2023/24 Operational Plan

for the National Kiwifruit Pathway Management Plan

July 2023

This plan aims to protect the New Zealand kiwifruit industry by reducing the risk of spreading biosecurity threats into orchards. Biosecurity threats include:

Ceratocystis fimbriata	
	**Not present in New Zealand.** Ceratocystis fimbriata (Cf) is considered one of the most significant biosecurity threats to the New Zealand kiwifruit industry. While Cf is a global pathogen to many crops, the strain impacting kiwifruit has only been reported from Brazil where it caused significant losses to kiwifruit growers.
***Pseudomonas syringae pv. actiniae* (Psa-V)**	
	**Present in New Zealand.** Psa is a bacterial pathogen that has been present in New Zealand since 2010 and is widespread through most growing regions but not detected in the South Island. This plan provides protection for growers who remain not detected for Psa, and to manage the risk associated with any new forms that may evolve or arrive from offshore.
Neonectria microconidia	
	**Present in New Zealand.** *Neonectria microconidia* is a fungal pathogen that has been present in New Zealand since at least 2002 and has been reported from all kiwifruit growing regions. This pathogen can cause cankers on trunks, graft unions and sometimes on vine leaders. There appears to be a higher incidence of Neonectria symptoms on the Gold 3 cultivar, however it has also been reported from Hayward and male varieties.

Phytophthora species

Some species present in New Zealand

Phytophthora species are fungal like organisms that are well known plant pathogens around the world. Over 30 species of *Phytophthora* have been reported in New Zealand of which several are capable of infecting kiwifruit, and many more species are present offshore. *Phytophthora* symptoms are typically associated with root and collar rot reducing fruit production and sometimes resulting in plant death.

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1. INTRODUCTION

The National Kiwifruit Pathway Management Plan (Pathway Plan) supports the New Zealand kiwifruit industry to work collectively to reduce the spread and subsequent impact of harmful organisms.

Biosecurity is one of the kiwifruit industry's biggest threats. We have learnt lessons from the Psa incursion of 2010 and must be prepared for a full range of potential biosecurity pest and diseases. Effective pathway management is fundamental to biosecurity preparedness as it underpins;

- surveillance to detect new or emerging risks;
- pathway hygiene and traceability; and
- preventing or slowing the spread of risk organisms.

This Pathway Plan aims to unite the efforts of growers and associated people and industries that influence risk associated with kiwifruit industry pathways. It provides for appropriate consistency and a coordinated approach to kiwifruit pathway management.

Key elements of the Pathway Plan involve surveillance and monitoring, reporting, movement controls and implementing standards and practices that include hygiene and traceability requirements, along with a continued focus on awareness, education, and research.

Only by working together will it be possible to bring about the outcomes the Pathway Plan is designed to achieve. It takes all of us to protect what we've got.

1.1 PURPOSE

This Operational Plan is prepared by Kiwifruit Vine Health (KVH) for the purpose of implementing the Pathway Plan objectives (refer below and Section 4 of this Operational Plan), and to meet requirements under section 100B of the Biosecurity Act 1993.

This Operational Plan comes into effect from 1 July 2023 and will be reviewed on an annual basis and amended as necessary.

This Operational Plan outlines how KVH will approach implementation, including its key policies and how these will be implemented, as well as information on KVH priorities, KPIs and budget over this term.

Pathway Plan objectives:

The Plan's objectives are:

a) to reduce the spread of harmful organisms on kiwifruit industry pathways; and
b) to ensure that harmful organisms on kiwifruit industry pathways are detected early; and
c) to ensure that the origin and spread of harmful organisms on kiwifruit industry pathways can be rapidly traced; and
d) to increase and sustain awareness in the kiwifruit industry of
    i. risks associated with the spread of harmful organisms on kiwifruit industry pathways; and
    ii. practices to manage those risks.

2 APPROACH TO IMPLEMENTATION

KVH will continue our approach of providing best practice information to support growers improve biosecurity practices on-orchard voluntarily, to better protect themselves from biosecurity threats and thereby achieve the KVH vision of a more biosecurity resilient kiwifruit industry. Our objective is that the industry complies with the requirements of the Pathway Plan voluntarily, because they understand the importance of biosecurity practice and the potential impacts of harmful organisms to their livelihoods, investments, and communities.

This is consistent with the KVH Strategy 2020-2025, which identifies four priority areas to achieve the KVH vision. Our implementation approach to the Pathway Plan works across all four of these areas:

- **A kiwifruit industry committed to biosecurity excellence –** the industry works together as one, taking ownership of our biosecurity.
- **Incursion readiness and response –** we are well prepared for the next biosecurity event.
- **Pathway risk management** – we focus on pathways to reduce pest and disease transmission.
- **Innovation in biosecurity management** – we strive for new, efficient ways to strengthen our biosecurity systems.

Implementation model

KVH also recognises that the compliance burden for kiwifruit growers is increasing – not only for biosecurity but in all aspects of horticulture. We seek to avoid adding to this burden unnecessarily and this is reflected in our design of the rules of the Pathway Plan which allows for high-risk organisms to be added or removed over time based on our knowledge of the risk that they present to the industry. This allows for an approach where risk management is appropriately balanced with pragmatism and can be adjusted as risk profiles change.

KVH is also streamlining compliance requirements by developing certification standards as a simple means to demonstrate compliance with the Pathway Plan; innovative digital tools to make data capture simple and robust; and embedding our requirements into existing industry assurance schemes to reduce duplication of effort.

2.1 COMPLIANCE AND COMMUNICATION

KVH has a wide range of existing communication channels to provide up-to-date information and advice to growers and stakeholders about KVH's wide-ranging biosecurity interests and activities, including the importance of integrating biosecurity day-to-day and reminders on how to meet the requirements of the Pathway Plan. These channels include the KVH website, KVH Bulletin (our fortnightly newsletter with over 2000 subscribers), workshops and field days, social media, and articles in relevant industry publications.

While encouraging stakeholders to manage biosecurity risk on a voluntary basis will continue to be our main focus, we will take compliance action where there are significant breaches that put others at risk. See section 5 for more details of the legal framework, the powers available to KVH Authorised Persons under the Biosecurity Act 1993 and offences and penalties for significant breaches of rules of the Pathway Plan.

KVH is also subject to the Official Information Act, which fits with its core value of being a pan-industry organisation that is transparent, acts with integrity and is accountable in all of its dealings. Refer to the KVH Official Information Act Policy.

2.2 HIGH-RISK ORGANISMS

The Pathway Plan sets out practices to reduce the biosecurity risk associated with the movement of risk goods on kiwifruit industry pathways. The plan recognises that for certain high-risk organisms these measures may not reduce risk to an acceptable level and additional organism specific measures may be required, such as diagnostic testing and the application of crop protection products.

High-risk organisms are specified by KVH and listed on our website, provided they meet the criteria specified in the Pathway Plan. That is, a high-risk organism is a pest:

- for which there are effective tools or measures available to control or reduce its potential impact; and
- that meets any two of the following criteria:
    i. there is a high likelihood of the pest spreading on a kiwifruit industry pathway;
    ii. there is a high likelihood of the pest establishing and forming self-sustaining populations in orchards;
    iii. there is a high likelihood of the pest causing significant economic impacts if it establishes in orchards;
    iv. there is a high likelihood of the pest causing serious harm to the kiwifruit industry.

KVH will list any high-risk organisms on our website, under the protocols to which they apply.

<u>High-risk organisms for the 2023 Operational Plan</u>

For this 2023 Operational Plan, the only specified high-risk organism is Psa (biovar 3, also known as Psa-V), although other high-risk organisms may be added or removed over time as their risk profile evolves. While there are only a small number of kiwifruit growers who remain Psa non-detected, retaining this status is extremely important to these growers, particularly in more challenging environments where Psa might thrive. The entire South Island remains Psa non-detected and retaining this status is of strategic significance to the industry as a source of Psa free material.

While Psa is widespread in the North Island, many growers recognise the benefit in starting with clean material to provide their orchards with the best possible chance of successful vine establishment and having Psa as a high-risk organism provides clear pathways for these growers to source clean material.

However, for a variety of reasons other members of the kiwifruit industry have expressed a strong desire to continue to be able to source material grown outdoors in environments where Psa is widespread, and the Pathway Plan also allows for this. While such movements are not biosecurity best practice for vine establishment, movement between properties of equal Psa status presents no significant increase in risk to the kiwifruit industry and is allowed under the Pathway Plan as a pragmatic and cost-effective option to support industry growth. But the movement from Psa positive to Psa non-detected properties remains strictly prohibited.

KVH is concerned about new strains of Psa naturally evolving and appearing in our industry over time with either increased virulence or resistance to crop protection products at levels that render these products ineffective. The industry will continue monitoring for these forms of Psa and if they appear, they could be included as high-risk organisms with specific diagnostic testing or crop protection requirements.

This approach of including Psa as a high-risk organism for the Pathway Plan provides consistency with the National Psa-V Pest Management Plan (NPMP) which was in operation until May 2023. All protocols relating to the two plans have been aligned to avoid confusion for the industry.

2.3 KVH APPROVED CROP PROTECTION PRODUCTS AND SANITISERS

Crop protection products and sanitisers play a key role in reducing the risk of spreading high-risk organisms on kiwifruit industry pathways, but products used must be effective and able to be used for kiwifruit production in New Zealand.

KVH will maintain an approved list of crop protection products and sanitisers to provide guidance on options available to meet the requirements of rules 6-11 of the Pathway Plan. These lists can be found on the KVH website and are linked to from the relevant protocols:

- KVH approved crop protection products (Appendix 2)
- KVH approved sanitisers (Appendix 3)

To become approved, a crop protection product must undergo a multi-stage product testing process that will determine the efficacy of a product in controlling the high-risk organism in kiwifruit vines. Only products that receive a label claim from ACVM (for the organism in question) are then approved for use in control of that organism and considered an effective crop protection product. They must be used in accordance with the Zespri Crop Protection Standard.

2.4 TRAINING

The monitoring of plants for symptoms is a key measure to reduce risk on kiwifruit pathways, but to be effective must be undertaken by an operator who is suitably trained or experienced. This is a requirement written into Pathway Plan rules for the movement of plants, budwood and pollen. To meet this requirement suppliers must provide evidence of training that has been undertaken, which may be formal training or informal training using resources from the KVH website.

Best practice guidance for training is available on the KVH website including monitoring, sampling, and testing guidelines. Evidence of this training will be required at the relevant audit.

- Nursery monitoring, sampling, and testing
- Orchard monitoring, sampling, and testing

2.5 APPROVED SAMPLING AND DIAGNOSTICS

Where diagnostic testing is required, KVH will approve independent diagnostic laboratories that have demonstrated testing proficiency for the specified high-risk organism. Approved diagnostic laboratories will be listed on the KVH website under the relevant section for nursery plants, orchard plants, budwood, pollen and compost respectively.

3 IMPLEMENTATION OF PATHWAY PLAN RULES AND KEY POLICIES

3.1 REPORTING THE UNUSUAL

Desired outcome:

The industry is biosecurity aware and reports suspect organisms or contamination early, allowing best possible chances of successful risk management.

