

ANNUAL UPDATE 2021/22



KO TĀTOU

THIS IS US BIOSECURITY 2025

**New Pathway Plan for better
biosecurity protection and more value**

**Prepared for kiwifruit's most
unwanted pests and diseases**

**Ensuring a future backed by science
and innovation**

**Partnering across industry
and nationwide to ensure
biosecurity resilience**

Fast facts: the year in numbers



92 guests so far at ongoing dedicated Pathway Management Plan workshops in growing regions

From 1 April 2022 the new Pathway Management Plan came into effect. Developed by KVH, the Plan is the first national one of its kind



63 live **Brown Marmorated Stink Bug (BMSB)** finds during the 2021/22 high-risk season



22 industry partners are now signed up to the Government Industry Agreement for Biosecurity Readiness and Response (GIA), and **KVH was the first**

46

nurseries are members of the Kiwifruit Plant Certification Scheme (KPCS) and have either Full or Restricted certification

110,00+ fruit fly trap inspections during the 2021/22 high-risk season



29

KVH Bulletin grower newsletters were published, featuring **282** articles



Twitter users saw KVH tweets **45,800+** times and Facebook users saw KVH posts **14,930** times



38 unusual pest and disease reports to KVH

7,726

wild kiwifruit vines controlled across 102 properties in growing regions



15,227 visits to the KVH website, viewing **63,572** pages



52 orchard visits by the KVH team

Foreword from the Board Chairman

For just over two years now we have been living in a Covid-19 world, where the only constant is change and being 'ready to respond' has become part of our daily lexicon.

What both of these have in common is the need for resilience. Resilience to cope with the unexpected that might come our way on any given day; resilience to know what resources we have and how to use them; resilience to ramp up or down our activities based on risk; and resilience to be open enough to use our networks to both give and get support.

You could be forgiven for thinking I am still talking about Covid-19, but these are all actually elements fundamental to good biosecurity resilience, and that is the vision for KVH – a biosecurity resilient kiwifruit industry.

As an industry our biosecurity preparedness and activities are numerous and robust. However, just like with Covid-19, we cannot rest on our laurels and think there will not be another potential threat or variant coming our way. Over the last year, and as you will see throughout this Annual Update, KVH has worked towards implementation of the new National Kiwifruit Pathway Management Plan to ensure this resilience continues and improves, now and into the future.

The new Pathway Management Plan manages biosecurity risk through better protection, greater value for money, and increased simplicity around standards for various activities e.g., on-orchard biosecurity planning and hygiene practices.

The main driver for this work is to ensure that we have measures in place to prevent the spread of a broad range of biosecurity threats, rather than a single organism (Psa). It means everyone associated with or involved in the kiwifruit industry has a clear role in biosecurity, knows the

The Pathway Management Plan is the first national plan of its kind implemented in New Zealand under the Biosecurity Act, demonstrating the continued biosecurity proactiveness of our industry.

benefits of the absolute best practices being in place, and has access to tools and resources that make it easy to implement these practices. We will all be thankful for the Pathway Management Plan should there be an incursion, and whilst it may be seen as another layer of compliance, the team are working really hard to make implementation easy for the industry, whilst banking the positives that having the plan will deliver.

The KVH Board views this ongoing piece of work as a priority, and I know I speak for every member when I say thank you to the KVH team for their efforts in this space. We were proud and delighted when the plan was formally approved by Government in early March 2022, for implementation from 1 April 2022, on schedule and as planned.

Thank you also to all those from across the industry who took part in the consultation stages since we first announced the proposal in November 2019. Your support and valued input contributed to development of the plan and helped formulate pragmatic and strong objectives and measures that manage pathway risks across all growing regions, throughout the country.

As I said earlier though, this is an ongoing piece of work and by no means is there a slowing down of efforts now that implementation is underway. You'll read throughout this update how tools are being developed and introduced for growers to be able to integrate biosecurity easily into day-to-day practices; how research and technology are being used to ensure we stay ahead of the game and aware of our biggest threats; and how we develop and use partnerships and networks to ensure we're advocating for the kiwifruit industry as well as raising awareness and improving biosecurity behaviours for the benefit of us all.

Lastly, I would like to thank Leanne and the KVH team for their continued dedication and performance over the last 12 months. I started out by mentioning resilience and I will end by reflecting on that word again because there has been a huge amount of resilience shown by the team who make up KVH. They have seamlessly adapted and never lost any of their passion or dedication during what has been another remarkably busy and constantly evolving year.

I would also like to take this opportunity to acknowledge two long-serving members of the team who retired within the last 12 months. Karyn Lowry and John Mather have both been integral to the success of the organisation. I thank them both for their efforts and wish them all the best,



although I am sure they will stay in touch and always be part of the KVH family.

To the KVH Board, thanks for your support and dedication to ensuring that KVH as an organisation is well governed and meeting industry needs. In particular, I would like to thank Cody Bent for his input as an Associate Director (Cody's term finished in December 2021) and welcome Erin Atkinson as the Board's newest member as Associate Director.

I end by thanking you for your support of KVH and assuring you that both Board and staff are committed to ensuring the best biosecurity outcomes for growers and the wider industry, now and into a very productive and exciting future.

Foreword from the Chief Executive

Having been at KVH for over a year now, I find myself reflecting on how much has been achieved by the organisation in such a short amount of time.

KVH is in a very good position to meet current and future biosecurity challenges. While it is harder to influence management of biosecurity risks outside of our industry and across all parts of the biosecurity system (such as pre-border where we do not have formal mandate), I am certain we are doing all we can to work collaboratively with the government and other industry groups to achieve the best possible outcomes for the kiwifruit industry.

Within the industry - which is always our main focus - our influence is not centred around telling people what to do. We are here to help kiwifruit growers and the wider industry understand what could be at risk if we are faced with an incursion, and how important it is that we try every day to stop such an event while at the same time being well prepared to face it if it happens.

The new Pathway Management Plan discussed in the Board Chairman's Foreword illustrates this and is a huge step forward for KVH, and the industry.

The plan helps us to manage our internal pathways in a much more robust and consistent way, but also with more pragmatism. We know that growers, orchard managers, and many others across the industry are facing increasing compliance and time burdens and so our goal throughout the development of the plan has been to listen carefully during our consultations and make sure we carefully consider the advice and concerns raised. This feedback has been valuable - and I thank all who took part as it is what has led to successful approval of the plan and now, implementation.

On the following pages (8-9) we go into this further and discuss the benefits of the plan, as well as what it means day-to-day for growers, contractors, nurseries, post-harvest and others across the wider industry. Then, on pages 14-15 you'll read about some of the highlights we've got underway in terms of new tools and technologies that make it simpler and easier for people to meet the requirements of the new plan and put consistent biosecurity best practice in place.

At this point, and as the Chairman noted, I would like to acknowledge the work of the KVH team in getting the plan to this point. We are the first industry in New Zealand to have a national plan of this nature and it is a huge achievement that we should all be proud of. I would like in particular to mention Matt Dyck, Biosecurity Manager, for his continued dedication to the project since work first began in 2019.

As I acknowledged however, it has been a team effort and many of you will have attended an event or workshop where KVH staff have discussed the plan and run through various elements such as on-orchard biosecurity planning. All the KVH team have taken part in these events one way or another and I am incredibly proud of the way they have been run - there has been great feedback and I encourage you to take part in future similar opportunities, or even get in touch to organise one. We are here to help, and we are focused on doing what we can to make biosecurity easy, every day.

While the new Pathway Management Plan helps us to have our own 'house in order' it is important that we continue to advocate for growers and ensure the industry's best interests are represented with government.

Through the Government Industry Agreement for Biosecurity Readiness and Response (GIA) we make sure fit for purpose plans are made in advance and agreements put in place for how we - KVH, other industry groups, and government - jointly respond to specific pest incursions. KVH is a leading GIA partner and much like the new Pathway Management Plan, this partnership goes a long way to improving and future-proofing our biosecurity readiness, as well as our resilience. On page 23 we discuss this further, including how we participate in shared decision making and associated cost sharing for readiness and response activities.

There are many partnerships and networks that KVH is active in, helping us to raise awareness of the importance of protecting the kiwifruit industry and improving biosecurity behaviours. Over the years it has become increasingly apparent that primary producers and associated/local communities need to be connected to each other and can learn from the similar challenges we all face, particularly around wanting to do the best we can for their businesses and livelihoods. On pages 20-22 we mention our work in just a few of these, such as the Port of Tauranga Biosecurity Excellence programme and Biosecurity Business Pledge, which now has over 150 members committed to integrating proactive biosecurity practices into their business culture and operations.

We have much more happening than I have mentioned here so do read this Annual Update for the full story, I hope you enjoy it. It has been a busy 12 months and I am sure the next year will be just as rewarding for us all as we continue to work together to do all we can for a biosecurity resilient kiwifruit industry.

