovis web page with links to information for farmers including;

- [M. bovis Calves – June 2018.](#)
- [Mycoplasma bovis FAQ's.](#)
- [Reduce the risk of M. bovis.](#)
- [Mycoplasma bovis Key Points.](#)
- [Winter Feeding Update – June 2018.](#)
- [M. bovis Information Sheet – May 2018.](#)
- [What to look out for poster.](#)
- [Advice on using imported semen.](#)
- [Managing Service Bulls to Prevent M. bovis.](#)

Referencing the Kiwifruit sector Matt Dyck stated, “1. Biosecurity awareness material needs to be made ‘real’ for growers, in terms they relate to such as potential impact to orchard productivity, trade, and orchard value.

2. Industry biosecurity guidelines are required, to indicate the level of practice required for business-as-usual operation in absence of an imminent biosecurity threat or response.

These guidelines would provide consistency across the industry, remove commercial disincentives that currently exist, and thereby improve the industry’s ability to withstand a future biosecurity incursion.

3. Guidelines should clearly explain the purpose of a recommended practice and how this mitigates risk.

4. Recommended practices should be practical and easy to implement. Industry bodies should facilitate this process.”²⁰

Generally the resources provided by industry meet many of the recommendations in the Dyck report and also those in a European Union review of biosecurity which states, “Successful biosecurity measures must address isolation of new animals brought to the farm, isolation of sick animals, regulation of the movement of people, animals, and equipment, correct use of feed, and procedures for cleaning and disinfecting facilities.”²¹

While farmers have access to a wealth of information through MPI, DairyNZ, Federated Farmers and others, some key questions remain;

- 1) How well is the information translated to on-farm practice?
- 2) How well is the practice managed to reduce risk?
- 3) How easy is it to implement?
- 4) Can a farmer be confident the effort and expense invested is matched by neighbouring farmers, to a similar standard, in a manner that captures specific need?
- 5) Do farmers want help in this area?

There is potential for the pastoral farming sector to pull together the various strands of biosecurity information and present them to farmers to facilitate better understanding of specific risk at the same time help ensure a standardised approach is followed across industry.

¹⁹ Federated Farmers website.

²⁰ Dyck, M. Avoiding Complacency in Kiwifruit Biosecurity – Kellogg Report June 2016.

²¹ A new Animal Health Strategy for the European Union (2007-2013) where “Prevention is better than cure”.

Farmers

Further objectives of this report are to gauge farmers' understanding of biosecurity risk, what strategies are in place on farm, who is responsible and what would be helpful in managing on-farm risk.

An online survey was developed and distributed to farmers through social media platforms Facebook and Twitter. The ten-question survey site recorded 101 unique visits resulting in 49 completed surveys. It is acknowledged that the small sample size will have impacted or influenced the findings from this research.

The survey attempted to offer respondents the opportunity to demonstrate their understanding of biosecurity and its importance and therefore many of the questions offered an indication of the type of answer required without offering specific answers to choose from.

The average farm size of respondents was larger than the 144 hectare²² average dairy farm size in New Zealand, with sixty five percent of respondents operating farms of greater than 150 hectares, as shown in Figure 4. It is possible that larger farm operators are more active on, or responsive to, the social media platforms used in this survey.

What is your farm size?

49 out of 49 people answered this question

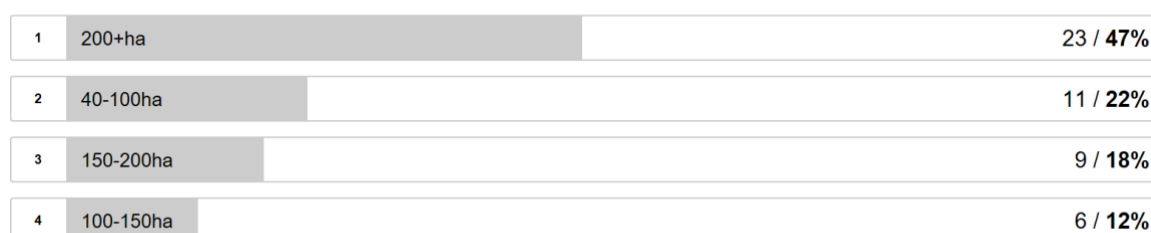


Figure 4. Farm size of respondents.

When asked how respondents ranked biosecurity in terms of daily routine, thirty three percent thought about it on occasion but had no written plan specific for their farm, as shown in Figure 5. Twenty four percent had a written biosecurity plan but did not review it regularly and twenty percent had an on-farm plan which was updated regularly. Sixteen percent of respondents felt having a plan was important but were not sure how to create one. Ten percent of farmers felt there was no need for a biosecurity plan as long as they were sensible in the way they operated their farm.

