

Virus elimination

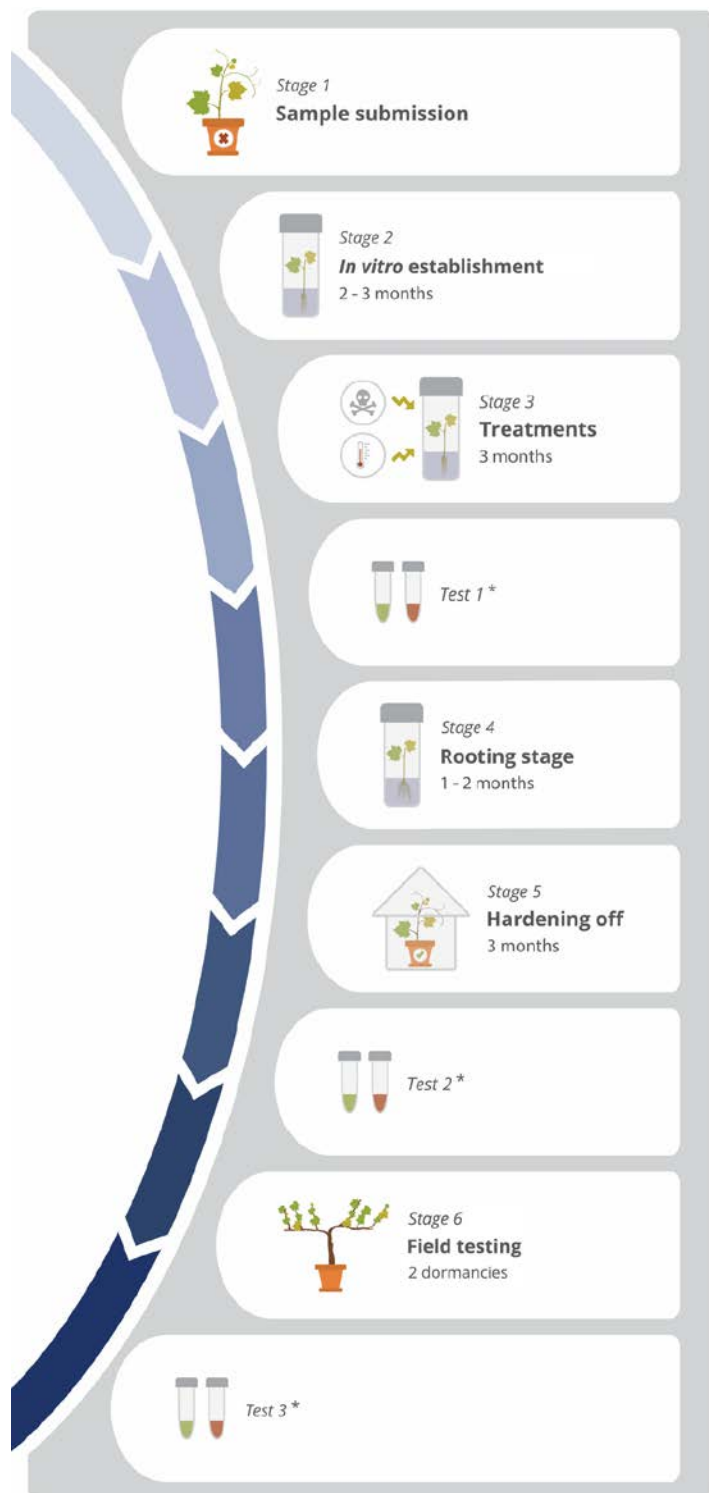


Figure 1: Virus elimination stages.
*samples must pass as 'virus-free' before progressing to the next stage.

Introduction

A crucial step in managing vineyard health is ensuring that all new propagating material is free of deleterious viral pathogens. Sourcing virus-free material is not always possible for certain grapevine varieties or clones. In such cases the economically important viruses must be eliminated before propagation material can be used.

AWRI Commercial Services offers a virus elimination service which uses meristem shoot tip culture, chemotherapy and thermotherapy on grapevine plantlets to remove viral contamination.

The process

There are multiple steps involved in the virus elimination process including several tissue culture steps, chemotherapy and thermotherapy treatment, PCR confirmation of virus elimination at multiple checkpoints and hardening-off of plantlets from tissue culture in the glasshouse. These steps are summarised in Figure 1.

Due to the unpredictable nature of tissue culture, and the variation across different clones in response time to treatment, it is difficult to predict exactly how long the process will take. As an estimate, the time from receiving tissue for virus elimination to delivery of virus-free plantlets takes approximately 12-24 months. The plantlets then need to be grown in pots (within the client's own facilities) for two dormancy periods before a final test is carried out to confirm the vine's 'virus-free' status. It is only after this final test that their release into the field would be recommended.



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Limitations

Plants subjected to the virus elimination service will be provided 'virus-free,' with the possible exception of Grapevine rupestris stem pitting-associated virus (GRSPaV). GRSPaV is found in approximately 95% of all grapevines in Australia, is usually asymptomatic and is sometimes impossible to eliminate from vines. The 'virus-free' status is determined by a PCR-based screening method and is limited to the viruses within the AWRI complete virus screen (see [Grapevine virus testing fact sheet](#) for list). Other unknown viruses may also be removed during treatment, but this is not guaranteed. In some instances, a virus titre may be present at very low levels that are below the detection threshold of PCR detection. Screening is therefore required at multiple points through the elimination process and after two dormancies before the vines can be confidently given a 'virus-free' status. **AWRI Commercial Services does not guarantee that the plants are 'virus-free' until this final testing is done.**

Costs

The virus elimination service costs \$2,400 (excl. GST) per sample. This cost is based on potted plants being submitted and the virus status of the plants already being known from recent AWRI Commercial Services virus testing results. It includes all PCR testing outlined in Figure 1. Additional costs apply for virus testing prior to the elimination service and for establishment of shoots from dormant material.

Payment is required in three stages:

- 50% up-front payment upon submission
- 25% when plants test virus-free following treatment in tissue culture (following Stage 3 in Figure 1)
- 25% upon receipt of virus-free plants (minimum of four plantlets provided).

Submission of samples

Potted plants are preferred. Each pot should contain at least two actively growing vines which originated from the same vine. Woody canes or dormant rootlings are also accepted (approximately 30 cm in length), but please note that an extra two months are needed to grow these in the glasshouse prior to the elimination process.

Interstate samples and quarantine regulations

To submit samples from outside South Australia, the vines must be located within a Phylloxera Exclusion Zone (PEZ). Current maps of phylloxera management zones in Australia are available from the [Vinehealth Australia website](#). AWRI Commercial Services cannot receive material for virus elimination from phylloxera risk and infested zones (PRZ and PIZ).



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Ten growing shoots (15 cm each) from a single actively growing vine, dipped in saturated floral foam, are required. Samples should be packaged in accordance with CA12 requirements (see instructions on [plant material movement declaration form \(virus testing\)](#) and be accompanied by a signed [plant material movement declaration form \(virus testing\)](#) and [plant virus elimination services agreement](#). Samples should be sent by overnight express post at the beginning of the week, to ensure no delays in transit, and when the temperature is below 30°C.

Contact

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