Lastly, a thank you to NZKGI and Zespri for your much appreciated ongoing support of KVH and



With the new plan we are focusing on clear and united goals across all growing regions, which offer better biosecurity for all.

our activities. I would also like to thank our KVH Board and staff for their expertise and dedication to biosecurity and the kiwifruit industry.

A handwritten signature in black ink, which appears to read 'Ian Stewart'. The signature is fluid and cursive.

What's happening around the world?

NORTH AMERICA

- Spotted Lanternfly (SLF) spread continues. California established a quarantine in July 2021 to prevent entry of the pest.
- Brown Marmorated Stink Bug (BMSB) abundance has increased, with reports of large numbers in Okanagan, Canada in autumn 2021.
- Asian Giant Hornet (new to the USA in 2019), a big threat to honeybees, are spreading. Three nests were found in a wine and stone fruit growing region of Washington in November 2021.
- A quarantine area of approximately 246km² was created in the Santa Clara and San Bernardino counties in response to Oriental Fruit Fly and Mediterranean Fruit Fly breeding populations detected in late 2021.

EUROPE

- The Yellow Spotted Stink Bug (YSSB) is slowly spreading outside its native range in Asia. It was confirmed in Albania in December 2021, the first reported establishment in Europe.
- BMSB populations continue to expand across the continent. It was most recently found in surveillance traps in the UK in October 2021, in Surrey, South England and new reports have come in from Hamburg, Germany as well as in a vineyard in Bordeaux, France.
- Valencia, Spain looks to construct a new world reference centre in the biological fight against pests. Work begins later in 2022 on this €14.2M project.

SOUTH AMERICA

- In 2021 BMSB was detected in an area outside of urban Santiago for the first time (established in the city in 2017). While large numbers are yet to be reported, this has implications as a significant southern hemisphere population would greatly increase the risk to New Zealand.
- The Chilean government has approved a two-year, \$US500K project to control Spotted Wing Drosophila. While not believed to be a pest of kiwifruit this pest has the potential to impact softer varieties, such as kiwiberry.



Keeping pace with change: Biosecurity risk constantly changes as new organisms are discovered, expand their host range, or invade new geographic areas. This map illustrates some of the key events over the past 12 months that influence risk for the New Zealand kiwifruit industry, and are closely monitored by KVH, using our international research and intelligence networks.

ITALY

- The second round of the Samurai Wasp biocontrol programme has been completed across 510 sites and has been extended to include southern Italy – 25% parasitism of BMSB eggs was reported in release sites.
- *T. mitsukurii*, another parasitoid of BMSB, was first reported in Italy in 2016 and has since expanded into almost all regions in northern Italy. It shows promising parasitism rates of BMSB (up to 60%) and appears to work with the Samurai Wasp, making it a great candidate for biocontrol. A research project is underway in New Zealand to investigate this parasitoid's presence.
- Kiwifruit Vine Decline Syndrome (KVDS) remains a focus for Italian growers. Improving soil characteristics and water management on-orchard appear to be having a positive effect on vines previously impacted. A survey to understand the scale of affected orchards is underway, as well as a research project using remote sensing to aid in early detection of symptoms.

CHINA

- KVH and Zespri continue to work to better understand what pests and pathogens are present in kiwifruit in China, by translating Chinese literature.
- A recent translation looked at Chinese records of micro-organisms on kiwifruit. This provided a list of fungi, bacteria, oomycetes, and viruses to which 70 species were selected to be further investigated, as they are not present or detected in New Zealand.

AUSTRALIA

- Southern Australia has continued to combat multiple Mediterranean and Queensland Fruit Fly (QFF) outbreaks. After most restrictions eased in February 2022, QFF maggots were detected in backyard fruit across a number of areas and male flies were found in surveillance traps. It is thought the infestations are from infected fruit from states in which QFF is present. Visitors are urged to leave all fruit and vegetables at home to prevent spread.
- Millions have been spent on South Australian fruit fly elimination efforts since December 2019. There have been 177,000 home and property visits, and 677 million sterile flies released to date.
- A new app developed by CSIRO and The Australian Department of Agriculture is being trialled by biosecurity officers to help differentiate between the destructive BMSB and a harmless stink bug. If successful, this real-time triage tool will improve surveillance outcomes and aid in early detection.

NEW ZEALAND

- As our borders begin to open to international passengers the risk of fruit fly entering on undeclared fruit increases, and a public awareness campaign is underway at international airports.
- There was only one fruit fly interception during the latest high-risk season, which was in September 2021 and of non-viable QFF larvae in a shipment from Australia. This compares to eight interceptions the previous 2020/21 season.
- A single, dead SLF was found in an imported bag (from China) in Hamilton in December 2021. The insect had been dead for some time.
- BMSB remains high-risk. There were 63 live finds during the 2021/22 high-risk season, compared to 47 for the previous season.
- Fall armyworm (FAW) has been detected in several regions of New Zealand since March 2022. Although kiwifruit is not reported to be a host, KVH and other industry members are closely monitoring the situation.
- Biosecurity New Zealand implemented a new online reporting tool in March 2022, making it easier for submitters to report the unusual in a way that suits them.



Pathway Plan 101: what you need to know

NOVEMBER 2019

Proposal for a new national Pathway Plan

Development, planning and consultation stages

DECEMBER 2020

The final consultation period ended

APRIL 2021

Pathway Plan submitted on schedule to the Minister for Biosecurity

MARCH 2022

The submission and review process was successfully completed

APRIL 2022

The new Pathway Plan came into effect with focus on protection against biosecurity threats

MAY 2023

NPMP expires after a one year overlap with the new plan

The Pathway Plan is significant and something the kiwifruit industry can be proud of

NEW PATHWAY PLAN A ROADMAP FOR BETTER PROTECTION

Biosecurity is one of the kiwifruit industry's biggest risks and we must be prepared, for now, and into the future.

Our biosecurity activities are numerous, and they have significantly increased and evolved as we have come to better understand potential risks and their pathways. However, the new Pathway Plan means we can enhance how we manage these as it provides better protection, more value for money, and increased simplicity around rules and regulations.

Instead of focusing on a single pest (like Psa) the new Pathway Plan, which came into effect from 1 April 2022, focuses on protection against the full range of biosecurity threats to our industry. It provides for a consistent and more pragmatic approach to managing pathway risks such as young plants, budwood, pollen, orchard equipment and other items moved by people.

It is similar to the current National Psa-V Pest Management Plan (NPMP) but is more fit-for-purpose and makes sure all the right settings are in place so that we can detect anything new quickly enough to stop its spread, limit impacts, and aim for eradication. The new plan will replace the NPMP when that expires in May 2023 as it retains the important elements needed for Psa protection (e.g., controlling movements of high-risk pathways to the South Island) as well as wider benefits.

KVH is excited about the future of biosecurity protection for the kiwifruit industry. The Pathway Plan provides a legal basis to make sure we are all playing our part and serves as a platform to bring together research and innovation outcomes to make biosecurity easier and more effective for the kiwifruit industry.

This is a step change in biosecurity preparedness from where we were just 11 years ago pre-Psa, and something that the team is looking forward to implementing alongside growers.

HOW WAS THE PATHWAY PLAN DEVELOPED?

From November 2019 through to April 2021, KVH worked with growers and others across the kiwifruit industry to develop and finalise a proposal for a new national Pathway Plan.

Development, planning, and consultation stages were all contributed to by many from across the industry, who provided support and valuable input. After the final consultation period ended in mid-December 2020, KVH incorporated changes suggested and backed by industry, and produced an extensive proposal document so that everyone had the opportunity to see the final version and how we took feedback into account.

Then, in April 2021, the Pathway Plan was submitted on schedule to the Minister for Biosecurity so that it could go through the required parliamentary process for review and approval. We were delighted to announce early March 2022 that this process had been successfully completed.

The Pathway Plan is significant and something the kiwifruit industry can be proud of. It's the first national plan of its kind implemented under the Biosecurity Act and shows the continued biosecurity proactiveness of our industry, as well as being an important step forward in the way we manage the risk of unwanted threats.

The great thing about it is that most people across the industry (especially growers) are already doing what the new plan asks of them and there aren't many big day-to-day changes for the majority who already follow best biosecurity practices.

It is estimated that up to 40% of food crops worldwide are lost annually due to plant pests and diseases. This not only reduces income for primary sectors, but it also leaves millions without sufficient food to eat.

WHY DO WE NEED A NEW PATHWAY PLAN?

We need to be as prepared as possible for the next biosecurity event and the Pathway Plan helps us ensure that we are. With this new plan we can lift our industry biosecurity practices, reduce the greatest threats, and be better prepared to reduce the potential spread and impact of any future incursions.

DON'T WE ALREADY HAVE GOOD BIOSECURITY ACTIVITIES IN PLACE BECAUSE OF WHAT WE LEARNT FROM PSA?

We do – as an industry our biosecurity activities are wide-ranging and have increased significantly over the years. They are however largely focused on Psa only and could leave us vulnerable if we have any new incursions that spread differently. By widening our scope to look at all pests and diseases that could threaten our industry, we can better manage any risks and incursions should they arrive.

