National Phylloxera Management Protocol

National Vine Health Steering Committee

Endorsed October 2009

Disclaimer

This document has been developed in good faith and based on the best up-to-date technical information. However no warranty is made nor is any responsibility whatsoever taken by the NVHSC or its subcommittees in relation to the adoption and application of all or part of the protocol by individuals or organisations.

INTRODUCTION

The National Phylloxera Management Protocol has been developed by the National Vine Health Steering Committee (NVHSC) to reduce the risk of spread of grapevine phylloxera. The National Protocol provides a consistent, technically justified framework for the movement of grapevines and grapevine material or associated potentially contaminated items between grapegrowing regions of different phylloxera status.

Taking a national approach

The primary purpose of the National Protocol is to provide a basis from which legislation and regulations for the movement of phylloxera risk vectors can be developed by each state and territory government, and to which the regulations can be aligned, creating a consistent set of requirements across Australia.

In addition, the procedures in the National Protocol can be used as best practice guidelines for the viticultural industries from which to develop regional, company-wide or individual protocols to prevent the spread of phylloxera. However, the national protocol does not replace state government legislation and it is important that relevant details of legislative and regulatory requirements are obtained from the department of Primary Industries or equivalent in each state, before any grapevine material, grape products or other identified phylloxera risk vectors are moved between states.

Dr Lois Ransom

Chair, National Vine Health Steering Committee

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OVERVIEW

Role of the National Protocol

The National Protocol has been developed and is maintained by the National Phylloxera Technical Reference Group (NPTRG), on behalf of the National Vine Health Steering Committee. The National Phylloxera Technical Reference Group comprises researchers, regulators, grapegrowers and others with expertise in the management of phylloxera and interpretation of scientific evidence.

The National Protocol is an **industry standard.** Its purpose is to define a set of agreed conditions under which a phylloxera risk vector may be moved from one region to another with a high degree of confidence that the movement will not lead to an infestation of phylloxera. It is *not* a legally enforceable document. The agreed conditions are based on an assessment of the risk of transfer associated with the risk vector, the research relating to survival of phylloxera in various situations, and the likelihood of phylloxera being present in the originating region. All conditions detailed in this Protocol are supported by scientific evidence and/or an agreed position reached by the committee members during discussion. See Appendix 4 for a list of the main reference documents and papers supporting the National Protocol.

NB It is the opinion of the NPTRG that, notwithstanding the conditions specified in this document, wherever possible, movement of risk vectors out of Phylloxera Infested Zones should be avoided.

Basic concepts underpinning the National Protocol

There are two important concepts that underpin the National Protocol. These are:

- National Phylloxera Management Zones
- Phylloxera Risk Vectors

Phylloxera management zones are classifications of geographical regions according to whether they have been found to have phylloxera or not. There are three types of zone:

- Phylloxera Infested Zones
- Phylloxera Exclusion Zones
- Phylloxera Risk Zones

All of Australia's grapegrowing regions have been classified in terms of these zones. The definitions of the zone categories can be found in the Glossary. The current list of recognised zones and a location map can be found in Appendix 1. It is important to note that these are industry terms and are not necessarily translated directly into state legislation.

The Protocol is designed to prevent the spread of grapevine phylloxera by:

- preventing the movement of phylloxera out of **Phylloxera Infested Zones (PIZ)** and out of **Phylloxera Risk Zones (PRZ)** where the phylloxera status is undetermined, and
- preventing the entry of phylloxera into **Phylloxera Exclusion Zones (PEZ)**.

Phylloxera risk vectors are defined as items that could potentially transfer phylloxera from one place to another.

Because phylloxera only survives on *Vitis* species (grapevines and ornamental vines), risk vectors are either grapevine material and grape products, or other items that come into contact with grapevine material, grape products or vineyard soil and therefore could be contaminated with phylloxera.

Risk vectors recognised in this document are:

- Grapevine material
  - Cuttings
  - Rootlings including grafted rootlings
  - Potted (green) vines
  - Diagnostic samples
- Winegrapes
- Tablegrapes
- Winegrape products[1]
  - Must
  - Juice
  - Marc
- Vehicles used in or near vineyards by vineyard visitors
- Vineyard equipment and machinery (used) – including grape bins
- Vineyard visitors (clothing and footwear)
- Vineyard soil

The full definitions of these risk vectors can be found in the glossary on the following page. Note that *vineyard* includes vineyards growing grapes for wine, table or dried fruit industries.

Legislative requirements

Phylloxera is a quarantinable pest that is currently known to be present in Australia only in certain defined areas of Victoria and New South Wales (see map – Appendix 1). These are quarantine zones, and legislative controls apply to movement of host produce (risk vectors) out of these zones. In addition, there are other areas in these states that are defined as phylloxera exclusion zones and entry of risk vectors into these zones is also controlled by state legislation. All other states have legislation that restricts or prohibits the entry of phylloxera risk vectors, depending upon where it originates from. Movement of phylloxera risk vectors (also described as "hosts" within government legislation) across state borders or between defined quarantine zones or phylloxera exclusion zones *must comply with the relevant state legislation.* State legislation is *generally* based on the National Protocol. However, the National Protocol does not attempt to prescribe the regulatory requirements that are put into place to manage compliance with the specified treatments and/or movement restrictions. Therefore there is no mention of permits, certificates or ICA arrangements in the National Protocol; although in practice these would apply as a regulatory overlay to allow the implementation of the protocol in practice.

See Appendix 3 for a list of contact details for Departments of Agriculture or Primary Industries in each state.

[1] Wine is not a risk product as the process of fermentation (for a minimum of four days) has been shown to be an effective disinfestation for phylloxera.

GLOSSARY OF TERMS

General phytosanitary terms

General phytosanitary terms and definitions used in this document are understood to have the meaning described in the International Standards for Phytosanitary Meansures (ISPM No. 5 – *Glossary of Phytosanitary Terms*). The glossary can be obtained from the following website: www.aphis.usda.gov/import_export/plants/plant_exports/downloads/ISPM5.pdf

Terms specific to the wine industry and the movement of phylloxera risk vectors are defined below.

Risk vectors

Cuttings are portions of a grapevine cane taken for use as planting material, that have not been planted in soil or permitted to develop roots.

Diagnostic samples can be any part of the grapevine plant – taken for the purpose of carrying out a diagnostic test, such as petiole analysis, disease identification, DNA-typing or bud dissection. Diagnostic samples also include vineyard soil samples.

Grape bins are bins used for collecting winegrapes from a vineyard for transporting to a processing facility.

Grapevine material includes plant material of any *Vitis* species – including *Vitis vinifera* (winegrape varieties), ornamental vines and American "rootstock" species. Material includes: cuttings, rootlings, grafted rootlings (graftlings), plants, prunings, diagnostic samples, germplasm material and leaves, sticks, roots etc.

Juice is the liquid fraction from must, excluding skins, seeds, and other large solids, that may contain some suspended solids.

Must is the total product of crushing grape berries, includes juice skins, seeds, pulp and possibly some stems and leaves.

Marc is the solids residue from crushing or pressing of must (*pre-fermentation marc*) or wine fermented on skins (*post-fermentation marc*), containing skins, seeds and possibly stems.

Rootlings are grapevine plants that have been grown in a nursery so as to develop roots (including callus). *Graftlings* are grafted rootlings where a scion cutting has been grafted onto a rootling.

Table grapes are grapes labelled as being table grapes. Note: dried fruit are not included in the ambit of this document.

Vineyard equipment or machinery includes any used machinery or hand-operated equipment, tools, etc. that have been used in a vineyard. For example: grape harvesters, grape bins, tractors, spray equipment, shovels, pruning snips.

Vineyard soil is any soil that comes from within 100m of a living grapevine.

Vineyard vehicles are any vehicles that drive onto vineyard soil – eg trucks towing in equipment or delivering grape bins and cars driven by vineyard visitors.

Vineyard visitors are any people who enter the vineyard and walk amongst the vines – eg vineyard workers, contractors, winemakers, consultants, supplier representatives, tourists.

Winegrapes are grapes grown for making into wine.

Other relevant terms

Crushing facility is a grape receiving and processing facility that may supply must or juice to another facility for further processing.

Phylloxera Exclusion Zone (PEZ)[2] is an area that is recognised by the NVHSC as being free of phylloxera. Such an area must have been demonstrated by scientific evidence to be free of phylloxera, AND be governed by appropriate legislation to control the movement of risk vectors into the area. There is a process defined as part of the National Protocol for upgrading the status of a grapegrowing region from PRZ to PEZ (see Appendix 3). A PEZ is an example of a **Pest Free Area** (ISPM 5).

