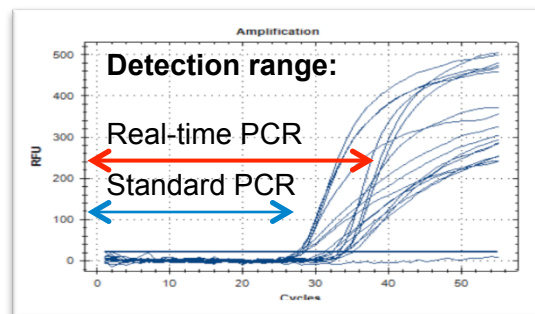


• **AL&L Crop Solutions** is staffed with experienced plant disease diagnostic professionals that have served local vineyard industries for the past two decades. From field to the laboratory, we work closely with you to ensure your specific testing needs are met.

• We utilize the latest technologies, such as Real-time PCR, along with more traditional methods, such as ELISA, and microbial culturing to detect disease-causing agents in plant material and soil.



• **Real-time PCR** with Taqman and SYBR-Green chemistries has improved the detection of grapevine viruses by providing a wider detection range and better (approx. 100-1000x) sensitivity compared to traditional PCR. This is important when diagnosing early infections.

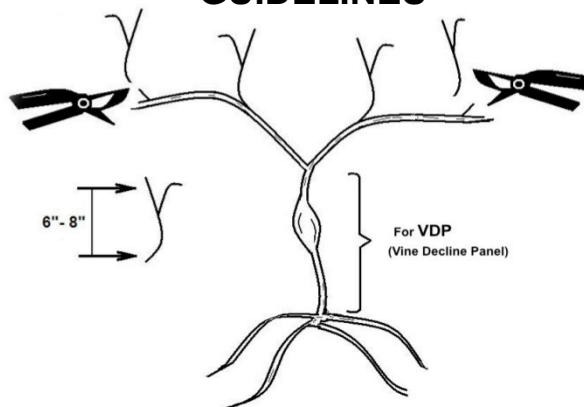
• Enhanced efficiency in Real-time PCR also improves detection and reduces false-negative results.

• Real-time PCR detects more virus strains than conventional PCR.

• Due to its sensitivity, Real-time PCR is a reliable and cost effective way to detect grapevine pathogens in composite samples.

• Real-time PCR technology can also be used for quantification of target pathogens such as grapevine **powdery mildew** and **Botrytis** spores in the vineyard air.

SAMPLE COLLECTION GUIDELINES



Sampling for Grapevine Viruses

- If sampling from *individual vines*, identify 2-4 canes from different locations on a vine. Viruses are unevenly distributed, so by taking samples from different parts of the vine, you maximize chances of including the virus in the sample. Cut 4-6 inch-long portions from the base of the canes and place these cuttings in a zip-lock bag. If sampling fresh shoots or petioles, change gloves and wash your sampling tools between each vine (water and Chlorox wipes).
- If taking *composite samples*, take two (2) cuttings per vine, and repeat this from five different vines. **Do not submit more than 10 cuttings per sample.**
- Place each sample into its own bag and label the bag. Proper labeling will help you identify the vine and match it with the corresponding test results.
- Include a sample submission form with your contact information. The forms are available in our website: www.allcropsolutions.com.
- If sampling in summer, keep samples cool with blue ice packs. Make sure the ice does not touch your samples. Ship them overnight to preserve the integrity of your sampled material.

Important information regarding sampling:

- **Sample at the appropriate time of the year**
 - Fall and winter (dormant season) are the best times for detecting most of the grapevine viruses.
 - Spring and early summer are the ideal times for sampling, if nepoviruses (GFLV, ToRSV) are the culprits.
 - Red Blotch and fungal pathogens can be detected year round.
- **Collect sample from appropriate part(s) of the vine**
 - For detection of bacterial and fungal diseases, take sample from symptomatic parts of the vine. Graft union, crown and roots should always be included in the sample suspected for vine decline disease.
 - For detection of viruses, collect sample according to the sketch on the opposite page. Matured canewood is good material throughout the year. Petiole samples and green shoots may be collected during the growing season.
 - For virus screens in propagation material, follow the above sampling guidelines.
 - When testing bench-grafted vines for viruses, cut off the roots 4 inches below the graft union to reduce the sample size.
 - For virus screens in propagation material, follow the above sampling guidelines. Composite samples are cost-effective way to increase representation of the whole vineyard block in a sample.
- **Contact us to discuss the best sampling plan for your specific situation.**

Test Panels for Grapes:

Short Screen Panel

GLRaV 1-3, GVB, GFLV, GRBaV

Wide Screen Panel

GLRaV 1-9, GLRaV-2RG, GVA, GVB, GVD, RSPaV, GFKV, GFLV, GRBaV

Leafroll Panel

GLRaV 1,2,3,4,5,7,9, GVB, GRBaV

Vine Decline Panel

Phaeoacremonium spp., *Phaeomoniella chlamydospora*, *Cylindrocarpon* spp.

Spring Panel

Nepoviruses: GFLV, ToRSV, TRSV, ArMV

Make-your-own Panel

Allows you to design your own panel of tests

Individual tests also available!

Not sure which panel to pick or how to sample?

Let our experienced diagnosticians help you in choosing right sets of tests for your purposes. On-site visits and diagnosis also available.

Contact us: ALL Crop Solutions

Tel: (530) 387-3270

Email: info@allcropsolutions.com

www.allcropsolutions.com

Grapevine Testing Services at AL&L Crop Solutions:

Bacterial and Viral Diseases:

- Grapevine Red Blotch associated virus (GRBaV)
- Grapevine leafroll virus (GLRaV) types 1-11 and LR2- RG strain
- Grapevine viruses A, B, D (GVA, GVB, GVD)
- Grapevine fanleaf virus (GFLV)
- Grapevine rupestris stem pitting associated virus (RSPaV) including RSP-Sy strain
- Grapevine fleck virus (GFKV)
- Tomato ringspot virus (ToRSV, grapevine yellow vein disease)
- Tobacco ringspot virus (TRSV)
- Arabis mosaic virus (ArMV)
- GPGaV (grapevine pinot gris associated virus)
- *Agrobacterium* (crown gall)
- *Xylella fastidiosa* (XF, Pierce's Disease)
- Phytoplasmas

Fungal Diseases :

- Vine Decline Fungi (*Phaeoacremonium* spp. and *Phaeomoniella chlamydospora*)
- Canker diseases: (*Eutypa*, *Botryosphaeria*, *Phomopsis*)
- Oak Root Disease (*Armillaria mellea*)
- *Phytophthora*
- Black Foot Disease (*Cylindrocarpon* spp.)
- Powdery mildew, Downy mildew, *Botrytis* etc.

AL&L CROP SOLUTIONS, INC.

An Agricultural Diagnostic Laboratory
Specializing in GRAPEVINE Diseases



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