

Background

Any substrate (plant material or inanimate object) has the potential to be a carrier of Psa-V bacteria onto a property, and within an orchard. Good hygiene practices will limit or prevent the spread of Psa-V from vine to vine or between orchards. It is impractical to stop all movement on and off the property so to mitigate risk a means of cleaning is required.

Scope

Orchard activities should be regularly reviewed to minimise the risk of transferring Psa-V infection within and between orchards through the movement of plant material. Orchard work should be avoided under wet or damp conditions. Using dedicated vehicles, washing down machinery on hard areas, and denying access to dirty machinery can reduce spread of disease. Cleaning tools between plants can reduce infection spread.

Requirements

The requirements described below are the minimum guidelines.

Access to orchard

- Contact the orchard owner or manager before entering any orchard property.
- Psa risk management signage should be displayed at the orchard property boundary with contact details listed.
- Ideally, there should be only one access point so all movements can be recorded—and an owner always knows who is on their property.
- Essential vehicles only should enter an orchard. Other visitors should be directed to a designated parking area outside the orchard.
- Growers should ensure contractors are aware of all key operational areas on the orchard—parking, equipment clean down, bin management and personnel sanitation facilities.

On arrival at an orchard

- Visitors should observe any additional hygiene requirements outlined by the grower.
- Before entering the property—and regardless of prior assurances—all visitor vehicles, equipment and footwear, should be cleaned in the dedicated wash-down area, and then sanitised by a disinfectant.
- Visitors should avoid going under the kiwifruit vines unless absolutely necessary. If a visitor is required to go under vines they must follow the owners expectations and wear the appropriate protective clothing (disposable coveralls, booties, hairnets etc.)
- Itinerant workers should not bring their own pruning tools and equipment onto the property.

Vehicle and Equipment Cleaning

- All orchards need to have a dedicated wash down/ hard-stand area, equipped with a high-pressure hose capable of dislodging caked mud from vehicles and equipment, prior to entry and exit.
- All tyres, wheel arches and other equipment taken onto an orchard should be sprayed with a high-pressure water hose. Particular attention needs to be paid to the underside of vehicles, ensuring tyres are thoroughly washed and nothing is trapped in the tread or in and around windows, bonnet and doors.
- After wash down of equipment, once visually clean, it should be sprayed with disinfecting solution, rinsed (optional) and air dried.
- Ensure any runoff or splash does not contaminate adjacent vehicles.
- No vehicles should leave an orchard until the vehicle has been sufficiently decontaminated



General hygiene—within orchard

- Dedicated equipment should be used. All equipment (including tools, and disposable footwear/clothing) should be assigned exclusively to the property.
- Tools should be washed and disinfected between bays/rows to limit any inadvertent spread of Psa-V within the property.
- Consider using two pairs of secateurs/girdling chain or other grafting equipment, alternating between them while the spare set is resting in disinfecting solution.
- Before leaving an orchard, used tools should be cleaned with detergent and water to remove all plant residues, then sterilised by soaking for a minimum of two minutes in a broad-spectrum disinfectant.
- Any cleaning equipment used, e.g. brushes, should be cleaned of visible plant material and disinfected afterwards.

Waste

- Any plant debris found must be placed in a special purpose rubbish bin to be disposed of on-site. Refer to KVH's *Disposal Options* on the KVH website www.kvh.org.nz/vine_removal.

People

- All workers and visitors should understand and follow the hygiene requirements prior to entering the canopy.
- Only necessary equipment and personal items are to be taken into the orchard property.
- Hands should be disinfected and footwear scrubbed (particularly the soles) immediately prior to entering and exiting the property. Use a footbath, or spray footwear with approved sanitiser.
- Before leaving the orchard, orchard workers and visitors should ensure clothing, headwear and footwear is clean and free of plant material/soil.



an

Sanitisers

Common sanitisers which can be used on surfaces that are visually free of contamination.

Product	Description	Typical uses
Broad spectrum disinfectants	Virkon, Trigene, Enviro-san, Varicide, *Extinct Pure. —use label rates	Orchard equipment and machinery, vehicles, footbaths.
*Citric Acid	Weak organic acid – use label rates	Orchard equipment and machinery, vehicle. Bins and picking bags.
10% household bleach	e.g. * Janola—use label rates	Orchard equipment, footbaths, bins and picking bags.
*Methylated spirits	> 70% alcohol solutions	Personal equipment .
*Disinfectant sprays	e.g. Dettol —use label rates	Hands, footwear.
*Hand Sanitisers	Gel, foam, and liquid antiseptic solutions	Hands.
* Aussen L44	Octanoic acid	Orchard equipment and machinery, vehicles. Bins and picking bags.
Harvestcide gel	Bromo-chloro-dimethylhydantoin	Orchard equipment and machinery, vehicles. Bins and picking bags.
* Nuron BioSafe	Sodium hypochlorite	Orchard equipment and machinery, vehicles. Bins and picking bags.