Background:

Reporting of unusual symptoms or pests enables KVH to gather new information that may elevate risk associated with a kiwifruit industry pathway. This information is fundamental to decisions on the best approach to pathway risk management and will enable KVH to determine if further action is required, such as diagnostic testing. It is well known that early detection of harmful organisms provides the best chance of successful risk mitigation, and establishing a culture of reporting in the kiwifruit industry maximises our chances of successful response outcomes in any future biosecurity incursions.

Pathway Plan requirements (wording of the rule in the Order):

A person who recognises that a risk item is, or is potentially, contaminated must, within 48 hours of first recognising the contamination, report the contamination:

a) to KVH; or
b) to any person who has been approved by KVH for that purpose and notified to the public.

Contamination or contaminated, in relation to a risk item, means that the item:

a) is exhibiting unusual symptoms; or
b) is harbouring a high-risk organism; or
c) has visible soil or extraneous kiwifruit plant material.

Implementation approach:

KVH has worked closely with the kiwifruit industry to encourage reporting of unusual symptoms. The unusual symptom reporting process involves various steps actioned by KVH staff. Reports are followed up by making contact through site visits, taking samples and submitting them to external providers for identification, and providing technical advice for any further actions required. KVH has been successful in increasing the number of reports received. This has been largely a result of providing tools and knowledge to facilitate reporting and providing a feedback loop to the industry to reduce concerns of unwanted outcomes.

KVH has established an industry network of biosecurity champions called KiwiNet, which meets twice a year. A standing item at these KiwiNet sessions is for KVH to report back on cases of unusual symptoms received and outcomes of any subsequent investigations. This feedback loop helps to normalise reporting and demonstrate the value to the grower of the process.

KVH has also been a strong supporter of Find-A-Pest, a mobile application that makes reporting easier for the industry and public. It enables the user to identify a pest of concern by submitting images via the app. These submissions are assessed by relevant sectors, who either identify the pest or pass the query to iNaturalist or the Ministry for Primary Industries (MPI) if there is concern it is a new-to-New Zealand species.

The persons approved for reporting are KVH, MPI and Find-A-Pest and this is publicly notified on the reporting factsheet on the KVH website.

Supporting resources and activities:

- Fact sheet on the KVH website of reporting options.
- KiwiNet meetings twice a year.
- Find-A-Pest app.
- Internal systems to track reports and provide feedback to growers.

3.2 PROVISION OF INFORMATION

Desired outcome:

The intent of this rule is to enable KVH as the management agency to gather information about biosecurity risks associated with kiwifruit industry pathways, including the location, condition, source, movement, or distribution of any risk item.

Background:

This information enables KVH to make decisions on the best approach to management of kiwifruit industry pathway risks, including to understand the likely mechanisms by which risk organisms have spread on industry pathways and to trace movements in specific situations, to enable risk to be reduced.

Pathway Plan requirements (wording of the rule in the Order):

1) This rule applies:
    a) to a person if a rule in clauses 19 to 26 (rules 3-10) applies to that person; and
    b) in respect of risk items that may cause unwanted harm to cultivated kiwifruit plants.
2) A person must provide KVH or an Authorised Person with any information of a kind described in subclause (4) that KVH or the Authorised Person requests in writing.
3) The person must provide the information within the time period specified in the request, which must not be less than 24 hours from the time the request is made.
4) The information is any information about the location, condition, source, movement, or distribution of any risk item.

In relation to point 3 above, this means when KVH or an Authorised Person requests information in writing, the person has *at least* 24 hours from the time the request is made to provide the requested information.

Implementation approach:

The timeframe to provide information will be dependent on the level of risk presented by the organism in question, but as specified in the rule cannot expect this to be less than 24 hours. KVH has developed templates and tools to make recording this information as simple as possible, should it ever be required. This includes integration of traceability requirements with industry assurance programmes, templates on the KVH website, and working with digital software providers to implement easy options for recording traceability information on a voluntary basis (should growers decide this adds value for them).

One example is a project between KVH and Onside to develop a simple and secure digital plant traceability tool that will be incorporated into the existing Onside app. Many growers are already using this app for health and safety purposes and to manage people movements.

3.3 ON-ORCHARD BIOSECURITY PLANS

Desired outcome:

All growers have a clear plan for managing biosecurity risk on their orchard and operate to this plan.

Background:

Creating a biosecurity plan helps growers identify potential threats and pathways of entry into their orchard and identify and prioritise biosecurity practices to manage this risk. Since 2013, kiwifruit growers have been required to have a Psa Risk Management Plan and therefore the concept of planning to manage biosecurity risk on-orchard is not new.

Furthermore, KVH has been promoting the need for growers to have an on-orchard biosecurity plan for several years. To assist growers in creating a plan, KVH has produced a template that growers have completed on a voluntary basis for the past two years and was previously a recommendation in Zespri GAP. This template meets the requirements of the Pathway Plan and therefore many growers will already be operating to an on-orchard plan that meets this rule. The template contains five steps that cover how to:

- understand your orchard-specific biosecurity risks;
- agree what must happen on the orchard (including establishing and ensuring biosecurity requirements to be met by people visiting the orchard);
- source and trace clean plant material;
- check and clean tools and other risk items entering the orchard;
- report any unusual symptoms.

Pathway Plan requirements (wording of the rule in the Order):

The Pathway Plan includes a rule that requires every grower to have, and operate in accordance with, a Kiwifruit Orchard Risk Management Plan. Specifically, this responsibility falls on the occupier of an orchard first and foremost, but where an occupier cannot be identified or made responsible, that responsibility shifts to the orchard owner.

A Kiwifruit Orchard Biosecurity Plan must cover at least the following:

a) a description of the risks in relation to kiwifruit industry pathways and how they are to be managed;
b) the source and location of any plant material that enters the orchard, including new budwood, kiwifruit plants, pollen, compost, and kiwifruit shelter belt plants;
c) the orchard hygiene practices that will be implemented to reduce the risk of harmful organisms entering and spreading in or from the orchard when entering, leaving, or moving within the orchard, including tool, vehicle, machinery, kiwifruit bin, and personal effects hygiene practices;
d) the person or groups of persons likely to enter or leave the orchard and the steps to be taken to ensure that they;
    i. understand the requirements in the kiwifruit orchard risk management plan; and
    ii. comply with them:
    iii. how risks relating to kiwifruit industry pathways will be monitored and reported.

Implementation approach:

KVH has produced a range of materials to support growers develop their on-orchard biosecurity plan. This includes the following:

- A five-step template available as a paper booklet or as an online tool (growers may use either of these or develop their own template provided it meets the legal requirements set out in the rule).
- Best practice guidance (videos and factsheets) for key biosecurity practices such as hygiene.
- Growers are able, and encouraged, to access technical advice and assistance with plan development over and above from KVH or their post-harvest representative.

Implementation approach for Growers under Zespri GAP:

As part of efforts towards simplicity, On-Orchard Biosecurity Plans are to be included within Zespri GAP, an assurance programme that includes about 95% of kiwifruit growers. Zespri GAP is a quality control system that encompasses the requirements of, and is recognised by, the international Global GAP standard. Zespri are able to include additional requirements outside of the Global GAP standard, such as the requirements of this Pathway Plan.

KVH has worked with Zespri to incorporate key elements of the Pathway Plan as control points within Zespri GAP. This includes the requirement to have an On-Orchard Biosecurity Plan. Growers will file their completed plan in their GAP manual, and it will be reviewed during their GAP annual audit. The GAP audit process will continue to operate as it currently does, as follows:

- KVH will work with Zespri and other marketers, in June each year, to ensure that standards within GAP (or equivalent) are compliant with KVH's Pathway Plan and specifically the On-Orchard Biosecurity Plan requirements.
- Grower audits will be conducted between September and December by post-harvest operators, who are in turn audited by Zespri.
- Independent verification of this process will be provided by AsureQuality, which also conducts random audits of some post-harvest operators and growers.
- KVH will receive reports of compliance against our control points. This enables KVH staff to undertake targeted follow up with growers where required.

Previous experience under the NPMP tells us the approach of incorporating KVH requirements into Zespri GAP will result in a high level of compliance in that growers will have an On-Orchard Biosecurity Plan. We expect that the effectiveness of plans will be continually improved over time and KVH will take an educative approach supported by research, to achieve this.

Implementation approach for other growers:

A small number of growers, typically those who grow multiple types of crops, operate under different assurance schemes outside of Zespri GAP. These growers will still be subject to an annual audit through KVH directly.

3.4 POST-HARVEST AND PROCESSOR BIOSECURITY PLANS

Desired outcome:

All kiwifruit post-harvest operators and kiwifruit processors have and operate in accordance with a biosecurity plan.

Background:

Post-harvest operators are associated with the movement of equipment, personnel/contractors, and plant material between orchards and in some cases between regions. Such movements may introduce pests or diseases into orchards.

Processors are also associated with movements of risk goods, in particular the transport and handling of reject fruit.

Therefore, under the Pathway Plan every kiwifruit post-harvest and processor must have and operate in accordance with a Kiwifruit Post-harvest and Processor Biosecurity Plan (in a similar way that growers and contractors must also have and operate in accordance with a Biosecurity Plan).

Similar requirements have been in place with the NPMP since 2013 and the introduction of the Pathway Plan will have little change for these operators, except the requirements and associated risk management plans are no longer limited to the single organism of Psa, and provide risk mitigation for a wider range of threats.

Pathway Plan requirements (wording of the rule in the Order):

1) A kiwifruit post-harvest operator and a kiwifruit processor must have, and operate in accordance with, a biosecurity risk management plan.
2) A person referred to in subclause (1) must ensure that the biosecurity risk management plan includes the following matters:
    a. a description of the risks to be managed in relation to kiwifruit industry pathways,
    b. the steps that will be taken to manage the risks, including:
        i. the hygiene practices in respect of all vehicles, machinery, tools, bins, equipment, and personal effects to reduce the spread of harmful organisms; and
        ii. a requirement to use only sanitisers that are approved by KVH and notified to the public; and
        iii. the time before entering an orchard at which the sanitiser should be used.
    c. the steps that will be taken to ensure that all kiwifruit post-harvest operator and kiwifruit processor personnel are aware, before entering an orchard, of:
        i. the risks to be managed in relation to kiwifruit industry pathways; and
        ii. the steps required to be taken to manage the risks; and
        iii. the reporting requirement in clause 17
    d. the system that will be applied to enable kiwifruit to be traced, and how the integrity of that system will be maintained.

Implementation approach for Biosecurity Risk Management Plans:

<u>Post-harvest</u>

Since the packing season of 2012, post-harvest operators have produced and submitted a Psa-V Risk Management Plan as a requirement under the Zespri Document Quality System (DQS), and then the NPMP from 2013. The new requirements under the Pathway Plan have only resulted in a few minor additions to the content of the previous Psa-V Risk Management Plans.

KVH has produced a Biosecurity Risk Management Plan template and audit checklist which are both available on the KVH website. Post-harvest operators can use this template to create their Biosecurity Risk Management Plan.

Post-harvest operators must review and submit their Biosecurity Risk Management Plan to KVH on an annual basis, prior to the post-harvest operator commencing packing for the season.

KVH will email all Post Harvest DQS contacts in advance to remind them of this requirement. KVH has established a dedicated email address for all registration requirements of the Pathway Plan, which is registration@kvh.org.nz.