²² DairyNZ QuickStats.

Where do you rank biosecurity in terms of importance in daily routine

49 out of 49 people answered this question

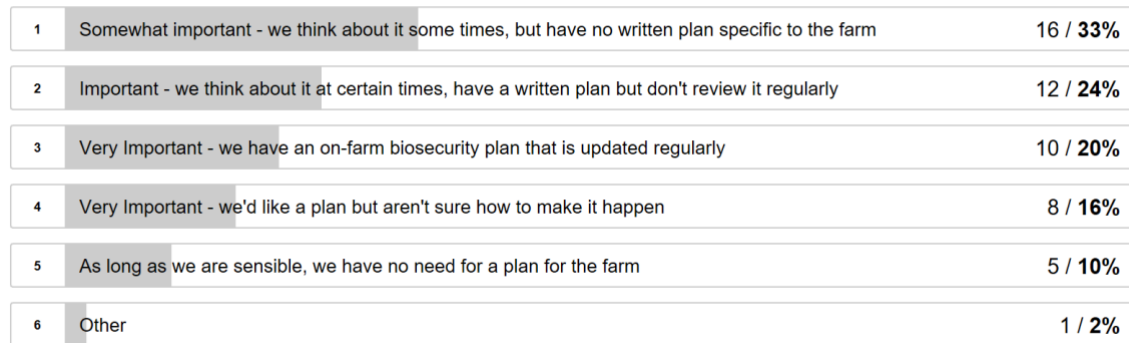


Figure 5. Importance of a biosecurity plan.

In total forty four percent of respondents had a biosecurity plan, but the standard of that plan is likely to be variable and over half of those farmers did not regularly review their plan. This isn't surprising given that most farmers know their critical risk points and likely manage them in different ways and with various levels of rigor.

When asked whether a workshop would be helpful to identify risk and prepare a farm plan, eighty percent of respondents indicated it would be of help and in terms of an assesment to help ensure it covered specific on-farm risks, seventy three percent of respondents agreed, as shown in Figure 6.

Would a short workshop based course be helpful in identifying risks and preparing a plan?

49 out of 49 people answered this question



Would it be valuable to have your plan assessed to help ensure it is specific to your farm?

49 out of 49 people answered this question



Figure 6. Short course in biosecurity planning and plan assessment.

Eighty six percent of respondents agreed that if every farm had an active biosecurity plan it would reduce overall industry risk, whilst twelve percent felt it would have limited impact and was not worth the time or money, as demonstrated in Figure 7.

If every farm owner had an active biosecurity plan, do you think it would reduce overall industry risk?

49 out of 49 people answered this question

1	Yes having an active plan would keep my farm and others safe	42 / 86%
2	It might have small impact, but isn't worth the investment of time and/or money	6 / 12%
3	I don't believe this would be valuable to my farm or industry	1 / 2%

Figure 7. Value to industry of active biosecurity plans.

The results of this survey are supported by European research on farmer attitude to biosecurity. “A large proportion of farmers (62.3–65.8%) agreed with statements relating to biosecurity improving the productivity and health and welfare of their cattle, and that biosecurity measures were worth implementing. Many farmers agreed with statements relating to biosecurity measures being costly and time consuming to implement.”²³

Respondents were asked if they knew of any on-farm bio security obligations, legal or otherwise and if so what those might be? Testing the level of understanding related to legal obligations was an important first step to gauge overall biosecurity knowledge and is helpful to inform potential short course content.

Thirty three percent of respondents had no awareness of a legal obligation in relation to biosecurity, as shown in Figure 8. Of the respondents who indicated an awareness of legal responsibility, NAIT (42%) and notifiable pest/disease obligations (27%) ranked the highest. Obligations related to control of existing biosecurity threats TB, Leptospirosis and Johne’s disease ranked significantly (24%) and a small number mentioned feed or animal remedy obligations (6%).