Phylloxera Infested Zone (PIZ) is an area containing vineyards known to be infested with phylloxera or to have been infested with phylloxera. The boundaries of a PIZ must be a minimum of 5km from the closest infested vineyard. PIZs recognised by the NVHSC are the phylloxera control areas defined in state legislation as a result of an outbreak having been detected. A PIZ is an example of an **Infested Area** (ISPM 5).

Phylloxera Risk Zone (PRZ) is defined as any area not otherwise classified as a PIZ or PEZ – ie an area where the phylloxera status is undetermined. While the definition principally refers to grapegrowing regions, it is not restricted to these. Therefore all of Australia not already classified as a PEZ or PIZ is automatically classified as a PRZ.

Receiving winery is a processing facility outside the grape source region where must or juice is sent for further processing.

Terms related to regulatory arrangements

Plant Health Certificate or Plant Health Assurance Certificate is an official document obtained from a State Department of Primary Industries (or equivalent) to certify that the requirements for movement of a risk vector have been met.

Interstate certification assurance agreement (ICA) is a formal agreement between States to facilitate movement of quarantine risk materials and minimise the risk of spread of specified pests or disease in accordance with a defined, self-managed procedure. There are three such agreements that relate to phylloxera: ICA-22 (movement of grape must and juice); ICA-23 (movement of whole winegrapes) and ICA-37 (hot water treatment of grapevines). ICA-33 relates to the movement of whole winegrapes where fruit fly as well as phylloxera is an issue. Refer to the website www.ica.gov.au for more information on the ICA system.

Permit is a general term for an official document obtained from a State Department of Primary Industries (or equivalent) as a necessary part of the process of moving a host product.

[2] The schedule of currently recognised PEZs and PIZs and a map showing their location can be found in Appendix 1.

MOVEMENT PROCEDURES

Summary of movement procedures and relationship to risk vectors

The table below is an overview of the agreed conditions for movement of different risk vectors, according to where they are moving from/to.

Risk vector	**PIZ to PEZ**	**PIZ to PRZ**	**PRZ to PEZ**	**PEZ to PEZ**
Whole winegrapes	Prohibited	Prohibited	Procedure A	No treatment
Grapevine cuttings and rootlings	Prohibited	Prohibited	Procedure B	Procedure B
Green potted vines	Prohibited	Prohibited	Prohibited	Procedure B1 *Not endorsed*
Diagnostic samples	Procedure C	Procedure C	Procedure C	No treatment
Must or juice	Procedure D	Procedure D	Procedure D	No treatment
Marc	Procedure E	Procedure E	Procedure E	No treatment
Tablegrapes	Procedure F	Procedure F	Procedure F1	No treatment
Vineyard equipment	Procedure G	Procedure G	Procedure G	No treatment
Vineyard visitors (clothing and footwear)	Procedure H	Procedure H	Procedure H	No treatment
Vineyard vehicles	Procedure I	Procedure I	Procedure I	No treatment

Note that in practice movement of a risk vector requires compliance with state legislation – which may not be identical to the National Protocol. Plant Health Certificates or other certification will usually need to be issued in the state where the material is to move *from,* to ensure that the correct procedures have been carried out. Alternatively a *permit* may be issued, which authorises movement under certain conditions, or movement may be authorised under an Interstate Certification Assurance (ICA) arrangement.

List of procedures

Movement of fresh winegrapes out of a PRZ into a PEZ	**Procedure A**
Requirements: source vineyard	Vineyard must be inspected annually for phylloxera using the NVHSC approved survey protocol – and no phylloxera found. Vineyard must have protocols in place to prevent the entry of phylloxera (ie visitor and machinery disinfestation procedures, controlled access, documentation of source of planting material). Grapes must be packed in bins which have been cleaned free of all soil and plant material before delivery and securely covered after packing.
Requirements: transport	Bins must be loaded onto a transport vehicle on a hard surface, not within the vineyard. Transport vehicle must be cleaned free of all soil and organic matter (see procedure I) Load must be securely covered. Transport should be via the most direct route possible and preferably not through a PIZ.
Requirements: receiving winery	Secure receival area with hard stand[3] and wash-down facilities. Waste water disposal away from vines. Inspect bins and transport vehicle for cleanliness and load security. Check origin of load.

[3] Hard stand could include consolidated gravel or rubble surface. Excludes earth surfaces.

Movement of grapevine cuttings and rootlings from a PRZ or PEZ vineyard or nursery into a PEZ	**Procedure B**
Requirements: cuttings	Cuttings must originate from a PRZ or PEZ vineyard. Cuttings must be fully lignified before taking. Cuttings must be washed free of soil and excess organic matter before bundling. (If bundled) no more than 200 cuttings approx. in a bundle. Cuttings must undergo disinfestation procedure below immediately prior to dispatch. Material must be handled subsequently so as to prevent contamination / infestation after treatment.
Requirements: rootlings (including grafted rootlings)	Original cuttings must be sourced from a PRZ or PEZ vineyard AND must be disinfested as below prior to growing on as rootlings. Rootlings (including grafted rootlings) must be fully dormant before lifting. Rootlings must be bare-rooted and washed completely visibly free of soil prior to treatment. (If bundled) no more than 100 rootlings approx. in a bundle. Rootlings must undergo heat treatment as specified below immediately prior to dispatch. Material must be handled subsequently so as to prevent contamination / infestation after treatment.
Requirements: transport	Transport should be via the most direct route and preferably not through a PIZ.
Disinfestation procedure:	Cuttings / rootlings must be hot water treated immediately prior to despatch as follows: EITHER at 50°C +/- 1°C for 30 minutes OR at 54°C +/- 1°C for 5 minutes The hot water treatment procedure MUST ensure that ALL material reaches the required temperature for the specified time.

Movement of green potted vines from a PEZ nursery into another PEZ	Procedure B1

This procedure has not been endorsed by the National Vine Health Steering Committee. It is still under development.

Movement of diagnostic samples from a PIZ or PRZ into a PRZ or PEZ	**Procedure C**
Scope	This procedure applies to diagnostic samples of any part of the grapevine plant, AND vineyard soil samples. Note: where possible, diagnostic procedures should be carried out within the PIZ or PRZ where the material originates from – or moved to another region of equal or lower health status for testing.
General procedure	1. Sample material MUST undergo one of the disinfestation procedures listed below, within the originating PIZ or PRZ region, before the sample is moved to another region for testing. 2. ONLY IF it is not possible to disinfest the material without compromising the integrity of the sample or the validity of the diagnostic procedure, or if there are no disinfestation facilities available in the region of origin, then movement may be allowed without disinfestation direct to the diagnostic laboratory, under strict conditions of security. 3. Sample collection Ensure that disinfestation procedure as per Procedure H is followed by those collecting samples. 4. Sample dispatch The laboratory to which the samples are being sent must be accredited/ approved by the State Department of Primary Industries or equivalent to handle potentially infested material. Samples are to be dispatched by overnight courier, express post or similar to minimise chance of sample being lost in transit, and to provide trace-back procedures if required. Samples must be labelled with the origin and nature of the sample, as well as contact details of the owner. 5. A log of samples dispatched should be kept until diagnostic testing has been completed and all samples accounted for. 6. The laboratory should be notified that a sample has been sent. 7. Sample receipt Samples are to be inspected on arrival. Samples received that do not meet the permit criteria are to be destroyed immediately. Samples are to be held in a secure area so that no material can be removed from the laboratory. 8. After analysis, samples and any unused material that were not disinfested beforehand must be disinfested using one of the approved disinfestation procedures (see below), or destroyed by an approved method – eg autoclaving.

Movement of diagnostic samples from a PIZ or PRZ into a PRZ or PEZ	**Cont.d**
Disinfestation procedures	Any ONE of the following procedures: a. Freezing to -18°C for 24 hours, pack in dry ice for transport b. Freezing and transfer under liquid nitrogen at -196°C c. Freeze drying d. Oven drying at 45°C for a minimum of 2 hours[4] e. Sealed, unbreakable vessel (for juice samples) f. Hot water treatment at 54°C +/- 1°C for 5 mins or 50°C for 30 mins g. Fixative – devitalisation using formalin/acetic acid, gluteraldehyde, 70% ethanol or similar

[4] Probes should be used with large samples to ensure middle has reached the required temperature.

