



# ANNUAL UPDATE 2017/18

## ARE WE PREPARED?

Kiwifruit biosecurity:  
the fight against our  
biggest threats

The season of the stink  
bug – how we stopped it

Helping communities  
build our biosecurity  
defence

Where in the world  
are our most  
unwanted?

# 1

## OUR YEAR AT A GLANCE

3

# 2

## INTRODUCTION

Foreword from Board Chairman Dr David  
Tanner and Chief Executive Stu Hutchings 4

# 3

## BIOSECURITY GLOBALLY

What's happening around the world? 6

# 4

## THE KVH IMPACT ON BIOSECURITY

Kiwifruit specific threats	8
Stopping BMSB from kicking up a stink	10
On-orchard biosecurity	12
Vigilance still required with Psa	14
Innovation: Psa and biosecurity research	15
Building a stronger biosecurity system	17
What does a 4.7 million biosecurity team look like?	19



**16,193**

**USES OF THE KVH  
PSA RISK MODEL**



**2 MILLION**

passenger arrivals over the summer  
AND 3,111 items of undeclared fruit  
seized by the Ministry for Primary  
Industries (MPI)



**55 NURSERIES**

have either full or 'within region only'  
Kiwifruit Plant Certification Scheme  
(KPCS) certification AND 50 are in  
Recovery regions

**91,000  
FRUIT FLY  
TRAPS**



inspected over the  
high-risk season

**2,218**

Brown Marmorated Stink  
Bugs (BMSB) intercepted  
at the border over the  
high-risk season



**216,000** people  
disembarked 83 cruise ships  
at the Port of Tauranga

## FAST FACTS FROM THE LAST 12 MONTHS



skilled KiwiNet members  
from across the industry  
trained and ready to help  
resource a biosecurity  
incursion

**18**

industries now signed  
up to the Government  
Industry Agreement for  
Biosecurity Readiness  
and Response AND KVH  
was the first



**107k** KVH tweets seen  
by Twitter users AND  
**17,293** posts seen by  
Facebook users



detector dogs teams (dog and handler)  
protecting New Zealand borders and one –  
Georgie – dedicated to sniffing out BMSB

**52**

**PEST AND DISEASE  
REPORTS TO KVH**

**120**

**orchard visits by  
the KVH team**

**14,600**



wild kiwifruit vines  
controlled across 136  
properties in the Bay  
of Plenty

# FOREWORD FROM BOARD CHAIRMAN DR DAVID TANNER AND CHIEF EXECUTIVE STU HUTCHINGS

The most robust approach to biosecurity is knowing what pests and diseases are on the horizon, stopping them at the border or even better, before they get here. This isn't easy and the risks are high, especially when we have thousands of travellers arriving at our airports every single day, hundreds of thousands of people visiting our ports each summer from cruise ships, and continuously growing volumes of mail and imports.

KVH monitors potential risk from across the world (as pests and diseases spread and new detections are made) and the maps on pages 6 and 7 show just how much has been happening – and changing – over the last 12 months. Incursions close to home, particularly several fruit fly detections in Australia, are something we monitor closely because of the likelihood they'll increase our risk. We also keep a close eye on expanding threats like the Brown Marmorated Stink Bug (BMSB) which is rapidly moving across Europe, Asia, and through almost every state of the USA.

The BMSB is a pest which harms many horticultural sectors and we do not want it in New Zealand. As part of an industry/government group, KVH ran an awareness and education campaign over the high-risk September to April months. A summary of our activities is on pages 10 and 11. One of the most popular resources we created during the campaign was a video demonstrating the impacts of BMSB on kiwifruit in Italy. It's been watched almost 2,500 times already and you can view it on our YouTube channel if you haven't seen it already.

**Protecting New Zealand's  
kiwifruit industry from  
biosecurity threats**

The increased interceptions of BMSB and the similar Yellow Spotted Stink Bug (YSSB) on car carrier vessels from Japan was a particularly noteworthy event. KVH was proactive in supporting the Ministry for Primary Industries (MPI) decision to turn away four ships because of the detections, and to this day we continue to back MPI for taking what we consider was the right action to protect our country and economy.

However, as advocates for kiwifruit growers and the industry, we must also demonstrate our leadership and challenge MPI at times to achieve solutions and improvements. A good example of this was when concerns were raised by KVH about the increased risk posed by BMSB on imported machinery, equipment and other risk goods from the USA and Italy which resulted in heightened treatment and inspection procedures. We will continue to engage in healthy debate with MPI where and when we see the need for improved risk measures and policy changes.