HOW IS THE NEW PATHWAY PLAN DIFFERENT TO THE CURRENT NPMP?

The new Pathway Plan makes things simpler and helps us manage risk more consistently. Instead of focusing on a single pest or disease, like Psa, it focuses on a wide range of threats and gives us a way to manage their pathways (such as people and equipment, budwood, pollen and young plants) very pragmatically.

WHAT KINDS OF ACTIVITIES DOES THE NEW PATHWAY PLAN MANAGE?

Some examples of everyday activities the new plan helps us all manage include:

- reporting unusual symptoms or threats and providing information;
- on-orchard biosecurity plans;
- tracing people, machinery, and plant movements;
- hygiene practices when entering and leaving orchards;
- sourcing clean plant material;
- achieving best practice when contractors are working on-orchard; and
- additional controls for moving risk material between the North and South Islands.

I'VE HEARD KVH MENTION ON-ORCHARD BIOSECURITY PLANS. WHAT ARE THEY?

We have been talking a lot about one of the key aspects of the Pathway Plan, kiwifruit orchard biosecurity plans. These are not new - there is currently a requirement under the NPMP for growers to have an orchard management plan for Psa-V. This new requirement broadens that to manage risk associated with a wider range of threats.

KVH has a kiwifruit grower's on-orchard biosecurity plan template which is aligned with

the new requirements of the Pathway Plan and available to complete online. Alternatively, you can of course fill in a printed version that you can hand-write your information in about how you manage risk. These are freely available from KVH (or can be printed from the KVH website).

In practical terms, effective biosecurity on-orchard involves a grower:

- understanding orchard-specific biosecurity risks;
- agreeing what must happen on the orchard (including establishing and ensuring biosecurity requirements to be met by people visiting the orchard);
- sourcing and tracing clean plant material;
- checking and cleaning other risk items (e.g., tools, vehicles, machinery, bins, footwear, and clothing); and
- reporting unusual symptoms or threats.



more about the tools and resources created for growers on pages 14-15 or see more about the plan itself on the KVH website: kvh.org.nz.



a biosecurity plan online, at your place in your own time on the KVH website.



for additional easy, simple, tools coming soon. We're working with Onside as we speak to include traceability in their app

Protecting plants from pests and diseases is far more cost effective than dealing with plant health emergencies. Plant pests and diseases are often impossible to eradicate once they have established themselves and managing them is time consuming and expensive. Prevention is critical to avoid their devastating impact on agriculture, livelihoods, and food security.

Biosecurity research and innovation

Biosecurity research is a bit like an insurance policy - by investing in science now, we can better protect and prepare for the possible impacts of pests and diseases in the future. If we don't have a plan in place now, we'll be too far behind if and when we're faced with a big incursion.

Biosecurity science and innovation underpins our ability to be prepared for our biggest biosecurity threats, now and into the future.

Research provides us with foresight and helps to ensure our resilience – not only by providing the knowledge to better manage a possible incursion of an unwanted pest or disease, but also by giving us the practical know-how to develop tools that will help prevent or slow their spread and manage them in a sustainable way.

KVH partners with Zespri Innovation to undertake scientific research, in collaboration with the Kiwifruit Biosecurity Steering Group. The group provides expert advice, recommendations, and decision-making support to KVH/Zespri to set up strategic direction of the Innovation portfolio to ensure delivery of objectives.

The group aims to reduce the risk and impact of future incursions to the kiwifruit industry by reviewing current and emerging kiwifruit biosecurity risks, identifying knowledge gaps, and prioritising research accordingly.

Expert membership of the Steering Group includes representatives from KVH and Zespri, as well as the Ministry for Primary Industries (MPI), Better Border Biosecurity (B3), Plant & Food Research, Scion and an external industry representative - currently from the NZ Forest Owners Association.



THE KIWIFRUIT BIOSECURITY RESEARCH PORTFOLIO

The Kiwifruit Biosecurity Research Portfolio includes research projects on pests and pathogens that potentially represent a significant threat to the kiwifruit industry and have not yet been reported within New Zealand.



PROJECT

PHYTOPHTHORA BIODIVERSITY

AIM

Determine which *Phytophthora* species are present in New Zealand kiwifruit orchards

FINDINGS

- Approximately 75 orchards in the North Island have been sampled
- No *Phytophthora* species detected so far in leaf samples (only roots and soil)
- Reports of species in kiwifruit that we didn't know about previously in New Zealand. But no new-to-New Zealand *Phytophthora* species detected so far

PRACTICAL OUTPUT

- Confirm if any identified species offshore are already present in New Zealand
- Create a baseline understanding of present *Phytophthora* species
- Rule out any biosecurity risk if they are already present

PROJECT

CHINESE LITERATURE RECORDS OF MICRO-ORGANISMS ON KIWIFRUIT

AIM

Research Chinese databases and find micro-organisms of concern for kiwifruit

FINDINGS

- 70 new unwanted species/genus discovered as a risk to kiwifruit
- 15 of these species went on to further investigation
- Link to new wealth of information of high-risk pests

PRACTICAL OUTPUT

- Improving and adding to the KVH risk matrix
- Further investigation and research into new organisms found
- Highlights importance of looking beyond English literature

PROJECT

BIOSECURITY RISK OF COMPOST

AIM

Evaluate the biosecurity risk of compost on kiwifruit orchards

FINDINGS

- Low-risk pathway for spread of new pests and diseases if manufactured correctly
- Risk higher when kiwifruit plant material included in compost inputs
- Current compost practices sufficient to manage high-risk

PRACTICAL OUTPUT

- Compost included in KVH's new Pathway Management Plan to ensure a baseline of biosecurity risk management

PROJECT

IMPROVING CERATOCYSTIS FIMBRIATA MANAGEMENT

AIM

Evaluate and develop better readiness and management practices against *Ceratocystis fimbriata*

FINDINGS

- All New Zealand cultivars are susceptible to infection
- Laboratory testing of sanitisers and fungicides showed efficacy
- Pruning tools have the potential to transmit *Ceratocystis* to healthy plants

PRACTICAL OUTPUT

- Bion 500® a good treatment option (which has the same active ingredient as Actigard)
- Next steps include on-orchard testing
- Highlights importance of good hygiene practices to minimise spread

PROJECT

STINK BUG SURVEILLANCE IN THE BAY OF PLENTY

AIM

Establish a Brown Marmorated Stink Bug (BMSB) trapping network for awareness and management

FINDINGS

- BMSB not detected so far
- Other stink bug species were detected (such as the *Pittosporum* shield bug and Australasian green stink bug)

PRACTICAL OUTPUT

- Strengthened the national BMSB surveillance network
- BMSB ID and surveillance training for industry
- BMSB identification/trapping training video

PROJECT

REVIEW OF KNOWLEDGE OF NEONECTRIA MICROCONIDIA

AIM

Summarise all available knowledge of *Neonectria* in New Zealand to date

FINDINGS

- Full host range uncertain
- *Neonectria* now found across most growing regions
- Cut shoot assays highlighted that *Neonectria* can infect multiple cultivars (G3 more susceptible)

PRACTICAL OUTPUT

- Increased understanding of *Neonectria* spread and history
- New baseline knowledge to drive future research

Psa research and innovation

Knowledge around management of Psa has grown significantly within the last decade, thanks to strong investment in research and innovation through this period. The upswing in Psa impacts in spring 2021 has however starkly highlighted the need to avoid complacency around this disease, both on-orchard and within our research programmes.

Climate challenges, possible Psa evolution and the long pipelines needed to deliver new products prompt the need to stay future focused.

Ongoing investment supports growers in reducing the risk of Psa spread to new growing locations, and in maintaining or lowering Psa risk levels on their orchards, and so underpins the ongoing profitability of investments.