Movement of must or juice from a PIZ or PRZ into a PEZ	**Procedure D**
Scope	This procedure applies to must and juice – ie the products of crushing/destemming and (optionally) pressing of red or white winegrapes.
Requirements	Product (must or juice) must EITHER Complete one of the disinfestation procedures described below OR Be moved under the conditions described in the rest of Procedure D. Products that have completed a disinfestation procedure as described below (wine or processed juice) may move out of a PIZ or PRZ into a PEZ unrestricted (with certification that the process has been completed and all conditions met).
Disinfestation procedures:	Completed at least three days (72 hours) of fermentation Filtered or otherwise processed to achieve a maximum particle size of 50 microns.

The remainder of this procedure applies to the movement of must or fresh juice that may potentially contain live phylloxera.

Movement of must or juice from a PIZ or PRZ into a PEZ	**Cont.d**
Requirements: crushing facility	The crushing facility must have: a. a hard stand[5] tanker/truck cleaning and inspection area, preferably with a sealed wash down and drainage area b. a dedicated tanker loading area, with a hard stand surface[6] c. a separate exit road for tankers, with a hard surface (preferably sealed), away from roadways adjacent to vineyards and roadways used for bringing grapes in to the receival point. d. appropriate signage and notices to ensure proper use of designated areas, applicable speed limits, restricted access areas etc.
Procedure: crushing facility	1. Grapes grown in the PIZ or PRZ vineyard are transferred directly to the crushing facility and crushed, with or without destemming and pressing 2. Must or fresh juice is loaded onto the tanker in the designated loading area. Any spillage or overflow (solid or liquid) is washed off to the disposal system 3. The exterior of the tanker is thoroughly cleaned (see below). 4. Relevant details, including verification of protocol compliance, are entered on the movement document.
Requirements: transport	1. Tankers must be in good condition, thoroughly clean and readily cleanable inside and out. 2. Tankers must be able to be sealed effectively to prevent leakage or spillage of must or juice. Valves should enable tankers to drain dry after emptying and cleaning. 3. The use of warning labels or stickers, on the tanker outlet valves, advising that the product originated in a PIZ or PRZ, is encouraged. 4. Drivers shall be equipped with an effective means of mobile communication such as CB radio or mobile phone. 5. It is recommended that dedicated tankers and trained staff be assigned to the duty of transporting grape products.

[5] Hard stand could include consolidated gravel or rubble surface. Excludes earth surfaces.
[6] A multi-purpose loading, cleaning and inspection area is acceptable

Movement of must or juice from a PIZ or PRZ into a PEZ	**Cont.d**
Procedure: transport to receiving facility	Loading 1. Tankers entering the crushing facility travel by specified roadways. 2. Tankers are parked initially on the designated loading area. 3. Drivers must not enter vineyards or grape processing areas. 4. All tanks are effectively closed and sealed. 5. The tanker is inspected before departure and documents signed. Journey 6. A travel plan showing the route to be taken to the destination outside the PIZ is prepared, recorded on the permit and subsequently followed. The route should be as direct as possible, confined to hard surfaced (preferably sealed) roads and preferably avoid passing through vineyards or their immediate surrounds. 7. The tanker travels to the destination along the predetermined route. 8. In the event of an accident and spillage of unfiltered juice or must, the disinfestation procedure below must be followed.
Disinfestation procedure for accidental spillage of must or juice en route from a PIZ or PRZ.	In a PIZ: Wash spilled material (liquid and solid) from the roadway well away from any vineyards. Restrict access by passing traffic and people, to avoid cross contamination. In a PEZ or PRZ remote[7] from any vine: As above. In a PEZ or PRZ close to grapevines: Restrict access by passing traffic and people. If a minor spill, ie less than 100 litres: 1. Wash material from roadway well away from vines 2. Attempt to contain spill with sand, block drainage toward grapevines. If a major spill, ie greater than 100 litres: 1. Notify Dept of Primary Industries or equivalent, who should take charge of clean-up as below. 2. Block drainage of the spill toward grapevines 3. Absorb spilled material with sand 4. Remove contaminated sand to a dry disposal area at least 500m from any grapevine 5. Disinfest the area as appropriate. In a PEZ or PRZ adjacent to or actually in a vineyard: Proceed as above. Quarantine the vineyard and test for the presence of phylloxera after two years and after four years.

[7] As a guide, "remote' is in excess of 100m; however topography and drainage patterns must also be considered. A vineyard on significantly higher ground than the spill site may be considered remote even if within 100m while vines down hill and in the path of a drain or gully may be at risk at distances over 300m.

Movement of must or juice from a PIZ or PRZ into a PEZ	**Cont.d**
Facilities: receiving facility	1. The receiving winery should have a dedicated unloading area for must and fresh juice, separated from traffic to and from local vineyards (eg route of trucks delivering grapes to the winery). The unloading area must have a sealed[8], hard surface with wash-down cleaning facilities and drainage to a defined area with no risk of wastewater or spillage running into vineyards. 2. Appropriate signs should be used to indicate designated areas and roadways, and access to these areas controlled – eg with physical barriers, bunting (flags), fencing etc. 3. All waste disposal (solid and liquid) must be controlled, eg with adequate divisional walls, guttering, pipelines and/or embankments to prevent untreated waste contacting vines[9]. 4. Waste water treatment facilities must comply with EPA installation and operational guidelines for prevention of accidental spillage. 5. Waste water treatment must be sufficient to avoid contact of untreated and potentially contaminated waste water with grapevines. Attention to be paid to the retention time, distance from vines and security to prevent cross-contamination. For example: i) direct land disposal, as with sprinklers, remote[10] from vines ii) single or sequential settling ponds – retention time at least 72 hours and bottom delivery (submerged inlet) iii) closed sewerage system. 6. Waste water must not be reused after treatment for vineyard irrigation unless it has been further treated to ensure phylloxera removal or destruction. 7. Solids from solid traps in effluent systems must not be emptied onto vineyards unless disinfested (eg by pasteurization or composting – see Procedure G). 8. Appropriate fences, walls or other barriers must be provided around waste disposal areas to prevent casual contamination by persons and vehicles. 9. The winery is required to maintain sufficient security of vessels to prevent spillage of juice and must.

[8] Bitumen, concrete or equivalent
[9] Control measures may be temporary – ie only during time when product is being received from a PIZ
[10] See note 7.

Movement of must or juice from a PIZ or PRZ into a PEZ	**Cont.d**
Procedure: receiving facility	1. Trucks entering the winery premises travel by the specified roadways to the dedicated unloading area. 2. Before unloading is commenced, the permits, cart note and other documents are checked by the authorised officer of the receiving winery to verify that all prescribed procedures have been followed. 3. The transport vehicle is inspected for cleanliness (especially for any plant residues and soil) and adequate sealing of the tanks immediately upon arrival. 4. Fresh juice or must is pumped to a closed, secure fermentation vessel or to the supply vessel for heating and concentrating. Fermentation must be initiated within four (4) hours (must) or 24 hours (juice) of unloading[11]. 5. Must from a PIZ may not be separated into juice and pre-fermentation marc at the receiving winery, ie it has to be fermented upon arrival for at least four days before separation of new wine from marc. 6. The truck and tanker is thoroughly cleaned with cold water and approved detergent compound OR pressure cleaned with hot water or steam. Provided that the outside of the tanker (including all surfaces on and below the tank) has been thoroughly hosed down before leaving the winery, tankers may be taken to an ICA-accredited truck depot for cleaning instead of being cleaned at the winery under specific arrangement as part of the ICA arrangement and with consideration of the risk associated with travel between the winery and depot. 7. Any spillage is dealt with as per normal winery hygiene procedures – this is safe provided that waste water management complies with the protocol. 8. There are no specific requirements for disinfestation of filtration or other winery equipment used in handling juice or must from a PIZ. Cleaning with water is sufficient provided that waste water management complies with the protocol.

[11] If the product is in a secure, bunded area in a sealed vessel then it can be held indefinitely before commencing fermentation or other treatment. After seven days the product will be considered to be disinfested as research indicates that phylloxera cannot survive for more than seven days in must or juice. Any must or unsterilised juice that cannot be processed in accordance with the conditions of this protocol MUST be returned to the PIZ within 24 hours – it cannot be disposed of within the PEZ.

Movement of marc out of a PIZ or PRZ	**Procedure E**
Requirements	Marc must undergo one of the disinfestation procedures described below. Marc that has not been disinfested (eg pre-fermentation marc) cannot be moved out of a PIZ or PRZ. Marc must be securely packed or covered to prevent spillage. Container and transport vehicle must be cleaned free of soil and organic matter.
Disinfestation procedure	Completion of three days (72 hours) of fermentation OR Composting or pasteurisation as per Australian Standard AS 4454.