*Sanitisers suitable for use on organic orchards. Ensure any products have BioGro approval prior to use. Refer to BioGro website www.biogro.co.nz

Sanitiser use and effectiveness

When using sanitisers there are a number of considerations:

- Will the item to be sanitised come into contact with picked fruit? (i.e. picking bags, bins, fruit grading equipment)
- Ensure the product is food safe. Refer to www.foodsafety.govt.nz/registers-lists/maintenance-compounds/index.htm

NB: DDAC-based compounds and other 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 suppliers are asked for an analysis certificate prior to purchasing sanitisers for use on surfaces which will come into contact with fruit.

For a list of sanitisers that are permitted on surfaces that contact fruit (picking bags, bins and fruit grading equipment) please contact your marketer (e.g. Zespri, Turners & Growers etc.). Do not use any sanitisers that do not have your marketer's prior approval.

- With all sanitising solution options, consider the corrosiveness of the solution.
- Check compatibility with other chemicals used on the equipment e.g. detergent
- Ensure safety for humans. (Check the *Material Safety Data Sheet* (MSDS) for this information—available from the product supplier.)
- When spraying sanitisers, ensure all surfaces are free of debris, e.g. soil and plant material
- When using in footbaths—change the sanitising solution daily or more frequently if heavily contaminated. A build-up of organic matter may reduce the efficacy of the sanitiser product over time.

Efficacy of various sanitisers against PsA-V. The reports of this testing by VLS is available on the following links:

www.kvh.org.nz/vdb/document/91553 (2013 VLS testing report)

www.kvh.org.nz/vdb/document/91123 (2012 VLS testing report)

www.kvh.org.nz/vdb/document/91565 VLS efficacy testing report for Aussen L44

Orchard Hygiene (includes sanitiser selection)

9 May 2013 (version 10)



Summary					Sensitive to		Spray Applied				Dip Applied			
							Minimum time required for kill efficacy							
Product tested	Active ingredient	Conc	pH	Likely Residue ?	pH	OM	Wood	Plastic	Tyre	Metal	Wood	Plastic	Tyre	Metal
Envirosan	Glutaral, didecyldimethylammonium chloride, propan-2-o, methanol	1%	6.9	Yes	B	NS	10s	1 min	NE	10s	10s	10s	NE	10s
Trigene	Polymeric (Hexamethylene) bigunide hydrochloride alkyl dimethyl benzyl dimethyl ammonium chloride, dodecylamine sulphamat	1%	7.3	Yes	NS	NS	30s	NE	NE	10s	10s	NE	NE	10s
Citrox	Citrus pulp extract, water (demineralised), citric acid, glycerine	1%	6.4	No	NS	NS	10s	10s	NE	2 min	10s	1min	NE	2min
Janola	Sodium hypochlorite, sodium hydroxide	1%	8.4	No	NS	S	10s	10s	10s	10s	10s	10s	10s	10s
Virkon	Potassium peroxomonosulphate, sodium dodecylbezen sulphonate, sulfamic acid	1%	4	Yes	NS	S	10s	10s	10s	10s	10s	30s	10s	10s
H2O2	Hydrogen peroxide	3%	6.8	No	NS	NS	10s	NE	2min	10s	10s	2min	NE	10s
Teracep	Paracetic acid (peroxyacetic acid), hydrogen peroxide	1%	4.8	No	NS	S	10s	10s	10s	10s	10s	30s	3s	10s
Kiwilustre	Phosphate buffered lactic acid	1%	4.1	No	S	NS	10s	NE	NE	30s	10s	10s	10s	2min
Extinct pure	Chlorine dioxide	1%	4	No	NS	NS	10s	2min	NE	10s	10s	2min	NE	10s
Citric acid	Citric acid (100%)	3%	2.5	No	S	NS	10s	10s	30S	10s	10s	10s	10s	10s
Aussan L44	Octanoic acid	0.3%	3.4	No	-	NS	10s	10s	10s	30s	30s	30s	30s	1 min
Harvestcide gel	Bromo-chloro-dimethyl-hydantoin	0.1%	5.5	No	NS	NS	10s	10s	10s	10s	10s	10s	10s	10s
Citrox 14T	Citrus extract	1%	3.9	No	NS	NS	1 min	1 min	1 min	30s	10s	1 min	1 min	30 sec
BioWash	Chlorine dioxide	1%	8.8	No	NS	S	1 min	2 min	NE	NE	2 min	2 min	NE	1 min
Nuron BioSafe	Sodium hypochlorite	0.1%	7.2	TBC	NS	NS	10s	10s	10s	10s	10s	30s	10s	10s

NE= Not Effective, NS = Not Sensitive, S=Sensitive, B=Sensitive to basic conditions, OM = Organic matter

Orchard Hygiene (includes sanitiser selection)

9 May 2013 (version 10)



Kiwifruit Vine Health Incorporated (KVH) makes no warranty or representation as to the accuracy or completeness of the information, photographs or other published material in this publication. KVH shall not be liable to any person for loss, injury or damages arising from a person's reliance on the published material. Published material authored by a person other than KVH reflects the view of the author and not necessarily the view of KVH. The published material may be subject to copyright and shall not be reproduced in any manner without first obtaining the permission of KVH.