Affinity Labs

Fact Sheet
ANALYSIS

Virus testing

Introduction

Grapevine viruses can shorten the life of infected grapevines and reduce both the quality and yield of grapes. Several viruses, especially those belonging to 'rugose wood complex', have been associated with graft incompatibility. In some cases, especially in many white grape varieties and non-*vinifera* rootstocks, virus-infected vines do not show symptoms but the virus can spread to susceptible neighbouring vines and vineyards. It is important to test propagation material prior to planting or grafting to avoid the risk of introducing or spreading viruses. Virus testing is also a useful tool to help diagnose poor-performing grapevines and to detect and eliminate infections before they become a serious problem.

Collection and shipment of samples

The reason for testing grapevines determines the best approach for sampling for virus testing. If symptoms have been observed, or are suspected, samples taken directly from the affected vine should be submitted for testing. However, if a vineyard block is being tested as a precautionary measure, it is important to ensure that a fair representation of the block is sampled. Vineyard blocks often vary greatly in size and collecting a sample representative of the entire block can be challenging. A minimum of five vines per 1,000 vines is recommended to ensure an accurate representation. Plant material from a maximum of five vines can be pooled together into one sample for virus testing while still ensuring high sensitivity of the test.

Recommended sampling procedure:

1. The most accurate virus detection is possible when samples are taken in spring, autumn or winter. Avoid sampling in the height of summer or on very hot days, as viruses become less active in hot conditions and virus concentration may be reduced to an undetectable level.
2. At a minimum, randomly select five vines for every 1,000 vines spread across the block, to ensure an accurate representation of the area tested. Tag the vines so they can be identified later.
3. From each of the vines, cut a minimum of two 20-30 cm sections of canes (dormant season), or green shoots (in season). The second node on either side of the trunk is an ideal location (see Figure 1).
4. If samples are being pooled, ensure that canes from no more than five vines are collated.
5. Ensure grapevine cuttings are clearly labelled, free of soil deposits and placed in a labelled sealable plastic bag. For samples leaving a biosecurity risk area, ensure that samples are double bagged, and the required quarantine standards are met (see below).

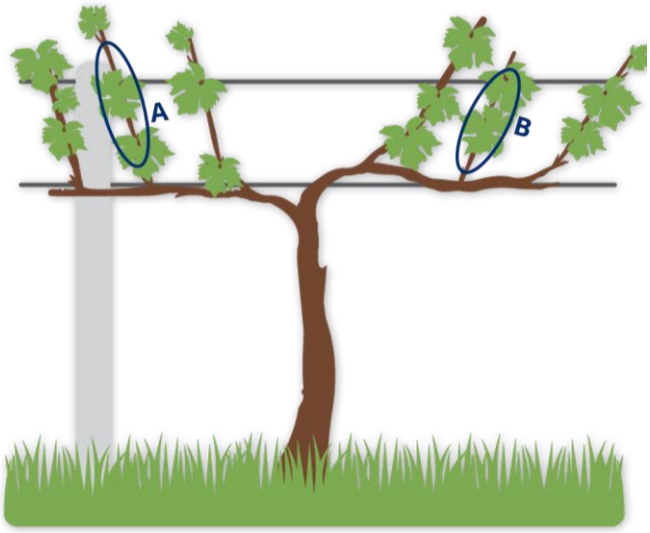

*Figure 1. Ideal sampling locations **(A and B)** for grapevine virus testing.*

6. Send cuttings as soon as possible, ideally within one to two days, to prevent them from drying out.
7. Ensure that samples have all the required documentation (especially if the samples are going interstate) to prevent delays in quarantine. A checklist is provided at the end of this fact sheet with details of required information.