<table>
<tr><th colspan="2">Movement of table grapes out of a PIZ into a PRZ or a PEZ</th><th>Procedure F</th></tr>
<tr><td>Requirements: source vineyard / packing shed</td><td colspan="2">Grapes packed for sale as tablegrapes must be free of soil and leaf material.
Grapes must be packed into new containers or returnable plastic containers free of soil and plant material.
Packed tablegrapes must undergo one of the disinfestation treatments specified below.</td></tr>
<tr><td>Requirements: transport</td><td colspan="2">Containers must be loaded onto a transport vehicle on a hard surface[12], not within the vineyard.
Transport vehicle must be cleaned free of all soil and plant material (see procedure I)
Transport should be via the most direct route possible.</td></tr>
<tr><td>Disinfestation procedure</td><td colspan="2">Packed with sulphur pads containing a minimum 970g/kg sodium metabisulphite at the rate specified on the label and in accordance with the manufacturer’s instructions.
OR
Fumigated with methyl bromide following one of the treatments listed below.
<table>
<tr><th>Fruit Pulp Temperature</th><th>Dosage Rate (g/m³)</th><th>Duration (hours)</th><th>Dosage at 30 minutes (75%)</th><th>Dosage at 2 hours (60%)</th></tr>
<tr><td>21°C or greater</td><td>32</td><td>2</td><td>24g/m³</td><td>20g/m³</td></tr>
<tr><td>15.5°C or greater but less than 21°C</td><td>40</td><td>2</td><td>30g/m³</td><td>24g/m³</td></tr>
<tr><td>10°C or greater but less than 15.5°C</td><td>48</td><td>2</td><td>36g/m³</td><td>29g/m³</td></tr>
</table></td></tr>
</table>

[12] Hard surface could include consolidated gravel or rubble surface. Excludes earth surfaces.

Movement of table grapes out of a PRZ into a PEZ	**Procedure F1**
Requirements: source vineyard / packing shed	Grapes packed for sale as tablegrapes must be free of soil and leaf material. Grapes must be packed into new containers or returnable plastic containers free of soil and plant material. EITHER (i) the source vineyard is to be inspected annually for property freedom (see below) OR (ii) fruit must be disinfested as per treatment options below.
Requirements: property freedom inspection	Vineyard must be inspected annually for phylloxera using the NVHSC approved survey protocol – and no phylloxera found. Vineyard must have protocols in place to prevent the entry of phylloxera (ie visitor and machinery disinfestation procedures, controlled access, documentation of source of planting material).
Requirements: transport	Containers must be loaded onto a transport vehicle on a hard surface[13], not within the vineyard. Transport vehicle must be cleaned free of all soil and plant material (see procedure I) Transport should be via the most direct route possible.
Disinfestation procedure	Packed with sulphur pads containing a minimum 970g/kg sodium metabisulphite at the rate specified on the label and in accordance with the manufacturer's instructions. OR Fumigated with methyl bromide (see Procedure F).

[13] See note 12.

Movement of vineyard equipment out of a PIZ or PRZ	**Procedure G**
Scope	Vineyard machinery and equipment is defined as *any* equipment, machinery or hand-held tools that have been used for vineyard operations. It includes, but is not restricted to, tractors, spray equipment, mechanical grape harvesters, excavators, pruning snips, shovels, back hoes, used trellis posts and netting[14]. This procedure also applies to grape bins used for collecting harvested grapes from a vineyard and delivering to a winery.
Requirements	A log of vineyard visits should be maintained by the machinery operator and shown to the vineyard manager before commencing work. Before leaving a PIZ or PRZ region, machinery must be cleaned AND disinfested[15] in accordance with the procedure below. Cleaning should ideally take place before leaving the vineyard.
Disinfestation procedure	**Cleaning** 1. Remove any parts of the machine or equipment which may hold and hide dirt and plant fragments. 2. Thoroughly clean the item with a steam cleaner or pressure water/air hose to ensure all soil and plant fragments are removed. **Disinfestation** (one of the following methods[16]) a. Steam i) Steam applied must be above 100°C as indicated by a jet of clear invisible steam between steam outlet and the visible condensate cloud. ii) Steam must contact all surfaces until the surface is left dry, not wet with condensate. b. Hot water i) Fully immerse the item in water at 70°C minimum, and hold in water for at least 2 minutes after it has reached 70°C. c. Dry heat [17] i) Place the item in a suitable room, shed or container that can be heated up to the required temperature (see below) ii) Apply temperature probes to the item, and measure the surface temperature and preferably some deeper parts of the equipment iii) Heat up the room until the probes indicate that the machine has reached the required temperature (see below) iv) Hold in the hot room for a minimum of EITHER 75 minutes after the machinery has reached 45°C OR two (2) hours after the machine has reached 40 °C

[14] In practice, it is unlikely that netting could be adequately cleaned and disinfested – therefore it is not recommended that this be transported out of a PIZ.
[15] Cleaning needs to take place before disinfestation
[16] In addition to the disinfestation methods listed, it is beneficial to park machinery in full sun wherever possible, to take advantage of natural heat disinfestation.
[17] For mechanical harvesters, the dry heat treatment specified in point c is compulsory

Movement of vineyard visitors out of a PIZ or PRZ vineyard	**Procedure H**
Scope	Vineyard visitors are defined as any people who enter the vineyard and walk amongst the vines – eg vineyard workers, consultants, supplier representatives, tradespeople, inspectors, maintenance personnel and tourists. The risk relates specifically to clothing and footwear. Note: the risk that visitors will pick up phylloxera crawlers on their clothing or footwear is particularly high between November and April, when phylloxera crawlers are likely to be present on the soil surface and in the canopy.
General requirements	1. It is recommended that unauthorised entry to a vineyard in any region be forbidden. The use of fences, barriers, signs and notices is encouraged. 2. Visitors must not remove vines (nor any parts of vines), grapes (nor any grape product other than packaged wine) nor soil from a PIZ vineyard. The use of signs and notices to advise visitors of legal restrictions and the vineyard/winery requirements is encouraged. 3. Visitors' vehicles should be confined to hard stand parking areas in full sun at least 100m from grapevines. 4. Visitors are encouraged to clean cars before leaving a PIZ or PRZ vineyard and to avoid travelling directly from a PIZ or PRZ vineyard to vineyards in a PEZ. The provision of wash-down facilities at the edge of the vineyard is encouraged. 5. Workers and visitors should visit phylloxera infested vineyards *after* visiting non-infested vineyards wherever possible. 6. Access to actual vine rows should be limited as much as possible. Authorised entry may be granted under controlled conditions: a. Resources and instruction on procedures are provided for those entering vineyards, and training for vineyard workers b. Authorised visitors wear gumboots provided by vineyard owner or disposable overshoes – or disinfest footwear as described below. c. Vineyard workers wear disposable, dedicated or cleaned clothing (eg overalls) for each vineyard. This applies especially between November and April when phylloxera crawlers are likely to be present in the canopy and there is a high risk of contamination of clothing. d. Vineyard workers wear dedicated footwear for each vineyard or disinfest footwear before leaving each vineyard (see below). The use of boots dedicated for vineyard use is recommended.

Movement of vineyard visitors out of a PIZ or PRZ vineyard	**Cont.d**
Disinfestation procedure	1. When leaving the vineyard, disinfest footwear as follows: a. scrub boots with the scrubbing brush to remove mud – preferably in water and detergent b. dilute chlorine with water in a tub to give a 2% active sodium hypochlorite concentration and dip and scrub boots in the freshly prepared[18] solution for a minimum of 30 seconds c. rinse thoroughly in clean water after immersion. 2. Wash and disinfect snips, small tools etc with 2% active sodium hypochlorite solution. 3. Change, wash or discard (if disposable) clothing before entering next vineyard.

Movement of vineyard vehicles out of a PIZ or PRZ vineyard	**Procedure I**
Transport requirements	1. Avoid entry to vineyard as much as possible. Otherwise: a. when servicing vineyards, load and unload only on hard stand areas away from vines; do not enter the vineyard proper nor travel between vines except on formed hard roadways b. where possible restrict the number of vehicles and drivers entering and leaving a PIZ vineyard, eg allocate nominated trucks and drivers for this business. 2. Drivers should be advised of the risks of phylloxera, existing regulations and protocol and associated operating procedures. 3. Before leaving a vineyard in a PIZ or PRZ: a. ensure the vehicle (including trailer, tanker etc) is free of all soil and plant material by washing down (in the designated wash-down area) – concentrating on undersides, mudguards, springs, shackles and chassis b. wash any loading equipment used (eg pallet loaders, skid pins, and chains) c. clean and disinfest foot wear (see procedure H). Alternatively, the use of a dedicated pair of boots for a PIZ vineyard and otherwise stored in a sealed container is recommended for drivers delivering to PIZ vineyards. 4. Plan the travel route to follow hard formed, preferably sealed roads.