Speaking of partnerships, Biosecurity Week at the Port of Tauranga was very successful last year. Run by the Port, KVH, MPI and several local primary industry groups, the week is an important initiative that relates to New Zealand's national strategy of creating a biosecurity team of 4.7 million people – a goal that we are passionate about at KVH.

The focus last year was two-fold: spending time with staff that work at and around the Port to make sure they know to report the unusual and how to do it; and using the week as a stepping stone into schools to talk to students and teachers about the role they play in looking after our environment and what the big biosecurity picture is for us all in terms of the impacts that unwanted pests could have on our environment, economy, workplaces and lifestyle.



**Chief Executive:**  
Stu Hutchings



**Board Chairman:**  
Dr David Tanner

Ruud 'the Bug Man' Kleinpaste was in Mount Maunganui with KVH for Biosecurity Week and he took part in events on the Port and made presentations to a wide range of student groups. You can read more about all the week's events and what we think a team of 4.7 million looks like, on page 19.

The year also marked great progress in our research and development programme. Investment in science to understand the nature of significant biosecurity threats, and development of tools for their management should they arrive, is a big priority for the kiwifruit industry, as detailed on pages 15 and 16.

On a final note, KVH is a small team of passionate and expert people who were lead for several years by Barry O'Neil before he left the organisation in March 2018. The work undertaken by Barry over the years has driven biosecurity solutions, lifted awareness across the industry and within New Zealand. The leadership and innovative approaches led by Barry, with the ongoing support of growers and wider industry parties, has greatly contributed to the success we are all now seeing after the height of the Psa incursion.

Former Board Chair Adrian Gault also stepped down from his role earlier this year to concentrate on other business ventures, including his own kiwifruit orchard. We thank Adrian for his commitment and efforts to tackle complex issues without losing sight of what's important to growers and what's best for the industry.

As we move forward we have our sights firmly set on leading KVH into the next decade doing everything we can for, and with growers. We will endeavour to work with everyone across the industry, remaining committed to a biosecurity resilient kiwifruit industry.

**Committed to a biosecurity  
resilient kiwifruit industry**

# WHAT'S HAPPENING AROUND THE WORLD?

## Keeping pace with change

Biosecurity risk constantly changes as new organisms are discovered, expand their host range or invade new geographic areas. These pages illustrate some of the key events over the past 12 months that influence risk for the New Zealand kiwifruit industry.

### HAWAII

- The decline of Hawaii's iconic ō'hi'a trees (a close relative of our pōhutakawa) are now believed to be caused by two species, which are distinct but closely related to *Ceratocystis fimbriata*, the pathogen causing Brazilian Wilt in kiwifruit. We are testing the Hawaiian species on kiwifruit to understand if these are a threat also.

### USA

- Several Mediterranean Fruit Fly (Medfly) responses in California. San Diego County undergoing sterile insect release to eradicate.
- Brown Marmorated Stink Bug (BMSB) continues to spread and cause public and horticultural impacts. Now found in all but six states, however less are being detected on goods from the USA to New Zealand because of increased border interventions.

### CHILE

- Chile has had a challenging year for biosecurity with multiple Medfly responses, an expanding BMSB population in Santiago and the discovery of Spotted Wing Drosophila (SWD) in the south.
- The BMSB population in urban Santiago is the first detection in the Southern Hemisphere. KVH visited as part of an 'NZ Inc' group to help implement trapping activities which have captured hundreds of bugs. The Ministry for Primary Industries (MPI) is keeping closely aligned with their Chilean counterparts to understand risk and assist where possible.
- Verticillium Wilt is a pathogen that has caused significant impacts to some kiwifruit varieties in Chile. KVH arranged for a New Zealand scientist to visit and undertake a review of the potential biosecurity threat to the New Zealand kiwifruit industry to shape our readiness planning for the year ahead.

## EUROPE

- BMSB spreading through Europe (14 countries) creating new potential pathways to New Zealand.
- Large BMSB populations in Georgia despite only being first detected a few years ago. Low risk to New Zealand as only a small volume of low-risk goods exported.
- New SWD finds reported in Sweden and Eastern Europe.

## ITALY

- BMSB populations growing and expanding range in the North-East near Slovenia. Increases in populations near Genoa, Rome and Naples. Impacts to kiwifruit appear to be occurring earlier than expected (from May, rather than July) which has implications for grower management strategies.
- White Peach Scale (WPS) present on some kiwifruit exports but levels seem lower than previous years.
- Strain of *Xylella fastidiosa* decimating the local olive industry. Kiwifruit is not a reported host however there are several strains around the world, so the potential threat from all strains is unknown.

