

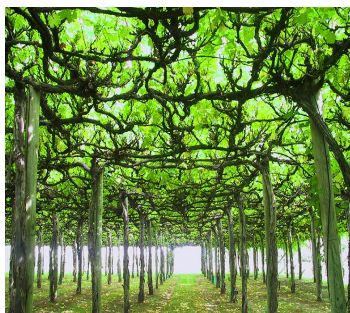


# Grafted Grapevine

## Standard



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*New Zealand Wine*  
the riches of a clean green land

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Those wishing to provide recommendations for change should send these in writing to New Zealand Winegrowers or by email to [info@nzwine.com](mailto:info@nzwine.com).

## Disclaimer

While this Standard's objective is to allow certification of plant material that has been produced under a system which aims to minimise the risk of grapevine leaf roll associated virus type 3 (GLRaV-3) being present in grafted grapevines, there remains the possibility that a proportion of plants may contain this virus. New Zealand Winegrowers accepts no liability for claims regarding virus being present in any certified plants.

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## **Background - The Grafted Grapevine Standard**

Grapevine leaf roll associated virus type 3 (GLRaV-3) is economically one of the most important and most widespread diseases of wine grapes. It poses a threat to the New Zealand wine industry's goal of growing quality grapes for premium wine production, as it delays ripening, reduces yield and depresses berry sugar content. This impacts on the wine-makers' options and ultimately on the quality of the wine produced. There are obvious links between healthy plants growing quality grapes producing high quality wines and the longevity of the vineyard.

Recognising this, the New Zealand Winegrowers Board agreed to develop a Grafted Grapevine Standard (GGS) and an associated certification program which has the objective of minimising the probability of infected material being released to the industry. The plant material that produces the grapes is a significant investment in vineyards - it is important that this is of the highest quality and of known origin. The outcome sought is to provide assurance to viticulturalists, winemakers, and other stakeholders including consumers, that grafted grape vines which are certified according to this Standard, can be described as "high health plants" in that they have been tested for and shown not to have Grape Vine Leafroll Virus 3 at the time of testing.

At the same time it was decided to include within the scope of the Standard requirements for specific physical specifications, and for trueness to type.

A Technical Reference Group of New Zealand Winegrowers has been established and resourced, as a decision-support group for the Board. Their function is to advise the Board on the content of the GGS. Nimmo-Bell & Company Ltd has been retained to assist the Board in establishing the programme.

In seeking to certify that plants comply with a standard, it is necessary to certify the production facility's management systems, as well as certifying that the plants meet set objective physical standards.

The process of certification for producing high health plants can be seen as the first step in the "chain of custody" concept, eventually extending through to the quality of the wine sold. Initiatives with the development of the GGS are, and will need to be, ongoing. New challenges to achieving high health plants can be expected to eventuate from time to time and will be addressed by the industry. At this time it is recognised that more work needs to be done firstly, to derive an appropriate system for clonal classification of some varietal material. Secondly, to develop a research based strategy for the procedures for virus testing of source blocks that have been tested and as a result have been able to be used in previous years.

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## The Grafted Grapevine Standard

### 1.0 Scope

This Standard applies to the production of grafted grapevine propagative materials. At this stage it does not cover the physical specifications for potted grafted grapevines – these are currently being developed and when finalised, the Standard will be amended by their inclusion.

Grafted grapevines which meet the requirements of this standard may be identified as meeting the New Zealand Winegrowers Grafted Grapevine Standard where the nursery holds a current certificate of compliance issued by a recognised third party auditor.

### 2.0 References

- a) Organisation Internationale de la Vigne et du Vin (OIV) Standards and definitions
- b) ISO 9001:2000 – Quality management systems, requirements
- c) Codex Alimentarius CAC/RCP 1-1969, Rev. 4-2003 Recommended international code of practice general principles of food hygiene
- d) NZS 4360:2004 Risk Management

### 3.0 Definitions

- 3.1 **Bundle:** a lot of either root stock, scion wood or grafted plants.
- 3.2 **Lot or batch:** Identifies grafted grapevine material produced from specified root stock and scion source blocks at a particular time in the production process and treated as one group for the purposes of manufacturing control.
- 3.3 **Mother plants:** the plants from which rootstock and scion wood cuttings are taken.
- 3.4 **Nursery Block:** the field nursery site in which newly grafted grapevines are grown in the nursery prior to sale.
- 3.5 **Propagative material:** includes cuttings of both rootstock and scion wood.
- 3.6 **Source Block:** the block containing Mother Plants.
- 3.7 **Type:** the variety of the plant material.
- 3.8 **Variety:** The classification of the grapevine plant material taken from the “International list of vine varieties and their synonyms” published by OIV.