An audit of the post-harvest operator will occur during the packing season to verify that the measures stated in the Biosecurity Risk Management Plan are being implemented.

Processors

The procedure for processors to obtain an approved Biosecurity Risk Management Plan is similar to that for post-harvest operators. Processors of kiwifruit must register with KVH. A KVH template and audit checklist is available for processors on the KVH website, which they can use to produce a Risk Management Plan and submit this to KVH.

A finalised Biosecurity Risk Management Plan, including any amendments that KVH may request in their review, must be filed with KVH prior to any processing of kiwifruit for the season. A requirement as part of this procedure is that processors are only able to obtain kiwifruit from post-harvest operators that already have approved Biosecurity Risk Management Plans in place.

An audit of processors will be conducted on an annual basis to verify that measures stated in the Biosecurity Risk Management Plan are being implemented.

3.5 CONTRACTOR BIOSECURITY PLANS

Desired outcome:

All kiwifruit contractors have and operate in accordance with a biosecurity risk management plan.

Background:

The kiwifruit industry relies heavily on the use of contractors to undertake specialist roles (such as spraying), or seasonal activities that require a high labour input over a short time period (such as pruning and picking). The risk contractors present depends on the activities being undertaken, but many contractors are regularly moving between orchards and often have equipment or tools that unless cleaned are likely to be contaminated with soil or plant material. The definition of contractor is broad, but KVH will adopt an implementation approach that is relative to risk and incorporate existing industry assurance systems.

Pathway Plan requirements (wording of the rule in the Order):

The Pathway Plan defines a kiwifruit contractor as:

a) any person who supplies goods or services that involve the movement of a risk item to:
    i. an occupier or owner of an orchard; or
    ii. any other person who produces or supplies kiwifruit plants, kiwifruit shelter belt plants, kiwifruit plant material, budwood, or pollen; and

b) includes, but is not limited to:

i. artificial pollen applicators, beekeepers, and maturity clearance staff; and
ii. contractors providing the following services:
(a) vine work, pruning, and other canopy work:
(b) spray application:
(c) shelter trimming:
(d) root pruning:
(e) fertiliser and compost spreading:
(f) pre-harvest assessments:
(g) post-harvest bud counts:
(h) pest monitoring:
(i) harvesting kiwifruit:
(j) technical advice:
(k) orchard mapping:
(l) irrigation:
(m) infrastructure development

The Pathway Plan rules states:

1) A kiwifruit contractor must have, and operate in accordance with, a biosecurity risk management plan.
2) A kiwifruit contractor must ensure that the biosecurity risk management plan includes the following matters:
   a. a description of the risks to be managed in relation to kiwifruit industry pathways;
   b. the steps that will be taken to manage the risks, including:
      i. the hygiene practices in respect of all vehicles, machinery, tools, bins, equipment, and personal effects to reduce the spread of harmful organisms; and
      ii. a requirement to use only sanitisers that are approved by KVH and notified to the public; and
      iii. the time before entering an orchard at which the sanitiser should be used.
   c. the steps that will be taken to ensure that all kiwifruit contractors are aware, before entering an orchard, of:
      i. the risks to be managed in relation to kiwifruit industry pathways; and
      ii. the steps required to be taken to manage the risks; and
      iii. the reporting requirement in clause 17 (*Rule 1*).

Implementation approach:

The primary focus of implementation for this rule will be on the highest risk contractors; that is, those who come into direct contact with fruit and producing vines (e.g., vine work -pruning and other canopy work; spray application; fertiliser application; supply of labour for any of the above activities). These contractors fall within Zespri's existing Compliance Assessment Verification (CAV) system for contractors, meaning it is a supply requirement for any contractors undertaking these activities on kiwifruit orchards that supply Zespri to achieve this certification. The CAV scheme provides a simple and cost-effective approach to incorporate all legal requirements for contractors working on orchards, including the requirements under this rule. At this stage the Zespri GAP/CAV requirements apply to a sub-set of contractors who come into direct contact with fruit and vines and this scope may expand over time.

Compliance Assessment Verification (CAV):

Contractors who are part of the CAV scheme will have a biosecurity plan included as part of their CAV requirements, and this will be audited as part of their existing CAV audit on an annual basis.

Non-CAV contractors:

For all other contractors that are not part of the CAV system, KVH has made available a simple Orchard Contractor Biosecurity Plan which can be completed and presented to growers or those engaging their services.

Supporting materials are available on the KVH website including:

- CAV contractor biosecurity plan template
- CAV contractor list
- Non-CAV biosecurity plan template
- Approved sanitiser list of products effective against high-risk organisms
- A good practice guide for on-orchard biosecurity, including contractors
- A pocket guide to orchard hygiene which is available in the following languages to recognise the diverse ethnic groups that operate in our industry:
    - English
    - Māori
    - Hindi
    - Nepalese
    - Punjabi
    - Samoan
    - Spanish
    - Thai
    - Simplified Chinese
    - Tongan

3.6 SAFE MOVEMENT OF NURSERY PLANTS AND SHELTER BELT PLANTS

Desired outcome:

To reduce the high risk associated with the movement of nursery plants and shelter plants into orchards without restricting practices necessary for industry growth.

Background:

The movement of plants is a high-risk pathway for spreading a wide range of pests. Nurseries, if not managed appropriately, are particularly high-risk as infected material could be spread to a large number of orchards across multiple growing regions within just 24 hours. This pathway isn't only limited to kiwifruit plants and also includes shelter plants which are planted within the orchard environment and may also provide a pathway for the entry of pests such as *Phytophthora.*

KVH has worked closely with kiwifruit nurseries since 2013 and has an existing biosecurity certification scheme in place, the Kiwifruit Plant Certification Scheme (KPCS). Over 50 nurseries are currently certified.

The KPCS is aligned with Pathway Plan requirements, meaning that certification to this standard provides a

simple means for nurseries to demonstrate they are compliant with the rules of the Pathway Plan. KVH has also supported the development of another certification scheme, Plant Pass, which is available to all plant producers in New Zealand, regardless of plant type. Plant Pass is a voluntary certification scheme recently developed by Biosecurity New Zealand, NZPPI, horticulture, viticulture, and forestry sectors, the Department of Conservation and regional councils to reduce risk associated with the plant production pathway. It is designed to protect the producer, their customers, the environment, and the New Zealand economy. KVH recognises Plant Pass as equivalent to the KPCS and meeting the requirements of the Pathway Plan.

Pathway Plan requirements (wording of the rule in the Order):

1) This rule applies to the owner of a nursery who sells or moves kiwifruit plants or kiwifruit shelter belt plants to an orchard or another nursery.
2) The owner must:
    a. immediately before the move, be registered with KVH; and
    b. have hygiene practices in place that ensure that, while the plants are grown at the nursery, all vehicles, machinery, tools, bins, equipment, and personal effects are clean and disinfected, using sanitisers approved by KVH and notified to the public; and
    c. have practices in place to ensure that:
        i. the plants are free from high-risk organisms; or
        ii. the movement of plants to an orchard or another nursery will not result in a significant increase in risk to the kiwifruit industry; and
    d. have a crop protection programme to manage and prevent the spread of high-risk organisms while the plants are grown at the nursery; and
    e. have practices in place to ensure that growing media are not reused (*see also* rule 10); and
    f. have practices in place to ensure that all tools, containers, and surfaces used during the plant production process, including the grafting and pruning processes, have been cleaned and disinfected using sanitisers approved by KVH and notified to the public; and
    g. have production and storage areas that:
        i. are free of harmful organisms; and
        ii. ensure that nursery plant batches are not mixed; and
        iii. ensure that kiwifruit shelter belt plant batches are not mixed; and
    h. have practices in place to ensure that monitoring of kiwifruit plants and kiwifruit shelter belt plants for harmful organisms is carried out by persons with the relevant experience, knowledge, and training; and
    i. have practices in place to ensure that testing for high-risk organisms, if required, is carried out by a laboratory approved by KVH and notified to the public that:
        i. has appropriate sampling and diagnostic methods; and
        ii. is independent of the producer; and
    j. have a system that enables the tracing of kiwifruit and kiwifruit shelter belt plant propagation material and plants:
        i. back to the last growing location and batch; and
        ii. forward to the buyer or final destination; and

k. have practices in place to ensure that records that enable the kiwifruit plant to be traced, including records of the entire chain of custody of the plants, are kept for a minimum of 7 years; and

l. have practices in place to ensure that all other records are kept for a minimum of 3 years.

3) An owner is exempt from complying with the requirements in subclause (2), other than having to keep records under paragraph (k), if the orchard:

a. supplies 1,000 kiwifruit plants or fewer per year; and

b. supplies only orchards that are owned by the owner.

Implementation approach:

To assist ease of compliance existing certification schemes (KPCS and Plant Pass) will be used as a clear path for nurseries to demonstrate compliance. The existing KPCS has been expanded to encompass shelterbelt species (those moved onto kiwifruit orchards) such that any plant producer growing kiwifruit plants, or kiwifruit and shelterbelt plants, that meets requirements of the KPCS will fully comply with this rule. This provides a clear and cost-effective pathway for nurseries and their customers to be assured they are fully compliant. For nurseries that do not grow kiwifruit plants, such as, those growing shelterbelt species only, KPCS is not available as a certification option but certification to Plant Pass satisfies the requirements of the plan.

The existing tailored risk management approach for kiwifruit growers who grow for own use will also be retained, with the intent that any kiwifruit grower that meets the grow for own use requirements will meet the requirements of this rule. The existing definition of grow for own use has been retained, which is movement of up to 1000 plants per year between orchards owned by the same legal entity. With the introduction of this rule the 1000 plant limit would apply to a cumulative total of kiwifruit and shelter plants.

KVH has a dedicated webpage for the safe movement of nursery plants which includes:

- listing of any high-risk organisms for this pathway (currently Psa);
- step by step guidance on how to meet the requirement of this rule;
- a manual that can be completed to demonstrate how these requirements will be met.

The current high-risk organism for the Pathway Plan is Psa and KVH will continue our current approach with a tiered certification, to allow for the movement of plants between properties of the same Psa status but prohibit movement from a positive to a non-detected property. Nurseries that can demonstrate freedom from the high-risk organism (Psa) are given KPCS Full Certification, whereas nurseries that are unable to demonstrate freedom (i.e., grow outdoor plants in an area where Psa is widespread and/or return Psa positive diagnostic test results) are given KPCS Restricted Certification. This tiered certification enables growers to easily distinguish the health status of the plants they are sourcing. Nurseries are required to label plant batches with their certification status and state it on the dispatch form. KVH provides a list of nurseries with certification status on the KVH website.

The Pathway Plan also has a 'Grow for your own use' option to enable the movement of up to 1000 plants per year to orchards owned by a single entity, with a lower level of risk management. This option recognises that some growers operate multiple orchards, and these properties may be highly connected through other pathways. Therefore, the movement of small volumes of plant material between properties under the same ownership presents little increase in risk to the industry and warrants a lower level or risk management.

There are three options available for sourcing or producing nursery plants:

- KPCS "Full Certification" (or Plant Pass equivalence)

- KPCS “Restricted Certification” (or Plant Pass equivalence)
- Grow for your own use – for smaller volumes and restricted movements subject to meeting risk management requirements.