## JAPAN

- Significant increase in BMSB and Yellow Spotted Stink Bug (YSSB) interceptions on car carrier vessels arriving in New Zealand from Japan. Appears to be a result of high pest numbers in the region this year. Four vessels turned away from New Zealand by MPI and treatment procedures implemented to manage risk.
- Psa biovar 6 discovered but appears to be confined in distribution. Studies for relative pathogenicity for this and other biovars planned.

## AUSTRALIA

- Significant year for Queensland Fruit Fly (QFF) incursions into pest free areas of Australia, such as Tasmania and Adelaide.
- Adelaide also had a Medfly response this year.
- Release of mass sterile male QFF to dilute the mating population.

## NEW ZEALAND

- Extended fumigation and inspection processes put in place to manage BMSB and other stink bug threats in goods from risk countries Japan, Italy and the USA.
- Horticulture industries working on pre-approval for the importation and release of the Samurai Wasp, a biological control effective in suppressing BMSB populations by up to 80%.
- Government Industry Agreement (GIA) grows with 18 partners undertaking detailed work to improve biosecurity readiness and response outcomes.
- High profile responses – myrtle rust, *Bonamia ostreae*, *Mycoplasma bovis* – attract media attention and although they have not had an impact on kiwifruit they are significant threats and a timely reminder of the importance of maintaining a high level of on-orchard biosecurity practice.



# PREPARING FOR THREATS SPECIFIC TO KIWIFRUIT

Pests like fruit flies and the Brown Marmorated Stink Bug are threats to most New Zealand horticultural sectors and as a result are the focus of large multi-sector readiness efforts. However, for threats specific to kiwifruit its up to KVH to drive readiness efforts, supported by our biosecurity partner, the Ministry for Primary Industries (MPI).

These readiness and response activities and associated cost shares are formalised under the GIA Sector Operational Agreement (OA) for Kiwifruit and Kiwiberry.

## What is Brazilian Wilt?

Brazilian Wilt, caused by the pathogen *Ceratocystis fimbriata*, has been the sector specific threat of focus for recent readiness efforts under the OA, prioritised because of its severe impacts to kiwifruit overseas, and the lack of scientific knowledge about the organism currently available. Infected kiwifruit orchards in Brazil have suffered 50% vine loss over the past five years and with no viable treatment, this pathogen threatens the viability of kiwifruit in the region.

Our activities to make sure we're prepared for Brazilian Wilt have included completing a readiness plan (the first under GIA), which KVH tested and refined with an industry simulation. There has also been more than \$200k invested in research through the Zespri Innovation portfolio to overcome knowledge gaps such as the susceptibility of our cultivars, and to develop diagnostic tools to detect the pathogen should it arrive here.

Our work on this organism is far from complete however, with many fundamental knowledge gaps remaining, such as the susceptibility of kiwifruit to closely related species impacting Hawaiian 'ōhi'a trees, and how many vines we should remove if infection is discovered. Additional research is being commissioned for the year ahead in partnership with Zespri and MPI and will be used to refine our response strategies.

Of course, we cannot predict what organism will trigger the next biosecurity incursion, so while this research is underway KVH continues looking into other sector specific pathogens, such as Verticillium Wilt.

## What is Verticillium Wilt?

Verticillium Wilt, like Brazilian Wilt, is caused by a soil borne fungal pathogen and has resulted in significant impacts to a South American kiwifruit industry - in this case Chile. Our knowledge about this pathogen is also relatively limited so we will be undertaking research in the year ahead to better understand the potential biosecurity risk to New Zealand and to develop detection tools and plans for how we would respond should it arrive.

The impact of Verticillium Wilt was first observed about 15 years ago, when a small number of growers were granted licences to grow Hort16A in Chile resulting in 140 hectares of planting. Within two years these vines showed symptoms and began dying. On some sites, 80% of vines were dead within five years. By 2009, most of the crop had been removed and about 60 hectares remained.

The decline was attributed to Verticillium Wilt and initially thought to be caused by *Verticillium albo-atrum*. Later, the pathogen was identified as *Verticillium nonalfalfae*, which has caused wilt in several different plants, but never before has it been associated with disease in kiwifruit.

The fungi doesn't kill the vine immediately but grows up through vascular tissue and colonises the whole plant from roots to canes. A toxin is then produced causing wilting and death of leaf tissue. The most severe impacts have only been reported on Hort16A, however inoculation lab trials have demonstrated that the species is also pathogenic to Hayward, but to a lesser degree.



The first signs of disease in canopy plants is leaf death and drop. Photo credit Bob Fullerton, Plant & Food Research



Despite the severity of the impacts, relatively little is known about this pathogen and even its identity was debated for years before being identified as *V. nonalfalfae* in 2007. The host range and distribution of the Chilean strains is based on circumstantial evidence and therefore not well understood. Hosts may include other crops of economic importance to New Zealand, and it may also be carried in plants that do not show symptoms.