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This dual purpose list includes information on the designation of varieties in the exchange of vine plants and the designation of wines made from different varieties. In order to avoid confusion with the wine origin, the OIV international labelling standard will be complied with.

#### 4.0 Requirements

All grafted grapevines shall be produced in a facility complying with the requirements of this standard.

#### 4.1 Trueness to Type

**Goals:**

- Specific and complete documentation of original germplasm to the varietal level
- Definitions of variety will conform to OIV Standards.
- Ampelography and DNA testing to the appropriate varietal level
- Records of propagation – both rootstock and scion wood and nursery processes

**Outcomes:**

- High level of confidence that the provenance (i.e. origin and history) of the plant is known and is accurate.
- Wine made from grapes from this plant can be labeled as being true to type.

#### Introduction – the New Zealand Situation

The Standard recognises that certainty of variety is paramount because of the legal requirements imposed on wine makers. Accurate documentation of variety is the minimum requirement for Trueness to Type for certified material. This can be verified by DNA testing and/or ampelography.

Wine is produced and designated by variety, or the varieties, used in its production. However, in a number of viticultural situations emphasis is placed on clonal selection. Presently available technology does not always enable this to be proved either by DNA testing or ampelography.

Further work is being undertaken to derive a realistic and appropriate system for the definition of clonal material in the New Zealand situation. These definitions and criteria will be incorporated in the Standard when completed and after consultation with industry stakeholders.

**Standard:**

- 4.1.1 Nurseries shall have evidence to prove that original propagative material (both rootstock and scion) is true to type at the varietal level. **These will be a minimum of one of the following:**
- a) A certified record of export from the supplier in the country of origin, or
  - b) A record from the organisation supplying propagative material in New Zealand showing that vines have been certified by an ampelographer working to standards recognised by NZ Winegrowers. Recognised ampelographers are:
    - Prof. Andy Walker UC Davis, California, USA
    - Dr. Jean-Michel Boursiquot, Entav, Montpellier, France
    - George Kerridge formerly of CSIRO at Merbein, Victoria, Australia.
    - Lucie T. Morton of USA.
    - Dr Erica Dettwieler of Neustadt University - or
  - c) A record of DNA certification to the varietal level provided by a laboratory approved by NZ Winegrowers, to validate that ampelographer's certification. A list of approved laboratories is being formulated and will be published as an Annex to this Standard. The sample size for validation purposes shall be from one or more vines.
- 4.1.2 Nurseries shall follow documented procedures<sup>1</sup> for production of grafted grapevines. Procedures shall be developed following a documented analysis of the risks that must be managed to achieve the objectives of this standard<sup>2</sup>.
- 4.1.3 Nurseries shall be able to demonstrate an unbroken chain of custody from the original mother plants verified as true to type in 4.1.1 to grafted grapevines, including:
- a) Planting maps showing location of mother plants in vineyards or other locations;
  - b) Each bundle at each step to the process being identified by way of labels (bar coded or otherwise) being attached to allow in-process identification;
  - c) Records tracing materials through the propagation process;
  - d) Records of where each batch was sold;

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<sup>1</sup> Where the term "documented procedure" appears in this standard it shall mean that the procedure is established, documented, implemented and maintained. Documentation shall be appropriate to the scale and complexity of the operation, and the skills and experience of staff.

<sup>2</sup> The risk analysis may be based on the principles of HACCP, adapted for nursery production, or on processes set out in NZS4360 Risk management or similar document / standard.

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- e) Reconciliation records for each batch showing the amounts of propagative material gathered, grafted, lost in process, sold, and in stock.

## 4.2 Virus Testing

### Goals:

- Both rootstock and scion sources tested for GLRaV-3 by ELISA and virus not found to be present at the time of testing.
- Some “end of process” ELISA testing of grafted plants to validate the effectiveness of risk management procedures.