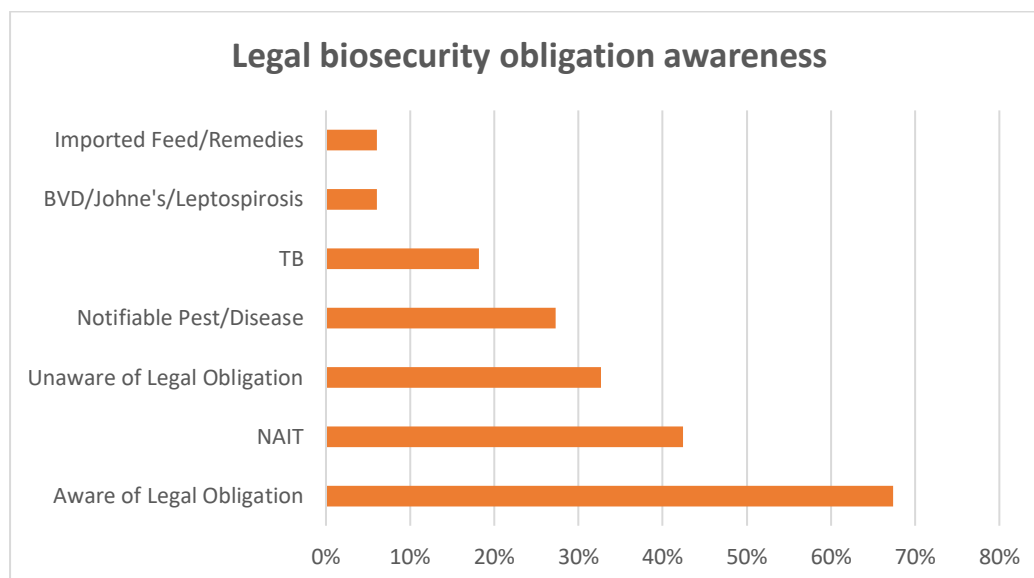


Figure 8. Legal biosecurity obligations.

Respondents were asked where they accessed biosecurity information and DairyNZ (59%) was rated highly by farmers with MPI (37%) being the second most accessed resource for industry information, as shown in Figure 9. Veterinarians (18%) ranked highly and other sources included other farmers

²³ Richens et al., Application of multiple behaviour change models to identify determinants of farmers’ biosecurity attitudes and behaviours.

(10%), farm consultants (10%) and Federated Farmers (8%). The internet and social media (22%) were mentioned regularly as mechanisms to search for information.

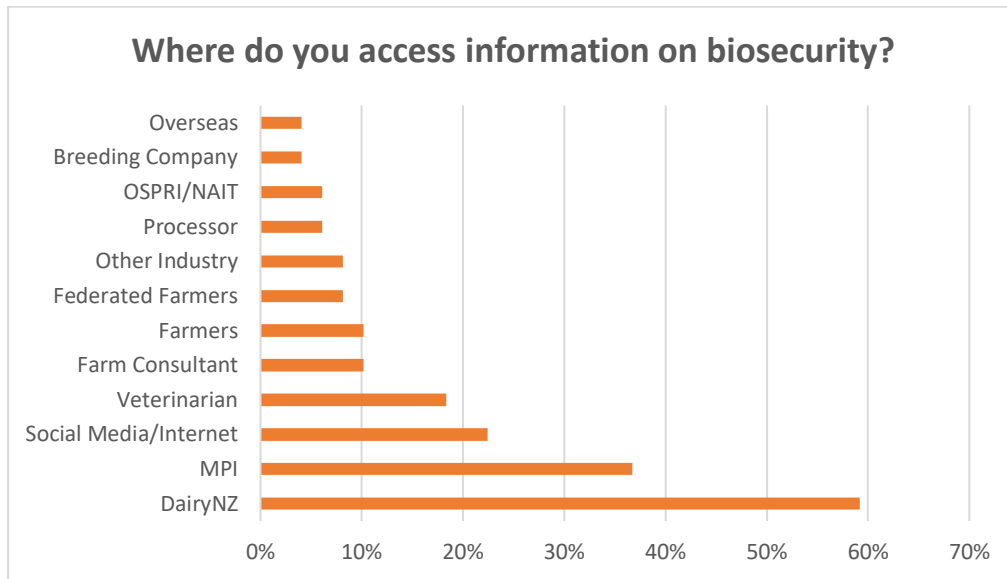


Figure 9. Access to information on biosecurity.

Given the recent outbreak of *M. bovis* it is unsurprising that stock movements ranked highly with respondents (83%) in terms of risk, as shown in Figure 10. Also, unsurprisingly the threat posed by Public/Visitors to farm ranked highly (55%) whilst the combined visitor risk including rural professionals sees the visitor risk (74%) more closely align with stock movement. Contractors/Machinery (38%) and Boundary Fencing/Stray Stock (26%) also ranked highly.

Despite being asked to rank the top 5 risks to farm, most respondents mentioned one or two risks which indicates that all significant risk factors are not front of mind for farmers and this may be because there are many other operational demands which take priority. Although a broad range of risks were identified, the low number of respondents covering multiple risks adds weight to farmer identified need for assistance in this area.

