



Grafted Grapevine

Standard



Accepted by New Zealand
Winegrowers Board, 23 August
2006 and as amended December
2006, July 2007, March 2008



NEW ZEALAND WINE

PURE DISCOVERY

Copyright

This Standard is copyright to New Zealand Winegrowers. The Standard may be reproduced in part or in full only where ownership by New Zealand Winegrowers is acknowledged.

Updates

The Standard will be amended from time to time, and the most recent version will be published on the New Zealand Winegrowers' website <http://www.nzwine.com>. Users should ensure that they are referring to the most recent version. Currently that is Version 2.1 which is effective from July 2007.

Those wishing to provide recommendations for change should send these in writing to New Zealand Winegrowers or by email to 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.

Publisher

New Zealand Winegrowers
PO Box 90276
Auckland Mail Centre
New Zealand

Located at Level 2, 52 Symonds Street, Auckland, New Zealand

Phone +64 (09) 303 3527
Facsimile +64 (09) 302 2969
Website: <http://www.nzwine.com>

1. 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 GLRaV-3 at the time of testing.

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

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 research based strategies have been derived for virus testing of both rootstock and scion source blocks in the first year, in years two and subsequently, and for end of process testing. It is recognised that more work needs to be done to derive an appropriate system for clonal classification of some varietal material.

The Grafted Grapevine Standard

1.0 Scope

This Standard applies to the production of grafted grapevine propagative materials, including potted grafted grapevines.

Grafted grapevines which meet the requirements of this standard may be identified as conforming to the criteria of the New Zealand Winegrowers Grafted Grapevine Standard where the product grafted by the nursery is so certified and listed in the Schedule issued by the recognised third party auditor.

2.0 References

- a) Organisation Internationale de la Vigne et du Vin (OIV) Standards and définitions
- 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
- e) ISO 2859-1: 1999 Sampling procedures for inspection by attributes -- Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection

3.0 Definitions

3.1 **Acceptable Quality Level:** Because it is not possible to absolutely guarantee that no virus infected plants are present the Acceptable Quality Level (AQL) is the largest percentage of defectives in a certain sample size that can make the lot definitely acceptable. In this Standard the AQL for “virus testing” is 0.1% (i.e. 1 in 1,000 grafted grapevines) and for “end of process testing” the AQL is 1.0%.

3.2 **Block:** For virus testing purposes a “block” is a discrete, continuous, and clearly defined area within a vineyard from which ampelographically checked rootstock or scion wood material is being collected for grafting. While it may contain different varieties, it does not include untested rows or untested material.

3.3 **Bundle:** a lot of either root stock, scion wood or grafted plants.

- 3.4 **End of Process Testing:** The sampling and testing of batches of grapevines at the end of the production process to provide assurance that all required processes have been followed and that those grapevines comply with the requirements of the Standard.
- 3.5 **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.
- 3.6 **Mother plants:** the plants from which rootstock and scion wood cuttings are taken.
- 3.7 **Nursery Block:** the field nursery site in which newly grafted grapevines are grown in the nursery prior to sale.
- 3.8 **Propagative material:** includes cuttings of both rootstock and scion wood.
- 3.9 **Source Block:** the block containing Mother Plants.
- 3.10 **Type:** the variety of the plant material.
- 3.11 **Variety:** The classification of the grapevine plant material taken from the “International list of vine varieties and their synonyms” published by OIV. 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 Current 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.

New Zealand Winegrowers is aware that a process is needed whereby suitably qualified ampelographers might be added to the current list set out in Section 1.1 of Annex 1. Criteria for the training and demonstration of expertise are being developed and will be published as an Annex to this Standard

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.

