VERSION 4.1

Grafted Grapevine Standard

Issued by New Zealand Winegrowers
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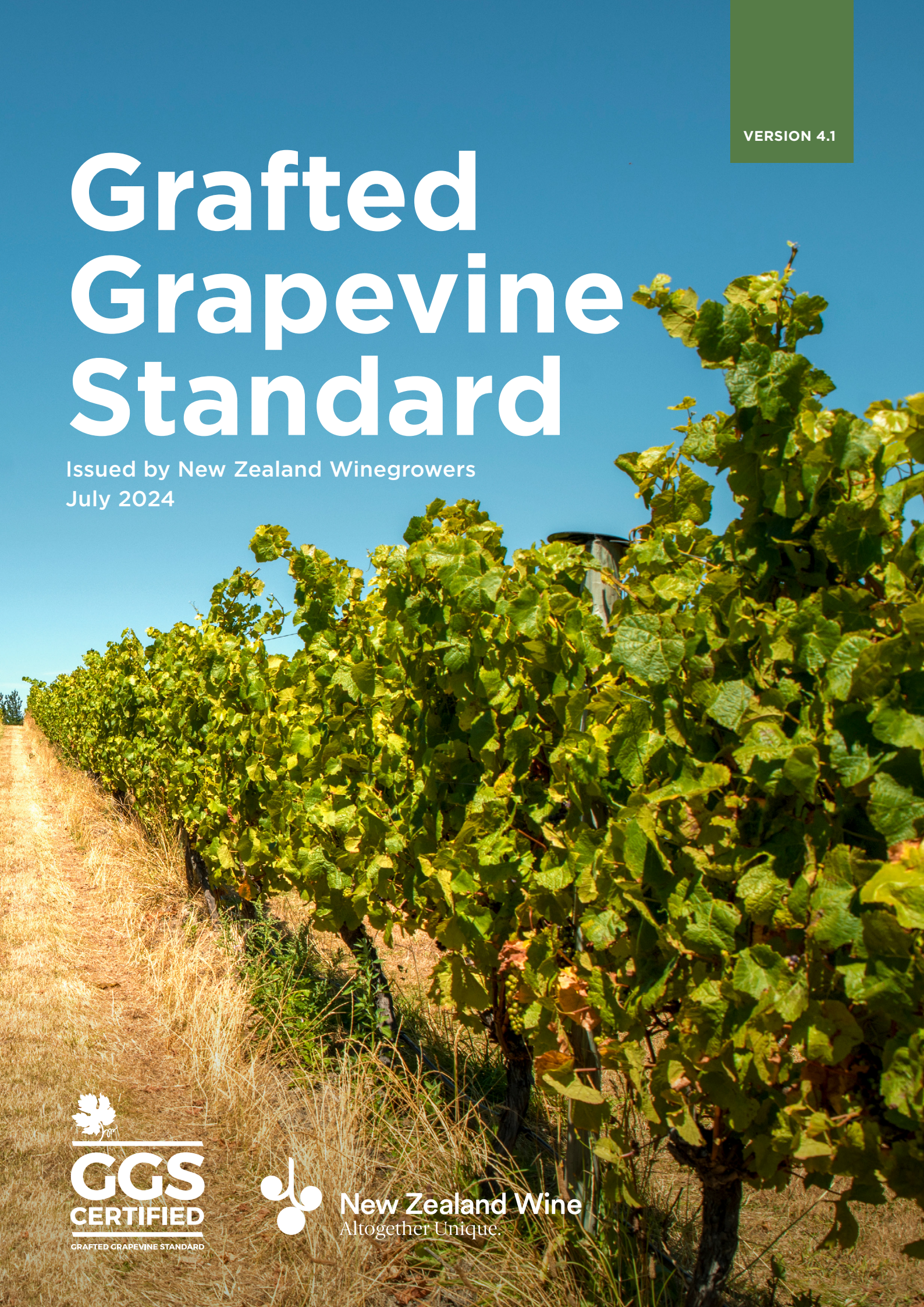

GGS CERTIFIED
GRAFTED GRAPEVINE STANDARD

New Zealand Wine
Altogether Unique.

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Updates

The Standard will be amended from time to time, and the most recent version will be published on the New Zealand Winegrowers' website nzwine.com.
Users should ensure that they are referring to the most recent version. Those wishing to provide recommendations for change should send these in writing to New Zealand Winegrowers or by email to biosecurity@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 Incorporated accepts no liability for claims regarding virus being present in any certified plants.

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INTRODUCTION

This Standard applies to the production of grafted grapevines.

All certified grafted grapevines shall be produced in a facility complying with all requirements of this Standard.

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

Facilities which comply with Section 7 of this standard also meet equivalence requirements for the Plant Pass Biosecurity Scheme (PPBS).

The PPBS scheme certifies the nursery, as opposed to the GGS which certifies the grafted grapevines produced. If equivalence with the PPBS is claimed, then all processes described in this standard which pertain to hygiene, traceability, pest and disease monitoring and biosecurity must be applied throughout the nursery and to all/any plants produced by the nursery (not just grapevines).

A Technical Reference Group of New Zealand Winegrowers has been established as a decision-support group for the New Zealand Winegrowers Board. Their function is to annually review new scientific material and determine its relevance to the GGS, and the Board on the content of the GGS.

The requirements of the standard are grouped into the following areas:

1. Management System
2. Trueness to type
3. Managing virus incidence
4. End of process testing
5. Physical specification
6. Vine health and Hygiene
7. Biosecurity Management (optional for Grafted Grapevine Standard certification, but required for nurseries also seeking PPBS certification)
8. Use of a contractor to collect or supply rootstock or scion wood
9. Certification statements and labelling
10. Certification of carried over vines

TRANSITION TO VERSION 4.1

EFFECTIVE DATE: The standards defined in Version 4.1 will apply from 1st July 2024.

TRANSITION: Any nursery practices that were undertaken prior to 1st July 2024 but where the plants were harvested post 1st July 2024 will remain certifiable provided that they met the requirements of Version 4.

ALTERATION:

Requirement 1.8 wording updated:

An annual external audit of all aspects of the nursery's operations **(except those as required by Section 7, Biosecurity Management)** shall take place, by an independent auditor as appointed by New Zealand Winegrowers. 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.

Arrangements for audit of product produced in the coming grafting season shall be made with the independent auditors no later than 31 March of each year.

