

Washington State Grape Quarantined Pests - Management Plan Basics

Quarantined Pests Covered: *Grapevine leafroll associated viruses*

Operations Covered: Those producing grape planting stock.

WAC Rules:

WAC Chapter 16-483; Grape Pest Quarantine.

<https://apps.leg.wa.gov/wac/default.aspx?cite=16-483>

Management Plan General Approach: Mitigation

Description: Grapevine leafroll is a complex viral disease. Six distinct *Grapevine leafroll- associated viruses* (GLRaVs) are documented in grapevines, GLRaV-1, -2, -3, -4, -7, and -13. Of these, GLRaV-1, -2, -3, and -4 are currently documented in Washington vineyards. GLRaV-1, -3, and -4 can be spread by grape mealybug and soft scale insects, whereas GLRaV-2 is not known to be spread by any insect vectors. Surveys indicated that GLRaV-3 is predominant than GLRaV-1 and -4 due to its efficient spread by mealybugs and scale insects.

Additional Resources:

Grapevine leafroll disease in Field Guide for Integrated Pest Management in Pacific Northwest Vineyards (2nd edition). PNW Extension Publication #644.

<https://pubs.extension.wsu.edu/field-guide-for-integrated-pest-management-in-pacific-northwest-vineyards-2>

Viruses of Grapevines in Pest Management Guide for Grapes in Washington. Washington State University Extension Publication #EB0762.

<https://pubs.extension.wsu.edu/2019-pest-management-guide-for-grapes-in-washington>

Viruses. Washington State University – Viticulture and Enology webpage:

<https://wine.wsu.edu/extension/pest-management/>

Know your viruses. Good Fruit Grower. <https://www.goodfruit.com/rayapati-know-your-viruses/>

Management Plan Specific Approaches

1. *Roguing of nursery mother vines positive for grapevine leafroll-associated viruses:*

Vines in nursery mother blocks testing positive for leafroll virus(es) should be immediately rogued from the vineyard site. Remove as much plant material, including root debris, as possible. All removed materials should be disposed of by burning in an isolated area.

2. *Testing / sampling in nursery mother blocks following roguing:* After roguing is complete, testing of surrounding vines for the presence of leafroll virus(es) should occur. This should include the 2 vines adjacent to the rogued vine in the vineyard row. Since viruses are present systemically in the vine, petiole samples can be collected throughout the season, independent of symptoms, for virus testing. Collect petioles from 2 to 4 mature leaves randomly from different parts of individual vines and pool them for virus testing. During the dormant season, collect 2 to 4 mature canes of approximately 2 to 3 internodal length randomly from each vine and pool them for testing. Random collection of samples is important to account for the possible distribution of the virus within a vine. Depending on the number of vines to be tested, samples from 2 to 5 vines can be pooled as a composite sample for virus testing. Samples should be sent to a WSDA-approved testing facility.

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3. If the adjacent vines are positive for leafroll viruses, rogue them as described above, and repeat the sampling and testing process until sampled vines are no longer testing positive.
4. If adjacent vines test negative for grapevine leafroll viruses, re-test those same vines again the following season. If any of these vines found positive during the following season, practice roguing as described above. If adjacent vines test negative for grapevine leafroll associated viruses for 3 consecutive years, the nursery mother block can be removed from WSDA Quarantine pest management regulation.
5. *Scouting, in nursery stock vineyards after initial roguing.* Scouting of *entire* nursery mother block vineyards should occur for 3 consecutive years after the first initial detection of leafroll viruses; emphasis should be placed on the vines near the initial detection, on end-of-row vines, and on vineyard border rows. Scouting for leafroll disease is based on visual symptoms, and should occur from véraison through October. Red-fruited varieties show a variety of visual symptoms which can be cultivar dependent. White-fruited varieties show mild or transient symptoms. See *Additional Resources* above for symptom descriptions. If suspect symptoms are seen, test suspect vines as described above.
6. *Vector mitigation plans:* Controlling mealybug and scale insect vectors depends on the type of leafroll virus detected in vines. If a vine tests positive for GLRaV-2, roguing virus-positive vine is adequate since there is no known vector for this virus. If a vine tests positive for GLRaV-1, -3, or -4, vector control will need to be implemented in addition to vine roguing. Vector control should occur over the entire nursery mother block. Please consult Washington State University or your agronomist for chemical control options.
7. *Use of regulated nursery mother block as a propagation source:* While a nursery mother block is under WSDA quarantine pest management regulation, only mother vines testing negative for leafroll viruses in that block can be used for propagation.
8. *Equipment cleaning requirements:* All equipment used for cultivation or harvesting of grapes and vines in the infested site must be thoroughly washed or steam cleaned to remove all soil and plant material prior to movement out of an infested site. While spread of viral particles on farming tools or equipment is negligible, it is recommended to clean pruning tools between blocks if pruning is occurring during active sap flow in the spring. Equipment cleaning must be completed until the site is no longer under quarantine pest management regulation.
9. *Individual vine replacement in nursery mother blocks.* Individual vines may be replanted into rogued vine locations in a nursery mother block only after the mother block is no longer under WSDA quarantined pest management regulation. Use of planting stock that has been tested and found to be free of known viruses is recommended (i.e., either certified nursery stock recognized by the WSDA, or stock from a Foundation source).