Ampelographic Services:

- 4.1.1 Nurseries shall have evidence to prove that original propagative material (both rootstock and scion) from each block is true to type at the varietal level. This will be by either of the two methods listed below as (a) or (b):
- a) A record from the organisation supplying propagative material in New Zealand showing that vines have been certified by an ampelographer recognised by NZ Winegrowers. Ampelographers currently recognised by New Zealand Winegrowers are listed in Annex 1.
 - b) A record of DNA certification to the varietal level provided by a laboratory approved by NZ Winegrowers.
 - c) The laboratories currently recognised by New Zealand Winegrowers as providing DNA testing at the varietal level are listed in Annex 1.
 - d) It is noted that there are a number of agencies that act as agents and submit material to established laboratories for testing.
 - e) The sample size for validation purposes shall be from one or more vines.
- 4.1.2 New Zealand Winegrowers accepts that individuals trained by recognised ampelographers are acceptable to perform this duty providing that:
- a) The recognised ampelographer has provided documentary evidence that they feel the individual is competent to carry out this task; and
 - b) The recognised ampelographer performs a series of checks on the decisions made by the individual once during each two year period.
- Note: A specific policy will be worked out by New Zealand Winegrowers in consultation with ampelographers who can offer the training component and have a reasonable knowledge of New Zealand conditions - and that policy will be promulgated by 30 June 2008.
- 4.1.3 Nurseries shall follow documented procedures¹ for the 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 Standard².

¹ 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.

² 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.

- 4.1.4 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:
- Planting maps showing location of mother plants in vineyards or other locations;
 - 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;
 - Records tracing materials through the propagation process;
 - Records of where each batch was sold;
 - 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.

Introduction – the Current New Zealand Situation

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.

The possibility that a significant majority of source blocks throughout New Zealand contain some GLRaV-3 virus, even at very low levels, is acknowledged.

In order to cope with this reality, some tolerance has to be allowed. The Acceptable Quality Level (AQL) for GLRaV-3 testing under this Standard is 0.1% (i.e. 1 per 1,000 grafted vines). The testing regime also acknowledges that different areas can have different levels of either, or both, presence of virus infection and vector pressure. Hence the specific provisions made for testing in the second, and subsequent years, as well as “End of Process” testing.

4.2.1 Definition of “block” for virus testing purposes

- A “block” is an area of vineyard or an area within a vineyard that
- is continuous and clearly defined; and

-
- is a discrete area from which propagation material is collected; and
 - does not include within its boundaries any untested rows or untested material; and
 - has been ampelographically checked with the varieties present being judged to be true to type.
- a) A number of different rows or varieties may be amalgamated into a single designated block as long as the conditions in the previous paragraph are met. A single testing regime must be applied across the entirety of any designated block and the testing regime is to be proportionally applied to each variety present.
- b) The testing regime is determined by the previous year's level of infection - see the Table in 4.2.3 below.
- c) If due to variations in positive virus infections within a proposed designated block, a single regime cannot be applied across the entirety of the proposed designated block, then the proposed designated block must be sub-divided into smaller units for the purposes of testing.

4.2.2 Virus Testing required in 1st, 2nd, and subsequent years³

Year 1. In the first year of drawing propagative materials from a new site, or in the first year in which certification of product is sought by the nursery, 100 percent of all mother vines for both rootstock and scion shall be Elisa tested for GLRaV-3 by a testing laboratory accredited by an ILAC member⁴ and any testing positive for GLRaV-3 excluded from the harvest population. Samples may be composited up to a maximum of 6 vines per test.

The laboratories currently recognised by New Zealand Winegrowers as providing virus testing are listed in Annex 1 and Annex 2.

Year 2. Blocks with a testing history from the previous year that recorded positive virus scores that were at or below the agreed AQL for source blocks of 0.1%, will require testing in the second year at 20% or 200 vines, whichever is the larger number.

- a) Blocks with a testing history from the previous year that recorded positive scores higher than the AQL, will require testing as per Table 4.2.3.

³ This testing regime will be reviewed annually by the New Zealand Winegrowers Technical Reference Group to the Grafted Grapevine Standard

⁴ New Zealand's ILAC member is International Accreditation New Zealand.

-
- b) Samples taken for testing that are less than 100% must be randomly selected from within each variety present in the designated block.

Subsequent Years: If a block that is tested at less than 100% in any year shows any new infections in the subsequent year, the block must be re-tested at 100% before use.