- First and second year of audits there shall be two audits. These will be scheduled at grafting (first audit) and lifting (second audit) so that the auditor may follow the process of individual graft lots through the entire production process.
- In the third and subsequent years the auditor will, at his or her reasonable discretion, determine that a single audit at lifting is sufficient to declare the notified graft lots as certified. For clarification, the determination of requirement for a second audit (third year onwards) will be based on the numbers of Corrective Action Requests (CARs) issued and the relative importance of each CAR in achieving the stated aims of the GGS. Trueness to type, freedom from Grapevine leafroll- associated virus 3 (GLRaV3) and physical specifications.
- **With regards to Section 7 (Biosecurity Management): if the nursery opts to have this audited for Plant Pass equivalence, it shall be included in one of the two audits in each of the first and second years. After successful completion of the second year audit, the auditor may determine that the nursery can transition to a three-year audit cycle for Section 7 requirements (starting from the date of the second year inspection). To become (and remain) eligible for the three-year cycle, the nursery must meet compliance criteria for any corrective actions within stated timeframes (as advised by the auditor).**

Requirement 3.1 wording updated:

ELISA testing of rootstocks is best done with dormant wood. The leaf is not a good substrate for rootstock testing, and there is no experience of testing on green shoots.

Requirement 3.4 wording updated:

Any positives and the immediate neighbours within the row should be isolated and removed or clearly marked on the block map, so that the infected vine(s) plus one on either side must be excluded in the future.

Supervisor's full name to be specified on End Of Process Supervision Checklist

Supervisor's full signature, not just initials, to be added to End of Process Supervision Checklist

Requirement 9.1 updated to include the following :

The following statement should be added to all vine labels to indicate year of supply: *Supplied for planting: (year)*

Eg. for all vines supplied to a purchaser in the 2024 year, it should say 'Supplied for planting: 2024'.

This is intended to help reduce issues associated with any onselling of vines by the original purchaser, especially after a period of cold storage.

SECTION 1 – MANAGEMENT SYSTEM

If the nursery is producing plants other than grapevines and claiming equivalence with the PPBS, the requirements of this section also apply to all/any plants produced, not just grapevines. In relation to PPBS equivalence, Requirement 1.4, verification of mother plants as being true to type is not required for non-grapevine species, and Requirement 1.4 e) does not apply.

Requirement 1.1	Nurseries must have sufficient resources (physical, human and financial) to adequately meet the requirements of this Standard.
Requirement 1.2	Nurseries shall be able to provide: a) Details of nursery location(s) b) An overview of the production system used c) A list of production sites d) Nursery maps, showing the location of key production areas and describing neighbouring land use.
Requirement 1.3	Nurseries shall follow documented procedures 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 Standard. › The risk analysis may be based on the principles of Hazard Analysis and Critical Control Points (HACCP), adapted for nursery production, or on processes set out in AS/NZS ISO 31000:2009 Risk management or similar document / standard. › Procedures need to be established, documented, implemented and maintained. › Documentation shall be appropriate to the scale and complexity of the operation, and the skills and experience of staff.
Requirement 1.4	Nurseries shall be able to demonstrate an unbroken chain of custody from the original mother plants verified as true to type to grafted grapevines, including: a) Planting maps showing location of individual mother plants in vineyards or other locations; (block/row/bay/vine position in bay). b) Maps of the nursery plantings c) Each bundle at each step in the process being identified by way of labels (bar coded or otherwise) being attached to allow in-process identification; d) Records tracing materials through the propagation process; e) Records of where each batch was sold; f) Reconciliation records for each batch showing the amounts of propagative material gathered, grafted, lost in process, sold, and in stock.
Requirement 1.5	In addition to other procedures covered in this Standard, nurseries shall maintain a management system[1] 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 the end product has a final inspection against all relevant criteria and is released for sale. The procedure shall specify the staff within the nursery that have authority to undertake this activity.

Requirement 1.6	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.
Requirement 1.7	There must be a minimum of one annual internal check (or audit) of each process as it occurs to ensure that the requirements of this standard are met and that documented procedures are being followed. The nursery will assign to a staff member or members the responsibility for carrying out internal audits. The frequency of checks shall be proportional to the risk of the activity 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.
Requirement 1.8	An annual external audit of all aspects of the nursery's operations **(except those as required by Section 7, Biosecurity Management)** shall take place, by an independent auditor as appointed by New Zealand Winegrowers. 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. Arrangements for audit of product produced in the coming grafting season shall be made with the independent auditors no later than 31 March of each year. › First and second year of audits there shall be two audits. These will be scheduled at grafting (first audit) and lifting (second audit) so that the auditor may follow the process of individual graft lots through the entire production process. › In the third and subsequent years the auditor will, at his or her reasonable discretion, determine that a single audit at lifting is sufficient to declare the notified graft lots as certified. For clarification, the determination of requirement for a second audit (third year onwards) will be based on the numbers of Corrective Action Requests (CARs) issued and the relative importance of each CAR in achieving the stated aims of the GGS. Trueness to type, freedom from Grapevine leafroll- associated virus 3 (GLRaV3) and physical specifications. › **With regards to Section 7 (Biosecurity Management): if the nursery opts to have this audited for Plant Pass equivalence, it shall be included in one of the two audits in each of the first and second years. After successful completion of the second year audit, the auditor may determine that the nursery can transition to a three-year audit cycle for Section 7 requirements (starting from the date of the second year inspection). To become (and remain) eligible for the three-year cycle, the nursery must meet compliance criteria for any corrective actions within stated timeframes (as advised by the auditor).**

[1] 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 1.5. 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.

SECTION 2 – TRUENESS TO TYPE

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.

Requirement 2.1

YEAR 1

Sample Size: 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% of all mother vines for both rootstock and scion shall be tested.

Evidence Options:

Ampelographic - A record from the organisation supplying propagative material showing that vines have been certified by an ampelographer recognised by NZW, or

DNA - A record of DNA certification to the varietal level provided by a laboratory approved by NZW.