[18] The active concentration of sodium hypochlorite solution declines over time, and should be changed frequently (eg every two hours) to ensure continued efficacy as a disinfestation treatment.

Appendix 1

Phylloxera management zones: definitions and descriptions

Phylloxera Infested Zone (PIZ)

A PIZ contains at least one vineyard known to be infested with phylloxera or to have been infested with phylloxera. The boundary of a PIZ must be set as a minimum of 5 km from the closest known infested vineyard.

The boundary of the PIZ may be defined by local government boundaries or other landmarks, provided they are a minimum of 5km from the closest infested vineyards. The boundaries of the infested region will be determined initially by the relevant State Chief Plant Health Regulatory Officer for the purposes of state quarantine activity, and will then be recognised by the NVHSC as a PIZ under the National Phylloxera Management Protocol.

A state Department of Primary Industries or equivalent may seek an upgrade in status for a PIZ based on evidence that phylloxera infestation is no longer present. Application is made to the NVHSC in accordance with the criteria specified in the *National Phylloxera Management Protocol: procedures for upgrading of phylloxera zone status (Appendix 2)*.

Phylloxera Exclusion Zone (PEZ)

A PEZ is an area that is recognised by the NVHSC as being a **pest free area for phylloxera.**

To acquire PEZ status, a region must have been established by historical information and/or a survey program as not being infested by phylloxera, AND be protected by appropriate legislation to control the movement of phylloxera host produce – including grapevine material, specified grape products and vineyard equipment – into the area. As a minimum, the requirements of the legislation must reflect the conditions for movement specified in this national protocol.

Application for an upgrade to PEZ status is made to the NVHSC and assessed in accordance with the criteria of the *National Phylloxera Management Protocol: procedures for upgrading of phylloxera zone status (Appendix 2)*.

Once PEZ status has been achieved, it must be actively maintained in accordance with the *National Phylloxera Management Protocol: maintenance of PEZ status.* This protocol reflects the **ISPM 4 Guidelines for the maintenance of pest free areas.**

Phylloxera Risk Zone (PRZ)

The boundaries of a PRZ are determined by default as all areas not defined as a PIZ or PEZ.

A state Department of Primary Industries or equivalent may seek an upgrade in status for a PRZ based on evidence that phylloxera infestation is not present. Application is made to the NVHSC in accordance with the criteria specified in the *National Phylloxera Management Protocol: procedures for upgrading of phylloxera zone status (Appendix 2)*.

All new or proposed grape growing regions in PRZs are encouraged to comply with PEZ entry protocols from the start and to seek PEZ status as soon as practicable.

Schedule of currently recognised PEZs and PIZs

As at September 2009.

Note: recently endorsed changes in status may not be reflected in state legislation.

Phylloxera Infested Zones (PIZ)

Victoria

- The North East Phylloxera Infested Zone
- The Nagambie Phylloxera Infested Zone
- The Upton Phylloxera Infested Zone
- The Mooroopna Phylloxera Infested Zone
- The Maroondah Phylloxera Infested Zone
- The Whitebridge Phylloxera Infested Zone

New South Wales

- The Counties of Camden and Cumberland near Sydney
- Hume-Corowa-Albury (local government areas of Albury, Hume and that part of Corowa within the county of Hume).

Phylloxera Exclusion Zones (PEZ)

Western Australia (state)

South Australia (state)

Northern Territory (territory)

Tasmania (state)

Victoria

- The Western Phylloxera Exclusion Zone (see schedule 1of the Plant Health and Plant Products Act 1995 for detailed textual description)

New South Wales

- Whole state barring those areas recognised as PIZs (above)

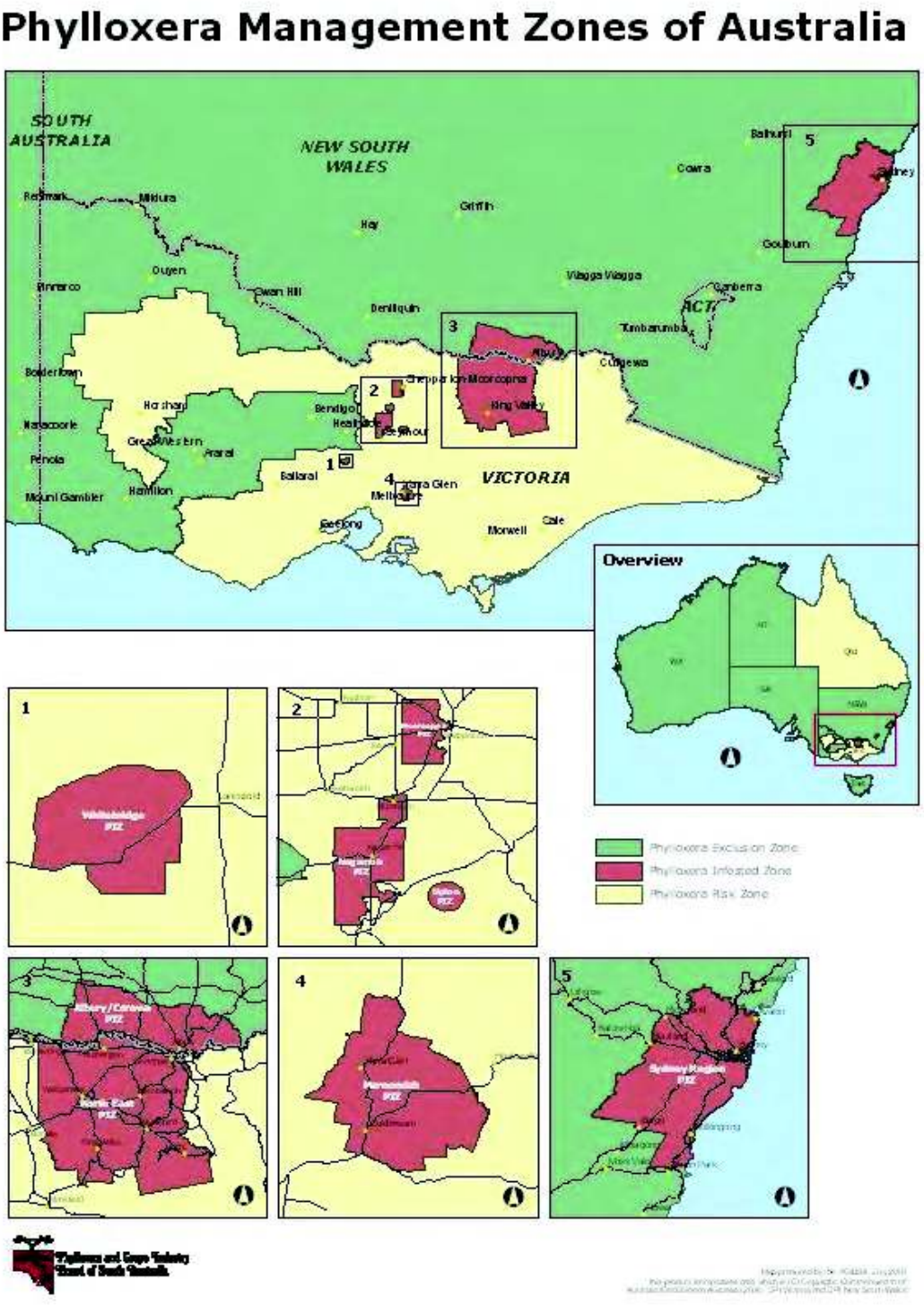
Transitional Phylloxera Risk Zones (upgrade process in progress)

Queensland

- Central Highlands (Emerald region), Gayndah/Mundubbera district, Balonne, Paroo, Roma, Manana, part of Dalby

Appendix 2

Map of phylloxera management zones in Australia



Appendix 3

Status upgrade procedures

National Phylloxera Management Protocol:

Procedures for the upgrading of phylloxera zone status

National Vine Health Steering Committee
(NVHSC – October 2009)

Procedures for the upgrading of the phylloxera zone status of grapegrowing regions in Australia

1.0 Purpose

The purpose of this document is to describe the principles of operation and standards required and the responsibilities and practices of personnel that apply to the upgrading of *Phylloxera* zone status of grape growing districts in Australia.