For the year ahead, the immediate priority is to develop diagnostic tools that can distinguish *Verticillium* in Chile from that present in New Zealand, and to develop a readiness plan that will identify our current level of preparedness, how we will respond to an incursion, and the knowledge gaps that should be pursued to underpin these strategies.



Underground reduction in root system. Healthy vine on the left, unhealthy vine on the right. Photo credit: Bob Fullerton, Plant & Food Research

### **How can growers reduce their risk?**

We can never be sure that organisms identified as the highest risk will be next to arrive on our shores, and there are examples where major responses have occurred for organisms that were new to science or not considered a high priority threat.

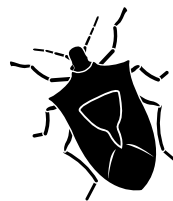
The good news is that there are several practices we can implement as an industry that will reduce risk regardless of what our next incursion is, and by maintaining these practices growers can more effectively help protect their investment when faced with the next biosecurity challenge.

On-orchard biosecurity best practice not only protects an individual's investment, it makes the whole industry better off as an incursion is more likely to be confined to a smaller area at the time of detection. For many organisms, whether it be a pest like BMSB or a disease pathogen like Brazilian Wilt, this is crucial if we are to have a shot at eradication.

Read more about how biosecurity is integral to protecting your growing investment on page 12.



# STOPPING BMSB FROM KICKING UP A STINK



Over the last 12 months the kiwifruit industry and others across the horticultural sector have been on high alert to stop the invasive Brown Marmorated Stink Bug (BMSB) from making a home in New Zealand.

Native to parts of Asia, BMSB is progressively spreading throughout the world - invading states across North America, and more recently Europe where it is now found in 14 countries. It has also been detected in Chile where a population has been discovered in urban Santiago.

The small 10-cent coin sized bug is one of our most unwanted biosecurity threats and would hugely affect production if it managed to make its way across our borders and establish in our orchards. A recent economic research report found BMSB impact on horticulture export value could be up to \$4.2 billion.

Then there's the social and lifestyle impacts as it infests homes over winter, covering everything from bedroom walls to outdoor decking, even getting inside your bathroom and wardrobe.

## WHAT'S BEING DONE TO REDUCE THE RISK?

### Keeping BMSB out

To manage the threat of BMSB crossing our borders during the high-risk season (September through to May 2018) the Ministry for Primary Industries (MPI) proactively introduced increased targeted inspections of cargo from risk countries and ports – the USA and Italy - and introduced several additional measures for offshore fumigation or heat treatment of containers and a wide range of goods.

Throughout February there were several media reports about car ships from Japan containing unexpected, and significant, numbers of stink bugs. KVH publicly supported and congratulated

**A must read article for every New Zealander: 'When twenty-six thousand stink bugs invade your home' courtesy of the front page of the New Yorker magazine and online at [www.newyorker.com](http://www.newyorker.com)**

MPI for taking the correct action in turning back these ships and enforcing cleaning and inspections for BMSB at an approved facility before coming back to New Zealand.

KVH took the opportunity to talk about these increased measures when visiting Bay of Plenty based car importers, transitional facilities, and hostels/backpackers (who host tourists as well as seasonal orchard workers) to remind them about the threat of stink bugs and the importance of being on the lookout.

### Everyone on the lookout

Every New Zealander has a role to play in managing the risk of this invasive hitchhiker. Building awareness of its potential impacts and how to recognise it has been a focus for KVH.

We co-funded a nationwide BMSB education campaign with MPI and other horticultural sectors to lift public knowledge and increase the likelihood of early detection through passive surveillance.

Key aspects of the strategy included producing videos featuring BMSB experts and Ruud 'the Bug Man' Kleinpaste, in collaboration with full-page advertising in several gardening and industry magazines.

**BMSB has never taken hold in New Zealand but has been caught at the border in cargo and passenger luggage. It's sneaky and it spreads fast. We must do everything we can to keep it out.**



This year, online advertising was used significantly more than previous years with ads running on TV on-demand services and national news websites. Facebook, Twitter and YouTube ads encouraged travellers to check their bags, rooms, and mail parcels when travelling to or from New Zealand. These digital ads had over 6.5 million views.

Interviews and stories with mainstream media outlets also proved popular. The morning after a KVH story about BMSB aired on the One News 6pm show in late August, MPI received 15 calls about suspect bugs from people who had seen the clip.

Overall, the summer campaign resulted in over 900 calls to the MPI biosecurity hotline (more than double last year) and over 30,000 visitors to the BMSB page on the MPI website, 12,000 more than over the same period the previous year.