Who can provide evidence: A list of approved ampelographers is published on the ViNA website, and on the NZW website at **www.nzwine.com/en/sustainability/biosecurity/grafted-grapevine-standard/**

NZW accepts that individuals trained by recognised Grade 1 ampelographers are acceptable to perform this duty as Grade 2 Ampelographers providing that:

a) The recognised ampelographer has provided documentary qualifications or training records as evidence that they are competent to carry out this task; and

b) The recognised Grade 1 ampelographer performs a series of checks on the decisions made by the Grade 2 ampelographer once during each three-year period.

c) These individuals will provide a true to variety service. This service will be based on variety confirmation of a vine or vines using a reference standard. Reference vines will have either been subject to individual ampelographic inspection by a recognised ampelographer, or, be proven true to type by DNA test provided by an approved laboratory. To qualify as a provider of such a service, the individual must have completed a training course run by a recognised ampelographer and submit their qualification to the GGS Technical Reference Group (TRG) of NZW. The TRG must be able to ascertain that the qualification is of a standard that confirms the ability of the individual to identify rogue plants at a varietal level.

Frequency of checks: Ampelography checks must be made during the growing season at the following frequency and timing.

Mother vines	Check once a year Check twice a year	Rootstock vines - spring only Scion blocks - spring and post veraison
Nursery blocks	Check twice a year	Full pre colour change canopy Early /mid colouration

NOTE: Trueness to type record keeping requirements are listed in section 1.4.

SECTION 3 – MANAGING VIRUS INCIDENCE

These testing protocols are intended to identify and then exclude any plants infected with GLRaV-3, thereby ensuring that eventually all source plants used should be GLRaV-3 negative.

Requirement 3.1 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 % of all mother vines for both rootstock and scion shall be virus tested for GLRaV-3 by a testing laboratory accredited by an ILAC member[2] and any testing positive for GLRaV-3 excluded from the harvest population. ELISA testing of rootstocks is best done with dormant wood. The leaf is not a good substrate for rootstock testing, and there is no experience of testing on green shoots. Samples may be composited up to a maximum of 6 vines per test. The exception is vines with traceability to a known clean source (such as vines from a quarantine station) where proof of 100% virus testing is available, or where planting material has been sourced from 100% tested mother vines. These vines may be tested at the 33% level in their first year of harvest and thereafter as per Table 1 (page 12). Laboratories recognised by NZW as providing virus testing can be found on **nzwine.com/en/sustainability/biosecurity/grafted-grapevine-standard/**
Requirement 3.2 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 33% for scion wood and 20% for rootstock. a) Blocks with a testing history from the previous year that recorded positive scores higher than the AQL, will require testing as per Table 1 (page 12). b) Samples taken for testing that are less than 100% must be systematically selected from within each variety present in the designated block. A suitable plan is required outlining the systematic sampling to ensure that all vines (in blocks with positive scores below the agreed AQL) would be tested every 3rd year for scion blocks and every 5th year for rootstock blocks. Blocks with a positive score above the AQL are to be tested more frequently as per Table 1.
Requirement 3.3 Subsequent Years	If a block that is tested at less than 100%, in any year, shows any new infections in a subsequent year, the block must be re-tested at 100% before use. Where the block is not virus tested or harvested for the production of certified vines in any year, the nursery may resume testing and harvesting in any subsequent year (maximum five years since last testing) at the testing level required under Table 1 (Page 12) provided the nursery meets the following conditions. › The source block has been maintained with particular attention to mealybug monitoring and control and the nursery can provide documented proof of this programme. › Vines either side of previous known positives are tested either individually or in composite. › The block is re-mapped with the intention of excluding unhealthy vines and new vines, unless those vines can be shown to have been planted as certified vines identical to the variety and clone of the original vines in the block.

[2] New Zealand's ILAC member is International Accreditation New Zealand.

Requirement 3.4 ALL years	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 excluded 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 latter case the infected vine(s) plus one on either side must be excluded.
	The testing protocols are aimed to identify and then exclude those GLRaV-3 infected plants thereby ensuring that eventually all source plants used should be GLRaV-3 negative. It is expected that no harvesting will occur until testing of the Source Blocks proposed to be used that year has been completed. **Any positives and the immediate neighbours within the row will be isolated and removed or clearly marked on the block map, so that the infected vine(s) plus one on either side must be excluded in the future.** If harvesting has occurred prior to results being available, the canes from each vine (or bay if composited) must be clearly labelled and quarantined until all results are available.
	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.
	A documented procedure shall set out steps to be followed should there be a positive virus test of Source Block material[3]. The procedure must define the appropriate steps undertaken to provide the required level of confidence that virus infected, or potentially virus infected material, will be removed from use.

[3] Also see steps to be followed if a positive test results during "End of Process" testing.

HOW TO CALCULATE SAMPLE SIZE FOR SECOND AND SUBSEQUENT YEARS

STEP 1 Based on the % of virus prevalence of the source block(s) from the previous year's testing determine the % testing required in 2nd or subsequent years.

Table 1: Sample size for virus testing in 2nd and subsequent years

Prevalence of infection in vines in previous year (% of total vines)	Testing required in 2nd or subsequent years for an Acceptable Quality Level (AQL) of 0.1% (%)
0.13	33
0.14	33
0.16	39
0.18	46
0.20	52
0.22	56
0.24	60

STEP 2 Multiply the % testing required 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.

STEP 3 Estimate the new percentage prevalence in the tested vines and work out if extra testing is required.

STEP 4 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.

STEP 5 If the prevalence in the tested vines is higher than the percentage of virus prevalence of the source block(s) from the previous year's testing – then there is evidence of spread of GLRaV-3. When this occurs, go back to the table above and recalculate the percentage testing required.

DEFINITION

Definition of "block" for virus testing

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 Table 1 (see above).

SECTION 4 – END OF PROCESS TESTING

Testing samples from 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 correct processes have 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 number will be less than that specified in the Acceptable Quality Level (AQL).

Requirement 4.1	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 28 February each year, after which time the auditors will select which batches require final virus testing. Collection of samples for end of process testing must be supervised by an independent body. The samples must be fully mature, late season leaves with no sign of senescence or fully mature canes. Samples must be collected across the entire population of the graft lot and representative of the population. This will enable approval of qualifying product prior to lifting and dispatch. The Supervisors protocol and sample supervision forms are attached at the back in Appendix 1.
Requirement 4.2	The numbers in batches for "End of Process" sampling purposes will be the volumes after the first dead pull against grafting numbers.
Requirement 4.3	End of process confirmation of processes should also include visual observation practices for both virus symptoms and Trueness to Type. Prior to leaf-fall, all vines must 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.
Requirement 4.4	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. For any graft lots that tested above the AQL tolerance level, provide documentation of the process that was carried out to identify and remove infected material and ensure products are now suitable to be sold as certified.