Figure: Logos of certification schemes available to nursery plants (from left) KPCS Full Certification; KPCS Restricted Certification; Plant Pass.

Guidance material:

KVH has a dedicated staff member to support nurseries meet certification standards for plant material movements, and has additional information and templates available online, such as:

- step by step guides to achieve KPCS certification including nursery manuals;
- testing forms for KVH approved laboratories;
- guidance on orchard hygiene, monitoring, KVH approved sanitisers and their usage;
- templates for monitoring, sampling and testing, and traceability.

Audit:

Nurseries are to arrange their own annual audit with a local trained Independent Verification Agency (currently AsureQuality do most audits, SGS do some in South Island). Nurseries are to submit leaf samples for testing using the supplied sampling packs to the approved laboratories (currently Hills Lab in Hamilton).

Certification will be issued once all requirements have been met and only then may plants be moved between properties.

This is a well-established programme that KVH has been operating with kiwifruit nurseries since 2015.

3.7 SAFE MOVEMENT OF ORCHARD PLANTS

Desired outcome:

To reduce the high risk associated with the movement of plant material between orchards without restricting practices necessary for industry growth.

Background:

While most kiwifruit plant movements originate from nurseries, growers may occasionally move older plants between orchards. This is usually a deliberate strategy where planting occurs at a higher density than required and replanted with the aim of reducing time to production. The movement of plants is a high-risk pathway for the potential spread of pests and pathogens and the Pathway Plan includes requirements to reduce this risk to a level comparable with other plant pathways.

Pathway Plan requirements (wording of the rule in the Order):

1) This rule applies to an occupier or owner of an orchard who moves kiwifruit plants to another orchard.
2) The occupier or owner of an orchard must:
    a. immediately before the move, be registered with KVH; and
    b. have practices in place to ensure that any budwood coming into the orchard:
        i. is free from high-risk organisms; or
        ii. is unlikely to result in a significant increase in risk to the kiwifruit industry; and
    c. have a crop protection programme that uses products approved by KVH and notified to the public for use against high-risk organisms; and
    d. have practices in place to ensure that monitoring kiwifruit plants for harmful organisms is carried out by persons with the relevant experience knowledge and training; and
    e. have practices in place to ensure that testing for high-risk organisms, if required, is carried out by a laboratory approved by KVH and notified to the public that:
        i. has appropriate sampling and diagnostic methods; and
        ii. is independent of the producer; and
    f. have a system that enables the tracing of:
        i. kiwifruit plants from the occupier or owner to the buyer or final destination; and
        ii. kiwifruit plants and any budwood grafted onto those plants back to the last growing location; and
    g. have practices in place to ensure that records that enable kiwifruit plants to be traced, including records of the entire chain of custody of the plants, are kept for a minimum of 7 years; and
    h. have practices in place to ensure that all other records are kept for a minimum of 3 years.
3) Subclause (2)(f)(ii) does not apply in respect of a kiwifruit plant that was already growing, or budwood that was grafted, before 1 April 2022

Implementation approach:

To assist ease of compliance, existing certification schemes will be used as a clear path for growers to demonstrate compliance with the rules of the plan. The existing KPCS has been expanded to encompass orchard plants, such that meeting requirements of the KPCS will fully comply with this rule. This provides a clear and cost-effective pathway for growers supplying and receiving orchard plants to be assured they are fully compliant. Unlike nursery plants, there is no grow for your own use option for orchard plants as these are a less frequent movement that pose greater potential risk.

KVH has a dedicated webpage for orchard plant movements which includes steps and supporting materials to achieve certification. An Orchard Plant Manual template is available which is completed and submitted to KVH online. KVH will issue a KPCS certificate once monitoring and testing requirements are met. Orchard plants cannot move off the orchard until the supplier is either KPCS certified or can demonstrate compliance with the Pathway Plan rule.

Most of the requirements of this Pathway Plan rule are to manage the spread of risk organisms generically, such as:

- monitoring and not collecting from symptomatic vines,
- hygiene practices,
- traceability.

The plan recognises that for certain high-risk organisms these measures may not reduce risk to an acceptable level and additional organism specific measures may be required, such as diagnostic testing and the application of crop protection products. These additional requirements are only applicable for specific named organisms that both meet the criteria of a high-risk organism as defined in the plan and are listed by KVH on our website for this purpose because they are considered high-risk on this particular pathway.

To clearly display to purchasers that there are different levels of KPCS certification, KVH will use the Full and Restricted labels to differentiate between Psa non-detected, and Psa positive respectively, consistent with nursery plants (see figure above).

There is the possibility that new forms of Psa will evolve over time, with increased virulence or resistance to crop protection products. The industry has several mechanisms to monitor for these, including the nursery testing outlined in this plan, and we may review testing requirements with any new information that comes to light from these.

Guidance material:

KVH also has additional information and templates available online, including the following:

- testing forms for KVH approved laboratories;
- guidance on orchard hygiene, monitoring, KVH approved sanitisers and their usage;
- templates for monitoring, sampling and testing, and traceability.

Audit:

KVH will conduct paper-based audits of KPCS manuals to ensure all requirements have been met before issuing KVH certification. This will include copies of diagnostic testing records which are sent to us directly from the lab and may require evidence to verify other practices have been undertaken, such as monitoring.

KVH will also undertake site audits of some orchard plant movements, based on a random or risk basis. There will be no charge for these audits.

3.8 SAFE MOVEMENT OF BUDWOOD

Desired outcome:

To reduce the high risk associated with the movement of plant material between orchards without restricting practices necessary for industry growth.

Background:

The movement of kiwifruit plant material is a high-risk pathway for transmitting pests and diseases between orchards. Budwood is material used for grafting, typically taken as cuttings from the canopy of older vines. Any pests present in this material can easily be transmitted to another orchard or growing region with this movement.

There are specialist budwood suppliers and distributors in the kiwifruit industry who move significant volumes of material, but there are also many other small movements of short distances, such as between neighbours or orchards of the same ownership. This is because all orchards are a potential budwood source

and it doesn't require a dedicated operation such as the production of nursery plants. The occasional short distance movement is of less risk than a large supplier moving material to many orchards across growing regions, however if not captured then cumulatively these movements could jeopardise other risk management practices. Therefore, based on feedback during the consultation process the rules for budwood strike a balance between risk management and pragmatism. The objective is to have visibility of all budwood material movements to enable traceability in the event of an incursion, enable short distance movements that don't increase risk to the industry, and have a higher level of risk management for commercial suppliers of budwood.

Pathway Plan requirements (wording of the rule in the Order):

1) Subclauses (2) and (3) apply to an occupier or owner of an orchard who moves or sells budwood to another orchard or to a nursery.
2) The occupier or owner of an orchard must ensure that the budwood is produced by a producer who
    a. has practices in place to ensure that they provide:
        i. budwood from orchards, or parts of orchards, that are free from high-risk organisms; or
        ii. budwood that is unlikely to result in a significant increase in risk to the kiwifruit industry; and
    b. has a crop protection programme that uses products approved by KVH and notified to the public for use against high-risk organisms; and
    c. has practices in place to ensure that monitoring of vines, for harmful organisms, from which budwood is collected is carried out by persons with the relevant experience, knowledge, and training; and
    d. has practices in place to ensure that testing for high-risk organisms, if required, is carried out by a laboratory approved by KVH and notified to the public that:
        i. has appropriate sampling and diagnostic methods; and
        ii. is independent of the producer; and
    e. has practices in place to ensure that all tools, containers, and surfaces used during the budwood collection process are cleaned and disinfected using sanitisers approved by KVH and notified to the public; and
    f. has practices in place to ensure that budwood is not collected from cuttings left on the ground after pruning; and
    g. has practices in place to ensure that budwood batches are free of high-risk organisms and that the batches are not mixed with other budwood batches; and
    h. has a system that enables the tracing of budwood:
        i. back to the orchard it is sourced from and to the relevant batch from that orchard; and
        ii. from the occupier or owner to the buyer or final destination; and
    i. has practices in place to ensure that records that enable budwood to be traced, including records of the entire chain of custody of the budwood, are kept for a minimum of 7 years; and
    j. has practices in place to ensure that all other records are kept for a minimum of 3 years.
3) An occupier or owner of an orchard is exempt from complying with the requirements in subclause (2), other than having to keep records under paragraph (i), if the orchard:
    a. supplies budwood that enables grafting of 1000 kiwifruit plants or fewer per year; and
    b. supplies only orchards that are owned by the owner.
4) Subclause (5) applies to a person (a budwood distributor) who:
    a. buys or receives budwood from an occupier or owner of an orchard who supplies budwood; or
    b. buys or receives budwood from another budwood distributor; or

c. distributes budwood between an occupier or owner of an orchard who supplies budwood and an occupier or owner of an orchard.

5) If a budwood distributor moves or sells budwood, the budwood distributor must:
   a. immediately before the move, be registered with KVH; and
   b. have practices in place to ensure that any bags or containers within which budwood is stored remain sealed to prevent contamination or further contamination; and
   c. have a system that enables the tracing of budwood:
      i. back to the orchard it is sourced from and to the relevant batch from that orchard; and
      ii. forward to the buyer or final destination; and
   d. have practices in place to ensure that records that enable budwood to be traced, including records of the entire chain of custody of the budwood, are kept for a minimum of 7 years.

Implementation approach:

The implementation of this rule takes a pragmatic approach to ensure that all budwood movements are captured in the system and risk management is appropriate, relative to risk. The intention is to avoid a system that is overly restrictive and may drive movements underground. The following options have been provided and all budwood movements should fit into one of these categories:

1) Grow for own use:

This is a simplified risk management approach that applies where a grower only supplies budwood from one orchard to another orchard or orchards owned by the same legal entity, up to a maximum annual amount that enables grafting of no more than 1000 plants per year (recognising that growers may graft multiple sticks per plant, so a plant limit is the most appropriate limit). This reflects that the risk profile for growers that are only supplying their own orchards is lower, as they have strong incentives to protect their own investment and typically have significant pathway connections between those orchards (e.g., using the same machinery, equipment, personnel etc.). This provides a consistent approach with the existing grow for own use scheme for kiwifruit plants.

Under this option growers are only required to keep traceability records. These should be documented in their orchard biosecurity plan and KVH will achieve oversight through this mechanism.

2) Budwood distributor:

The distribution of budwood beyond an initial supplier may aid in the transmission of pest and diseases. Measures to mitigate risk for budwood distributors are focused on registering with KVH so that we are aware of whom to follow up with in an event, keeping traceability records, and maintaining the health status of the material by avoiding contamination. KVH will be working with the industry to ensure awareness of these requirements through targeted communications to parties most likely to act as budwood distributors; Zespri, post-harvest entities, grafters, and growers themselves who may end up with surplus wood and wish to provide this to others.

KVH has developed a traceability template, and online registration form to assist budwood distributors in meeting these requirements. These are available on the KVH website.

3) Budwood supplier:

Growers who provide budwood to other orchards (other than for own use) are considered budwood suppliers and are the main focus of this rule. Budwood suppliers are required to demonstrate how they meet the requirements of the rule above. To simplify this process KVH is expanding the existing KPCS to

include budwood, so that any budwood supplier who meets the requirements of the KPCS also meets the requirements of this Pathway Plan rule. This provides a simple means for suppliers to demonstrate to purchasers that their budwood meets the requirements of this Pathway Plan.