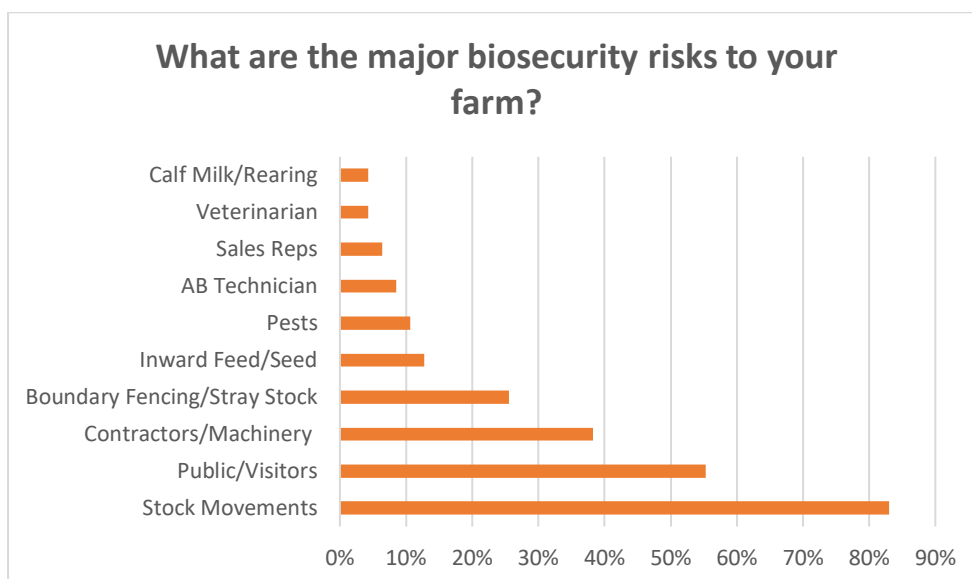


Figure 10. Major biosecurity risks to a farm.

The strong sentiment from respondents was that they and their staff were responsible for protecting their farm (71%) and this is unsurprising given farmers generally view themselves as guardians of the land which extends to everything associated with it, as shown in Figure 11. The number of respondents who felt everybody associated with the farm had a responsibility was far lower (23%) whilst the most noted external parties included the Contractor (17%), Suppliers/Visitors (17%) and the Transport Operator (15%).

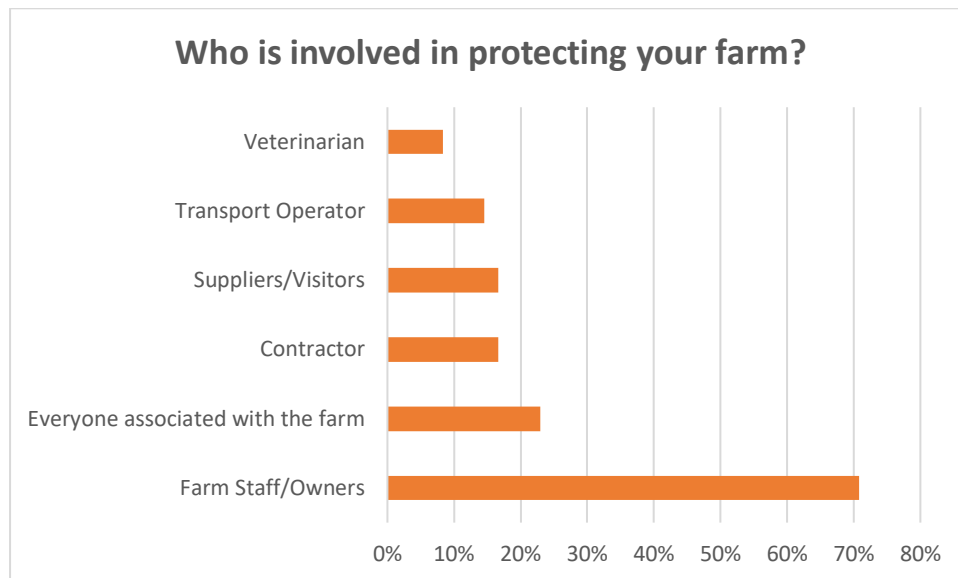


Figure 11. Who is involved in protecting your farm?

The survey result showed that respondents are acutely aware of current risks and industry has developed significant resources to assist in understanding them. High risks identified by respondents were stock movements and visitors to farm, be it contractors, members of the public or rural professionals. The concept of biosecurity risk is well understood as are some of the significant threats, but what is less well understood is what that looks like on-farm and how that general knowledge is best applied constructively to manage risk.