4.2.3 Calculation of sample size - reference Table 4.2.3

- a) For the 2nd and subsequent years - take the percentage of virus prevalence of the source block(s) from the previous year's testing - this is the figure in column 1.
- b) Look up the % testing required - this is the figure in column 2.
- c) Multiply this by the number of vines in the block to get the number of vines to test:
- If this number is less than 200, then sample 200.
 - If the block size is less than 200 then sample 100% of the block.
- d) With the test results estimate the new percentage prevalence in the tested vines so as to decide if extra testing is required.
- e) If the prevalence in the tested vines is less than the percentage of virus prevalence of the source block(s) from the previous year's testing - no more testing is required.
- f) In the situation where there is spread of GLRaV-3 it is likely that the prevalence in the tested vines will be greater than the percentage of virus prevalence of the source block(s) from the previous year's testing. This will need to be determined and when this occurs, go back to 4.2.3 (b) above and recalculate the percentage testing required using the new prevalence.

Table 4.2.3. Sample size for virus testing 2nd and subsequent years

| Column 1 Prevalence of infection in vines as a % of total vines | Column 2 Percentage of vines to be tested for an AQL of 0.1%. |
|--|--|
| 0.13% | 20% |
| 0.14% | 31% |
| 0.16% | 39% |
| 0.18% | 46% |
| 0.20% | 52% |
| 0.22% | 56% |
| 0.24% | 60% |
| 0.26% | 63% |
| 0.28% | 66% |
| 0.30% | 69% |
| 0.35% | 73% |
| 0.40% | 77% |
| 0.45% | 80% |
| 0.50% | 82% |
| 0.60% | 85% |
| 0.70% | 88% |
| 0.80% | 89% |
| 0.90% | 91% |
| 1.00% | 92% |
| 1.50% | 95% |
| 2.00% | 97% |
| 2.50% | 98% |
| 3.00% | 99% |
| 3.50% | 99% |
| 4.00% | 99% |
| 4.50% | 100% |
| 5.00% | 100% |

4.2.4 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 or the individual plants within that group are retested. In that case the infected vine(s) plus one on either side must be excluded.

- 4.2.5 The testing protocols are aimed to identify and then exclude those plants thereby enabling nurseries to migrate over time to 100% of the plants in the Source Block being clear. It is expected in future 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.
- 4.2.6 Nurseries shall follow documented procedures for maintaining effective hygiene and vector control of Source Blocks under the nursery's direct control, 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. Where material is collected from source blocks not under the direct control of the nursery, it will be necessary to ensure that adequate documentation is available from the respective parties for review by the independent auditors.
- 4.2.7 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.
- 4.2.8 A documented procedure shall set out steps to be followed should there be a positive virus test of Source Block material⁵. 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 a 5 metre separation (as recommended by ENTAV) between potentially infected material and other material being used to produce certified plants at all stages throughout the grafting and propagation process.

⁵ See also 4.3.7 for the steps to be followed if a positive test results during "End of Process" testing.

4.3 End of Process Testing

Goal:

- The effectiveness of the process used to produce grafted grapevines is checked.

Outcome:

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

4.3.1 Sampling batches of grapevines at the end of the growing process (i.e. at the last practicable time prior to harvest of the vines but not before 20 March) will provide an assurance that the processes has been followed with the result that grafted grapevines are likely to comply with the requirements of the Standard. In particular, should any GLRaV-3 infected plants be present in the grafted grapevines then the numbers will be less than the AQL specified.

Notes:

1. Approval of plants under the Standard is dependent upon the nursery submitting to the independent auditors a finalised list of conforming batches no later than 31 March each year. After which time the auditors will select which batches require final virus testing. Samples for end of process testing should be fully mature, late season leaves with no sign of senescence and this will enable approval of qualifying product prior to lifting and dispatch.
2. The numbers in batches for “End of Process” sampling purposes will be the volumes after the first dead pull against grafting numbers.
3. End of process confirmation of processes should also include visual observation practices for both virus and Trueness to Type. Prior to leaf-fall, all vines should be inspected by a suitably trained person to identify and remove any vines showing virus symptoms or physical characteristics which are not compliant with the varietal claim.

4.3.2 Sample sizes⁶ have been calculated using an AQL of 1.0% for the end of process testing. There are two samples to be taken:

- a) A sample of batches or lots put up for certification (sample of all lots).

⁶ Based on ISO 2859, an international standard for sampling

b) A sample of each lot or batch selected for sampling (sample of a lot).