### Outcomes:

- High level of confidence that plants have been grafted from rootstock and scion that has been tested and shown to be negative for the range of diseases tested.

- 4.2.1 In the first year of drawing propagative materials from a new site, or in the first year in which nursery certification is sought, 100 percent of all mother vines for rootstock and scion shall be Elisa tested for GLRaV-3 by a testing laboratory accredited by an ILAC member<sup>3</sup> and GLRaV-3 not found to be present. Any vines which test positive for GLRaV-3, as well as one vine on each side of that vine in the same row must be removed from the harvest population. In the case of composite positives, all vines in the composite plus one vine on each side within the row must be excluded from the harvest population.

**Note 1:** There may be exclusions to this requirement agreed with New Zealand Winegrowers. Where there has been a demonstrable history of virus testing in the immediate past years it is highly likely that the testing requirement in subsequent years will be less than 100%. The exact percentage to be tested annually, or what to be tested in each subsequent year, is yet to be determined but it is expected that the percentage to be tested will depend on the percentage of plants with virus found in previous years.

**Note 2:** The possibility that a significant majority of source blocks throughout New Zealand contain some GLRaV-3 virus, even at very low levels, is acknowledged. The testing protocols are aimed to identify and then exclude those plants thereby enabling nurseries to migrate over time to the 100% clear

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<sup>3</sup> New Zealand’s ILAC member is International Accreditation New Zealand.

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- Source Blocks goal. It is expected that no harvesting will occur until testing of the Source Blocks proposed to be used that year has been completed and any positives and the immediate neighbours within the row, isolated and removed.
- 4.2.2 Based on the test results under 4.2.1 the frequency and type of testing for each block tested in future years will be contained in an annex to this Standard to be published at a later date, but not later than December 31<sup>st</sup>, 2006.
- 4.2.3 Nurseries shall follow documented procedures for maintaining effective hygiene and vector control of Source Blocks, and shall monitor the plant health status of plants in both the Source and Nursery Blocks. Records of monitoring and control activities shall be maintained.
- 4.2.4 A statistically valid proportion of grafted plants, the figure to be advised by 31 December 2006, will be subject to end of process virus testing to validate the overall process.
- 4.2.5 Composite testing of samples from up to six vines may be used. Laboratory sampling protocols shall be followed, and samples shall be traceable to individual vines, or up to six individual vines for the purposes of bay composites.
- 4.2.6 A documented procedure shall set out steps to be followed should there be a positive virus test of Source Block material. The procedure shall include the following actions:
- a) Determine the appropriate steps required to provide the required level of confidence that virus infected, or potentially virus infected material will be removed from use, or if all propagative material from the infected bay, block or vineyard must be rejected;
  - b) The development and implementation of a plan to:
    - i. Identify and remove potentially infected material from current and future propagation programmes;
    - ii. Maintain an effective degree of separation between potentially infected material and other material being used to produce certified plants at all stages throughout the grafting and propagation process.
- 4.2.7 A documented procedure shall set out steps to be followed should there be a positive virus test at time of end point inspection. The procedure shall include the following actions:
- a) Where possible, the immediate quarantining of all plant material gathered from the variety, source, or “process lot” until a course of action to

effectively manage the risks of virus infected grafted grapevines being sold has been determined and implemented;

- b) Review of the outcome of associated “lots”, sampling and testing programme, and of all results from that seasons end point testing;
- c) Determine the appropriate steps required to provide the required level of confidence to achieve the specified tolerance levels, that virus infected, or potentially virus infected, material will be removed from use;
- d) The development and implementation of a plan to:
  - i. Identify and remove potentially infected material from current and future propagation programmes;
  - ii. Identify any potentially infected grafted grapevines that may have been sold, to notify the buyers and where possible withdraw product from the market.
  - iii. Ensure that any graft lots that test above the tolerance level are not offered for certification.

**Note 3:** While the intention is to work towards all certified grafted grapevines testing negative for GLRaV-3 it is going to take some time to get confirmation of that status. In the meantime, for a variety of reasons, some tolerance has to be allowed. It is proposed that initially this be a maximum of 0.1% (i.e. 1 per 1,000 grafted vines). The degree of tolerance to be reviewed as part of the ongoing updating and amendment of the Standard.