Building an understanding of legal and regulatory obligations might be helpful as part of driving understanding of the place of an on-farm plan in the wider ecosystem that is the New Zealand biosecurity plan, Biosecurity 2025. Initially the farm plan might be informed by the national programme, but if managed well a collective of individual farm plans could be valuable in informing the national plan.

A key focus of Strategic Direction 4 is that “participants see how they are working to an agreed system strategy – they understand the full biosecurity system (not just their part of it)”,²⁴ so part of a biosecurity workshop might capture the role of an individual farm plan as part of a wider collaborative effort.

Importantly, respondents felt that specific on-farm biosecurity plans for all farms would reduce the risk to industry and this aligns with the Biosecurity 2025 objective to have 90% of businesses engaged in biosecurity.

²⁴ Biosecurity 2025 Strategic Direction 4 - Effective leadership and governance.

Further comments provided by respondents either support the findings, or provide design challenges needing to be contemplated;

- "A plan is only useful if it is implemented."
- "A further risk would be neighbours and people over the boundary not complying."
- "Being able to do this via apps or online would be valuable."
- "If more people are aware of the risks then the attitude will improve."
- "Farms should have a biosecurity folder and plan just like they (should) have H&S plans and training."
- "Biosecurity is important, and farmers need to be educated but not forced to implement more changes to their systems."
- "All the rules can be made, however unless we are all on the same page it is not of value to the industry."

Other Industries

To investigate what a dairy farm plan could look like it is valuable to understand the experiences of other industries.

Pork Industry

The pork production sector contributed \$21 million to New Zealand GDP in 2017 and employs 435 people.²⁵ The specific production system within the pork production sector drives the level of biosecurity activity on-farm. Barn raised production units can incorporate measures such as shower-in/shower out and air/water filtration systems which provide effective biosecurity controls.

Free range farms are more aligned to dairy production systems and are exposed to similar risks in terms of visitors, pests, weeds and windborne risks.

One key similarity between industries is transport. The conditions for providing a service transporting slaughter pigs,²⁶ as detailed in Appendix 1, highlights the differences in traditional approach to stock movement between the industries. For the dairy sector it represents a paradigm shift in understanding and behaviour, which M. bovis to an extent has sparked.

Poultry Industry

The poultry production sector contributed \$107 million to New Zealand GDP in 2017 and employs 2,398 people.²⁷ The Poultry Industry Association of New Zealand (PIANZ) is the industry organisation representing the interests of the poultry meat industry. The poultry meat production sector is vertically integrated with a small number of companies owning the egg stock, from which a third generation is generally a table bird. The company will own the bird, control the feed, water, manage bird welfare in the shed and control the entire processing and distribution process to market. As such the industry demonstrates a unique level of control over the three main biosecurity threats to the industry, Avian influenza, Newcastle disease and Infectious bursal disease (IBD).

New Zealand is the only country in the world without these diseases and as such MPI has strict rules protecting the industry, including a ban on the importation of raw chicken meat. The Poultry Industry Association, representing growers, tests every farm six times per year for IDB.

The egg laying industry is slightly more vulnerable with more free-range activities, although approximately twenty farms produce eighty percent of the eggs for domestic consumption. These

²⁵ Pork Production Sector Profile 2017. Infometrics.

²⁶ Andrews, H. Conditions for providing a service transporting slaughter pigs.

²⁷ Poultry Production Sector Profile 2017. Infometrics.

units have sound biosecurity plans and many of the large companies manage their own feed mills to ensure they can manage feed risk.

The biggest risk associated with the industry is the number of back-yard producers who have a limited understanding of biosecurity risk. It is estimated through feed sales that the back-yard layer bird population might sit near 250,000 birds.²⁸

The risk profile presents some strong parallels with the pastoral farming industry. To be effective in managing biosecurity risk it would be important that all pastoral farming operations have access to the same resources and process. A significant number of lifestyle farmers are involved in breeding or rearing of livestock and small holdings of pastoral land might not have the same level of risk management capability that a commercial dairy farm might have.

The design of a biosecurity plan for a dairy farm should therefore consider and attempt to meet the needs of other pastoral farmers. The need for accurate and timely shared digital information, as highlighted in Strategic Direction 3, could mean that a digital option for the preparation and maintenance of an on-farm biosecurity plan might extend to all pastoral farmers – perhaps managed in a similar way to the NAIT scheme.

How could Industry help?