The sample of all lots will be calculated from the Table 4.3.2 below:

Table 4.3.2

| Numbers of lots put up for certification | Sample size |
|--|-------------|
| 1 or 2 | all |
| 3 to 50 | 3 |
| 51 to 280 | 13 |
| 281 to 500 | 20 |
| 501 to 1,200 | 32 |
| 1,201 to 3,500 | 50 |

4.3.3 Each sample of a lot shall be based on the number of grafted grapevines in the lot, according to the Table 4.3.3 below:

Table 4.3.3

| Number of grafted grapevines in a lot | Sample size |
|---------------------------------------|-------------|
| 1 or 2 | all |
| 3 to 50 | 3 |
| 51 to 280 | 13 |
| 281 to 500 | 20 |
| 501 to 1,200 | 32 |
| 1,201 to 3,200 | 50 |
| 3,201 to 10,000 | 80 |
| 10,001 to 35,000 | 125 |
| 35,001 to 150,000 | 230 |
| 150,001 and more | 315 |

4.3.4 As an example, a nursery has 50 lots of grafted grapevines put forward for certification. Three lots will be sampled at random (selected by the independent auditor). If the three selected lots have 2,000, 7,500 and 15,000 vines in them respectively, then 50 plants will be selected from lot 1, 80 from lot 2 and 125 from lot 3. These samples may be combined for virus testing (6 to 1), meaning a total of $(50+80+125)/6 = 43$ tests.

4.3.5 When results are reviewed, an accept / reject decision is made: is the lot or the entire process to be accepted, or rejected? The Table 4.3.5 below is used for this.

Table 4.3.5

| Accept / Reject criteria | |
|---------------------------------|--|
| Number of samples tested | Reject if the number of non conforming items is equal to or greater than |
| 3 | 1 |
| 13 | 1 |
| 20 | 1 |
| 32 | 1 |
| 50 | 2 |
| 80 | 3 |
| 125 | 4 |
| 230 | 6 |
| 315 | 8 |

4.3.6 A decision on acceptability is made in two parts:

- a) For each individual lot - if the number of plants tested positive for viruses within a lot is over the reject number, then that lot fails. This acknowledges that where a positive virus test is found in a composite sample, a retest of the individual plants within that group may be required.
- b) For all lots, if the number of sampled lots that fail is equal to or above the reject number, then all lots are rejected – i.e. the process has resulted in an unacceptable result. If the process is unacceptable, then a nursery can determine the reasons for non conformity, identify those lots which have unacceptable non conformity, reject those, and resubmit the balance for certification.

4.3.7 A documented procedure shall set out steps to be followed should there be a positive virus test outside AQL at time of “End of Process” 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”, the sampling and testing programme, and of all the results from that season’s end of process 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 not be sold as certified;
 - 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.

4.4 Physical Specifications

Goal:

- Grafted grapevines, either not potted or potted, meet the physical specifications for the specified category.

Outcome:

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

Physical Specifications – Grafted Grapevines – “Bare Rooted” or “Field Grown”

4.4.1 Grafted grapevines offered as “Bare Rooted” or “Field Grown” 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 250 mm⁷ from the base of the rootstock to the base of the first season's growth;
 - c) The thickness of the rootstock shall be a minimum of 7 mm immediately below the region of the 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 rootstock curvature of more than between 10 and 2 o'clock from the perpendicular;
 - e) Plants shall not have a scion wood curvature of more than between 10 and 2 o'clock from the first bud of the previous season's growth;
 - f) There shall be at least two visible dormant buds above the graft union;
 - g) 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;
 - h) Rootstock shall be able to withstand moderate bending in two directions to identify any dead tissue;
 - i) Root diameter shall be at minimum 2 mm at 10 mm from the base of the trunk, and roots to be visually healthy;
 - j) If trimmed, roots are to be at least 75 mm in length;

Note 1: It is recognised that root development on the grafted plant will be determined by the rootstock used and the conditions in which the plant is grown. Where the root development is predominately a fibrous root mass i.e. if roots are less than 2 mm in diameter, coverage needs to be spread over at least 180 degrees with

- a) No less than 9 roots spread evenly (if no lateral branching) or
- b) No less than 5 roots spread evenly with main roots having fine lateral branching. Minimum root length must be maintained as per 4.4.1 (i) – 75 mm.