KVH has a dedicated webpage for budwood suppliers, which includes steps and supporting materials to achieve certification including an online registration form to initiate the process. A Budwood Manual template is available which is completed and submitted to KVH online. KVH will issue a KPCS certificate once monitoring and testing requirements are met and budwood cannot move off the orchard until the supplier is either KPCS certified or can demonstrate compliance with the Pathway Plan rule.

Most of the requirements of this Pathway Plan rule are to manage the spread of risk organisms generically, such as:

- monitoring and not collecting from symptomatic vines,
- hygiene practices,
- traceability.

To clearly display to purchasers that there are different levels of KPCS certification, KVH will use the Full and Restricted labels to differentiate between Psa free, and Psa positive respectively, consistent with nursery plants (see logos in figure above).

There is the possibility that new forms of Psa will evolve over time, with increased virulence or resistance to crop protection products. The industry has several mechanisms to monitor for these, including the nursery testing outlined in this plan, and we may review testing requirements with any new information that comes to light from these.

Guidance material:

KVH also has additional information and templates on our website, including the following:

- testing forms for KVH approved laboratories,
- guidance on orchard hygiene, monitoring, KVH approved sanitisers and their usage,
- templates for monitoring, sampling and testing, and traceability.

Audit:

KVH will conduct paper-based audits of budwood manuals to ensure all requirements have been met before issuing KVH certification. This will include copies of diagnostic testing records which are sent to us directly from the lab, and may require evidence to verify other practices have been undertaken such as monitoring.

KVH will also undertake site audits of a proportion of budwood suppliers each year. These audits may be random or targeted based on risk. There will be no charge for these audits.

3.9 SAFE MOVEMENT OF POLLEN

Desired outcome:

To reduce the high risk associated with the movement of pollen between orchards without restricting practices necessary for industry growth.

Background:

The movement of pollen is considered a medium risk pathway for transmitting pests and pathogens on kiwifruit industry pathways. Research shows that pollen is a potential transmission pathway for some

organisms, such as Psa, however the range of organisms is not as great as other plant material pathways such as plants and budwood[1]. The Pathway Plan includes requirements to reduce risk on this pathway through a range of generic practices and may also include additional measures for specific high-risk organisms. For this 2023 Operational Plan, the only specified high-risk organism for pollen is Psa. In practice this means that the requirements of the Pathway Plan for the movement of pollen will be similar to the existing requirements under the NPMP.

Pathway Plan requirements (wording of the rule in the Order):

1) A person must not move pollen onto an orchard unless the pollen is produced by a pollen mill operator that:
   a) immediately before the move, is registered with KVH; and
   b) has practices in place to ensure that they only mill flowers:
      i) from orchards, or parts of orchards, that are free from high-risk organisms; or
      ii) that are unlikely to result in a significant increase in risk to the kiwifruit industry; and
   c) has a crop protection programme that uses products approved by KVH and notified to the public for use against high-risk organisms; and
   d) has practices in place to ensure that monitoring, for harmful organisms, of kiwifruit plants from which flowers are collected is carried out by persons with the relevant experience, knowledge, and training; and
   e) has practices in place to ensure that testing for high-risk organisms, if required, is carried out by a laboratory approved by KVH and notified to the public that—
      i) has appropriate sampling and diagnostic methods; and
      ii) is independent of the producer; and
   f) has practices in place to ensure that all tools, containers, and surfaces used during the pollen milling process are cleaned and disinfected using sanitisers approved by KVH and notified to the public; and
   g) has practices in place to ensure that:
      i) pollen containers are sealed to prevent contamination; and
      ii) pollen containers are opened for the purpose of testing pollen viability in an area that is clean, sterile, and free of harmful organisms; and
   h) has practices in place to ensure that records that enable pollen to be traced, including the carrier records, are kept for a minimum of 7 years; and
   i) has practices in place to ensure that all other records are kept for a minimum of 3 years.
2) A pollen distributor that is not a pollen mill operator must not move pollen onto an orchard unless the distributor:
   a) immediately before the move, is registered with KVH; and
   b) has practices in place to ensure that:
      i) pollen containers are sealed to prevent contamination; and

[1] Everett KR, Xu G. July 2020. BS20149 Pollen pathway risk review. A Plant & Food Research report prepared for: Zespri Group Limited. Milestone No. 86095. Contract No. 38113. Job code: P/341085/01. PFR SPTS No. 19654.

ii) pollen containers are opened for the purpose of testing pollen viability in an area that is clean, sterile, and free of harmful organisms; and

c) has practices in place to ensure that records that enable pollen to be traced, including the carrier records, are kept for a minimum of 7 years

Implementation approach:

Pollen mills are required to demonstrate how they meet the requirements of the rule above. To simplify this process KVH is expanding the existing KPCS to include pollen, so that any pollen mill who meets the requirements of the KPCS also meets the requirements of this Pathway Plan rule. This provides a simple means for pollen mills to demonstrate that their pollen meets the requirements of the Pathway Plan.

KVH has a dedicated webpage for bees and artificial pollination, which outlines the requirements for both the Pathway Plan. This page includes steps and supporting materials to achieve certification including an online registration form to initiate the process.

A KPCS Pollen Manual is available on the KVH website which is completed and submitted to KVH online. KVH will issue a KPCS certificate once monitoring and testing requirements are met. Pollen cannot move from the mill until they are either KPCS certified or can demonstrate compliance with the Pathway Plan rule.

Anyone who has sourced pollen from a mill for further distribution is required to register with KVH and maintain traceability records. Growers must only source from pollen mills that meet the requirements of the Pathway Plan.

Most of the requirements of this Pathway Plan rule are to manage the spread of risk organisms generically, such as:

- monitoring for harmful organisms,
- hygiene practices and,
- traceability.

For this Operational Plan, Psa is the only specified high-risk organism and diagnostic testing is only required for Psa non-detected suppliers to enable supply to Psa non-detected growers (which is the same as operations under the NPMP).

To clearly display to purchasers that there are different levels of KPCS certification, KVH will use the Full and Restricted labels to differentiate between Psa non-detected, and Psa positive respectively, consistent with nursery plants (see logos in figure above).

There is the possibility that new forms of Psa will evolve over time, with increased virulence or resistance to crop protection products. The industry has several mechanisms to monitor for these, including the nursery testing outlined in this plan, and we may review testing requirements with any new information that comes to light from these.

Guidance material:

KVH also has additional information and templates available online, including the following:

- testing forms for KVH approved laboratories,
- guidance on orchard hygiene, monitoring, KVH approved sanitisers and their usage,
- templates for monitoring, sampling and testing, and traceability.

Audit:

KVH will audit all pollen mills to ensure all requirements have been met before issuing KVH certification. This will include copies of diagnostic testing records which are sent to us directly from the lab and may require evidence to verify other practices have been undertaken such as monitoring. There will be no charge for these audits.

3.10 SAFE MOVEMENT OF GROWING MEDIA

Desired outcome:

To reduce the risk associated with the movement of growing media between orchards without restricting practices necessary for industry growth.

Background:

Compost and mulch are routinely used by some kiwifruit growers to improve soil and plant health and to suppress weeds. These inputs and other organic inputs can introduce pests and pathogens into kiwifruit orchards. The level of risk is further elevated when kiwifruit plant material is included in growing media.

The kiwifruit industry recognises the movement of growing media as a pathway of significance and should be included in the Pathway Plan but tailored to focus on specific high-risk organisms of concern. Such practices have been in place for Psa under the NPMP, which as an organism specific to kiwifruit is relatively easy to manage on this pathway by excluding kiwifruit material as input into the product. Where kiwifruit is an input, such as for some commercial compost manufacturers, manufacturing to a specific time-temperature combination is sufficient to eliminate the threat.

Pathway Plan requirements (wording of the rule in the Order):

1) This rule applies to a producer of growing media who moves growing media onto an orchard.
2) The producer must have practices in place to ensure that:
    a. the product is free from high-risk organisms; or
    b. movement of the growing media to the intended location is unlikely to result in a significant increase in risk to the kiwifruit industry.
3) The producer must have practices in place to ensure that records are kept for 7 years after each movement that:
    a. set out how this rule has been complied with; and
    b. enable the growing media to be traced, including records of:
        i. the orchard receiving the goods; and
        ii. the carrier taking the goods; and
        iii. the dates of delivery of the goods to the orchard

Implementation approach:

Psa is the current specified high-risk organism for the Pathway Plan and therefore KVH's initial focus is growing media pathways that could potentially transmit this organism, which are mulch and compost.

Mulch containing kiwifruit plant material should not be moved between kiwifruit orchards and is prohibited from being moved from Psa positive to Psa non-detected orchards.

KVH has developed a simple manual for compost suppliers moving material between orchards to complete and demonstrate how they can meet the rules of the plan. With approved suppliers being listed on the KVH website. Compost manufactured appropriately removes many but not all pathogens including Psa.

Current compost manufacturing process requirements to reduce the risk of Psa are:

- turned at a minimum of every 30 days (over a minimum 5-month period),
- reach a minimum temperature of 55°C for a minimum of 3 consecutive days between turn periods (exceeding an advised threshold of which most organisms could survive).

These requirements are consistent with other New Zealand Standards (New Zealand Standard for compost, soil conditioners and mulches, NZS 2005; New Zealand Standard for organic production NZS2003)

KVH has a dedicated webpage for the safe movement of growing media which includes:

- listing of any high-risk organisms for this pathway (currently Psa),
- step by step guidance on how to meet the requirement of this rule,
- a manual that can be completed to demonstrate how these requirements will be met.

Audit:

KVH will conduct paper-based audits of compost suppliers which use kiwifruit plant material as an input, and may undertake site-based audits based on risk to ensure that any threats from high-risk organisms are being managed according to the practices documented in the Compost Manual.

Suppliers will have the option of being listed on the KVH website if they wish to be contacted by growers as a KVH approved source of growing media.

3.11 SAFE MOVEMENT OF RISK ITEMS BETWEEN NORTH AND SOUTH ISLANDS

Desired outcome:

An additional layer of protection is applied to movement or risk items across the Cook Strait.

Background:

The Cook Strait represents a defendable barrier to the spread of kiwifruit industry pests and pathogens. It represents both a barrier to natural spread of organisms (e.g., by wind, flight etc.) as well as a barrier to spread of organisms by people, as movements of risk items are more limited and easier to control. This has been demonstrated by the successful exclusion of Psa from the South Island to date.

This barrier represents a strategic opportunity for the industry to protect growers and ensure areas of clean plant material and fruit supply are maintained in the event of any outbreak affecting either island. This rule enables a higher level of risk management for movements between the North and South Islands (and vice versa) relative to movements within the North Island or within the South Island. These risk management practices can be tailored to reflect the level of risk associated with the movement and operate in either direction, recognising that the organism of concern may be present in either island.