HOW TO CARRY OUT END OF PROCESS TESTING

STEP 1 **SAMPLE NUMBER**

Two samples need to be taken:

1. A sample of batches or lots put up for certification (SAMPLE OF ALL LOTS)
2. A sample of each lot or batch selected for sampling (SAMPLE OF A LOT)

SAMPLE OF ALL LOTS	
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

SAMPLE OF A LOT	
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

Note: Sample sizes for end of process testing only have been calculated using an AQL of 1.0%, based on ISO 2859 international standard for sampling.

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)

- Lot 1 has 2,000 vines = 50 plants will be selected
- Lot 2 has 7,500 vines = 80 plants will be selected
- Lot 3 has 15,000 vines = 125 plants will be selected

› Samples may be combined for virus testing (6 to 1)

(50+80+125)/6 = 43 tests required.

HOW TO CARRY OUT END OF PROCESS TESTING

STEP 2 ACCEPT OR REJECT

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

For each individual lot – If the number of plants that tested positive for GLRaV-3 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. The reject number is calculated based on the number of samples tested, a nursery may increase the samples collected independent of the size of the graft lot, however the samples must be collected randomly and must conform to the appropriate reject number listed in the table above. The nursery must be able to prove documented proof of the location of the random samples.

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 incidence of GLRaV-3. 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.

SECTION 5 – PHYSICAL SPECIFICATION

BARE ROOTED (FIELD GROWN)

The physical specifications listed here for field grown and potted grafted grapevines must be met for vines to be certified under the Grafted Grapevine Standard.

Requirement 5.1

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, cracks or green tissue around the graft union;

b) The length shall be a minimum of 250 mm from the base of the rootstock to the base of the first season's growth;

c) The minimum acceptable diameter of the rootstock is 7 mm immediately below the region of the graft. The minimum acceptable diameter of the shoot of the scion is 4 mm at the first clear internode – measured on the wider diameter in the case of oval stock;

d) Plants shall not have rootstock curvature or be angled beyond 10 and 2 o'clock from the perpendicular;

e) Plants shall not have a scion wood curvature or be angled beyond 9 and 3 o'clock from the first bud of the previous season's growth;

f) There shall be at least three strong live roots (with at least two growing in opposite directions) with others evenly distributed;

g) There shall be a minimum of one visible dormant bud above the graft union;

h) Roots shall have a minimum of 2 mm diameter at 10 mm distance from the base of the trunk, and roots will be visually healthy;

i) If trimmed, roots will be at least 75 mm in length;

j) Rootstocks (not the union as per 5.1(a) shall be able to withstand moderate bending in two directions (this will identify any dead tissue that is not acceptable);

k) There shall be no breakages, cracks, or evidence of damage, except as noted in Note 2 following, regarding damage to the rootstock in the area which has grown below the ground.

Note 1: Root Development

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 5.1 (i) – 75 mm.

Note 2: Minor Damage to Rootstock

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 in total length, 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 5.1 (a) above).

BARE ROOTED (FIELD GROWN)

The physical specifications listed here for field grown and potted grafted grapevines must be met for vines to be certified under the Grafted Grapevine Standard.

Requirement 5.2	Deviation from physical specifications of up to a total of 2% of samples from all grafted plants in a lot or batch is permitted. This is deviation over the total range of physical specifications – not 2% for each category. Guidelines for customer assurance on physical specifications are included in Appendix 2.
Requirement 5.3	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.

POTTED GRAFTED GRAPEVINES

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 seeks to cover both possible sale times:

Requirement 5.4	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, 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, diseases or weeds in the pot.
Requirement 5.5	Deviation from all potted grafted plants is permitted. Physical specification of up to a total of 2% of samples from all potted grafted plants. This is deviation over the total range of physical specifications – not 2% for each category.
Requirement 5.6	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.
Requirement 5.7	Because of the time of sale of most potted grafted grapevines, they are excluded from the requirement for end of process testing unless dispatched after 1st March in any year.

SECTION 6 – VINE HEALTH AND HYGIENE

Within the nursery environment, good hygiene standards are essential at each stage of the grafted grapevine production process to mitigate the risk of spread of fungi causing grapevine trunk disease and young vine decline. If the nursery is producing plants other than grapevines and claiming equivalence with the PPBS, the requirements of this section also apply to all/any plants produced, not just grapevines.

Requirement 6.1 Nursery Hygiene	Good hygiene practices are critical for reducing the likelihood of biosecurity threats spreading within the production environment. Nurseries shall be able to provide documented evidence of the following, across all areas of nursery operation: a) How workers are informed of and trained in nursery hygiene measures. b) How tools and equipment are cleaned. c) How work areas are kept clean to avoid contamination of vine material and prevent infestation by pests or pathogens.
Requirement 6.2 Source block management	Nurseries shall follow documented procedures for the areas noted below to show effective maintenance of hygiene and vector control of all source blocks under the nursery's direct control. The nursery shall monitor the plant health status of all 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. **a) Pest and disease control** i. A programme to monitor and control pest and disease throughout the growing season and up until harvest. ii. Monitoring records are to be kept for all rootstock and scion wood source blocks. Inspection should include but not be limited to powdery mildew, downy mildew, phomopsis and mealybug. **b) Pruning** i. Disinfection of pruning equipment after completion of each bay. ii. After completion of each bay, pruning wound protection must be applied to rootstock mother source blocks. iii. Pruned organic waste can be a biosecurity hazard and must be managed/disposed of as appropriate to the season. **c) Harvesting** i. All wood for propagation (rootstocks and scion) must be harvested from trellised vines and must not come into contact with the ground. ii. The nursery shall be able to provide evidence of measures undertaken to avoid contamination of harvested material through handling by workers or contaminated tools/equipment. iii. Measures must be in place to avoid contamination during transport of harvested material from the field to storage or further processing. iv. At all stages of the grafting process all wood harvested for propagation (rootstocks and scion) must be placed into and stored in new or disinfected (steam, heat or chemical disinfection) packaging.

Requirement 6.3
Grafting and hydration

Plants are highly vulnerable to contamination by pathogens during propagation; hazards include:

i. airborne and water-transmitted pests,

ii. contaminated tools,

iii. machinery and work surfaces,

iv. contamination by workers within the propagation area.