2.0 Scope

The scope of this procedure is for the orderly transition of a region from a PIZ or PRZ status to a PEZ status. It does not include consideration of the requirements that apply where the PEZ status of a region is lost.

3.0 References

3.1 NVHSC National Protocol: definitions of phylloxera management zones

3.2 NVHSC National Protocol: movement procedures for phylloxera risk vectors

3.3 NVHSC National Protocol: status upgrade procedures (remote sensing)

3.4 Appendix 1: questionnaire

3.5 Appendix 2: vineyard survey procedures

4.0 Definitions

Accredited Survey Group	Means an individual or group that can demonstrate satisfactory competence in *Phylloxera* identification and survey procedures with current accreditation from a state agency.
Department of Agriculture	Means the department of Primary Industries and Resources South Australia or Department of Agriculture NSW or Department of Primary Industries Victoria and other States and Territories Agricultural Departments
Phylloxera Exclusion Zone (PEZ)	Means a known and gazetted *Phylloxera* free area, protected by regulation under State legislation, as recognised by the NVHSC
Phylloxera Infested Zone (PIZ)	Means the declared *Phylloxera* infested areas under State legislation, as recognised by the NVHSC
Phylloxera Risk Zone (PRZ)	Means areas other than a PIZ or PEZ
Steering Group	Means a State Organisation or Committee formed within a district association to plan and manage the requirements of this operational procedure.

5.0 Responsibilities

5.1 Steering Group is responsible for:

- defining the boundaries of the district;
- compiling details of vineyards operating in the defined areas (see appendix 1)
- identifying high risk non-commercial vines for surveying
- coordinating the activities of members for effective implementation of the program;
- provision of funding;
- developing the program strategy;
- developing an annual survey program;
- arranging for an accredited group to undertake surveys;
- liaison with industry, government and community for effective delivery of the program
- management and implementation of the program, and
- providing reports of annual surveys to the Department of Agriculture and the National Vine Health Steering Committee

Note: This document should be read in conjunction with the following supporting documents:

- *Appendix 1: questionnaire* - has been developed to assist the Steering Group to compile the necessary information to allow the State Department of Agriculture to approve and present the program documentation to the National Vine Health Steering Committee for endorsement
- *Appendix 2*: *vineyard surveys* – gives details of methodology to be used in conducting ground surveys for phylloxera.

5.2 District Grape Growers are responsible for:

- supporting the Steering Group
- supplying accurate information requested by the Steering Group
- permitting surveys to be conducted on their properties
- adhering to the program protocols

5.3 Accredited Survey Groups are responsible for:

- undertaking *Phylloxera* surveys as required under the program;
- providing reports on the results of surveys to the Steering Group - see Attachment 2

5.4 Departments of Agriculture are responsible for:

- reviewing and approving the program developed by the Steering Group;
- presenting the program to the National Vine Health Steering Committee (NVHSC) for endorsement;
- providing legislative and operational support for effective operation of the zone;
- assessing the implementation of the program through regular audits; and
- recommending to the NVHSC endorsement of the *Phylloxera* status of the District

5.5 The National Vine Health Steering Committee is responsible for

- endorsing district programs and the phylloxera management status of grape growing districts

Note: The declaration of district status is the legislative responsibility of the relevant State or Territory Government

6.0 Requirements

6.1 General Criteria for Confirmation, Maintenance and Changing Phylloxera Status of Districts

6.1.1 A District Steering Group must be established within the local industry Association

6.1.2 The Steering Group is responsible for securing support from vineyard owners within the participating district and obtaining funding for the program, including surveys

6.1.3 The Steering Group must compile the following information:

- boundaries of existing or proposed area based on LGA or other criteria (minimum size is a "shire" or equivalent);
- details of the areas of vineyards planted within the boundaries;
- grower lists;
- for each vineyard a complete Vineyard Survey sheet;
- survey plan for the district based on the *Survey Crite*ria for commercial vineyards and other planting's;
- nomination of Accredited Survey Group;
- details of consultation, eg. with their state industry association and local government bodies for acceptance
- details of the proposed community awareness program.

6.1.4 Following acceptance by the District the Steering Group must submit the information to their State Department of Agriculture for:

- approval of the proposal and documentation;
- notification to NVHSC for endorsement for the program;
- revision of legislation to regulate grape material machinery and soil movements; and
- agreement between Department and District on supervision and audit of procedures.

6.2. Implementation of Program

6.2.1 General requirements for confirming or changing the zone status

Existing PEZ	**Transition from PRZ to PEZ (standard)**	**Transition from PIZ to PRZ**
Status confirmed through: 1) demonstrated maintenance of appropriate regulations / legislation regarding entry criteria 2) Demonstrated efforts to ensure a high level of industry and public awareness of the regulations 3) Requirements in state legislation that any infestation / violation of regulations be reported	Adoption of the General Criteria for a minimum three year program *To be based on assessment of vine material and grape product movement history.*	Adoption of the General Criteria for three year program. *NB An additional subsequent three year program at least is required to move to a PEZ*

Transition from PRZ to PEZ (emerging regions)		
Emerging region defined as: *An area defined by boundary that has limited plantings of grapevines up to five years in age and a maximum of 500 hectares in total, and is more than 40km from a known infested vineyard.* As for all regions seeking PEZ status, an emerging region must: ➢ *Be a minimum size of a "shire" or equivalent* ➢ *Have demonstrated support of all growers in region (including nurseries where applicable)*	Pre-requisites: ➢ No evidence of existence of vines prior to development of current vineyards ➢ Documented proof of planting material origin and health status (must come from PEZ and/or have been hot water treated) ➢ Existing written and supported SOPs relating to movement protocls for labour, machinery and vineyard materials – fully documented from time of first plantings ➢ Ongoing adherence to PEZ protocols *Note: partial compliance with above requirements is not sufficient – otherwise full adherence to the standard program is required.*	Survey program: *Surveys for ONE year of all vines over two years old*

6.2.2 Survey requirements (standard program)

Year 1

- Conduct first year surveys and if negative:
- Application of relevant national and local protocols (vines, machinery grape products and soil) including those that apply to general plant nurseries
- Initiate a community and industry awareness program in the district

Year 2 and 3

- Continuation of the survey program
- If negative and program effectively implemented (demonstrated through audit) refer to the National Vine Health Steering Committee by Department of Agriculture for approval of the Phylloxera status of district.
- If not effectively implemented then the program would be extended for a further year.

6.2.3 Survey requirements (alternative program)

Year 1

- Conduct first year surveys and if negative:
- Application of relevant national and local protocols (vines, machinery grape products and soil) including those that apply to general plant nurseries
- Initiate a community and industry awareness program in the district

Year 3

- Repeat the survey program with high risk vineyards (see Operational Procedure) being surveyed at a higher intensity than low risk vineyards
- If negative and program effectively implemented (demonstrated through audit) refer to the National Vine Health Steering Committee by Department of Agriculture for approval of the Phylloxera status of district.
- If not effectively implemented then the program would be extended for a further year.

6.2.4 Survey requirements (alternative program incorporating aerial surveying)

See Status Upgrade Procedures (remote sensing)

7.0 Operational Procedures

7.1 Surveys

7.1.1 Aerial Surveys

See Status Upgrade Procedures (remote sensing)

7.1.2 Ground Surveys

	Commercial Plantings	Non-commercial Plantings
Upgrade status – standard program	Survey all vineyards for three consecutive years. Survey vineyards as per attachment 2: a single vine in every 5th panel in every 3rd row. All visibly weak vines are to be surveyed.	Undertake an inspection of any high risk vines in household blocks, wineries and amenity areas.
Upgrade status – alternative program	Survey all vineyards twice over a three year period. Survey low risk vineyards as per attachment 2: a single vine in every 5th panel in every 3rd row. All visibly weak vines are to be surveyed.	Undertake an inspection of any high risk vines in household blocks, wineries and amenity areas.

Note: sampling can be carried out from flowering until the soil temperature falls below 18°C at 10cm soil depth – as long as there are feeder roots present. This equates *approximately* to the time period from November to April in most regions.

Refer to Appendix 2*: Ground survey protocol* for detailed operational survey methodology.

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

INTRODUCTION

This questionnaire was developed to gather information on how phylloxera has been managed in your wine region to support an upgrade in Phylloxera quarantine status. It addresses issues such as:

- Contacts to arrange access for ground surveys,
- Location and size of vineyard to survey for planning purposes,
- Sources of planting material, and the methods used to control vineyard access for visitors, workers and contractors to enable the State Department of Agriculture to undertake a desktop risk assessment of the likelihood of phylloxera being present,
- An indication of phylloxera awareness and education within the region.