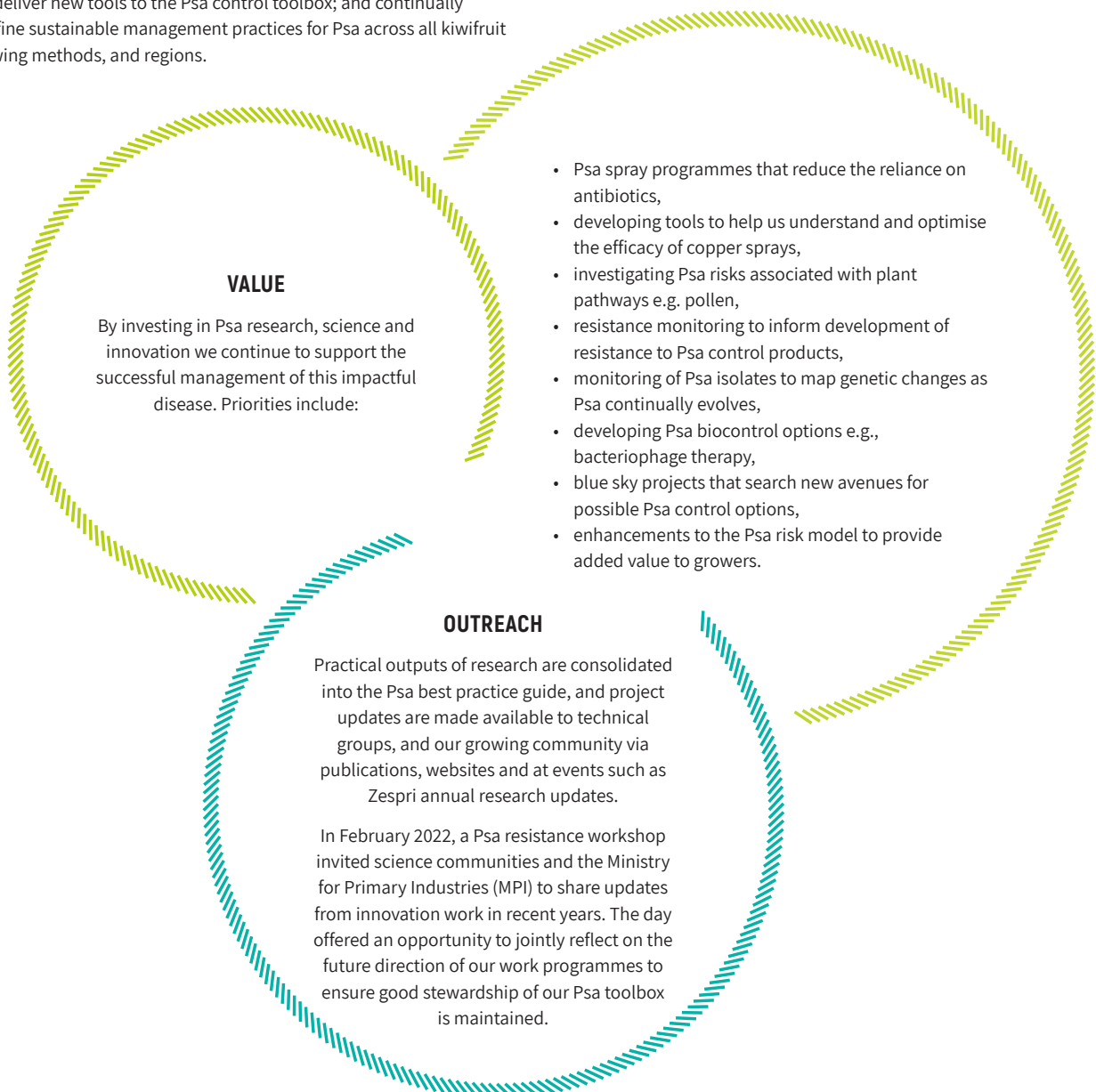
KVH partners with Zespri Innovation to deliver a research programme which addresses immediate knowledge gaps and looks for smarter, greener control solutions to deliver the resilience needed to meet future Psa management challenges for the industry. Expert members of the Steering Group

include representatives from KVH and Zespri, researchers, and experienced grower members who bring a practical industry lens to discussions.



THE KIWIFRUIT PSA RESEARCH PORTFOLIO

The Kiwifruit Psa Research Portfolio includes research projects designed to discover and deliver new tools to the Psa control toolbox; and continually inform and refine sustainable management practices for Psa across all kiwifruit varieties, growing methods, and regions.



PROJECT

PSA RELATED FLOWER BUD ROT - IN HAYWARD AND IN GOLD3

AIM

- Identify flower bud stages susceptible to Psa
- For Gold3 – also explore rootstock impacts (Bounty vs Bruno)

FINDINGS

- Flower buds are highly susceptible one-to-two weeks after emerging
- Infection occurs up to 14 days before symptoms (brown sepals)
- Orchard inoculum (cankers/infected males) and rainfall through susceptible growth periods drives the appearance, rate of increase and severity of bud rot
- The Psa Risk Model accurately predicts weather risk for flower bud rot
- For Gold3 - bud rot effects are higher on Bounty rootstock

PRACTICAL OUTPUT

- Confirms early protection (from budbreak) is important
- Identifies inoculum removal and timely sprays, informed by the Psa Risk Model, can reduce risk
- Identifies Gold3-Bounty as more at risk to Psa related flower bud rot

PROJECT

ANNUAL PRODUCT RESISTANCE MONITORING AND BIENNIAL REVIEW OF PSA ADAPTION

AIM

- Identify the emergence of Streptomycin, Kasugamycin and copper resistance among Psa populations
- Two-yearly check for evidence of changed Psa genetics

FINDINGS

- Streptomycin resistance was consistent with 2020 levels
- No Kasugamycin resistance was identified
- Copper resistance levels continue to rise but no Psa isolates grew in the presence of copper when applied at field rates
- Isolates with increased copper resistance had new genetic elements introduced by horizontal gene transfer
- No increased pathogenicity or environmental fitness of isolates was seen

PRACTICAL OUTPUT

- No indications of significant increased risk due to failure of Psa control products or genetic change were found

PROJECT

IMPACT OF APPLYING POLLEN NATURALLY CONTAMINATED BY PSA IN A COMMERCIAL HAYWARD ORCHARD

AIM

- Determine pollen effects on disease level (leaf spot) and fruit set

FINDINGS

- Trap plants exposed to pollen naturally contaminated by Psa showed no more spotting than unexposed plants
- No statistical increase in orchard disease was observed
- No obvious impact on fruit set was seen

PRACTICAL OUTPUT

- Confirms North Island growers on Psa positive orchards can source pollen locally
- South Island and Psa undetected orchards should continue use of Psa free pollen

PROJECT

WILD KIWIFRUIT MICROBIOME

AIM

To compare microbiomes associated with Psa affected vines versus vines not affected; and commercial versus wild kiwifruit vines

FINDINGS

- No consistent differences in microbiomes of Psa affected vines versus non-Psa vines were found
- Fungal microbiomes of wild and commercially cultivated kiwifruit differed
- Core groups of bacteria and fungi were common in all samples

PRACTICAL OUTPUT

- Understanding core microbiomes provides insight into their role in establishing and growing kiwifruit

PROJECT

COPPER BIOSENSOR DEVELOPMENT

AIM

Develop a biosensor to detect and quantify Psa infection; and one to measure bioavailable copper on sprayed leaves

FINDINGS

- Two highly sensitive biosensors were developed
- Two tested coppers provided similar initial bio-available copper, but ongoing protection differed
- Differences in copper levels on upper and lower leaf surfaces, and between young and old leaves were measured

PRACTICAL OUTPUT

- Tool to understand effective copper concentrations provided by different copper products

Pathway Plan tools

SMART TOOLS FOR IMPLEMENTING THE NEW PATHWAY PLAN

KVH has a vision of a biosecurity resilient kiwifruit industry, prepared for not only high-profile pests like the Brown Marmorated Stink Bug (BMSB) and exotic fruit flies, but also the unknown threats; those which may be unseen, undiscovered, new to science or not yet well understood.

Preparation for unknown biosecurity threats relies on having consistent risk management practices in place across our internal pathways to prevent spreading pathogens before they are discovered and having sound traceability so that if a new threat is discovered on our orchards, we can trace back to determine where this may have come from, and trace forward to determine which other orchards may also be infected.

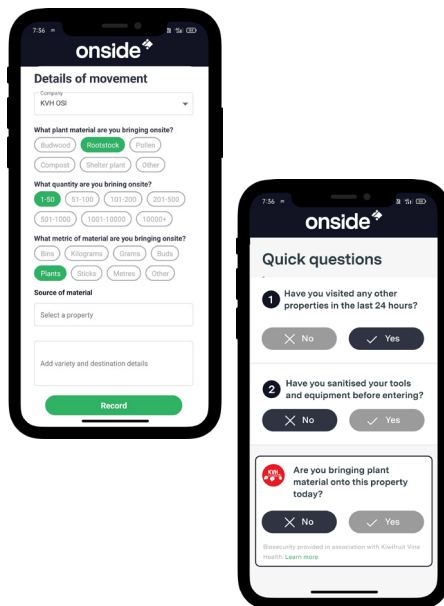
The new Pathway Plan puts the framework and legislation in place to achieve this, but we also need smart tools that enable these practices to be undertaken pragmatically. Here are three examples of what KVH has under way in this innovative space.

MAKING TRACEABILITY EASIER WITH ONSIDE

KVH is working with Onside to make it easier for growers to keep records for plant material movements. This makes meeting the requirements of the Pathway Plan simple (and ensures you meet your requirements under GAP) and improves KVH's ability to quickly and accurately trace movements should we be faced with an incursion.

Onside is a New Zealand based technology company that provides a digital check in solution for the rural sector. The app is widely used in the kiwifruit sector, with around 2,500 properties mapped and thousands of movements being recorded in real time every week.