⁷ 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%.

Note 2: It is recognised that some insect damage and minor flaking of the bark can occur on the rootstock which has grown below the ground and provided the damage is well healed and does not collectively measure more than 20mm, this is acceptable.

“Well healed” in this context means that the vine has fully covered the injury with callus tissue and that it survives the “stress/bend test” - that is moderate bending in two directions, as used for the graft union test (see 4.4.1 (a) above).

k) There shall be no breakages, cracks, or evidence of damage except as noted above regarding damage to the rootstock in the area which has grown below the ground.

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

Note 3: This is deviation over the total range of physical specifications – not 2% for each category.

4.4.3 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.

Physical Specifications – Potted Grafted Grapevines

4.4.4 A high proportion of potted grafted grapevines are sold in spring when they are in the active growth phase while others are sold in late summer or autumn. Therefore the physical specifications for potted grafted grapevines seek to cover both possibilities:

a) For potted vines sold in spring it is expected the graft union will be waxed, sometimes taped, and because it is not fully developed no “pressure or bend test” should be applied.

For the potted plants sold later when dormant – 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 rootstock shall protrude from the soil a minimum of 200 mm up to the graft

union and the height of the current season's growth shall be a minimum of 200 mm above the graft;

- c) The thickness of the rootstock shall be a minimum of 6 mm immediately below the region of the graft and the thickness of the shoot of the scion a minimum of 3 mm at the first clear internode – both measured on the wider diagonal in the case of oval stock;
- d) Plants shall have neither rootstock curvature nor scion wood angle of more than between 10 and 2 o'clock from the perpendicular using the width of the pot as a reference point;
- e) The root mass should be visible at the base of the pot and be sufficient to hold the media secure around the roots when planting. Any aerial roots will have been removed;
- f) There shall be no breakages, cracks, or visual evidence of damage or diseases - or weeds in the pot.

4.4.5 Deviation from physical specification of up to a total of 2% of samples from all potted grafted plants.

Note 4: As with 4.4.2 above this variation in 4.4.5. is over the total range of physical specifications for potted grafted grapevines - not 2% for each category.

4.4.6 At delivery, as a minimum, all potted grafted grapevines must be clearly identified as to certification status (i.e. certified or not certified), variety, and graft lot or batch number.

4.4.7 Because of the time of sale of most potted grafted grapevines, they are excluded from the requirement for end of process testing referred to in 4.3.

4.5 Management system requirements

Goal:

- Nurseries follow an appropriate management system.

Outcomes:

- High quality plants are produced, with the entire process capable of being satisfactorily audited by third party auditors.

- 4.5.1 Nurseries shall have sufficient resources (physical, human and financial) to adequately meet the requirements of this Standard.
- 4.5.2 In addition to other procedures covered in this Standard, nurseries shall maintain a management system⁸ 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.
- 4.5.3 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.
- 4.5.4 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 4.1.3), 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.

⁸ 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 4.5. 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.

4.5.5 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.

4.6 Use of contractor to collect or supply rootstock or scion wood

Goal:

- Control over the activities of contractors performing activities usually performed by nurseries

Outcomes:

- Material collected by contractors complies with this Standard.

Introduction – the Current New Zealand Situation

There may be situations where a nursery uses a contractor to supply or collect rootstock or scion wood which is then grafted by the nursery under its control. An important factor will be the degree of control that the nursery exercises over the contractor.

There are two options to verify compliance:

- a) The contractor can be audited to the Standard, and provide certified root stock and/or scion wood to a nursery; or
- b) The contractor can, following successful audit, become an “approved supplier”, with defined scope, meaning that nurseries can rely on the “approved status” to assure them that all the relevant requirements of the Standard have been met.

4.6.1 Where the contractor is under the direct supervision of the nursery, acting in the same way as an employee, no further action needs to be taken.

4.6.2 Where the contractor takes responsibility for actions covered under the Standard, it will be essential they comply with the relevant requirements of the Standard. For example, if they select the blocks and test for virus, they shall comply with the trueness to type and virus testing requirements – and the elements of the management system requirements that may be reasonably expected to ensure and demonstrate compliance. In practice this will be all elements.