Information packs and leaflets were also distributed to nurseries, retail stores and various community garden and outdoor activity groups.

### What we do if it gets here

KVH continues to work with Zespri to develop on-orchard management strategies for BMSB (should it establish) so that we can identify the best control approach and if needed, implement research to support it. This work complements the BMSB simulation exercise held last year to test capability for operational activities in a response and how information could quickly and efficiently be shared with growers.

A steering group including KVH has sought Environmental Protection Authority (EPA) pre-approval to release the Samurai Wasp should BMSB establish here. The wasp is our most promising control strategy, and a natural enemy of the BMSB that can provide ongoing population suppression by up to 80%. At the time of printing, the EPA is considering submissions from the public consultation stage of the process.

The Samurai Wasp does not sting and is harmless to humans. It's the size of a poppy seed. The female wasp lays her eggs inside the stink bug eggs, killing the the stink bug in the process.

### Readiness and response activities agreed up front

An agreement under the Government Industry Agreement for Biosecurity Readiness and Response (GIA) was signed in July 2017 by KVH, other horticultural groups and MPI.

The agreement sets out the operational requirements for readiness and response activities; cost sharing arrangements between government and affected industries; and enables joint decision making.



# ON-ORCHARD BIOSECURITY

## PROTECTING YOUR GROWING INVESTMENT

Key to helping growers combat the effects of Psa after it was first found in New Zealand orchards nearly eight years ago was the rapid uptake across the industry of on-orchard hygiene practices, and a step-up in overall orchard biosecurity behaviours.

As time has moved on many growers have successfully integrated Psa management into orchard programmes and operational plans, limiting the impact of the disease on orchard productivity.

However, with reduced impacts from Psa we are seeing less focus and a decline in biosecurity practices on some orchards, increasing the risk of potential new incursions.

The outbreak of *Mycoplasma bovis* in the livestock sector serves as a vivid reminder of how vulnerable the primary production sector and the country still is to new biosecurity threats, and the potential cost associated with control should they make their way across our borders.

KVH continues to promote the need for growers and the wider industry to be vigilant and proactively work together to manage the threat from new biosecurity risks to kiwifruit. Maintaining on-orchard biosecurity best practice is key to this.

Brazilian Wilt, the fungal disease decimating kiwifruit orchards in Brazil (and which has resulted in up to 50% vine loss on some orchards) is a clear example of a threat we want to keep out. Without good day-to-day practices in place on the orchard, a disease like this could readily spread through soil and plant movements between orchards and regions before we find it.

Although we have many tools in our readiness and response toolbelt (including a wide ranging national and international network of contacts that help us identify threats to the kiwifruit industry, a million-dollar research programme, response plans and regular simulations) we can never be sure that organisms identified as the highest risk will be next to arrive.



An orchard with restricted access, signage including contact details, and a sanitising footbath.



Almost every biosecurity response, simulation and readiness plan has had one common message for growers: by maintaining an elevated level of biosecurity practice and taking responsibility for your own orchard borders, you are more likely to effectively protect your investment when we are faced with our next biosecurity challenge, regardless of whether this is an organism that we have prepared for, a native pest that has evolved, or a threat that was previously unknown and new to science.

KVH held several workshops over the last 12 months to help guide our approach to working with growers and the wider industry to raise awareness of good biosecurity practice on-orchard and the benefits that come with it. In learning from those who spend the most time working on, and managing kiwifruit orchards, and any common limitations to putting practices in place, we have – as an industry – identified five key behaviours that protect orchard investment from biosecurity risks.

The KVH team, supported by a wide cross sector of the industry, will work with growers to help overcome barriers to the ongoing implementation of these best practices and will continue working with postharvest, orchard and labour contractors, suppliers and growers to encourage a renewed focus on protecting our industry and livelihoods.



### Understanding your risks

- What new pests and diseases could affect my orchard?
- What is happening on-orchard in my local area?
- How might a new risk enter my orchard?
- Ensure everything going to and from your orchard is recorded.



### Agree what must happen on the orchard

- Share your knowledge and expectations with staff and contractors.
- Agree what precautions you require to be carried out and check that they are completed.



### Source clean plant material

- Rootstock, budwood, pollen, and shelter plants should all be sourced from the cleanest possible source.
- Buy only Kiwifruit Plant Certification Scheme (KPCS) certified plants.
- Ensure traceability of where plants come from and where in the orchard they are planted.



### Check and clean

- Consider the risk from tools, vehicles and machinery, harvest bins, and people.
- Ensure everything coming across your boundary is free of soil and plant material.
- Clean tools regularly.