Our partnership with Onside offers users of the app a digital solution for traceability record keeping, that is simple and easy to use, and available on both the free and premium versions of the app. It's worth noting that while it is mandatory under the new Pathway Plan to record plant material movements in and out of orchards, growers can use whatever system they choose to create and store these records, provided they are accurate and up to date and this partnership with Onside simply provides



another option.

The importance of traceability cannot be understated – one of the most fundamental aspects of any disease control programme is the ability to trace the movements of material transmitting the disease or pest. This aspect has been clearly shown during the Covid-19 pandemic

where New Zealand borders were closed to prevent people bringing in the virus and huge emphasis was placed on being able to record where people had been to assist in contact tracing should a new case be found.

A second example is the *Mycoplasma bovis* eradication programme where significant resource is applied to being able to contact trace animal movements using tools such as the National Animal Identification and Tracing (NAIT) programme, and trucking records to understand where potentially infected cattle have come from, or more importantly, where contacts from them have moved to.

The same principles apply for the plant sector and kiwifruit industry. Many diseases are capable of being transmitted either on or within plant material (including rootstock, budwood, pollen or mature plants) when it is moved from one location to another. The ability to be able to move kiwifruit plant material is a fundamental component of the annual industry growth process, so understanding the risks associated with this and being able to record, retrieve and analyse these movements in a simple, rapid, and accurate manner means a much higher chance at early eradication.

Want to take part in or host a chat on the new Pathway Management Plan? Get in touch, we can come to you (or go virtual) and run a session on how the new plan improves biosecurity for us all.

We can also run interactive sessions as small or large as you like on how to develop biosecurity plans – these have been popular in the past with attendees leaving with their own on-orchard plan, tailored to their property.



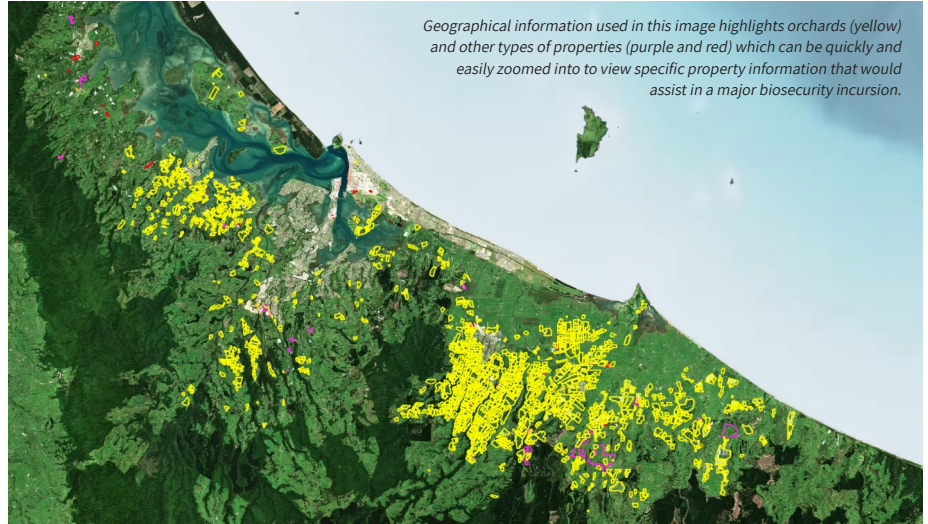
Get in touch via info@kvh.org.nz or
by phone 0800 665 825

GPS PINPOINT MAPPING

The kiwifruit industry is advanced in our geographical information systems. Businesses such as Zespri and post-harvest organisations have been using GPS mapping for years, building capability that is used for on-orchard productivity practices and licence enforcement.

Mapping also provides an extremely valuable tool for biosecurity readiness and response. In the event of an incursion, whether it be a pest or a soil-borne threat like Psa, the ability to know where our orchards are - as well as pack-houses, nurseries, and pollen mills - allows KVH to work with the Ministry for Primary Industries (MPI) to minimise the impacts to our industry. By knowing where our host material is we can make more informed decisions that minimise impacts to the industry, and ensure we are engaging with the right people, keeping everyone informed of what is happening every step along the way.

We have been working with Landkind directly to incorporate very specific biosecurity functionality into geospatial information. This means that for example, in an incursion, we can search the location of an organism and with a click of a button have all the surrounding and potentially impacted orchards clearly highlighted to inform risk management and communications. Using latest technology, we have the ability to then zoom



Geographical information used in this image highlights orchards (yellow) and other types of properties (purple and red) which can be quickly and easily zoomed into to view specific property information that would assist in a major biosecurity incursion.

in and view individual orchards (including planting information and hazard identification) and mark specific areas within rows that require monitoring or unusual symptom follow up.

These principles are not new, but the technology that provides the platforms to access this information is rapidly advancing. As a small organisation, KVH doesn't necessarily drive all innovation, however we are making sure that our industry partners are aware of our needs and that we can leverage and keep pace with the innovation

of others. This means that if an incursion were to occur, we can act in a timely and effective manner with compatible systems and information. It is for this reason that KVH asks growers to share the property and KPIN information contained within their Zespri registration forms with us, so that in the event of a big biosecurity response we have accurate information to feed into our smart response tools.

ON-ORCHARD BIOSECURITY PLANS

Implementing on-orchard biosecurity is the responsibility of every person working on or visiting an orchard. The 5-step on-orchard biosecurity plan template produced by KVH brings together a set of measures that protect a property from the entry and spread of pests and diseases and has been developed to provide guidance to help identify risks, and how to address them as well as meeting requirements under the Pathway Plan.

By using the new online (or printed/handwritten if preferred) template to develop an orchard biosecurity plan, growers can identify and prioritise biosecurity practices that are relevant to their orchard and property and be able to treat biosecurity planning in a similar manner to quality assurance or risk planning such as Health & Safety or emergency preparedness.

These plans can be as short, or long, as needed and can be built on over time. What's important is that the plans are personalised and suit the property. Biosecurity plans need to be kept on file so that they can be shown to Zespri GAP auditors and provided to KVH if requested in a biosecurity response. If a plan is completed online a PDF is then made available so that it can be stored electronically and/or printed.



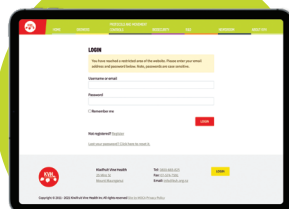
You can complete the plan online at www.kvh.org.nz



Or by filling in the paper copy available either from the website or in the post from KVH.



Phone us to request on 0800 665 825.



RESOURCES AND TEMPLATES

All of us within the kiwifruit industry have an important role to play in biosecurity, and protecting our orchards, businesses, and livelihoods from the threat of unwanted pests and diseases. With the introduction of the new Pathway Management Plan, we can help make it easier, simpler, and more pragmatic for everyone to do this.

While these three examples highlight how digital technology is being used to advance our thinking, there is also a very wide range of other tools available from KVH including advice and support from team members and templates/forms online.

Via the KVH website you'll find helpful information specifically designed for:

- growers
- contractors
- nurseries
- budwood suppliers and distributors
- post-harvest operators and processors
- pollen millers and distributors
- compost providers

Most unwanted and the season ahead

HOW TO BECOME ONE OF 'KIWIFRUIT'S MOST UNWANTED'

KVH regularly talks about fruit fly being our number one threat, closely followed by the Brown Marmorated Stink Bug (BMSB), but how are these rankings assigned and are there any new pests that growers should be aware of?

KVH retains a list of all the potential threats to kiwifruit that we hear about offshore, from networks, publications and even translations of Chinese literature. This includes insect pests, bacteria, fungi, viruses and others and currently features over 150 organisms - some of which are significant threats and others of which we might know very little about.

To prioritise this list into a manageable number for readiness activities and communications we use a risk matrix, which provides an objective, simple and useful methodology to clarify the thought process needed to prioritise our readiness and response planning. Of course, not all our efforts are focused on the list and generic readiness is

a key focus to ensure that we are also prepared for other threats that may arrive, which include organisms that may not even be known to science.

The matrix allocates scores based on four categories - likelihood of entry, establishment and impacts to market access and production. One way we populate these scores is by utilising networks to learn about new and emerging threats to our industry. These networks include local and international scientists who share information about research and development within their field of expertise, and the Ministry for Primary Industries (MPI) Emerging Risk System (ERS).

Members of the kiwifruit and other plant-based industries also play a vital role in these networks by passing on reports or observations from their individual connections with other experts, or observations from working abroad.

Once we run the greatest threat pests and pathogens through the risk matrix, the organisms that are considered the highest risk to the kiwifruit industry come out on top and make up Kiwifruit's

Most Unwanted. The matrix and the ranking system have both been reviewed by scientists to ensure it is robust and fit for purpose.

The Most Unwanted list features many pests and pathogens that will look familiar as you would have seen them mentioned regularly in KVH publications and at events. For the organisms considered the highest threat (such as fruit flies, BMSB, and *Ceratocystis fimbriata*) significant efforts are put into readiness planning. This essentially involves working with others in our industry, MPI and other affected sectors to agree how we would respond to an incursion of these organisms and running simulations to test these readiness plans. KVH continues to update the Most Unwanted list to reflect any changes in organism risk profiles and we maintain the updated list on our website.