Industry could assist by facilitating the development of a short course related to biosecurity and a process to assist in ensuring it is fit for purpose and specific for an individual farm.

What could that look like?

The survey result suggests that a workshop should first look at the bigger picture, where a farm plan sits in the wider New Zealand biosecurity ecosystem, touch on the legal obligations and laws governing biosecurity and consider aspects such as reputational risk, market access and social license to farm.

More specific impacts could cover financial loss (genetic gain, reduced value of stock/crops/land or lower productivity), increase in costs (containment, treatment, compliance), human costs such as stress, depression, low staff morale and potential transmission to humans (e.g. Leptospirosis).

Some of the areas that would need to be considered in the development of a farm specific plan are summarised in Figure 12 below. There are six key areas, each of which will present a different level of risk depending on the individual farm:

- Transport.
- People.
- Pests/Weeds.
- Animals.
- Infrastructure.
- Product.

²⁸ Michael Brooks, PIANZ.

Potential elements of an on-farm biosecurity plan



Figure 12. Potential elements of an on-farm biosecurity plan.

The scale of the information would require a day long workshop and should leverage the knowledge farmers already have. A peer to peer learning session would assist in the development of a broad plan which could then be made specific by each farmer for their farm. The learning could use case studies from the dairy industry such as M. bovis and from other industries, for example, the impact of Psa on the Kiwifruit industry.

The workshop could be facilitated by a range of industry experts such as veterinarians, QCONZ, Asure Quality or a training organisation such as Dairy Training Limited (DTL) or Taratahi Institute of Agriculture (Taratahi) might deliver the workshop content and facilitated learning.

Wherever possible the prevention of duplication should be considered in the development of solutions. There are animal welfare biosecurity related products in market presently, WelFarm being an example. WelFarm is a nationwide initiative developed by XLVets New Zealand in conjunction with Fonterra which assesses animal health, welfare and productivity with the goal being to deliver value to the producer and assurance to external stakeholders²⁹. WelFarm and other solutions, which represent part of the wider on-farm biosecurity picture, could be used to inform a whole farm biosecurity plan and thereby reduce duplication.

How could implementation be measured?

Once the workshop is completed a farmer might engage with other rural professionals such as a veterinarian or farm consultant to complete a farm specific plan which could then be assessed by a range of appropriately qualified assessors i.e. QCONZ or Asure Quality.

To ensure consistent quality of the plan across multiple farms and regions in New Zealand the workshop session and assessment could be managed through a new type of formal qualification called a micro credential. A micro credential is a small qualification designed to fit a specific industry need

²⁹ [XLVets WelFarm](#)

and is registered with the New Zealand Qualifications Authority (NZQA) by an Industry Training Organisation (ITO).

The Primary ITO is the body legally mandated to develop, register and maintain qualifications for industry training on behalf of the primary sector. It would lead the development of unit standards for the qualification and be responsible for maintaining it along with ensuring the quality of the qualification. In addition, it would be responsible for moderating farm plans to ensure they met minimum standards thereby ensuring farmers could trust the system was consistent across the country.

Furthermore, the Tertiary Education Commission (TEC) which funds qualifications in New Zealand is investigating options to fund micro credentials which meet industry need and are not covered in existing qualifications. TEC funding would be beneficial to ensure farmers can cost effectively engage in the process and could be critical in making it an effective biosecurity tool.

Industry may be able to assist by developing a standardised platform for the development and storage of individual farm plans. Given most biosecurity risks span the breadth of the pastoral industry the platform development might best be made available to all pastoral farmers and contemplate the needs of the entire primary sector. It would make sense therefore the process might be best managed by a government organisation with support from industry.

The GIA might be a sensible forum to begin the conversation if our industries were represented, in their absence however, the engagement framework might still be valuable. The result of the M. bovis outbreak will result in increased NAIT system resilience and participant requirements and as such it might be the right time for MPI to begin a conversation with industry to introduce a system to assist farmers which would also meet the objectives of Biosecurity 2025.

Conclusions

This report reaches the following conclusions:

- Farmers are acutely aware of the immediate and critical biosecurity risks, but many do not have an active biosecurity plan for their farm and implementation of biosecurity practices are largely ad-hoc.
- There is adequate biosecurity information available through DairyNZ, Federated Farmers, MPI and others.
- A significant majority of farmers surveyed indicated an interest in a workshop-based biosecurity learning opportunity and help assessing whether the plan they had developed was specific to farm.
- Farmers strongly agreed that if every farm had an active biosecurity plan it would reduce overall industry risk.
- What is missing is a mechanism to implement that knowledge on-farm, a method to test and maintain the relevance and consistency of that implementation and a digital platform which facilitates ease of use and data sharing.
- Support from processors, milk and meat, could play a key role in ensuring the success of a biosecurity scheme in terms of uptake, and supply chain transparency suggests they would be a motivated interest party.
- Veterinary practices might also have a role to play in providing advice and facilitating groups of farmers to participate as part of the value-add component to their businesses.
- Organisations such as QCONZ, DTL or Taratahi might have a role to play in facilitating biosecurity workshops.