5. Documentation of, and claims for, certified grapevines

- 5.1 As this is a Business to Business programme, there is no logo for the grafted grapevine certification scheme.
- 5.2 The New Zealand Winegrowers logo may never appear on product labels, promotional materials, stationery or similar materials in conjunction with product certification claims.
- 5.3 Under no circumstances shall any claim or inference be made that the nursery is itself certified.
- 5.4 It is appropriate that the following claim can be made for certified products:

“Certified to New Zealand Winegrowers Grafted Grapevine Standard,
Version X.X - Schedule YY XXX”

(where YY XXX is the schedule number issued byASUREQuality)

This statement may be made on labels, packing slips, invoices, or similar documents. The wording shall be legible, in any font or colour, up to a maximum height of 10 millimetres.

For reasons of size, labels may use abbreviations such as “Certified to NZW GGS V X.X, YYXXX”, or “Certified to GGS V X.X, YYXXX” or similar words, providing that the meaning is clear, and reflects the main statement above.

- 5.5 Nurseries may use the following claim on promotional materials:
“Selected lots / batches of grapevines are certified to the New Zealand Winegrowers Grafted Grapevine Standard”

Words similar to these may be used providing that:

- a) There is no doubt that in a reasonable reader’s mind that certification only applies to selected / approved lots or batches; and
 - b) There is no claim or inference that the nursery has been approved.
- 5.6 Nurseries are encouraged to check proposed use and/or wording with their auditor prior to use, and to obtain written approved for the form of words proposed prior to committing to expenditure.

Annex 1 – Details of Current Testing Laboratories and Ampelographers

1. Ampelographers – Section 4.1.1 (a)

- 1.1 Ampelographers currently recognised by New Zealand Winegrowers are:
- Prof. Andy Walker, of 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

2. Laboratories recognised as providing DNA testing – Section 4.1.1 (c)

- 2.1 The laboratories currently recognised by New Zealand Winegrowers as providing DNA testing at the varietal level are:
- a. Waite Diagnostics, Adelaide, Australia
 - b. University of California, Davis, USA
 - c. Linnaeus, Gisborne
 - d. Entav at Montpellier, France
 - e. University of Montpellier, France

- 2.2 As noted in 4.1.1 (d) there are a number of agencies that act as agents receiving material for analysis and then submit the samples to established laboratories for testing.

3. Laboratories recognised as providing virus testing – Section 4.2.2

- 3.1 The laboratories currently accredited by an ILAC member for providing Elisa testing for GLRaV-3 and hence meeting the requirements of 4.4.2 are:
- Linnaeus, Gisborne;
 - Vine Test Lab Ltd, Hawkes Bay.
- 3.2 As noted in Section 3.1 of Annex 2 testing undertaken by HortResearch will be recognised by NZ Winegrowers as being appropriate for recognition under the Standard as they have undertaken appropriate steps to achieve accreditation.

Annex 2 - Details of Transitional Measures for this Version 2.1

1. **Effective Date:**

- 1.0 This revision of the Standard comes into effect from and will apply to all materials certified from 1 July 2008.

2. **Audit Procedures**

- 2.1 Arrangements for audit of product produced in the coming grafting season shall be made with the independent auditors (currentlyASUREQuality Ltd) no later than 31 March of each year.
- 2.2 The contact forASUREQuality Ltd is Andrew Mill, phone 06 873 4135 or 021 246 7353 or by email to millap@asurequality.com

3 **Accredited Laboratories - transitional arrangements**

- 3.1 As a transitional measure it has been agreed virus testing already done by HortResearch, will be recognised by NZ Winegrowers as being appropriate for recognition under the Standard. This was on the provision that they had entered into the process for accreditation by IANZ, and obtained accreditation by 31 December 2007. HortResearch had advised accreditation was pending at this date but no technical issues had been raised, an extension was granted to June 2008.

4. **Timing of initial virus testing**

- 4.1 Testing of rootstocks is best done between mid April to late August, or anytime the wood is dormant. The leaf is not a good substrate for rootstock testing, and there is no experience of testing on green shoots.