KIWIFRUIT'S MOST UNWANTED AS AT JULY 2022



#1

Fruit flies e.g., Queensland, Oriental, Mediterranean, South American



#2

Ceratocystis fimbriata



#3

Brown Marmorated Stink Bug



#4

Spotted Lanternfly



#5

Psa non-New Zealand strains



#6

Yellow Spotted Stink Bug



#7

White Peach Scale



#8

Verticillium Wilt

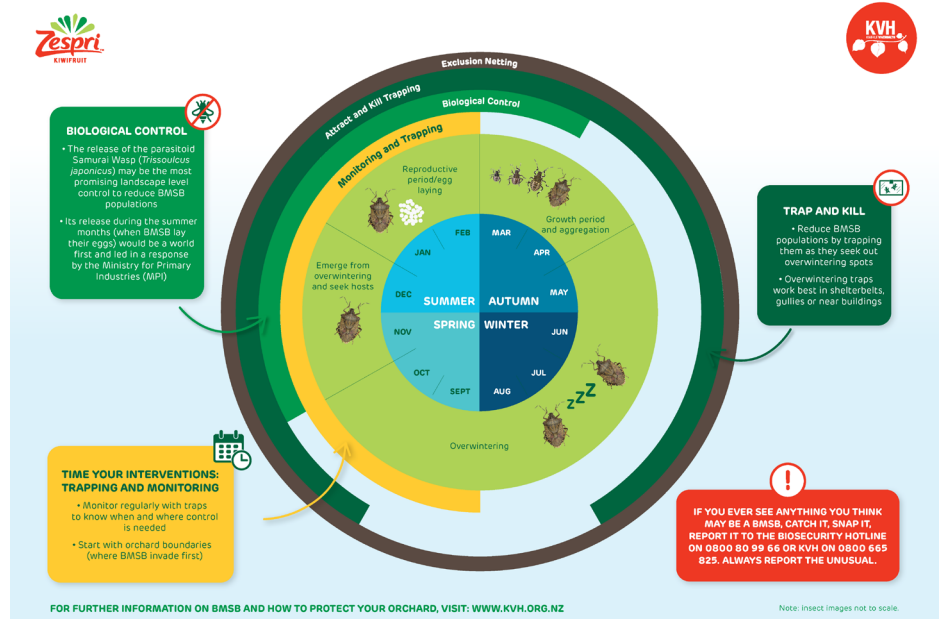
PREPARING LONG-TERM

KVH and the kiwifruit industry are at the forefront of biosecurity readiness planning. This involves being able to detect significant pests and diseases if they arrive, and then being able to immediately activate the appropriate response activities in order to give us the best chance of eradication.

There are many wide-ranging activities and events in this space, notably including recent guidance developed for growers and post-harvest, detailing the likely sequence of events if a fruit fly or BMSB response was to occur in a kiwifruit growing region. The guides can be used to help business continuity planning at an orchard level and are split into sections that cover all the things growers can do on-orchard during a response, as well as longer-term tools.

Working alongside Plant & Food Research, a new video training resource was developed in 2021 to demonstrate BMSB trapping materials and methods that could be integrated into kiwifruit growing systems if we were ever facing a possible incursion of this unwanted pest.

At the 2021 Kiwifruit Grower Biosecurity Day, KVH and Zespri jointly launched a newly designed



infographic tool encouraging growers to cast their eye into a possible future where BMSB has arrived in New Zealand and all response/eradication efforts have failed. What long-term management

of the bug might look like on-orchard; factors to consider into future planning; and the times of the year each is most appropriate, is summarised in the new infographic.

PASSENGER PATHWAY PROTECTION

International airports are reopening to travellers, which means increased biosecurity risk from this pathway – particularly when it comes to hitch-hiking pests like the BMSB, and fruit fly host material.

Risk assessment: This is the most important part of passenger clearance. Biosecurity officers assess each arriving passenger, and if they are high-risk they may be directed to have their baggage physically inspected. Officers also receive alerts about passengers who may be more likely to carry risk goods.

X-ray screening: All passenger baggage is subject to x-ray screening to detect potential biosecurity threats. There are 23 traditional 2D x-ray machines in international airports and two 3D scanners being trialled at Auckland Airport.

Detector dogs: Specialising in detecting meat, vegetables, seeds and other plant material, detector dog teams can pick up threats that are harder to detect with x-ray screening.

Passenger arrival card: The arrival card is used to identify risk goods of interest. It is a legal

declaration that all passengers must complete.

Public awareness: Campaigns are run to educate passengers about the requirement to declare or dispose of risk goods on arrival, or to leave them behind. This includes advertising overseas, biosecurity information supplied with entry visas, an inflight video during travel and fines that could be incurred.

CRUISE SHIPS ON THE RADAR

With maritime borders reopening later this year, cruise ships are very much on our radar.

Foreign cruise ships are scheduled to start arriving in New Zealand again from October. With this in mind, Biosecurity New Zealand has started talking with cruise lines about biosecurity requirements, particularly the existing accreditation programme.

The cruise ship accreditation programme has been in place since 2016 to provide assurance that passengers and crew pose low-biosecurity risk.

Accredited vessels source fresh produce and

other food from reputable suppliers, reducing biosecurity risk. They also take an active role in educating passengers about biosecurity before port visits.

The quality management approach for the new season will standardise how the programme operates and provide additional assurance that everything is working as it should.

Biosecurity New Zealand officers will continue to have a strong presence at ports, especially at locations where cruise ships first make landfall in New Zealand.



Unusual symptoms

SEEN SOMETHING UNUSUAL?

Early detection of new pests or diseases can make a big difference towards a successful biosecurity response.

While there are several national surveillance initiatives to provide early detection for high-risk pests such as fruit flies and Brown Marmorated Stink Bug (BMSB), we don't yet have a formal kiwifruit specific surveillance programme. This is the subject of a current research initiative that KVH is working on with Zespri Innovation.

Our best chance of detecting a new threat is either through monitoring required under the Pathway Plan for certain plant material movements, or the industry reporting unusual vine symptoms.

Members of the kiwifruit industry often report unusual vine symptoms to KVH, which we investigate to determine the likely cause, and what actions may be required to manage risk. Often this investigation is undertaken with support from a diagnostic lab, with the Ministry for Primary Industries (MPI) Plant Health and Environment Laboratory (PHEL) our primary contact if there are any grounds to suspect a new to New Zealand organism may be involved.

KVH SHARES SUMMARIES OF INVESTIGATIONS

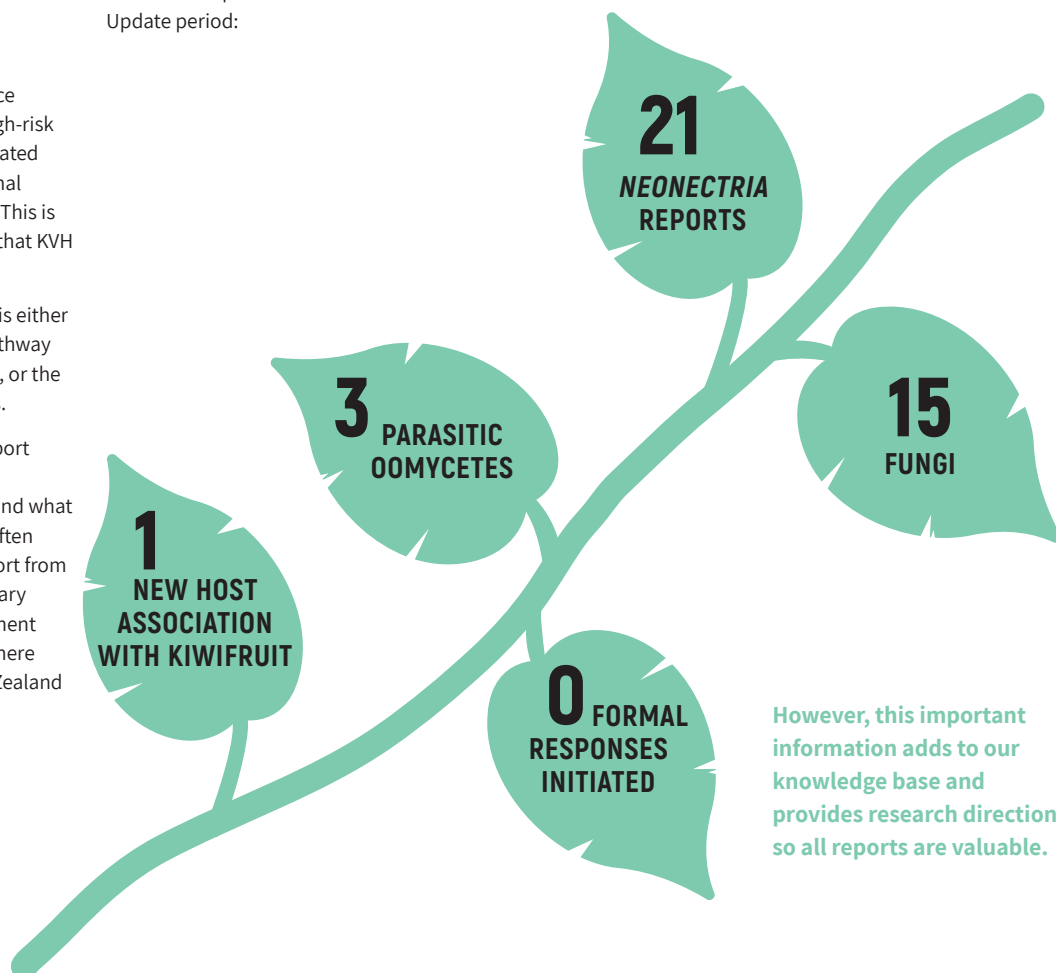
KVH often prepares reports of interest to help growers, and others in the kiwifruit industry, identify similar symptoms they may be seeing on their own properties and to increase general awareness of how growers need to be reporting unusual symptoms that they may be seeing.