SURVEY DISTRIBUTION

All vine planting's known to association members should have a separate questionnaire and all questions must be attempted. Supporting documentation and/or certification should be copied and attached. Where the owner is uncooperative or unknown, the questionnaire is to be completed by an association representative, but the declaration should not be signed.

SURVEY RESULTS

Once the questionnaire sheets are returned to the State Department Agriculture, a comprehensive report can be prepared on how phylloxera has been managed in the region based on the data that is collected. The results will provide evidence of the steps that the region has taken to ensure that the risk of phylloxera has been managed. It will also allow the State Department of Agriculture to undertake a risk assessment so that the intensity level of ground surveying can ultimately be determined.

ADDITIONAL INFORMATION

The Vineyard Association will be asked to provide additional information on the history of viticulture in the region. Should you have anything of relevance on the region or your specific vineyard it would be appreciated if you could attach this information and/or a brochure to this questionnaire.

Privacy Notice

The information provided in this questionnaire is being collected for the purpose of Phylloxera. It will be used by the State Department of Agriculture for planning and undertaking vineyard surveys to determine the phylloxera status of the viticultural district and will not be provided to any other agency except in a summary format. This format will not identify the ownership of particular vineyards. The information has been provided voluntarily and will be stored securely within:
(The details contact of the State Coordinator must be added to complete the Privacy Legislation Requirements)

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

ENQUIRIES:

State Department of Agriculture must enter contact details for:

The Project Coordinator

OWNER

Name	
Postal address	
Telephone home	
Telephone business	
Telephone mobile	
E-mail Address or Fax Number	

PROPERTY

Site Manager & contact number	
Title detail of block(s) where vines planted	*eg. lot/DP or Portion number, Parish and County where vines are planted to allow us to electronically map the district.*
Street location of vineyard entrance	

VINEYARD

Total Area of vines (hectares)	
Year vines first planted	
History of previous vine planting's on or near site? If so, when?	

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

Please insert or draw a map of the location of the vineyard in relation to the nearest township.

ATTACHMENT 1

P H Y L L O X E R A S U R V E Y Q U E S T I O N N A I R E 2 0 0 2

VINE MATERIAL (TYPE AND SOURCE) – please attach a copy of your vineyard layout if available.

Block No. (your number)	Variety	Area (ha)	Date planted	Clone & Rootstock (nominate if known, or state "own roots" or "rootstock" if unknown)	Was material Hot Water Treated?	Name and address of Nursery supplying material (certificate number if appropriate)

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

VINEYARD ACCESS FOR VISITORS AND VEHICLES

1. Please tick all the methods you use for vineyard hygiene

Footbath	☐	Restricted access for visitors (eg. fences and locked gates)	☐
Warning signs for phylloxera	☐	Restricted access for vehicles	☐
None	☐	Other, please list	☐

VINEYARD WORKERS AND CONTRACTORS

2. Have you used itinerant, casual or contract staff in the vineyard?

Yes ☐ No ☐

3. Are they employed in vineyards elsewhere?

Yes ☐ No ☐ Don't know ☐

Please nominate where if outside region:

4. Please tick the methods you use to manage vineyard hygiene with these staff

Footbath	☐	Inspection of footwear and clothing	☐
None	☐	Other, please list	☐

5. Did you use a contractor to establish the vineyard?

Yes ☐ No ☐

6. If yes, please provide contractor's name and contact details

_____

_____

_____

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

VINEYARD EQUIPMENT AND INFRASTRUCTURE

7. Have you shared any vineyard equipment (excluding harvesters) with any other vineyard?

Yes ☐ No ☐

8. If yes, what methods were used to clean the equipment between vineyards?

Hosed down ☐ Steam cleaned ☐ None ☐

9. Have you used contract harvesters?

Yes ☐ No ☐

10. If yes, what method does the contract harvester use to clean the harvester between vineyards?

Hosed down ☐ Steam cleaned ☐ Heat treated ☐

11. Have you used any second hand posts in the vineyard?

Yes ☐ No ☐

12. If yes, please provide details of where they were purchased/acquired

_____

_____

_____

13. If yes, how were the posts cleaned prior to being used?

_____

_____

14. Have you used any second hand vine guards?

Yes ☐ No ☐

15. If yes, please provide details of where they were purchased/acquired

_____

_____

_____

16. If yes, how were the guards cleaned prior to being used?

_____

_____

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

PHYLLOXERA AWARENESS/EDUCATION/GENERAL

17. Have you completed any training in phylloxera identification?

Yes ☐ No ☐

18. Do you understand what a Phylloxera Infested Zone, Phylloxera Risk Zone and Phylloxera Exclusion Zone mean to your vineyard operation?

Yes ☐ No ☐

19. Do you wish to receive more information on Phylloxera?

Yes ☐ No ☐

20. Do you suspect that you could have Phylloxera in your vineyard?

Yes ☐ No ☐

DECLARATION:

The information contained in this questionnaire is provided in good faith for the purposes stated. The information provided is, to the best of my knowledge, true and correct at the time of completion.

Signature:

Name:

Position:

Date:

OPTIONAL CONSENT:

*The Privacy and Personal Information Protection Act 1998 obliges NSW Agriculture to make you aware of the purposes for which we might use the contact details you supply us with. In order to comply with the requirements of the Act, I am obliged to ask you to indicate whether or not you wish to have your name and address include on a mailing list for the purpose of distributing information regarding Phylloxera. The mailing list will remain in use for a period of three years and you may amend, or remove, your contact details from the mailing list at any time by contacting (*Name of Program Coordinator)*, Phylloxera Project Coordinator at, (*Postal address of Program Coordinator.) *Please indicate your preference with a tick:*

☐ **Include my personal contact details on the phylloxera mailing list.**

☐ **Do not include my personal contact details on the phylloxera mailing list.**

SIGNATURE: **NAME:** **DATE:**

ATTACHMENT 1

P H Y L L O X E R A S U R V E Y
Q U E S T I O N N A I R E 2 0 0 2

Operational procedure for conducting vineyard (ground) surveys for the presence of phylloxera

1. Purpose

This procedure is intended for use by Departments of Agriculture/Primary Industries to conduct ground surveys on a regional or broad-scale basis, for the purpose of seeking an upgrade in phylloxera zone status from a PRZ to PEZ or delineating the extent of a phylloxera outbreak. *It is not intended for use by individual growers inspecting their vineyards for the presence of phylloxera.*

2. Survey intensity

Purpose	Commercial Plantings	Non-commercial Plantings
Upgrade status PRZ to PEZ	Survey all vineyards within a defined area for three consecutive years. In every 3rd row, a single vine in the 5th panel is to be inspected. Areas within vineyards showing low vigour or other symptoms characteristic of a phylloxera infestation are also to be surveyed. See methodology section below. **OR** Survey all vineyards within a defined area twice over a three year period: • **High risk vineyards** (Questionnaire incomplete or evidence of high risk practices) In every second row, a single vine in the 5th panel is to be inspected • **Low risk vineyards** (Questionnaire complete; no evidence of high risk practices) In every third row, a single vine in the 5th panel is inspected. • **All visibly weak vines** or vines showing symptoms characteristic of phylloxera infestation are also to be surveyed.	Undertake an inspection of any high-risk (see definition[1]) vines in household blocks, wineries and amenity areas. Amenity vine sites are those that include plantings of five or more vines for non-commercial purposes.

[1] High risk vineyards are defined as business who on a regular basis use contract machinery on farm or have been farmed in association or have links with phylloxera infested regions...

Delineation of a new outbreak	Survey all vineyards within a defined area (quarantine zone) and other vineyards identified as having links to each infested vineyard. Visually inspect one vine in every 5th panel in every 3rd row. All visibly weak vines are to be inspected. See methodology section below.	Undertake an inspection of any high-risk vines in household blocks, wineries and amenity areas.

3. Timing of surveys

Root surveys for phylloxera can be undertaken from flowering until the soil temperature falls below 18°C at 10cm soil depth – as long as there are feeder roots present. This equates *approximately* to between November and April in most regions.

Optimal periods of detection of symptoms based on visual inspection are from December to February when phylloxera-induced water stress and stunted shoot growth are most apparent and phylloxera numbers are highest. Surveys should ideally be conducted within this timeframe. Warmer regions should be surveyed before cooler regions – to allow longer for populations to build up in the cooler regions.