The nursery shall be able to provide evidence of measures undertaken to mitigate these risks of contamination of all scion and rootstock materials while they are being prepared for grafting.

a) If wood is hydrated (submerged or partly submerged in water for any length of time) the water must be drained to waste and replaced with clean water each time the tank is filled with rootstock or scion wood cuttings.

b) If wood is soaked in a fungicide dip for any length of time, the nursery must have a policy around the number of times the fungicide dip is used. This policy is to be based on scientific evidence of the effectiveness of the fungicide dip over time.

c) Disinfection of grafting tools and surfaces is required between each graft lot and work session throughout the day.

d) Sterilisation of all callus media and containers is required prior to each use.

e) Any fungicide use throughout the process must be recorded, including:

i. Date of application

ii. Product details

iii. Applicator's name and certification details (if required by the type of spray used)

Requirement 6.4
Nursery field operations

All growing plants are exposed to a wide range of biosecurity risks from nursery activity, facility management and building/machinery condition, neighbouring areas and the environment. Many of these can be mitigated through sound hygiene, regular crop monitoring and good facility design. Nurseries shall meet the following requirements:

a) Resting or rotating nursery soils to mitigate the build-up of soil borne pathogens. Nursery soils must be rested for at least one year, after a maximum of four years of use as a nursery. During the rest period it is recommended that cover crops are grown on the site, but no grapevines are to be grown on the site for a minimum period of 12 months.

b) A programme is required to monitor and control pest and disease throughout the growing season and up until lifting.

Any sprays used throughout the process must be recorded, including:

i. Date of application

ii. Product details

iii. Applicator's name and certification details (if required by the type of spray used)

c) For vines in callus houses, hardening off beds or potted beds, nurseries shall be able to provide evidence of measures undertaken to ensure vines are not contaminated while standing out, or during any movement between callus house and hardening area, or between potted beds.

SECTION 7 – BIOSECURITY MANAGEMENT

Compliance with this section is optional for GGS certification, however, nurseries that choose to meet the requirements of this section can also be certified under the Plant Pass Biosecurity Scheme through an equivalence arrangement.

It is critical that nurseries take appropriate steps to manage and minimize biosecurity risk. Anything coming into the nursery from offsite can pose biosecurity risk, including staff, visitors and nursery supplies, as they may inadvertently carry pests or pathogens in with them.

Requirement 7.1 Nursery details and PPBS management	a) In addition to the details required in Section 1.2 of this standard, nurseries shall be able to provide key contact details for the nursery, a list of nursery water sources, and nursery maps which show the location of biosecurity risk areas. b) Dedicated resource shall be assigned the responsibility for implementing all aspects of the GGS (including this section), including the planning, implementation and maintenance of procedures and the documentation of these in the Nursery Manual or elsewhere. The nursery manager may assign responsibility for the implementation of the GGS to a senior staff member, who will be aware of the need for good nursery practice, nursery hygiene and the biosecurity risk management procedures required for the GGS to maintain equivalence with the Plant Pass Biosecurity Scheme (PPBS). Nurseries shall be able to provide evidence of who is responsible for implementation of the GGS and PPBS.
Requirement 7.2 Signage	Nurseries will use signage to inform visitors that access control and biosecurity are important, and that they have a responsibility to ensure they do not bring unwanted pests or pathogens on to nursery sites. Nurseries shall provide evidence of signage that: a) Highlights the importance of biosecurity to the nursery environment. b) Indicates that entry is restricted to permitted persons only. c) Shows visitors where to park. d) Directs visitors to the office or provides contact details for a visitor to log their presence.
Requirement 7.3 Visitors	People moving between nurseries and other horticultural enterprises can unknowingly spread pests and diseases. Nurseries should have mitigation measures in place to minimize this threat. Vehicles can also harbour and transfer pests, particularly when contaminated with plant material or growing media. Nurseries shall be able to provide evidence of: a) How visitors are made aware of biosecurity and nursery hygiene requirements. b) How the biosecurity risks presented by visitors and their vehicles are mitigated. c) Where the visitor register is located and how it is maintained.

Requirement 7.4 Nursery biosecurity measures	Any plant material or inanimate substance has the potential to carry biosecurity threats into a nursery. Having good biosecurity practice in place is important to reduce the likelihood of biosecurity threats entering and spreading within the nursery environment. Nurseries shall be able to provide evidence of: a) How nursery site biosecurity issues are managed. b) How access to nursery production areas is controlled. c) How vehicles are cleaned and records of regular vehicle inspections (for possible biosecurity contamination). d) How plant and other biological waste is disposed of. e) How the movement of people, equipment, and vehicles between multiple sites is managed to control the risk of pests being transported from one site to another (if the nursery operates on more than one site). This includes the movement of people, equipment and vehicles around non-nursery owned sites that are used for collecting source material. f) How nursery staff are trained to be aware of potential biosecurity risks.
Requirement 7.5 Inwards supplies	Any nursery supplies sourced offsite may present biosecurity risk; the material, packaging, or means of transport may be contaminated. Nurseries should have some system in place to validate the trust they place in external suppliers. Upon receipt of supplies, inspection to ensure there is no contamination or hitchhiking pests associated with them is an important biosecurity risk mitigation. Nursery supplies include growing media (and its component materials), fertiliser, containers (pots, bags, trays) and budwood. Nurseries shall be able to provide evidence of: a) How suppliers are assessed to ensure nursery management staff are confident pests are unlikely to be introduced on supplies sourced offsite. b) How nursery supplies and any associated packaging are inspected on arrival, and evidence of any other measures undertaken to ensure nursery supplies are free from pests. c) Records to show where supplies came from. d) Measures undertaken to ensure nursery supplies are prepared and stored in ways that avoid contamination by pests. e) Measures undertaken to manage the risk of contamination if any nursery supplies are recycled or reused. f) Measures to manage contamination risk if organic manures are used as fertilisers.
Requirement 7.6 Handling of plant material	Contamination risks from workers and tools can arise when handling plants for growth management activities (such as moving, spacing, pruning, staking, shaping), and during the harvesting process, in both source blocks and in the nursery field. In the case of potted plants, until they are properly established plants are susceptible to competition from weeds, attack from pathogens and infestation by insects. Hazards include airborne and water-transmitted pests, contaminated tools, machinery and work surfaces, and contamination from workers within the potting area. Sound nursery hygiene practices are crucial to protecting young plant stock. Nurseries shall be able to provide evidence of: a) the measures undertaken to avoid contamination of the plants during handling throughout all stages of the production process. b) measures undertaken to avoid contamination during the potting process (where applicable).