Reporting the unusual is a good thing – it shows that as an industry we are all on the lookout and aware of the need to report potential biosecurity threats that could be significant risks to the industry.

Growers, contractors, and anyone else on-orchard are the best people to spot anything unusual early

REPORTS OVER THE LAST 12 MONTHS

Number of reports from the 12-month Annual Update period:



However, this important information adds to our knowledge base and provides research direction so all reports are valuable.

on. Stay vigilant, be on the lookout, and report anything you notice.

Reporting the unusual isn't just about what is new to New Zealand, it is also about surveillance of the spread of known pests and diseases to new regions or areas of New Zealand, so we can keep track of any changes in invasion distribution.

REPORT IT, EVEN IF YOU'RE NOT SURE

Pests and diseases can spread quickly between orchards and over large distances. It's essential that reports of new finds are made as soon as possible, so that we have the best chance of containing them before they spread.

If it's a pest or bug you're reporting, catch it if you can and take a photo. If it's a disease symptom on a plant, tree, or vine, take some clear photos but try not to touch it. Remember, the sooner a report is made and looked into, the more we can do to slow the spread and limit impacts.

To make a report call KVH on 0800 665 825, or the Biosecurity New Zealand hotline 24 hours a day, 7 days a week on 0800 80 99 66.

If you prefer to make a report online there are some great new and easy options. You can go to mpi.govt.nz/pest and submit a photo and details, or you can use the free Find-A-Pest app which uses artificial intelligence to help identify pests known to the kiwifruit industry.



CATCH IT



SNAP IT



REPORT IT



Biosecurity New Zealand

Ministry for Primary Industries
Manatū Ahu Matua

WHAT HAPPENS AFTER MAKING A REPORT?

The potential benefit to our industry of making a report cannot be overestimated, and the earlier something is reported the greater chance we have of eradicating it. Although generic and slightly different for each report and case, there is a process for what happens next that you can be assured of, and that will always include ongoing support and contact with KVH.



AFTER REPORTING	DESCRIPTION	ACTIONS YOU CAN TAKE TO ENSURE SMOOTH-RUNNING
<p>Identification, assessment, and response</p>	<p>The suspicious find is identified. In most instances it is found to not be of concern with no further response action required, or not new to New Zealand and managed on-orchard.</p> <p>If the organism is found to be new to New Zealand, Biosecurity New Zealand will undertake an investigation to determine risk of the organism and feasibility of undertaking action. Biosecurity New Zealand will contain the pest/pathogen to understand more about it and the impact it may have.</p> <p>Biosecurity New Zealand, KVH and any other affected groups then work together to decide whether to formally respond and if so, set goals such as eradication or containment. Sometimes a response then moves into long-term management (as is the case with Psa currently).</p>	<p>Timeframes from notification to a response decision vary. For pests with serious impacts that we know a lot about (like fruit fly) it can be immediate, but for others the investigation may take weeks.</p> <p>After reporting you need to be prepared to access and provide records and information when requested (traceability information of plant material movements on and off the property is critical for a successful response); follow directions to manage the pest/pathogen and respect confidentiality to avoid unnecessary market reaction.</p>
<p>Effect on OGR</p>	<p>Most reports of unusual symptoms turn out to not be a biosecurity threat and there are no implications for growers. However, if a response is activated and losses are incurred because of response activities, you will be eligible for compensation under the Biosecurity Act (subject to some conditions).</p>	<p>Losses must be verifiable, so good production and business records are essential for compensation claims. Make sure you note where your records can be found in your absence.</p>
<p>Who to talk to</p>	<p>KVH provides regular information and advice about managing identified pests/pathogens and how a response is unfolding.</p> <p>NZKGI provides advice and support information to growers.</p> <p>Post-harvest operators help with operations and advice.</p>	<p>Ensure you have stored or noted phone numbers and contact details for KVH, NZKGI and your post-harvest operator, and make sure they can be found in your absence.</p>

A year in partnership

ANOTHER SUCCESSFUL ANNUAL INDUSTRY BIOSECURITY DAY

In mid-November 2021 KVH and Zespri jointly hosted a Kiwifruit Grower Biosecurity Day, providing the opportunity for everyone to learn more about work underway to protect the industry from unwanted pests and diseases.

Key research findings, and practical examples of research the industry has been taking part in were discussed, particularly around one of our highest risk threats, the Brown Marmorated Stink Bug (BMSB).

Long-term management of BMSB (in the event the pest was to establish here, and response efforts were unsuccessful in eradicating it) was discussed in-depth by Matt Dyck and Yanika Reiter from KVH. Shane Max from Zespri discussed what has been learnt from research and overseas experiences with tools such as netting, chemical control, and trapping. Factoring these control measures into future planning was worked through by growers in the room during an interactive session where groups discussed what might be barriers or uncertainties when considering investing in such future tools.

Biosecurity responses to BMSB and other high-risk threats were discussed at a national level by several speakers, including Nicola Robertson from New Zealand Apples & Pears and Chair of the BMSB Council, who talked about current and completed research projects undertaken by the Council to ensure tools for management of the pest are available and ready to be utilised by all

affected industries if needed - such as biocontrol and netting for example. Brendan Gould from the New Zealand Forest Owners Association and Dave Teulon from Better Border Biosecurity (B3), who both spoke about the different layers of the New Zealand biosecurity system. They explained how the layers fit together to ensure there are numerous intervention points that either stop biosecurity risk getting here or capture and manage the risk that does make it to our shores. They also discussed how important it is that different industries and groups continue to listen and learn from each other if we are to increase our joint resilience.

Important industry research and development programmes were delved into in more detail during presentations by Zespri and Plant & Food Research, with discussions focused on new learnings about the biosecurity risk of compost and *Phytophthora* diversity.



all presentations from the day on the KVH YouTube channel.



to a podcast recorded on the day with Yanika from KVH and Shane from Zespri on Apple iTunes, Soundcloud, or the KVH website: kvh.org.nz.

FUTURE FOCUS FOR KIWINET

KVH ran another of our regular KiwiNet workshops in July 2021, with around 40 people from across the kiwifruit industry coming together for the day's presentations.

KiwiNet is the team of people selected from across the kiwifruit industry who champion biosecurity readiness and coordinate the deployment of kiwifruit industry resources into biosecurity responses.

This workshop included a special presentation from 'the pea weevil lady' Karen Williams, who talked about the pea weevil eradication in the lower North Island. Karen is a Carterton pea grower and a member of the Pea Weevil Governance Group, who were advisors during the four year never-done-before response. Her presentation focused on the importance of community engagement and collaboration

in a response and how elements within 'true partnership' (such as acting quickly, face-to-face, and trusting others to share your messaging) contribute to successful biosecurity responses.

Former Horticulture NZ Chief Executive Mike Chapman offered his insights on the future of biosecurity, successes and changes he has seen in the kiwifruit industry since the early days of the Psa incursion, and the challenges to come - particularly in terms of ensuring KVH continues to be a leading biosecurity organisation and how other industries could develop in similar ways.

Sophie Badland from NZ Wine provided an update on how the wine industry - and others, like KVH - are preparing for *Xylella fastidiosa* by developing readiness plans and working with/learning from affected areas overseas such as California and parts of Italy.



all presentations from the day on the KVH YouTube channel.



more about KiwiNet and see images of the team in action on the KVH website: kvh.org.nz.

PROVIDING ADVICE AND SUPPORT

KVH sometimes hears reports from growers where Psa has been more challenging and this was the case last October, when KVH had a number of reports of challenging Psa across multiple sites.

We put the call out for growers to get in touch with any questions or concerns and produced a summary to share what had been reported. This included several sets of images from different sites and regions, and video footage.

