

## **Comparative diagnostic methods for grapevine red blotch virus (GRBV)**

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Grapevine red blotch disease diagnosis is often challenging due to the nature of symptoms in grapevines and complexity of testing methods. Recently, a Loop Mediated Isothermal Amplification (LAMP) method has been developed for Grapevine red blotch virus (GRBV) testing, and is purportedly more sensitive, quick, and affordable than PCR-based diagnosis. However, with limited field testing, it is difficult to fully rely on the test results to determine full impact on vineyard. In 2020, an experiment was conducted to compare the accuracy of three GRBV detection methods in samples collected from a commercial vineyard in southern Oregon. Vines were naturally infected, and their GRBV status was predetermined from year-end sampling in 2019. Leaf samples were collected from basal, middle, and apical shoot nodes at berry set, veraison, and harvest. Each sample consisted of two whole leaves (blades with attached petioles) collected from each cordon. Samples were rated for GRBD symptoms at the time of collection, and subsequently tested for GRBV infection using LAMP, PCR, and qPCR assays. All positive vines were consistently positive in 2020; however, their detectability by the assays differed significantly among node positions depending on phenology. At berry set, qPCR was the only assay that detected positive vines with 100% accuracy from basal samples. At veraison, both PCR and qPCR, and at harvest, all methods including LAMP detected positive vines with 100% accuracy from basal samples. When the ability of these methods to detect negative vines was analyzed, both PCR and qPCR test results were 100% negative; however LAMP test results were positive for 24 and 19% of the samples at veraison and harvest respectively. Given its specificity, affordability, and simplicity, the LAMP method can be a promising tool in monitoring grapevine red blotch virus. However, its sensitivity to negative vines needs further validation.