4. Survey methodology

4.1 Survey team

- All survey team members must successfully complete competency training in this survey methodology and in the identification of phylloxera symptoms in the field, prior to undertaking survey work. Training to include:
    - Identification of phylloxera symptoms in the field
    - Phylloxera life stages and biology
    - Information collection and data recording
    - OH&S responsibilities
    - Disinfestation protocols

4.2 Setting up

- Establishment of a marshalling point and designated disinfestation area, with access to water and (preferably) a hard surface for washing down
- Equipment required: shovels/spades, magnifying eye-glass, sample containers
- Team leaders must ensure that the transport vehicle(s) remain at least 100m from the nearest vines, and preferably should remain on a road or hard surface.

4.3 Visual inspection

- Team members to work in pairs as a minimum.
- Visually inspect both sides of the vines both in the designated vine rows and the non-designated rows, for vines showing comparatively poor growth (see below), particularly accompanied by unusually strong weed growth. In grafted vineyards, because phylloxera is less likely to result in poor growth, also inspect for the

presence of rootstock suckers, volunteer vine seedlings and sprouted scion cutting remnants of winter pruning.

Comparatively poor vine growth
Short shoot growth (shoot growth of some vines not reaching the foliage wire) and a relatively short internode length may be associated with soil type, depth of top soil, available moisture and fertility but may also indicate the presence of some pest or disease causing problems with the root system of the vine. This is very evident when vines appear weak and unthrifty but there is strong weed or grass growth at the base of the vines.

Rootstock suckers can be identified by their distinctive leaf shape. These suckers should be inspected for the presence of leaf galls, which generally only form on the leaves of phylloxera resistant rootstocks. Leaf galls may be easier to detect than root populations in grafted vineyards.

Fig 1

Fig 2

Fig 1 Shows comparatively poor vine growth, foliage wire visible and strong grass growth under vines.
Fig 2 Same vines two years later showing decline with stressed leaves.

Volunteer vine seedlings and sprouted scion cuttings
If any volunteer seedlings or sprouted scion cuttings can be found, these provide an opportunity to examine young, *Vitis Vinifera* root systems for the presence of galls or insect colonies. This is of particular value when surveys are conducted in vineyards planted on phylloxera resistant rootstocks where there are no Vitis Vinifera root systems to examine.

4.4 Root examination

- Dig under the target vines (see below) within 60cm of the trunk or in the vicinity of irrigation drippers to expose the actively growing feeder roots.
- Sever the roots if necessary to collect a piece of root mass containing fibrous roots at least one hand's width wide (or 10cm long).
- Inspect for root galls or individual insects, using a10x magnification hand lens.
- In grafted vineyards, also inspect the roots of any volunteer vine seedlings or sprouted scion cuttings within the inspection panel.

- Mark suspect vines (ie those showing evidence of phylloxera) with survey tape and alert team leader
- Team leader to assess marked vines removing samples where required (see 4.6 *Sampling Procedure* below). If a "suspect" sample is taken, all further work on the property should cease.
- Once the survey of the vineyard has been completed, return to the marshalling point to disinfest clothing, footwear and tools/equipment before departure (see 4.5).
- (Optional) Record the longitude and latitude of the vineyard (GPS)

Target vines
The target vines are those identified by the survey random sampling procedure, and any visibly weak vines. Dead vines are not necessarily suitable target vines. In advanced infestations, vines on the edge of dead patches would be expected to have large numbers of active phylloxera on the root systems if phylloxera has been the cause of death to the adjacent vines. Dead vines may show nodosity galls on the structural roots.

Adequacy of samples
If a sufficient size of fibrous root material cannot be obtained, then the accuracy of the sample is compromised. It is strongly recommended that emergence traps – applied to targeted weak spots - be used as a supplementary survey technique in these situations to increase confidence.

Additional considerations for grafted vineyards
In grafted vineyards, it is likely to be more difficult to detect an infestation of phylloxera, as phylloxera resistant rootstocks usually do not form nodosity galls or support very high populations of phylloxera. Greater efforts therefore need to be made to examine the roots of volunteer vine seedlings or sprouted scion cuttings for phylloxera insects or nodosity galls, and examine rootstock suckers for phylloxera leaf galls.

In grafted vineyards, survey administrators are encouraged to use additional measures such as emergence trapping or DNA analysis of soil samples, to provide greater assurance in regard to phylloxera absence or presence.

4.5 Disinfestation procedure
After each vineyard is surveyed, all team members must disinfest their footwear, clothing and shovels etc. before leaving the vineyard, in accordance with the *Procedures and hygiene for vineyard personnel moving from a vineyard in a PIZ* (National Phylloxera Management Protocol – NVHSC).

4.6 Sampling procedures

Samples of phylloxera must be taken for positive identification by a Reference Entomologist nominated by the State Department of Agriculture for any suspected detection.

- Mark vine with survey tape before the removal of the sample
- Remove the sample and check with hand lens for the presence of insects.
- Place sample in a sample bottle or vial filled with 70% ethanol.
- Label sample, and cross reference to survey form
- Place sample into a thermally insulated container.
- Record number and details of vine position and row number, and sketch plan and position of vine on survey form – or use GPS locating.
- If the team leader is confident that phylloxera is present in the vineyard, the survey within that vineyard should be terminated.
- The vineyard manager should be informed that a sample has been taken for positive identification and that notification will follow positive identification and additional surveys of the property may be necessary.
- The vineyard will need to be quarantined in accordance with Department protocol pending the confirmation of the identification.

Appendix 4

Contact details

For more information on the elements of the National Protocol and/or legislative requirements for moving phylloxera risk vectors between states, please contact the Department of Agriculture/ Primary Industries in your state, or the Phylloxera and Grape Industry Board of South Australia. Contact details are given below (current as at 30 September, 2009)

New South Wales

www.dpi.nsw.gov.au/agriculture

- John Slack, Industry and Investment NSW

Ph: 02 6391 3593 Fax: 02 6391 3206 email: john.slack@industry.nsw.gov.au

Northern Territory

www.nt.gov.au/d/primary_industry

- James Swan, NT Quarantine

Ph: 08 8999 2088 Fax: 08 8999 2053 email: james.swan@nt.gov.au

Queensland

www.dpi.qld.gov.au

- James Planck, Queensland Department of Primary Industries and Fisheries

Ph: 07 3239 3943 Fax: 07 3211 3293 email: planckj@deedi.qld.gov.au

South Australia

www.pir.sa.gov.au/planthealth

- Bruce Baker, State Quarantine Inspection Service

Ph: 08 8168 5203 Fax: 08 8344 6033 email: bruce.baker@sa.gov.au

- Sandy Hathaway, Phylloxera and Grape Industry Board of S.A.

Ph: 08 8362 0488 Fax: 08 8362 0499 email: sandyh@phylloxera.com.au

Victoria

www.dpi.vic.gov.au/psb

- Gary D'Arcy, Department of Primary Industries

Ph: 03 9210 9390 Fax: 03 9210 9396 email: plant.standards@dpi.vic.gov.au

Western Australia

www.agric.wa.gov.au

- Greg Power, Agriculture Western Australia

Ph: 08 780 6277 Fax: 08 9780 6229 email: gpower@agric.wa.gov.au

Appendix 5

References underpinning protocol

Page ref	Element of protocol	Reference

Appendix 6

List of changes from previous version 2009.1

Page ref	*Procedure*	*Summary of change*
1	Introduction	Rewritten
1	Introduction	References to "NVHSC" changed to "NVBC".
6	Glossary of terms	"Fresh winegrapes" changed to "Winegrapes"
11	Procedure B	Under "Requirements: rootlings" – inserted "or PEZ" for source of cuttings.
11	Procedure B	Removed reference to accredited nurseries and inspection of vineyards. Included material from PEZ vineyards in this procedure. Some additional requirements included.
12	Procedure B1	Modified to cover green potted vines only. Included in document for first time (seeking endorsement).

List of changes from previous version 2009.2

Page ref	*Procedure*	*Summary of change*
1	Overview	Inserted clarification of *vineyard* definition as applying to dried fruit and tablegrapes as well as winegrapes.
11	Procedure B	Removed specification regarding temperature probes.
12	Procedure B1	Removed from document because not endorsed by NVHSC for publication.
15	Procedure D	Re-inserted "filtration to a maximum particle size of 50 microns" as a disinfestation option.

List of changes from previous version 2009.3

Page ref	*Procedure*	*Summary of change*
		Version number updated to 2009.4
		"Draft" replaced with "endorsed"
1	Introduction	References to "NVBC" changed back to "NVHSC".