- A digital on-farm biosecurity plan would fit with the aims of Biosecurity 2025.
- Many biosecurity risks are common to the entire pastoral farming sector.

Recommendations

Develop a biosecurity micro credential

Primary ITO could develop a biosecurity micro credential qualification which could include a full day workshop and plan assessment component. The advantage of this approach is that it would result in nationwide consistency and quality.

Utilise existing providers

Course content could be delivered by Taratahi, DTL or veterinary practices and assessment support managed through QCONZ or Asure Quality.

Funding

There is a possibility that some of the cost of the micro credential could be met through TEC funding.

Develop a digital solution

There is a need for a digital biosecurity plan solution which facilitates data sharing and ease of use for farmers. Data sharing would facilitate the farm plan fitting within the wider New Zealand biosecurity plan and assist in supporting farmers who, as guardians of the land, have traditionally felt most of the responsibility for protecting their farms.

Engage Industry

The support of milk and meat processors would be valuable in assisting with adoption and ongoing management. Biosecurity planning could be built into a provenance story from an industry able to demonstrate supply chain transparency.

Consider the entire pastoral farming sector

Discussions with other industries suggests that biosecurity risk would be limited by inclusion of the entire pastoral sector and as such a collaborative effort through the GIA, or GIA framework, managed in a similar way to an improved NAIT system would be advantageous.

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Appendix 1 – Conditions for providing a service transporting slaughter pigs

The transporter must ensure that any truck used to transport The Farm slaughter pigs has not been used to transport other pigs for a minimum of 36 hours (2 nights downtime from other pigs). Any deviation from this must be approved by The Farm in writing

The truck used to transport The Farm pigs may, at any other time, only be used to provide a service using for transporting slaughter pigs to the following businesses This is subject to change if the health status of any of these farms should change or become at risk of changing. Any deviation from this condition must be approved by The Farm in writing

The truck driver and anyone working with the truck must not work with or have any other contact with pigs outside of their employment with the Transporter and from the properties outlined above.

The Transporter must take steps to prevent any source of pig-origin organic matter from coming into contact with the truck and The Farm at all times. This must include effluent that is either transported or irrigated, or spray drift from irrigation of effluent or aerosol spread of disease from nearby pig farms. Any such issues should be immediately discussed with The Farm and managed under their guidance.

A laminated copy of this protocol must be present at all times in the cab of all trucks that provide any service to The Farm transporting pigs. The drivers must be aware of its presence and must be familiar with its requirements. This will be checked during random audits carried out by The Farm or their authorized representative.

The Transporter must bring to the attention of The Farm any situation, event or set of circumstances which may pose a risk to the health status of The Farm stock.

Prior to arrival at The Farm for collection of stock

The driver of the vehicle must ensure that the entire vehicle has been cleaned to the following standards:

1. A thorough wash-down with a high-pressure hose/washer to remove all organic loose organic matter attached to the load bed, the tyres, the wheel arches and under the vehicle. The driver's foot well must be cleaned and floor mats removed, cleaned and disinfected. Boots and over-clothes used at the abattoir must be thoroughly cleaned.

2. Apply disinfectant to all surfaces on the load bed and tailgate or areas where the driver may walk when loading pigs. The disinfectant used must be either:

- a commercial Glutaraldehyde / QAC combination applied at a dilution rate of 1.7g Glutaraldehyde / litre water plus associated QAC component (e.g. MS Megades at 1:200 or Terminator at 1:100) OR
- a QAC/Biguanidine combination disinfectant (e.g. F10 or Sterigene applied at a dilution rate of 1:200).
- This disinfectant must be applied to a completely clean and dry surface and allowed to dry for a minimum of 20 minutes after application without rapid drying by wind. If applied to a wet surface or if contact time must be less than 20 minutes due to wind drying then the concentration of disinfectant must be double that stated above.