## REPORT THE UNUSUAL



**CATCH IT**



**SNAP IT**



**REPORT IT**

Be on the lookout. Catch, snap, and report any unusual pests or disease symptoms. If an insect is found catch it and seal it in a container.

Phone KVH on 0800 665 825 or call the Ministry for Primary Industries (MPI) biosecurity hotline on 0800 80 99 66. The sooner we know of anything unusual, the more we can do to help.

# VIGILANCE STILL REQUIRED WITH PSA

**Increased levels of Psa symptoms were seen on many orchards in spring 2017, a reminder that this highly virulent disease has not gone away and as an industry we need to remain vigilant. Good hygiene practices along with a comprehensive spray protection programme over winter and early spring remain key tools in managing Psa.**

As weather patterns appear to be changing and we see more extreme weather conditions associated with climate change the potential for increased Psa impacts on-orchard remain. Conditions in prime growing areas are changing, with more rain and wind events predicted. As the industry expands and we see increased development in what historically is thought to be more marginal locations it is important those selecting sites for new plantings consider the locations potential for Psa susceptibility.

Gene sequencing carried out on Psa samples collected around the country highlight that Psa is a complex disease and that the genome continues to evolve. Through the resistance monitoring programme, we have seen Psa bacteria collected from orchards that are showing increasing signs of resistance to copper in a lab environment. This demonstrates the need for us to ensure copper is applied at full label rates to reduce the chance of Psa resistance developing on-orchard. KVH also recommends growers look to reduce copper use over the warmer months when the Psa bacteria are less active.

KVH continues to work with scientists and industry to find alternative control products. We expect a new yeast-based product will come to market within the next 12 months. This product has shown promise as an alternative to some seasonal copper applications. There are also control products coming under greater restriction and even possible threat of removal as market forces change. Healthy tension exists to ensure useful tools remain available as long as possible, while there is a concurrent drive to find fresh solutions.

The characteristics and virulence of evolving Psa strains are unknown. We need to be proactive and continue our current monitoring programme to try and find, and therefore manage, new types of Psa as early as we can. At the same time, we must have prudent movement policies in place, so we don't risk spreading them around New Zealand growing regions before we realise we have a problem.

There are still regions (Whangarei and all the South Island) – and within regions a sizable number of orchards – with either no Psa symptoms or minimal infection. KVH continues to be active in supporting growers in these regions to identify Psa and mitigate spread as soon as possible and we are thankful for the work done by regional coordinators in supporting regional growing communities.

KVH has a primary focus to make sure we have sustainable Psa control processes in place, and the best available science is used to base both immediate and long-term decisions around what these controls should be. They are in place for the industry's current and future protection.



Psa on a Whanganui G14 block in spring 2017. The block has been heavily affected by Psa in the past – a reminder that Psa is systemic and doesn't disappear.



Autumn photos from a Hawkes Bay site, indicating Psa had been lurking. Infected vines have been tagged and dated to provide valuable feedback of infection progress, which give the orchard manager information on which to base management decisions.

KVH still has a focus on the removal of abandoned and unmanaged orchards and to date has dealt with 125 abandoned orchards and 20 unmanaged ones. We also have a collaborative approach to wild kiwifruit control working closely with regional councils and have controlled over 14,000 kiwifruit vines across 136 properties over the last year.

Despite the damage Psa caused the industry, it has bounced back. We cannot become complacent however or forget that other biosecurity risks are equally real. KVH continues to do what we can to mitigate these risks.

# INNOVATION

## RESEARCH DELIVERING THE KVH STRATEGY

### Psa

The Psa research plan has matured over the years to what is now a programme of deep science projects aiming to achieve long-term sustainable management of Psa.

One of the highlights of the last 12 months has been completion of the first year of the GoldFutures project. This is a four-year research project working with Gold3 growers to find solutions in identifying best management practices for Psa.

The basic research design is that we observe a difference in the impact of Psa on different orchards (and even blocks within the same orchard) that don't seem to relate to environmental factors. A year of observational study has highlighted management practices in blocks suffering less. These practices have now been transferred to blocks that are more impacted and we are waiting to see if positive change has been affected.

These management practices are not new but provide a timely reminder to all growers about the importance of good orchard tool hygiene; cutting out and removal of infected material; optimising spray coverage; and targeting sprays to high-risk periods, particularly when wounds are present.

Effective wound protectants for use on Gold3 and Hayward have been identified including a BioGro option for organic growers. Two products consistently provided protection – copper paste and InocBloc (BioGro registered) - with other products showing varying degrees of protection at various times of the year.