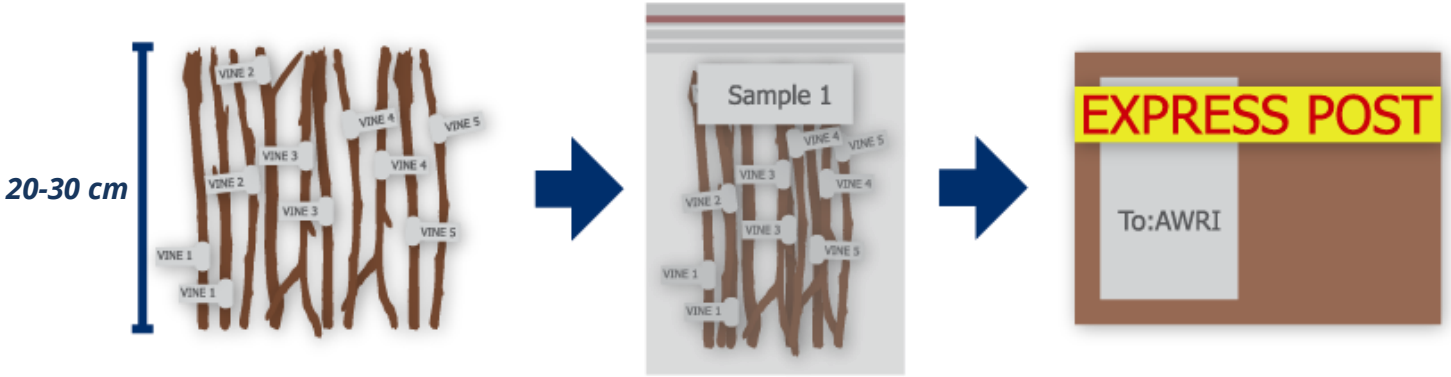

Figure 2. Correct packaging and shipment of samples for virus testing.

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Quarantine regulations

To submit samples from outside of South Australia, plant material must be accompanied by a completed plant material movement declaration form (virus testing) and be packaged as detailed in this document.

Please contact the virus testing team for more information regarding samples being shipped internationally, or samples shipped from a *Phylloxera*-risk or -infested zone.

Available analyses

Depending on the reason for the analysis, virus testing can be carried out as either a broad screen for multiple viruses, or a single test for a specific virus. A sample preparation fee is charged only once per sample irrespective of the number of viruses being screened for.

Single virus check
This test is used to detect the presence of a specific virus. The single virus check is a useful tool to determine if a problematic virus has been eliminated or to establish the severity of a known infection.

Pre-grafting screen (three or four viruses)
This screen is used to check both existing rootstocks as well as scions for potential infection prior to top-working or grafting. This screen tests for the presence of grapevine leafroll-associated viruses 1 and 3 as well as grapevine virus A. In cases where Chardonnay grapevines are involved in the grafting process, the four-virus screen is recommended, as it also tests for the presence of grapevine leafroll-associated virus 2 which is associated with graft incompatibility.

Complete virus screen
This is a complete screen for the most common viruses that affect grapevines. This screen is recommended for imported samples, as well as a general screen for rootstock suppliers and nurseries.

Complete screen testing list:

- Grapevine leafroll-associated viruses (detecting six virus types: 1, 2, 3, 4, 4/6 and 4/9)
- Grapevine rupestris stem pitting-associated virus (GRSPaV)
- Grapevine virus A (GVA)
- Grapevine virus B (GVB)
- Grapevine fleck virus
- Grapevine Pinot Gris virus

ELISA testing
Unlike PCR, which detects the presence of viruses based on their DNA or RNA sequences, an enzyme-linked immunosorbent assay (ELISA) can detect the target virus using specific antibodies. This can be a cheaper alternative to PCR-based testing, but if not properly validated can also be less accurate. Currently Affinity Labs only offers an ELISA option for Grapevine leafroll-associated virus type 3.

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Checklist

- [ ] Signed plant virus testing order form
- [ ] Samples (canes/shoots from a maximum of five vines per bag)
- [ ] Plant material movement declaration form (virus testing) *
- [ ] Samples packaged according to CA12 certification requirements (see Plant material movement declaration form for details)*

* *only required for interstate samples*

Contact

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