Pathway Plan requirements (wording of the rule in the Order):

Final destination is orchard

1) A carrier must not move a risk item between the North and South Islands to an orchard unless:
    a. the carrier notifies KVH in writing at least 7 days before the proposed movement; and
    b. KVH approves the movement; and
    c. for kiwifruit plant material, the carrier ensures that the material has been quarantined, in a facility approved by KVH or an authorised person for that purpose and notified to the public, for the period of time required (if any) to:
        i. enable both the mother plants and any progeny to be determined to be free of high-risk organisms; or
        ii. establish that the movement of the material to the intended location is unlikely to result in a significant increase in risk to the kiwifruit industry; and
    d. for vehicles, machinery, and equipment intended to be moved to an orchard or used for processing pollen, the carrier ensures that the vehicles, machinery and equipment are:
        i. free of visible soil and plant material; and
        ii. sanitised with a sanitiser approved by KVH and notified to the public before movement between the North and South Islands; and
        iii. stored and transported in a manner that avoids contamination by any high-risk organism.
2) The period of time required to comply with subclause (1)(c) must include, if applicable, the time for the material to be:
    a. explanted from the in vivo plant to generate tissue cultures; and
    b. prepared for deflasking, including rooting and hardening; and
    c. tested for disease, and for testing results to be returned.
3) An occupier or owner of an orchard who receives a risk item moved between the North and South Islands must have documented practices in place to ensure that they obtain evidence that the carrier has complied with this rule before accepting receipt of the goods.

Final destination is nursery

4) A carrier must not move kiwifruit plant material between the North and South Islands to a nursery unless:
    a. the carrier has notified KVH in writing at least 7 days before the proposed movement; and
    b. KVH or an authorised person has approved the movement; and
    c. the carrier has ensured that the requirements in subclause (1)(c) have been met.
5) An owner of a nursery who receives kiwifruit plant material moved between the North and South Islands must have documented practices in place to ensure that they obtain evidence that the carrier has complied with this rule before accepting receipt of the goods.

Moving pollen-related items

6) A carrier must not move vehicles, machinery, or equipment between the North and South Islands for the purpose of pollen processing unless:
    a. the carrier has practices in place to ensure that the item is stored and transported in a manner that avoids contamination by any high-risk organism, and complies with those practices; and
    b. the carrier notifies KVH in writing at least 7 days before the proposed movement; and
    c. KVH has approved the movement; and
    d. the item:

i. is free of visible soil and plant material; and
ii. is sanitised with a sanitiser approved by KVH and notified to the public before the movement.

7) In this rule, **carrier** means the person responsible for moving and preparing the risk items for movement between the North and South Islands.

Implementation approach:

The rule applies to the movement of all risk items where the destination is an orchard, nursery, or for the movement of items associated with kiwifruit pollination. Risk items are defined in the Pathway Plan as:

Risk item means any organism, organic material, or other thing that (by reason of its nature, origin, or other relevant factors) it is reasonable to suspect constitutes or contains an organism that may cause unwanted harm to kiwifruit plants or the kiwifruit industry, including:

a) kiwifruit plant material; and
b) kiwifruit shelter belt plants; and
c) growing media; and
d) vehicles, machinery, and equipment (including beehives); and
e) personal effects.

For this 2023 Operational Plan, Psa is the only specified high-risk organism and the implementation of this rule is focused on preventing the movement of Psa from the North Island (where Psa is widespread) to the South Island (where Psa has not been detected). This provides consistency with previous measures under the NPMP where the South Island was an Exclusion Region and movement controls restricted the movement of risk goods from the North Island Recovery Region.

Vehicle machinery and equipment movements:

For the movement of vehicles and machinery, KVH must be notified in writing and equipment sanitised for the movement between islands. Inspections will be done by KVH staff in the Bay of Plenty and by KVH Regional Coordinators in other regions. KVH will provide written permission for the movement once inspection has been undertaken to provide suppliers, recipients, and carriers of goods confidence that requirements of the Pathway Plan are being met.

Plant material movements:

For plant material movements, which present the highest risk, the plant material must be free of high-risk organisms or not likely to result in a significant increase to the kiwifruit industry.

For movements from the South Island to the North Island – fulfilling the requirements under rules 6-10 fulfil this requirement with notification occurring during the annual registration step, and diagnostic testing undertaken to provide evidence of freedom from the high-risk organism (Psa). No further quarantine is required.

For movements from the North Island to the South Island – the presence of Psa in the North Island and absence from the South Island means that movements from Psa positive to non-detected orchards is prohibited. However, KVH developed a tissue culture pathway to enable the safe movement of clean material into Psa Exclusion and Containment Regions under the NPMP. This will be used to meet the requirements of this rule with approval from a KVH Authorised Person. This tissue culture pathway is a two-year process based on risk management measures from the *Actinidia* Import Health Standard and involves three stages; laboratory-based tissue culture; greenhouse; and an outdoor containment facility. KVH undertakes audits at each stage of the process. The tissue culture standard is available on the KVH website here and was last updated in June 2021.

Currently, while the South Island retains area freedom from Psa, meeting the requirements of this Tissue Culture Standard or Post Entry Quarantine are the only pathways available for the movement of kiwifruit plant material from the North Island to the South Island. Movement of kiwifruit plants, budwood or pollen by other means is prohibited under the Pathway Plan.

KVH has a dedicated webpage which provides clarity and public notification of these movements.

3.12 UNMANAGED AND ABANDONED ORCHARDS

Desired outcome:

To reduce the risk of pests and diseases spreading from unmanaged or abandoned orchards to other orchards, either by returning the orchard to a situation where it is effectively managed or removing abandoned vines and kiwifruit plant material.

Background:

Diseased orchards, if left unmanaged, increase the likelihood of amplification and pathway spread to other orchards.

Abandoned orchards with fruit present on vines pose a risk in terms of spread of kiwifruit seeds (for example, by birds), which could lead to establishment of wild kiwifruit populations.

Wild kiwifruit populations create a potential reservoir for pests and threaten indigenous biodiversity values, which is outside the scope of the Pathway Plan but is of significant concern to regional authorities, and the communities they represent.

The focus of KVH is to intervene in serious cases where an orchard is in a state that could lead to spread of harmful organisms to other orchards, and where every reasonable attempt has been made to achieve a voluntary solution, without success.

Since 2013 (under the NPMP) KVH has successfully worked with many growers to find voluntary solutions for dealing with unmanaged orchards and this is expected to be the primary approach here. This could involve the grower undertaking action, or another leaseholder taking over management of the orchard.

Targeted movement controls may be applied to prevent the spread of harmful organisms while the orchard is returned to a managed state.

Implementation approach:

KVH will only get involved to take action where the state of an orchard may cause unwanted harm to kiwifruit plants or the kiwifruit industry and where reasonable attempt has already been made by the grower and post-harvest operator to seek a voluntary solution, without success.

Where voluntary solutions are not found, KVH has a range of options available depending on the situation at hand, including:

- applying quarantine measures,
- applying targeted movement controls,
- applying effective treatments to reduce the risk of spread,
- giving directions to undertake management activities to reduce the risk of spread,
- working with regional authorities to remove the orchard where it may be considered wild kiwifruit under a Regional Pest Management Plan. KVH already has an existing memorandum of understanding (MOU)

between itself and some regional authorities, to jointly implement measures that relate to wild kiwifruit. KVH manages wild kiwifruit where these harbour, or have the potential to harbour, pests or pathogens that have the potential to spread on kiwifruit industry pathways. Some regional authorities manage wild kiwifruit and abandoned orchards in order to reduce the impact of wild kiwifruit as a plant pest that threatens indigenous biodiversity values. Where these interests align, KVH and the particular regional authority share costs and agree the most cost-effective approach to manage the risk.

3.13 WILD KIWIFRUIT

Desired outcome:

To reduce the risk of pests spreading from wild kiwifruit populations to kiwifruit orchards, and to work collaboratively with regional authorities and other agencies, orchard owners and the community to manage wild kiwifruit.

Background:

Wild kiwifruit populations are potential reservoirs for kiwifruit pests and therefore have been included as a kiwifruit industry pathway to be managed in this Plan.

Wild kiwifruit populations are unlikely to receive any form of crop protection and these unmanaged pest reservoirs may undermine wider efforts to control pests at a landscape level. This is particularly important when wild plants are accessible or in close proximity to managed orchards where there are a number of potential pathways for these pests to enter the orchard.

Uncontrolled, wild kiwifruit plants often produce fruit containing viable seed. Infestations can then spread, mostly through bird-borne seed dispersal, increasing the size of the problem and associated risk over time. Wild kiwifruit is difficult to control, and represents a clear case where prevention is better than cure and there is a strong economic rationale for getting on top of the problem early.

Relationship with regional authorities and regional pest management plans:

Some regional authorities have an interest in, and take action to manage, wild kiwifruit as part of a strategy to reduce the impact of wild kiwifruit on indigenous biodiversity values. Increasingly, regional authorities are adding wild kiwifruit as a pest plant within their Regional Pest Management Plans (RPMPs).

The preferred position of KVH is to collaborate with regional authorities where the interests of a regional authority and KVH align (i.e., KVH interest in disease control, and regional authority interest in protection of indigenous biodiversity), to achieve a coordinated approach to wild kiwifruit surveillance, monitoring, control, compliance, and related communications activities.

The opportunity for both KVH and regional authorities includes:

- achieving a greater level of overall control of wild kiwifruit, and reduced risk to values (orchard and indigenous biodiversity protection);
- achieving greater landowner cooperation, through a united approach, and ability to influence landowners from our different points of persuasion;
- leveraging our combined networks, to strengthen surveillance and encourage reporting of wild kiwifruit populations; and
- realising mutually beneficial savings by sharing costs.

Implementation approach:

KVH currently manages a wild kiwifruit control programme with a total budget of $665k, with significant funding contributions from the kiwifruit industry, Bay of Plenty Regional Council and landowners. As well as in-kind surveillance contributions from Tasman District Council, Marlborough District Council and Waikato Regional Council. This programme has a long history of successful control on a voluntary basis, with landowners incentivised by a 75% contribution towards control costs. Where the landowner has had no involvement in kiwifruit production, the programme may contribute up to 100% of control costs.

Highly subsidised rates offered by this wild kiwifruit programme make it likely that voluntary solutions to control this plant will be achieved with the landowner. However, in instances where voluntary agreement cannot be achieved, KVH could seek to use administrative powers under the Pathway Plan (see Section 5); or work with a Regional Authority to achieve compliance where wild kiwifruit is included as a pest plant within an RPMP.

3.14 RESEARCH AND DEVELOPMENT

KVH and Zespri collaborate on biosecurity research for the kiwifruit industry. KVH provides input into the strategic direction of the portfolio and technical input into specific projects, and Zespri Innovation fund and manage the portfolio.

The programme is overseen by a Technical Advisory Group which consists of members selected for their relevant expertise in biosecurity research. Representation includes organisations such as Crown Research Institutes, the Ministry for Primary Industries, Zespri, KVH and a Biosecurity Manager from another sector.

This portfolio of biosecurity research provides an avenue to address knowledge gaps relevant to the Pathway Plan, such as the justification to remove or add specific high-risk organisms to pathway requirements.

Technology transfer:

Results and outcomes from each individual research project are converted into grower summaries and made available to KVH for dissemination to kiwifruit growers via:

- R&D section of the KVH website,
- summaries in KVH grower newsletters,
- extensive articles in the technical Kiwifruit Journal magazine,
- presentations at the annual industry Grower Biosecurity Day in spring.