The Transporter should take due care with respect to:

- Health and Safety considerations when using all such disinfectants especially those containing Glutaraldehyde and related chemicals.
- Not wear any clothes or footwear that has been worn on another livestock property that has not been freshly cleaned. In the case of footwear, they must be disinfected after removal of all organic matter.
- Not bring any accompanying person onto The Farm property without them reading, understanding and complying with these regulations.
- Not be accompanied by any animals, including dogs, cats or any other pets or livestock
- Travel equipped with a coarse nylon brush and a spray container containing approved disinfectant as in point 3 above and used at the stated dilutions. This must be used to clean and disinfect any potential risk areas or footwear or parts of the truck during loading and off-loading such as the tail-gate of the truck after it contacts the loading ramp at The Farm or the abattoir.

On arrival at The Farm the driver must:

- At the entrance gate, put on the protective clothing supplied by the farm.
- Drive only on the route intended and signposted for slaughter vehicles that leads directly to the loading ramp. No other route entering the farm may be used
- Approach the loading ramp in the vehicle and make his/her presence known to the farm staff (e.g. sound hooter).
- Not enter the farm perimeter fence under any circumstances.
- Not cross the red line at the top of the loading ramp leading to the inside of the pig unit.
- Not allow any The Farm staff to cross the red line on the ramp to the outside of the unit, or touch any part of the truck.
- Not permit any animal to return down the loading ramp into the farm after entering the load area of the truck.
- Count all the pigs and reconcile stock numbers and classes with the delivery documents supplied by the farm.
- Require the farm to supply an Animal Status Declaration for Pigs for the stock to be slaughtered. This will be handed to the person receiving the pigs upon delivery.
- Not allow pigs to be loaded above a stocking density of 0.4 m² per 100kg liveweight equivalent.
- Not take any pork products, including in lunches or other food kept by the driver, onto the The Farm premises or to be fed or to come in contact with the pigs.
- On leaving the farm, the driver must change back out of the protective clothing supplied by the farm.

When delivering stock to an abattoir the driver must:

- Put on alternative boots (or disposable over boots) and trousers/overalls before unloading the pigs.
- Avoid walking on areas contaminated by pig effluent and organic matter from other pig delivery trucks (e.g. the loading ramp and surrounding area). Do not enter the lairage area.
- Not allow staff from the abattoir or other transporters to walk on the truck or tail-gate.
- Avoid stressful handling behaviours during loading or unloading of pigs. Moving boards, shakers and coaxing should be encouraged. Hitting, kicking, slapping or very loud shouting should be avoided as these increase the risk of inducing Porcine Stress Syndrome and adversely affecting animal welfare and meat quality.

- Clean down and spray disinfect the tail-gate of the truck that has been in contact with the loading ramp at the abattoir.
- After unloading the truck, if possible hose off boots and pants to remove the bulk of organic matter. Place the footwear and pants used during off-loading in a compartment away from the footwell or seats in the cab, awaiting cleaning and disinfection with the truck before the next use.
- Spray the footwell and driving shoes with disinfectant (after removal of any organic matter) before entering the cab and proceeding.

Appendix 2 – Survey Questions

1 → What is your farm size?

A 40-100ha

B 100-150ha

C 150-200ha

D 200+ha

2 → Do you know of any on-farm bio security obligations, legal or otherwise. Yes and they are? No, I'm not aware. *

Type your answer here...

3 → Where do you access information regarding on-farm biosecurity eg. farm consultant, other farmers, industry or government organisation (if so which & how)? *

Type your answer here...

4 → Where do you rank biosecurity in terms of importance in daily routine *

Choose as many as you like

A Very Important - we have an on-farm biosecurity plan that is updated regularly

B Very Important - we'd like a plan but aren't sure how to make it happen

C Important - we think about it at certain times, have a written plan but don't review it regularly

D Somewhat important - we think about it some times, but have no written plan specific to the farm

E As long as we are sensible, we have no need for a plan for the farm

5 → What are the major biosecurity risks to your farm e.g. stock movements (list your top 5, or more)? *

Type your answer here...

6 → Who is involved in protecting your farm? Think on-farm and off-farm e.g. farm staff, transport operator etc. Do they know what their role is?

Type your answer here...

7 → Would a short workshop based course be helpful in identifying risks and preparing a plan?

*

Y Yes

N No

8 → Would it be valuable to have your plan assessed to help ensure it is specific to your farm? *

Y Yes

N No

9 → If every farm owner had an active biosecurity plan, do you think it would reduce overall industry risk? *

A Yes having an active plan would keep my farm and others safe

B It might have small impact, but isn't worth the investment of time and/or money

C I don't believe this would be valuable to my farm or industry

10 → Do you have any further comments that might be useful?

Type your answer here...