A strong focus remains on additional tools for the toolbox in the form of products that utilise mother nature to combat Psa. Four biologically based products are in various stages of development and we are confident that this time next year one of them will be in the market. We are greatly improving our understanding of the plant defence mechanisms in play with a view to utilising this information in the form of a product. ►



Trap plants hanging in one of the GoldFutures sites to monitor inoculum levels – covered during spraying.



# INNOVATION CONTINUED

We are also committed to optimising current control options (recently new data on the effectiveness of various wound protectant products was released) and understanding unintended impacts. We are tracking levels and impacts of copper in soil and monitoring for changes within the Psa population that may indicate a build-up of resistance to control products.

The annual KVH update from last year profiled work to add a frost component to the existing Psa Risk Model. This is a project that has yielded some interesting data in its first year as to what level of frost is required to exacerbate infection. There are plans to validate this in the field this coming frost season, including establishing the value of frost fighting during winter.

The susceptibility to Psa of cultivars in the breeding programme continues to be monitored with a long-term goal of identifying and releasing a resistant cultivar.

## Biosecurity

In line with the changing emphasis from KVH towards more biosecurity activity, the biosecurity research programme has grown significantly to develop new knowledge and tools and advance our preparedness for biosecurity threats.

Brown Marmorated Stink Bug (BMSB) continues to receive a lot of warranted attention as recent interceptions highlight the high-risk of entry and potential establishment of this bug in New Zealand. International research efforts haven't focused on kiwifruit, so undertaking our own research has been necessary to better understand impacts to fruit and how we would manage the pest over the longer term.

Key projects during the past year provided evidence that BMSB likes both green and gold kiwifruit and existing grading technology can sort fruit with moderate and severe BMSB damage.

Complementing this work, KVH led an industry-wide simulated incursion response in 2017 to identify key players and activities which will need to be implemented as part of readiness and response activities if the bug were to arrive and establish.

Further trials have been established which will determine the lifecycle of BMSB in kiwifruit orchards in Italy and China. Non-chemical options are likely to be a key control strategy for BMSB – we have another project looking at the efficacy of trap plants or covers at keeping BMSB out of orchards.

With the KVH focus on prevention we have been working to understand both the identification of key pathogens of concern and developing detection technology against them. These organisms include Verticillium Wilt, Brazilian Wilt (*Ceratocystis fimbriata*), Summer Canker, and Pelargonium Zonate Spot Virus. Both activities are important in keeping these pathogens out of New Zealand.

Research into Brazilian Wilt has been undertaken in Brazil and provided some hope of there being tolerant kiwifruit cultivars.

Northern Italy has lost almost 2000 hectares of kiwifruit in recent years, with the cause largely unknown. We have commissioned research to understand if this is a potential biosecurity threat to New Zealand, which has been inconclusive at this point.

Translating Chinese literature has also helped us understand what other potential threats exist in kiwifruit's native range. This will be expanded by a subsequent project reviewing the top five kiwifruit pests in other countries and their management strategies.

KVH continues to support larger multi-sector programmes that investigate risk pathways and pre or post-border detection technologies, such as the Scion led urban battlefield programme. The programme will provide an integrated package of tools that address both the technical and social issues confronting agencies responsible for implementing or contributing to pest eradication programmes. At the same time the research will give primary sectors more efficient methods to manage already-established-pests.



BMSB feeding damage and BMSB nymph on a kiwifruit leaf

# BUILDING A STRONGER BIOSECURITY SYSTEM

**As a nation we have a strategic goal of having a biosecurity team of 4.7 million New Zealanders by 2025. As an organisation, KVH is passionate about this goal and making sure everyone in the community becomes a biosecurity risk manager.**

The enormity of the biosecurity task means everyone needs to pitch in, know the importance of biosecurity and be motivated to act.

There are several initiatives KVH has undertaken within Bay of Plenty schools, workplaces and community groups over the last 12 months to raise awareness of the task at hand and how every individual can play their part, which came together during Biosecurity Week.

Hundreds of people took part in activities organised for the 2017 Biosecurity Week at the Port of Tauranga. Port staff and locals got up close and personal with bugs at events hosted by special guest Ruud 'the Bug Man' Kleinpaste while biosecurity experts showed people how the Port has worked with the community and local organisations to develop a pest-free environment.

Thousands of people work on and around the port every day, and many of them are on the frontline knowing biosecurity is a critical issue. By working together, we can protect the kiwifruit industry - and other horticultural industries - from unwanted biosecurity risks. The port community understands the risk and knows that they make a difference by being vigilant and aware of new and emerging threats.

We all remember how Psa devastated not only the kiwifruit industry but the community and supply chain. Knowing what to look for and reporting anything unusual will help protect businesses and the future of the kiwifruit industry.