Requirement 7.7 Transport of plant material within the nursery	As plant material is transported around the nursery and/or planted in the field, it is at risk of possible contamination from equipment and workers. Standing water on roadways can harbour pathogens and affect nearby plants if water splash occurs. Newly potted plants are also at risk of contamination as they are transferred to growing areas The nursery shall be able to provide evidence of measures undertaken to ensure plants or plant material are not contaminated during: a) transportation to and planting in the field. b) transport from field to storage or processing for dispatch. c) movement from potting area to growing area (where applicable).
Requirement 7.8 Storage of nursery plant material	Correct storage of plant material at all stages of the production process (including processed grafted grapevines and plants stored prior to dispatch) is essential to control and maintain hygiene levels. The nursery shall provide evidence of: a) The process(es) and person(s) responsible for storage of plant material at all stages of the production process. b) Measures to avoid contamination during storage of plant material. c) Records of inspection during storage of plant material.
Requirement 7.9 Irrigation and nutrition amendment	a) Contamination risks from nutrition amendment in the growing area (eg. fertigation) can arise from workers who may introduce pests from other parts of the nursery or offsite. The nursery shall be able to provide evidence of measures taken to manage the risk of pests being spread while undertaking nutrition management. b) Irrigation water can be a source of biosecurity contamination and may require testing and/or treatment to provide assurance it will not contaminate plants. The nursery shall be able to provide: i. Details of water sources used in the nursery. ii. Evidence of measures to manage the risk of pests or pathogens being introduced and spread through irrigation (for example: water testing, storage, any treatments used). iii. Evidence of measures to ensure that run-off doesn't re-enter growing areas.
Requirement 7.10 Vine distribution and transport to clients	Plant distribution and transport is a key control point in the management of pest spread. Pests can be spread on plants themselves, on packaging, or by the vehicles undertaking transport. Nurseries should be able to provide assurance that the plants they supply and the associated packaging have been inspected and signed off prior to transport. a) The nursery shall be able to provide evidence of how the nursery dispatch process minimizes the risk of spreading pests and disease via plants, packaging and vehicles used for transport.

SECTION 8 – USE OF CONTRACTOR TO COLLECT OR SUPPLY ROOTSTOCK OR SCION WOOD

Follow this process in 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:

Is the contractor under the direct supervision of the nursery, acting in the same way as an employee?

YES

No further action needs to be taken

NO

There are two options to verify compliance of the contractor:

1. The contractor can be audited to the Standard, and provide certified root stock and/or scion wood to a nursery;

   or

2. The contractor can be trained by the nursery in growth and collection of rootstock or scion wood, and provide all relevant paperwork that the nursery usually completes, to show conformance with the individual nursery policies and the GGS. This paperwork must be available for inspection at the time of audit.

Note: If 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.

SECTION 9 – CERTIFICATION STATEMENTS AND LABELLING

✓ DO

Requirement 9.1

- ✔ 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 by the auditors); or*
  *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 reflect the main statement above.**
- ✔ 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.
- ✔ Nurseries may use the following claim on promotional materials:

  "Selected lots / batches of grapevines are certified to the New Zealand Winegrowers Grafted Grapevine Standard"
- ✔ The following statement should be added to all vine labels to indicate year of supply: *Supplied for planting: (year)*

  Eg. for all vines supplied to a purchaser in the 2024 year, it should say 'Supplied for planting: 2024'.

  This is intended to help reduce issues associated with any onselling of vines by the original purchaser, especially after a period of cold storage.

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.

- ✔ It is appropriate that the approved "Grafted Grapevine Standard Certified" logo can be used for certified product labels, packing slips, invoices, or similar documents and for promotional material as long as it relates to certified materials only.

The GGS logo can be requested by emailing **biosecurity@nzwine.com.**

- ✔ Nurseries are encouraged to check proposed use and/or wording with their auditor prior to use, and to obtain written approval for the form of words proposed prior to committing to expenditure.

✗ DO NOT

- ✖ The New Zealand Winegrowers logo may never appear on product labels, promotional materials, stationery or similar materials in conjunction with product certification claims.
- ✖ Under no circumstances shall any claim or inference be made that the nursery is itself certified.

Requirement 9.2 (for those nurseries wishing to obtain PPBS certification through equivalence)

Producers who achieve equivalence with the PPBS Core Standard are to identify themselves as such through the inclusion of a statement on their documentation – product lists, packing slips, invoices, marketing materials etc.

Acceptable wording includes "[Producer name] is certified to the Plant Pass Biosecurity Scheme Core Standard". A logo will be made available for optional use on documentation.

Where producers are managing a biosecurity threat identified by a Specific Module they should follow the identification requirements specified in that module to identify that the plants have been managed to reduce risk from the given threat.

These may include Scheme identification on plant labels or other means physically attached to individual plants, lots or batches.

* Labels must also conform to the requirements specified in 5.3 (bare rooted) and 5.6 (potted).

SECTION 10 – CERTIFICATION OF CARRIED OVER VINES

It is acknowledged that some nurseries will replant unsold vines in the nursery at the end of the delivery season. The intention is that these vines may retain their certification status.

Requirement 10.1	These vines will be subject to the normal field husbandry employed in each nursery. During the second or any subsequent growing season the replanted vines will be at the risk of virus infection. Certified replanted vines may be sold as certified vines under the following conditions. a) Each lot is included in the list of certified lots provided to the auditor for selection of end of process testing lots. b) They are identified as two year old vines (may be abbreviated as '2YO'), at point of sale, on bundle labels and in all correspondence with clients.

BACKGROUND – GRAFTED GRAPEVINE STANDARD

Grapevine leafroll associated virus 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 winemakers' 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 NZW 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 outcome sought by the Grafted Grapevine Standard is to provide assurance to growers, viticulturists, winemakers, and other stakeholders, 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 detectable GLRaV-3 at the time of testing.

TRUENESS TO TYPE

In a number of viticultural situations emphasis is placed on clonal selection, however currently 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 once completed and after consultation with industry stakeholders.