Budget:

The research budget is set by the Zespri Board and currently sits around $700K per annum. This could be increased if there were significant threats facing the industry.

4 PRIORITY OBJECTIVES AND PERFORMANCE MEASURES

4.1 PLAN'S OBJECTIVES: GENERAL

The Plan's objectives are:

a) to reduce the spread of harmful organisms on kiwifruit industry pathways; and
b) to ensure that harmful organisms on kiwifruit industry pathways are detected early; and
c) to ensure that the origin and spread of harmful organisms on kiwifruit industry pathways can be rapidly traced; and
d) to increase and sustain awareness in the kiwifruit industry of:
    i. risks associated with the spread of harmful organisms on kiwifruit industry pathways; and
    ii. practices to manage those risks.

4.2 PLAN'S OBJECTIVES: INTENDED ACHIEVEMENTS IN THE FIRST 10 YEARS

The following are intended to be achieved in the first 10 years after the Plan comes into force:

a) increased and sustained awareness in the kiwifruit industry of all risks associated with the spread of harmful organisms on kiwifruit industry pathways;
b) occupiers or owners of an orchard, kiwifruit post-harvest operators, and kiwifruit processors to have comprehensive risk management plans;
c) comprehensive risk management programmes for all kiwifruit plant material;
d) comprehensive risk management programmes for all orchard contractors that are proportionate to the level of risk they present;
e) systems in place to effectively trace risk items;
f) any spread of high-risk organisms on kiwifruit industry pathways to be limited and the existing freedom to move kiwifruit plant material between places to be maintained.

4.3 PERFORMANCE MEASURES AGAINST PATHWAY PLAN OBJECTIVES

KVH will report on the following measures in the annual Operational Plan. See Appendix 1 for the 2022/23 Operational Plan reporting.

Performance measures	*How these will be monitored and recorded*
Level of compliance with rules of the Plan	• Audit outcomes from industry assurance schemes (Zespri GAP) • Audit outcomes from certification schemes • Reporting of powers used under Act (i.e. Notice of Directions given under s122)
Level of biosecurity awareness and reporting in relation to the Plan	• Number of suspect organism reports to KVH • If high-risk organisms spread, or new high-risk organisms establish in the kiwifruit industry, the degree to which these are reported to KVH or MPI.
Level of uptake of biosecurity programmes and tools	• Number of certified nurseries, budwood suppliers, and pollen mills • Uptake of tools provided by KVH such as online biosecurity plan

provided by the Plan	portal.
The rates and establishment or spread of high-risk organisms associated with the Plan	• Monitoring and testing records from the suppliers of plant material (plants, budwood, pollen) will indicate if high-risk organisms are spreading. Retaining the South Island status as free of the initial high-risk organism Psa is the current objective. • Number of wild kiwifruit vines controlled. • Number of abandoned/unmanaged orchards removed with KVH assistance.
Traceability of risk items	• Audit records from Zespri GAP and certification schemes • Uptake of any digital traceability tools available to meet these requirements. • Number of movement permissions issued across the Cook Strait.

4.4 BUDGET

Implementing the Pathway Plan (excluding research) is budgeted at $992k for the 2023/24 financial year with these costs funded by the Pathway Plan levy struck at 0.6c per tray.

- This is a reduced budget from the $1.162M agreed at the 2022 KVH AGM, because of a significantly reduced kiwifruit tray volume forecast.
- This budget and levy per tray are a slight increase from 2022/23 because there were previously some efficiencies with the overlap of activities from the National Psa-V Pest Management Plan (NPMP) which expired on 13 May 2023.

The KVH budget is set at each KVH AGM, related to the resolution that sets the levy for the subsequent year.

5 LEGAL FRAMEWORK

There are two Orders in Council that provide the legal framework for implementing the Pathway Plan:

i. the Biosecurity (National Kiwifruit Pathway Management Plan) Order 2022; and
ii. the Biosecurity (National Kiwifruit Pathway Management Plan - Kiwifruit Levy) Order 2022.

The Biosecurity (National Kiwifruit Pathway Management Plan) Order 2022 establishes:

- KVH as the management agency responsible for implementing the Pathway Plan;
- objectives and principal measures of the Pathway Plan;
- rules within the Pathway Plan;
- powers that either KVH or an Authorised Person (refer to section 7.1 below) can use to implement the Pathway Plan.

The Biosecurity (National Kiwifruit Pathway Management Plan - Kiwifruit Levy) Order 2022 establishes a grower levy on kiwifruit exports (to countries other than Australia) to fund the implementation of the plan. The levy has a maximum rate of 0.7c per tray and will be set at 0.6c per tray for 2023/24.

KVH must report annually on its activities in accordance with requirements under the Biosecurity Act 1993 (i.e., section 100 (B) requirement to submit an annual Operational Plan, and report against the Operational Plan annually).

5.1 EXERCISE OF POWERS BY KVH AND BY AUTHORISED PERSONS

The Pathway Plan establishes powers that can be exercised in order to achieve the objectives of the Plan. Some of these can be exercised by KVH as the 'management agency' only, while others can be exercised by an 'authorised person' only.

KVH as the 'management agency' can exercise the power to:

- act on default (see section 128 of the Act);
- declare a specified area to be a controlled area (see section 131 of the Act);
- recover costs (see section 135 of the Act); and
- waive all or any part of a debt (see section 136(3) of the Act).

Authorised Persons can exercise:

- power to require assistance (see section 106 of the Act);
- power of inspection (see sections 109 and 112 of the Act);
- power of entry in respect of offences (see sections 111 and 112 of the Act);
- power to record information (see section 113 of the Act);
- general powers (see section 114 of the Act);
- power to apply articles or substances from an aircraft (see section 114A(3) of the Act);
- the use of dogs and devices (see section 115 of the Act);
- power to seize evidence (see section 118 of the Act);
- power to seize abandoned goods (see section 119 of the Act);
- power to intercept risk goods (see section 120 of the Act);
- power to examine organisms (see section 121 of the Act);
- power to apply any article or substance (see section 121A of the Act);
- power to give directions (see section 122 of the Act);
- power to vaccinate, etc (see section 123 of the Act);
- power to declare a place to be a restricted place (see section 130 of the Act).

Authorised Persons are appointed, at the request of KVH, by a Chief Technical Officer within the Ministry for Primary Industries. KVH must provide the Chief Technical Officer with evidence that proposed appointees have appropriate experience, technical competence, and relevant qualifications. Authorised persons must comply with any lawful direction or instruction given by a Chief Technical Officer in relation to the exercise of the above powers.

KVH intends to maintain appointment of three (two at a minimum) authorised persons for the term of the Pathway Plan. Current KVH staff as authorised persons are the Chief Executive, Biosecurity Manager, and National Operations and Compliance Officer.

5.2 OFFENCES AND PENALTIES

Failure to comply with any of the Plan rules 1-11 are an offence under the Biosecurity Act 1993 (see section 154N(18) of the Act).

Table 1: Summary of offences and corresponding penalties under the Biosecurity Act 1993, for serious cases of failure to comply with the Pathway Plan.

Offence	*Corresponding penalties*
Failure to comply with a rule of the Pathway Plan	• in the case of an individual person, to a fine not exceeding $5,000 • in the case of a corporation, to a fine not exceeding $15,000
Failure to comply with movement controls (set out in a Controlled Area or Restricted Place Notice)	• in the case of an individual person, to imprisonment for a term not exceeding 3 months, a fine not exceeding $50,000, or both • in the case of a corporation, to a fine not exceeding $100,000
Failure to comply with use of powers by an authorised person to 'inspect an organism' and 'to apply article or substance to place' (sections 121 and 121A of the Act respectively)	• in the case of an individual person, to a fine not exceeding $5,000 • in the case of a corporation, to a fine not exceeding $15,000
Threatening, assaulting, or intentionally obstructing or hindering an authorised person	• in the case of an individual person, to imprisonment for a term not exceeding 5 years, a fine not exceeding $100,000, or both • in the case of a corporation, to a fine not exceeding $200,000

Appendix 1: Performance measure reporting 2022/23

Performance measures	*How these will be monitored and recorded*	*2022/23 Reporting - 1 July 2022 to 30 June 2023*
Level of compliance with rules of the Plan	• Audit outcomes from industry assurance schemes - Zespri GAP.	851 GAP audits completed with 100% compliance. Note: KVH have three biosecurity control points within the Zespri Gap audit with no visibility on non-compliances that have been corrected to gain compliance. KVH will continue to work with Zespri to create visibility for reporting going forward.
	• Audit outcomes from industry assurance schemes - CAV.	523 CAV contractor audits completed with 100% compliance.
	• Audit outcomes from certification schemes.	52 nursery audits completed, 26 non-compliances raised and corrected for 100% compliance. 6 budwood supplier audits completed with 100% compliance. 10 pollen mill audits completed with 100% compliance.
	• Reporting of powers used under Act (i.e. Notice of Directions given under s122).	7 Notices of Direction issued to prevent the spread of a high-risk organism (Psa-V). 6 for a PSA-V variant investigation and 1 for an unmanaged nursery.
Level of biosecurity awareness and reporting in relation to the Plan	• Number of suspect organism reports to KVH.	47 total. 33 pathogens (fungal/bacterial/viral); 9 pests; 5 Other (nutritional/spray related). 6 of 47 referred to MPI PHEL.
	• If high-risk organisms spread, or new high-risk organisms establish in the kiwifruit industry, the degree to which these are reported to KVH or MPI.	>10 North Island KPINS notified KVH of a change of status from 'non-detected' to 'detected' for Psa-V. The South Island remains free of Psa-V. 0 new high-risk organisms were notified.
Level of uptake of biosecurity programmes and tools provided by the Plan	• Number of certified nurseries, budwood suppliers, and pollen mills.	46 certified nurseries; 29 certified budwood suppliers; 15 certified pollen suppliers.
	• Uptake of tools provided by KVH such as online biosecurity plan portal.	68 on-orchard biosecurity plans were submitted. Note: a biosecurity plan can cover multiple KPINs.
The rates and establishment or spread of high-risk organisms associated with the Plan	• Monitoring and testing records from the suppliers of plant material (plants, budwood, pollen) will indicate if high-risk organisms are spreading. Retaining the South Island status as free of the initial high-risk organism Psa is the current objective.	KVH records have 3,501 KPINS listed. 3,023 are Psa-V positive; 168 are 'non-detected'; and 310 currently have no status.
	• Number of wild kiwifruit vines controlled.	13,305 individual vines and 3.5 of matted vines were destroyed by KVH contractors.
	• Number of unmanaged/abandoned orchards removed with KVH assistance.	3 orchards removed with assistance from KVH.
Traceability of risk items	• Audit records from Zespri GAP and certification schemes.	851 GAP audits completed with 100% compliance. Note: KVH has a control point in the Zespri Gap audit stating all movements must be compliant with the Pathway Plan. Currently there is no visibility on non-compliances for this control point that have been corrected to gain compliance. KVH will continue to work with Zespri to create visibility for reporting going forward.
	• Uptake of any digital traceability tools available to meet these requirements.	2,741 properties were invited to use Onside. 858 properties have registered and 706 have enabled recording of movements.
	• Number of permissions issued for movements across the Cook Strait.	45 movement permissions issued by KVH in total. 6 of 45 movements were to an orchard or nursery as a final destination and complied with Pathway Plan requirements.