Importantly, the summary gave us the opportunity to remind growers of the range of resources available year-round to assist with advice, and the many different channels and people who have worked together to produce them, including:



A podcast with Mike Montgomery on his orchard in Paengaroa, talking about managing Psa on Bounty rootstock. Mike also discussed the support and welfare advice he received, and how important this was for him and his team.



A Spotlight on Psa for the monthly Kiwiflier, alongside Zespri using infographics to provide an understanding of the Psa disease cycle.



Printed booklets and posters that detail year-round guidance for protecting and managing orchards.



An easy read on the value of the Psa Risk Model to predict forward risk from the Farmlands website and their Growing Success magazine.



Video and imagery created by KVH, Zespri, and Fruition Horticulture to support growers, managers, and post-harvest decision making and team training.

INDUSTRY GROUPS WORKING TOGETHER

KVH continues to stay widely connected with key horticultural industry sectors, embracing the true nature of partnership. Connection between industry players underpins our success as leaders of biosecurity in New Zealand.

Industry biosecurity managers from NZ Wine Growers, NZ Avocado, the New Zealand Forest Owners Association (FOA), Horticulture NZ, Potatoes NZ, Foundation for Arable Research (FAR), NZ Plant Producers Incorporated, NZ Apples & Pears Incorporated and Citrus NZ meet every six months to share biosecurity-related updates within each sector and discuss topical items.

Sector biosecurity managers utilise these meetings to align with each other and reduce any disconnect between industry, which was one of

the key lessons from the response to Psa to work closely with other sectors on biosecurity issues. These meetings are valuable as they provide the opportunity for sectors to learn from each other, exchange information, and maintain open lines of communication.

KVH also uses this industry network to share and receive relevant information on any new and emerging threats. A key benefit of this partnership is the ability to join voices and form a united industry position when advocating for tighter measures in the biosecurity system, such as submitting together on any Import Health Standard (IHS) proposals where multiple sectors are concerned.

CREATING A BIOSECURITY CAPITAL

KVH has continued to be an active partner in the Tauranga Moana Biosecurity Capital (TMBC) initiative, bringing together mātauranga Māori, industry, science, education, and government to protect what we love about the region from pests and diseases.

The main focus of TMBC this year has been in connecting partners through a series of online forums and guest presentations from biosecurity experts across the region and country, and running awareness-raising activities for the public, that encourage learning more about the importance of looking for and reporting harmful threats to local industries.

Of particular note for the kiwifruit industry was the Great Tauranga Moana Biosecurity Hunt across local growing regions including Te Puke and Katikati. The aim of the campaign was to educate locals about invasive species and encourage them to get into nature and protect the biosecurity of the region, with prizes from locally owned and operated businesses for completing one or all of the seven hunts.

Locals were asked to use their wits, knowledge, and orienteering skills to find locations of pesky creatures, answer quiz questions, and report them to biosecurity experts. Over 500 families took part and thousands more saw and shared social media posts about the campaign and the region's biosecurity goals.



A year in partnership

BUSINESS PLEDGE UNDERWAY

Since June 2021 the Biosecurity Business Pledge has had a formal activity programme to support Pledge members progress their commitment to integrate proactive biosecurity practices into their business culture and operations.

The kiwifruit industry (including KVH, Zespri and Trevelyan's) is active within the Pledge partnership and KVH's Leanne Stewart is the Chair of a project focused on supporting leaders and executive teams to install good biosecurity within their businesses. The aim of the project is to design training materials that individual

businesses can use to understand their biosecurity responsibilities; measures for reporting biosecurity risk; and templates so that leaders and directors can seek biosecurity reporting from their management teams.

There are two other programme projects – one focused on ensuring businesses have easy access to collateral and education material that helps them raise awareness with their own staff, customers, and public; and the other aimed at developing guidance material to help businesses include biosecurity

expectations and targeted outcomes in their operational policies, documentation and supplier engagements/contracts.

KVH supports the Pledge partnership as it is key to helping all New Zealand businesses take a proactive approach to their biosecurity practices and provides a framework for managing the risk of unwanted pests and diseases (plant or animal) disrupting individual businesses and/or having flow-on effects that could potentially affect whole industries, including our own.

ENSURING A PEST FREE PORT

The Bay of Plenty kiwifruit industry is a stone's throw from New Zealand's busiest port. Therefore, KVH is a key player in a local partnership between industry and government at the Port of Tauranga that encourages everyone who works around the port to play their role in keeping pests out of New Zealand.

The initiative is driven by KVH, the Port of Tauranga, the Tauranga Biosecurity New Zealand office, and local government and industry organisations. The aim is for everyone involved in port activities to have a better understanding of biosecurity risks.

The Port of Tauranga is New Zealand's largest and fastest growing port, processing a large volume of goods, from a wide range of diverse origins. This presents a key risk to the kiwifruit industry and local businesses as these goods may contain biosecurity threats. With more than 1,000 workers on the port and several different companies operating, there is dispersed social and geographic responsibility for managing these threats. Frontline staff are the focus of the partnership and activities to raise awareness of biosecurity responsibility at the border this year have included a focused induction for all port workers; awareness campaigns and pest alerts; a widely distributed calendar showing the range of

potential threats and their impacts; and regular communication with the port community through signage, staff presentations, and special activities and functions.

Although Covid-19 has restricted the on-port activities of this partnership, regular meetings of key partners have continued this year to ensure alignment when these activities do start up again and also to prepare for the return of cruise ships and passengers to the region this summer.

The partnership is seen as an exemplar for other ports looking to implement similar pieces of work.



READINESS AND RESPONSE PLANNING WITH GOVERNMENT

There is always the risk of an unwanted exotic pest or disease making its way to New Zealand's shores and impacting kiwifruit.

While the industry has a good understanding of how to manage biosecurity risks, and the tools needed to identify emerging risks, there is also an engaged biosecurity relationship with government and increased capability to respond thanks to the Government Industry Agreement for Biosecurity Readiness and Response, or GIA.

The GIA partnership commits the kiwifruit industry to work with government and other primary sector industries to improve readiness for future biosecurity events and jointly respond to future outbreaks.

Importantly, GIA also creates a framework where industry groups and the Ministry for Primary Industries (MPI) - as the government's representative - can participate in shared decision making and associated cost sharing for readiness and response activities, leading to better biosecurity outcomes. Its development was led by the strong desire for industry to be able to have a direct influence on decisions that are made in relation to prevention and management of pests and diseases that can have a devastating effect on our orchards.

There are now 22 industry partners signed up to GIA, of which KVH was the first. This was a significant achievement and was driven on the back of the Psa outbreak and direct industry involvement in the management of this significant disease. The experience gained in collaboratively managing Psa and becoming the management agency under the Biosecurity

Act demonstrated that being proactive in thinking about future risks from pests and diseases currently not in New Zealand is always worthwhile.

An incursion of such high-risk threats as Brown Marmorated Stink Bug (BMSB) or fruit fly within the rural Bay of Plenty community or any other growing regions will have major impacts on many kiwifruit growers. Understanding the risks and preparing operational plans in advance means that should a detection occur we kick straight into action and reduce impacts to growers, rather than wasting precious time determining who pays.

KVH works collaboratively with other industry groups and MPI through GIA Operational Agreements to undertake research so we can better understand the risks and management recommendations that can be applied in a

practical sense for growers. And where knowledge gaps exist that are specific to the kiwifruit sector, KVH works collaboratively with Zespri Innovation to overcome these. Research outcomes are then shared through ongoing communications such as our website and Bulletins and at such events as roadshows and field days.

Early and proactive involvement in the GIA development process has meant that equitable cost share agreements have been able to be established in the respective Operational Agreements and our representation over recent years in key GIA leadership positions means we have an ability to influence policy (politically as well as within MPI) outcomes.

Five separate Operational Agreements signed by KVH so far:



Fruit fly: joining MPI and organisations representing the pipfruit, avocado, citrus, summerfruit and vegetable sectors.



BMSB: joining MPI and a wide range of industry groups.



Kiwifruit sector specific: for threats that may only impact the kiwifruit and kiwiberry sectors (such as *Ceratocystis fimbriata*, Verticillium Wilt, Psa-non-New Zealand strains, Invasive *Phytophthora*): joining MPI.



Plant production biosecurity scheme: promoting risk management of all nursery material.



Xylella fastidiosa: an interim agreement assessing the risk of *Xylella* and development of response procedures.

WHAT DOES KVH DO AS A LEADING GIA PARTNER?

We work to improve and future-proof biosecurity readiness and response for kiwifruit growers through:



shared decision-making and responsibilities in managing threats



shared costs of managing threats



creating awareness campaigns and education programmes to improve biosecurity performance



participating in working groups, which respond to specific threats and outbreaks



collating and sharing information about New Zealand's biosecurity system and changes



hosting and taking part in open forums to decide how to improve the biosecurity system.

During the last (2019) Queensland Fruit Fly) responses in Auckland, we worked with MPI to decide how to respond to the incursion and provided technical support and resources, especially through the skilled KiwiNet network.

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