VIRUS TESTING

GLRaV-3 testing results (2006 to 2014) shows only low incidence in both scion and rootstock source blocks. It is also recognised that recently infected vines with low titre levels, and/or vines infected post leaf testing may escape detection and the end of process testing (AQL).

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 regions can have different levels of either, or both, presence of virus infection and mealybug vector pressure.

GRAPEVINE TRUNK DISEASE AND YOUNG VINE DECLINE

It is recognised that fungi with the potential to cause grapevine trunk disease or young vine decline can be spread through the propagation process. While the research is not clear on the incidence and effects of these fungi, adopting nursery practices to minimise any spread is a sensible precaution. Hot water treatment (HWT) as a means to combat the spread of these fungal diseases has not been widely adopted in NZ because of issues with poor growth and unacceptable vine deaths. Until there is a better understanding of the efficacy and the long term effects of HWT, nursery management practices, such as sourcing only from vines grown on a trellis, and careful management of hydration tanks, should be used to reduce any potential risks.

EQUIVALENCE WITH THE PLANT PASS BIOSECURITY SCHEME (PPBS)

Nurseries which demonstrate compliance with all sections of this standard, including Section 7, are eligible for PPBS certification via equivalence as well as having their vines GGS-certified. The process for obtaining PPBS certification is as follows:

First year

1. Nursery registers with PPBS (NZPPI) and flags their intent to seek PPBS equivalence.
2. NZPPI processes and invoices PPBS programme fee.
3. Nursery undergoes GGS audit.
4. The nursery supplies NZPPI with evidence of conformance to GGS including PPBS related clauses
   › Confirmation that Section 6 criteria are used nursery/crop wide
   › Conformance to Section 7.
5. NZPPI processes, sends certificate, updates PPBS register.

Subsequent years

1. NZPPI sends nursery a prompt and programme invoice some two months out from certificate expiry.
2. As per #3-5 previously.

DEFINITIONS

Acceptable Quality Level (AQL)	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 non-conforming vines 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%. Tables establishing appropriate testing regimes in the Standard were developed from reviewing testing results.
Appropriate	An accepted action or outcome deemed fit for purpose by a regulator, standard setting body or industry.
Bare-rooted vine	A vine that has been lifted from the field in winter, washed and is despatched to the customer as complete dormant vine, ready to plant in the ground.
Batch	Plant material from a single source that is treated as one group for the purposes of production in the nursery.
Biosecurity	Measures taken to prevent the introduction and/or to minimize the risk of establishment and spread of pests and disease.
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 includes only vines that have been virus tested and ampelography checked according to the GGS protocol.
Bundle	A lot of either root stock, scion wood or grafted plants
Clean	To make free from unwanted material that may harbour pests or pathogens.
End of Process testing (EOP)	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.
Field grown	A young vine that has been planted in the field and grown on for at least one season following bench grafting.
Grafted grapevine	A vine that has undergone the matching of scion wood to rootstock through the process of bench grafting.
Growing area	Any area in a nursery where plants are established to grow through from one production stage to another.
Hitchhiking pest	A pest that is carried by plants, plant materials or packaging and does not infest those plants or plant products.
Key measures	Management processes necessary to adequately address biosecurity risk.
Lot (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.

DEFINITIONS

Mother plants	The plants from which rootstock and scion wood cuttings are taken.
Nursery	Any property location where a plant producer undertakes the growing of plants.
Nursery block	The field nursery site in which newly grafted grapevines are grown in the nursery prior to sale.
Pest	Any species, strain or biotype of plant, animal or pathogenic agent that adversely impacts plants in commercial production or the natural environment.
Plant Pass Biosecurity Scheme (PPBS)	A framework to help plant producers improve biosecurity risk management.
Potted vine	A vine that has completed its nursery process and is sold to the customer as a vine contained within a pot, with the roots established in soil.
Propagative material	Includes cuttings of both rootstock and scion wood used in the propagation process.
Production site	A distinct area that is physically separated from another to the extent it can be regarded as a discrete area.
Source block	The block containing mother plants further definition is above in the 'Block' definition.
Traceability	The ability to follow nursery inputs, plants or a group of plants from one point in the supply chain to another.
Treatment	An accepted procedure for the killing, inactivation or removal of pests, or for rendering pests infertile, or devitalisation of seeds.
Type	The variety of the plant material.
Variety	The classification of the grapevine plant material taken from the "International list of vine varieties and their synonyms" published by the International Organisation of Vine and Wine (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.
Virus test or virus testing	For the purposes of this document means to test for GLRaV-3 by either enzyme linked immunosorbent assay (ELISA) or polymerase chain reaction (PCR) methods in accordance with the techniques prescribed by the laboratories listed on.nzwine.com/vina
Work area	Any area in a nursery where plants are manipulated or handled through the production process.
Worker	All the people engaged by the nursery – includes paid employees, workers and volunteers. For clarity, third party contractors are regarded as visitors rather than workers.

REFERENCES

- Hoskins N, O'Neill R, (2015) New Zealand Grafted Grapevine Standard; A review of literature relating to grapevine trunk disease and nursery production.
- Codex Alimentarius CAC/RCP 1-1969, Rev. 4-2003 Recommended international code of practice general principles of food hygiene
- 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
- ISO 9001:2000 – Quality management systems, requirements
- NZS 4360:2004 Risk Management
- Organisation Internationale de la Vigne et du Vin (OIV) Standards and definitions
- PPBS Core Standard v 1.1 (2020).

APPENDIX 1: END OF PROCESS TESTING – SUPERVISION OF COLLECTION BY AN INDEPENDENT BODY

INSTRUCTIONS FOR INDEPENDENT BODY

Currently New Zealand Winegrowers recognise Fruitfed Crop Monitoring Services as being able to provide this service.

Background

Section 4 of the GGS States:

Testing samples from batches of grapevines at the end of the growing process will provide an assurance that the processes have been followed with the result that grafted grapevines are likely to comply with the requirements of the Standard.

4.1 Approval of plants under the Standard is dependent upon the nursery submitting to the independent auditors a finalised list of confirming batches no later than 28 February each year. After which time the auditors will select which batches require final virus testing.

Collection of samples for end of process testing must be supervised by an independent body. The samples must be fully mature, late season leaves with no sign of senescence or fully mature canes. Samples must be collected across the entire population of the graft lot and representative of the population. This will enable approval of qualifying product prior to lifting and dispatch.