As part of Biosecurity Week staff from KVH and the Ministry for Primary Industries (MPI) visited transitional facilities across the Bay of Plenty to share up-to-date information about managing risks and to learn more about the improvements to biosecurity systems organisations have in place.

The first cruise ships for the season coincided with Biosecurity Week, so KVH staff took the opportunity to meet with tour bus drivers to discuss what to look for and how to make reports if they suspected anything unusual. KVH also took the opportunity to provide bus drivers with pre-written messages to share with the international cruise ship passengers they host on trips to local kiwifruit orchards and other tourist attractions. It proved to be very successful and will be repeated as part of future biosecurity initiatives. ►



Visits were also organised for the Bug Man to horticulture students and tutors at Toi Ohomai Institute of Technology; Omanu Primary School in Mount Maunganui; and Trevelyan's packhouse staff and growers. Presentations focused on why it is important to keep local communities, industries, and the environment free of unwanted threats.



An official function was held to celebrate the success of Biosecurity Week and this was attended by senior staff from government, local industry, transport and logistic groups and the Bug Man who kept all attendees entertained. Ruud reiterated the success of the group in setting a regional example of partnering to build a biosecurity team of 4.7 million.

The science sector is also on board with the Port's biosecurity awareness initiative. Researchers from the Better Border Biosecurity (B3) collaboration are trying to understand and predict local biosecurity risks, trial new detection tools and measure the impacts of events such as Biosecurity Week. Social scientists are monitoring the change in biosecurity awareness among Port staff and locals to better understand how to build a Tauranga community fully engaged in preventing pest and disease invasions.

KVH, MPI, the Port of Tauranga and several other local industry groups and businesses are involved in Biosecurity Week and all are committed to working together – alongside the local Mount Maunganui community – to ensure everyone plays their part in keeping unwanted pests out of New Zealand and no biosecurity incursions come through the local community or Port of Tauranga.



To complement Biosecurity Week and the port-based initiative, B3 has been working with Tauranga-based education trust House of Science to develop a biosecurity classroom pack for school children in years 1 to 8.



# WHAT DOES A 4.7 MILLION BIOSECURITY TEAM LOOK LIKE?

## EVERYONE CAN:



Take a photo of any unusual bug or disease symptom in the orchard or environment and report it to KVH on 0800 665 825 or the Ministry for Primary Industries on 0800 80 99 66.



Thoroughly check and clean all vehicles, machinery and tools before moving them to another property or orchard.



Routinely unpack online purchases carefully in case any hitchhiker pests are inside.



Promote New Zealand's biosecurity rules to overseas family before they come to visit.

## AT YOUR PLACE OF WORK, YOU CAN:



Build biosecurity requirements into contracts.



Establish a pest of the month campaign to educate staff about potential risks and what to do if anything of concern is found.



Include biosecurity as a standard item on meeting and board agendas.



Get staff training to manage biosecurity risks encountered on the job.



CATCH IT



SNAP IT



REPORT IT

**REPORT THE UNUSUAL**  
**CALL KVH 0800 665 825**





# OUR TEAM

## CHIEF EXECUTIVE



**Stu Hutchings**

stu.hutchings@kvh.org.nz  
027 478 7901

## BIOSECURITY TEAM



**Matt Dyck**

Biosecurity Manager  
matt.dyck@kvh.org.nz  
027 838 7129



**John Mather**

NPMP Analyst &  
Compliance Officer  
john.mather@kvh.org.nz  
027 838 8974

## OPERATIONS TEAM



**Peter Mourits**

Operations Manager  
peter.mourits@kvh.org.nz  
027 445 8497



**Karyn Lowry**

Compliance &  
Surveillance Advisor  
karyn.lowry@kvh.org.nz  
027 227 1157



**Linda Peacock**

Grower Services & Technical  
Support Specialist  
linda.peacock@kvh.org.nz  
027 475 2909

## SUPPORT TEAM



**Jacqui Craig**

Office & Accounts Manager  
jacqui.craig@kvh.org.nz  
027 622 2717



**Lisa Gibbison**

Communications Advisor  
lisa.gibbison@kvh.org.nz  
022 025 4724



**Monique Finlay**

Administrative Coordinator  
monique.finlay@kvh.org.nz  
021 888 459

Kiwifruit Vine Health  
Suite 3, Level 1, Customhouse Building  
314 Maunganui Road, Mount Maunganui  
PO Box 4246, Mount Maunganui, 3149  
New Zealand  
Tel: 0800 665 825  
Email: [info@kvh.org.nz](mailto:info@kvh.org.nz)  
[www.kvh.org.nz](http://www.kvh.org.nz)