### 4.3 Physical Specifications

**Goal:**

- Grafted grapevine meets the physical specifications for the specified grade.

**Outcome:**

- Strong, healthy plants of known provenance available for purchase by vineyard managers.

4.3.1 Grafted grapevines<sup>4</sup> shall comply with the following specifications:

- a) The graft union must be healthy and strong – able to withstand the stress/bend test with medium pressure being applied to the union in two directions. After application of medium pressure the callus must be seen to be fully mature with no visible damage such as holes or cracks or green tissue around the graft union;
- b) The length shall be a minimum of 300 mm<sup>5</sup>;

<sup>4</sup> Potted vines are excluded from scope, see 1.0

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- c) The thickness of the rootstock shall be a minimum of 7 mm immediately below the region of graft and the shoot of the scion a minimum of 4 mm at the first clear internode – measured on the wider diagonal in the case of oval stock;
  - d) Plants shall not have curvature of more than between 10 and 2 o'clock from the perpendicular;
  - e) There shall be at least two visible dormant buds above the graft union;
  - f) There shall normally be at least three strong live roots (with at least two growing in opposite directions) with others evenly distributed in proportion to the variety of the vine;
  - g) Rootstock shall be able to withstand moderate bending in two directions to identify any dead tissue;
  - h) Root diameter shall be at minimum 2 mm at 10 mm from the base of the trunk, and roots to be visually healthy;
  - i) If trimmed, roots are to be at least 75 mm in length;
  - j) There shall be no breakages, cracks, or evidence of damage.

4.3.2 Deviation from physical specifications of up to a total of 2% of all grafted plants in a lot or batch is permitted.

**Note 4:** This is deviation over the total range of physical specifications – not 2% for each category.

4.3.3 All vines shall be bundled and labelled as to grade conformity including as a minimum certification status (i.e. certified or not certified), variety, and graft lot or batch number.

#### 4.4 Management system requirements

**Goal:**

- Nurseries follow an appropriate management system

**Outcomes:**

- High quality plants are produced, with the entire process able to be satisfactorily audited by third party auditors.

4.4.1 Nurseries shall have sufficient resources (physical, human and financial) to adequately meet the requirements of this standard.

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<sup>5</sup> All linear measurements may be made with un-calibrated measuring equipment providing that the equipment has a margin of error of plus or minus 10%.

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- 4.4.2 In addition to other procedures covered in this standard, nurseries shall maintain a management system<sup>6</sup> appropriate to the scale and nature of their operations. The management system shall be documented (in any form of media) and shall address:
- a) A procedure for record keeping. Records shall be kept for seven years, and shall be legible, identified and retrievable;
  - b) A procedure for control of non conforming product, which shall prevent inadvertent use or sale as certified grapevine plants;
  - c) How documents are maintained and controlled, so that they are reviewed at defined intervals, approved by appropriate staff prior to use, and are made available (in the latest version) to all those who need to access them;
  - d) A procedure by which product has a final inspection against all relevant criteria, and is released for sale. The procedure shall specify those positions within the nursery that have authority to undertake this activity.
- 4.4.3 Nurseries shall document competency criteria for staff, and shall ensure that staff meet those criteria. Where required, training shall be provided to staff. Records of staff competency and training shall be maintained.
- 4.4.4 There shall be periodic internal checks (or audits) of the management system to ensure that the requirements of this standard are met, and that the documented procedures are being followed. The frequency of checks shall be proportional to the risk of the activity (see 4.1.2), and previous findings. Non conformances and potential non conformances shall be documented, root causes of problems shall be identified, and suitable corrective and preventive actions shall be taken. The effectiveness of corrective actions shall be verified. The minimum frequency for such checks is annual.
- 4.4.5 A periodic review of all aspects of the nursery's operations shall take place, at least annually. The review shall consider the effectiveness of the management system and processes to meet the requirements of this standard, and shall result in documented outputs that will lead to continual improvement of outcomes.

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<sup>6</sup> Those nurseries that are certified to ISO 9001 with a scope of production including grafted grapevines shall be deemed to have satisfied the requirements of section 4.4. Those nurseries that do not have ISO 9001 certification are recommended to review ISO 9001's requirements and associated guidance materials (ISO 9000, ISO 9004) for guidance on developing their own management system.