Calculation of Sample Size

The auditor and the nursery would have calculated how many samples to take. There are two calculations for this, and they are outlined in the GGS.

The number of samples that a nursery must take for EOP testing is determined by the number of lots they have put up for certification:

Number of lots put up for certification	Sample Size
1 or 2	All
3 – 50	3
51 – 280	13
281 – 500	20
501 – 1200	32
1201 - 3500	50

The number of samples taken from each lot is based on the number of vines in each graft lot:

Number of grafted grapevines in a lot	Sample Size
1 or 2	All
3 – 50	3
51 – 280	13
281 – 500	20
501 – 1200	32
1201 – 3200	50
3200 – 10000	80
10001 – 35000	125
35001 – 150000	230
150001 and more	315

It is helpful for the independent supervisor to understand the processes behind determining the number of samples that should be taken from each lot. However, they should not need to calculate this number as it should be provided for them.

Composite vs Individual Samples

A nursery may decide to test their samples in a composite. This means that they can test several vines together. For example, the leaves from six vines may be collected together in one bag so that the laboratory can test them at once. This reduces the cost for the nursery. If the nursery is collecting composite samples, it should label the vines that it tests so it can go back and get individual tests if a positive result occurs.

If a nursery is collecting in composite samples, it will reduce the number of samples that are submitted to the laboratory for testing. For example, instead of testing 125 samples, the laboratory can test 21 samples of six leaves each (or 20 samples of six leaves and one sample of 5 leaves).

Each nursery should have a procedure around End of Process testing. It would be helpful for supervisors to request a copy of the procedure and be familiar with it prior to arriving at the nursery. Please note that all procedures for each nursery are commercially sensitive information and the procedures are not to be distributed without the written permission of the nursery.

Maps

Most nurseries will have a map showing where the vines are planted. This is a good starting point to identify where the samples will be collected from. Nurseries may or may not have a detailed planting plan associated with the map which provides more information about the location of the vines.

Graft Lot/Batch

The GGS defines a batch or lot as the same thing. It is: Identified grafted grapevines material produced from a specified rootstock and scion source blocks at a particular time in the production process and treated as one group for the purposes of manufacturing control.

Supervision of collection by an independent body requires:

- Visiting the nursery at the time of End of Process Collection
- Becoming familiar with the nursery procedure for End of Process testing.
- Supervising the nursery personnel who will be collecting the leaves for virus collection.
- Checking that the collection occurred in batches as identified by the auditor. Use the nursery map and labels in the field to check this is occurring.
- Checking that the samples are labelled appropriately.
- Checking that the submission form for the laboratory identifies the samples appropriately.
- Filling out the End of Process Supervision Checklist for each batch that is required to be tested under the GGS.
- Sealing the box that the end of process samples are placed in for delivery to the laboratory

NOTE: It is the nursery's responsibility to ensure that the laboratory that is undertaking the testing, formally acknowledges that the samples were submitted in a sealed box.

Supervisor's full name

END OF PROCESS SUPERVISION CHECKLIST

Nursery

Date Address

End of Process Testing

Nursery Batch Number of Samples Required

Location of batch

Method of Collection

- ☐ Leaf
- ☐ Cane

Sample Type

- ☐ Individual
- ☐ Composite – Number of samples

Sample Collected by ☐ Samples

Labels checked ☐ Laboratory Submission form

Notes

The samples collected are a representative sample of the nursery batch:

Signature Date

Full signature, not just initials

End of Process Testing

Nursery Batch Number of Samples Required

Location of batch

Method of Collection

- ☐ Leaf
- ☐ Cane

Sample Type

- ☐ Individual
- ☐ Composite – Number of samples

Sample Collected by ☐ Samples

Labels checked ☐ Laboratory Submission form

Notes

The samples collected are a representative sample of the nursery batch:

Signature Date

Full signature, not just initials

End of Process Testing

Nursery Batch | Number of Samples Required

Location of batch

Method of Collection

- ☐ Leaf
- ☐ Cane

Sample Type

- ☐ Individual
- ☐ Composite – Number of samples

Sample Collected by | ☐ Samples

Labels checked | ☐ Laboratory Submission form

Notes

The samples collected are a representative sample of the nursery batch:

Signature | Date

Full signature, not just initials

End of Process Testing

Nursery Batch | Number of Samples Required

Location of batch

Method of Collection

- ☐ Leaf
- ☐ Cane

Sample Type

- ☐ Individual
- ☐ Composite – Number of samples

Sample Collected by | ☐ Samples

Labels checked | ☐ Laboratory Submission form

Notes

The samples collected are a representative sample of the nursery batch:

Signature | Date

Full signature, not just initials

APPENDIX 2: CUSTOMER ASSURANCE PROCESS FOR GRAFTED GRAPEVINE STANDARD VERSION 4.1 – SECTION 5

Purpose

These customer assurance guidelines help ensure the robustness of the Grafted Grapevine Standard by setting out a feedback mechanism for growers who consider their vines may fall outside the thresholds set out in Section 5 - Physical Specification.

When to use

Before delivery check your supply contract with your nursery and ensure you inspect the vines within the timeframe specified in the contract. Issues with vines physical specifications are easier to see before vines are planted. Communicate with your nursery to let them know you have checked the order.

Samples will vary depending on the size of the order, but it is important that any sample gets good coverage across the scope of the order. Do not just open one box as this won't indicate whether it is a systemic or point problem.

For example, a guideline sample size could be:

5% for orders under 1,000 vines; reducing % down to a maximum of 1% for orders 100,000 vines or more.

If, following an appropriate sample for the size of the order, the customer considers that more than 2% of sampled vines received fail to meet the specifications set out in Section 5, they should:

- Contact the relevant nursery and New Zealand Winegrowers. Nursery and customer to resolve and then contact New Zealand Winegrowers to advise
- Nursery to consider whether issue is specific to the order supplied to the customer or if it is a wider nursery issue.
- If the issue is an order specific issue, the nursery is to make a note on the record and advise GGS auditor at next audit.
- If the issue identified is a wider nursery issue, the Nursery must:
  1. Contact all customers who have taken delivery of vines that may be affected and advise the client of the issue.
  2. Provide appropriate resolution for the problem, this may include, and is not limited to, updated procedures.
  3. Advise New Zealand Winegrowers as soon as possible.
  4. Depending on the circumstances, New Zealand Winegrowers may request another audit of the nursery at the nursery's cost.

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