PSA-V SEASONAL MANAGEMENT WALL CHART 2022–2023

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BUILD A PLAN THAT MATCHES YOUR ORCHARD

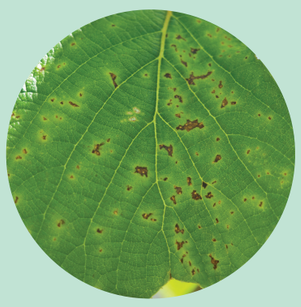
- Consider variety and rootstock, vine age, region, orchard environment, management practices and seasonal conditions when creating your plan.
- Use cultural methods to reduce Psa risk.
- Maintain a protective spray programme year-round.
- Use the Psa Risk Model (www.kvh.org.nz) to help plan spray timings and orchard work.

Scan for the Psa Risk Model.

CULTURAL METHODS

Monitor regularly to identify presence of Psa symptoms


Red/orange exudate


Leaf spot


Shoot and cane die-back


Flower bud infection

Prune out and dispose of infected material to reduce risk of Psa


Check for staining


Cut back to clean wood


Treat wounds


Always sanitise tools

Pre-flower girdle (Hayward and G14) to reduce flower-bud infection

- Girdle 30 days pre-flower on high-risk Hayward and G14 sites
- Avoid stressed vines
- Check girdle depth

- Girdle in dry weather only
- Sanitise tools between plants
- Apply summer rate copper to protect girdles

SPRAY PLAN

Develop a plan that considers orchard Psa risk, and weather risk, and be sure to protect wounds

Spring (very high-risk)	Maintain protective copper cover from budbreak through to flowering. Include products with different modes of action – Aureo Gold, Actigard and consider CPPU (for Hayward). Bactericides suit high-risk sites.
Summer (lower risk)	Apply copper prior to significant high-risk weather events. Also consider Aureo Gold.
Autumn (risk increases)	Use copper and Actigard immediately post-harvest. Maintain copper cover throughout leaf fall.
Winter (risk continues)	Apply winter copper before and after winter pruning and immediately prior to budbreak.

KVH RECOMMENDED PRODUCT LIST

Products have ACVM registration for Psa control. Spray rates are for high volume spraying (ie.volumes to the point of run-off). Adjust product rates per 100L if concentrate spraying. Use water rates appropriate for the size of the canopy to give complete coverage. This table is subject to change – refer to the KVH website for updates.

	Bud break	Green tip	Shoot growth	Flowering/pollination	Fruit growth	Post harvest	Leaf fall	Dormancy
COPPERS: Apply winter rate copper immediately prior to budbreak. From budbreak, apply summer rates at regular (10-14 day) intervals to protect expanding leaves, shoots and flower buds ahead of high-risk weather. Do NOT spray open flowers. After harvest apply copper to protect fruit stalks and leaf scars, and winter pruning wounds. Do NOT apply within 7 days of bud enhancing sprays. Always apply in good drying conditions and always use label rates. Max 8kg active/Ha/yr or 3kg for organics.								
Nordox™ 75 WG	37.5g/100L (summer)			DO NOT APPLY	37.5g/100L (summer) PHI 7 day	55 – 70g/100L (winter)		
Norshield 45WG	62.5g/100L (summer)				62.5g/100L (summer) PHI 7 day	92 – 117g/100L (winter)		
Kocide® Opti®	70 – 90g/100L				70 – 90g/100L PHI 7 day	70 – 90g/100L		
ChampION++®	70 – 90g/100L				70 – 90g/100L PHI 7 day	70 – 90g/100L		
Hortcare® Copper Hydroxide 300	50 – 90g/100L (summer)				50 – 90g/100L (summer) PHI 7 day	70 – 90g/100L (winter)		
Coptyzin	150 – 225ml/100L (spring)				125ml/100L (summer) PHI 7 day	150 – 300ml/100L (winter)		
Tri-base Blue®	150ml/100L				150ml/100L PHI 7 day	150ml/100L		
BACTERICIDES: Apply in high-risk orchards to reduce inoculum prior to, or immediately after, high-risk weather events. Leaf area is sufficient when leaves reach 25–30mm in diameter (50c coin). Use AI nozzles and drift-reducing adjuvants. Do NOT spray any flowers (male or female) or fruit. One pre-flower Kasumin® is allowed. Provides 10-14 days protection. KeyStrepto™ and additional Kasumin® applications require a JA. Follow user guides.								
Kasumin®	500ml/100L 21 DAY GAP			DO NOT APPLY	DO NOT APPLY	DO NOT APPLY		
KeyStrepto™	60g/100L (JA ONLY) 1 WEEK GAP							
BIO-BACTERICIDES: Apply when early leaves reach 25–30mm diameter (50c coin), and up until 6 weeks after flowering. Apply before high-risk weather to protect against leaf spot and flower bud infection. Reapply at 7-14 days, as required. Do not apply closer than 10 days after Kocide or 14 days after Nordox. DO NOT TANK MIX with coppers. Adjuvant use is recommended. Maximum 10 applications/year. Do not exceed 4.5kg/active/Ha.								
Aureo®Gold	50g/100L				DO NOT APPLY	DO NOT APPLY		
ELICITORS: Apply when early leaves reach 25–30mm diameter (50c coin) to protect against leaf spot and flowerbud infection. Requires 4–7 days for full effect. Reapply prior to flowering allowing 21 days between sprays. Do NOT apply to stressed plants. Do NOT spray flowers or fruit. Use immediately after harvest to protect fruit stalks and leaf scars. Foliage must be actively photosynthesising. Maximum 4 applications per season.								
Actigard®	20g/100L DO NOT exceed 200g/ha			NON PRODUCING VINES ONLY		20g/100L DO NOT exceed 200g/ha	DO NOT APPLY	
CPPU: Apply preventatively to protect against leaf spot. Requires 5-7 days for full effect. Apply when shoots reach 15-25cm and up until 3 weeks before first female flower opens. One pre-flower Ambitious is allowed. Use AI nozzles and drift reducing adjuvants. Ensure even coverage and Good Agricultural Practice spraying conditions. Do NOT spray female flowers or fruit. Not permitted on Gold3 or Red varieties. Not permitted as a growth regulator. Follow CPPU user guide.								
Ambitious 10SL®	50ml/100L	3 WEEK GAP		NON PRODUCING VINES ONLY		DO NOT APPLY		
BIOLOGICALS: Use in a programme. Suit lower risk sites. For BOTRY-Zen® use sufficient water to achieve run-off. Reapply after 7-14 days. Do not apply to fruit. Apply KiwiVax® soil drench through periods of active growth in damp conditions when temperatures are above 10°C. Apply 3 applications per season.								
BOTRY-Zen®	600g/100L				DO NOT APPLY	600g/100L		
KiwiVax® (Limited claim)	20g/100L – minimum 200g/ha			20g/100L – minimum 200g/ha (JA only)		20g/100L – minimum 200g/ha		DO NOT APPLY

Appendix 3: KVH approved sanitisers

Sanitiser information

Background

Appropriate hygiene measure must be taken to minimise the risk of transferring disease from vine to vine or between orchards. Disease can easily spread through infected plant material but equally may be transferred through orchard machinery, pruning tools, equipment, harvest bins, clothes and vehicles which are not cleaned.

Orchard hygiene practices are very important to help prevent disease spread, especially the removal of soil and plant material from equipment and machinery and footwear. Following with the application of a sanitiser is effective in killing many bacteria, fungal pathogens and viruses that may be present.

Sanitiser use and effectiveness

When using sanitisers consider the following:

- Do they have proven efficacy against a range of pathogens?
- Will the item being sanitised come into contact with picked fruit (i.e., picking bags, bins, fruit grading equipment)? If so, ensure the product is food safe.
- Does the product need to be Biogro approved (refer to the Biogro website)?
- Be aware of any health and safety risk associated with use (refer to Material Safety Data Sheet (MSDS) available from the supplier).
- Some sanitisers can be corrosive on some surfaces so refer to the supplier for more information.

TO ENSURE EFFECTIVENESS

- Before spraying with sanitiser ensure all surfaces are free of debris e.g., soil and plant material.
- Application method, minimum times, and rates of use in the efficacy table must be followed.
- Change sanitising solutions frequently (e.g., in footbaths) as a build-up of organic matter may reduce the efficacy of the sanitiser product over time.

DDAC-based compounds and other QACs (quaternary ammonium compounds) - such as benzalkonium chloride (BAC) - are not permitted for use on surfaces that come into contact with fruit as these products can create residue issues within markets.

It is recommended that post-harvest operators ask their sanitiser suppliers for an analysis certificate prior to purchasing sanitisers for use on surfaces which will come into contact with fruit.

Sanitiser information

Product type and/or active ingredients	Description and trade names	Rate	Effective on			Area for use					
			Fungal pathogens (Soil borne and tissue)	**Viruses**	**Bacteria** (including Psa)	**Hands**	**Facilities and work areas**	**Tools, equipment, and machinery**	**Footbaths**	**Vehicles**	**Harvest bins and picking bags**
			Effective when any soil and plant material removed before sanitising								
Broad spectrum disinfectants	Virkon	1%	✓	✓	✓			✓		✓	
	Varicide[2]		✓	✓	✓			✓			
	Envirosan	1%	✓	✓	✓			✓			
	Sterigene	1%	✓	✓	✓			✓			
Chlorine dioxide	Southwell AC, Hortisan, Biowash	1%	✓	✓	✓						✓
Household bleach[1]	e.g. Janola (unscented)(1:100 dilution)	1% (5% for tools)	✓	✓	✓		✓	✓	✓	✓	✓
>70% alcohol solutions	e.g. Methylated spirits *	Full strength			✓			✓			
Disinfectant sprays	e.g. Dettol use label rates	Label rates				✓	✓			✓	
Hand sanitiser	Gel, foam, or liquid antiseptic solutions	Full strength				✓					

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Bromo-chloro-dimethylhydantoin	Harvestcide gel	0.1%	✓		✓		✓	✓	✓	✓	✓
Octanoic acid	Aussan L44 *	0.3%	✓	✓	✓		✓	✓	✓	✓	✓
Sodium hypochlorite	Nuron BioSafe*	0.1%	✓	✓	✓		✓	✓	✓	✓	✓
Natural botanical oils	ActiveClean Botanical*	5%			✓		✓	✓	✓	✓	✓
Enzyme based cleaner/ sanitiser	Bio-Zyme Multipurpose*	6.25%			✓		✓	✓	✓	✓	✓
Weak organic acid – use label rates	Citric acid*	3%	✓		✓		✓	✓	✓	✓	✓
Citrus extracts	Citrox14T	1%	✓		✓		✓	✓	✓	✓	✓
	Citrox PWT	1%	✓		✓		✓	✓	✓		✓

[1] Bleach solutions must contain 0.042% hypochlorite to be effective against Psa. For Janola, this means a 1% working concentration (a dilution of 1:100). For other bleach solutions check the label to determine the dilution required. Janola breaks down over time so change the solution regularly if using long term.

[2] For Varicide efficacy testing refer to www.kvh.org.nz/vdb/document/657

Sanitiser information

∗ Sanitisers suitable for use on organic orchards.

For use on non-fruit contact surfaces only - HIGH RESIDUE RISK