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Impact of Grapevine Red Blotch Virus on Pinot noir grape and wine composition

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Grapevine Red Blotch Virus (GRBV) is a single-stranded circular DNA virus that can cause Grapevine Red Blotch Disease (GRBD). The virus was first identified in Cabernet Sauvignon grapes in 2008 in California, and now the disease is known to be widespread in many wine grape-growing regions in North America. The leaves of infected grapevines turn red, and the fruit does not ripen, typically having reduced Brix and color (anthocyanin). Specifically, GRBV inhibits grape ripening pathways by altering transcription factors and hormone networks, disrupting normal grape berry development.

To better understand the impacts of GRBD on grape and wine quality – and potentially remedy the issue –we examined wine aroma composition of wines produced from GRBV positive vines that had undergone two different leaf removal treatments. This work was done in conjunction with Dr. Patty Skinkis (Professor and Viticulture Extension Specialist) and Dr. James Osborne (Professor and Enology Extension Specialist), both of OSU. The leaf removal trial was implemented in 2018-2020 growing seasons with 100% cluster zone leaf removal applied pre-bloom and compared with east-side cluster zone leaf removal by machine at fruit-set (industry-standard method). The result showed that earlier and more complete leaf removal increased monomeric anthocyanin and phenolic compounds in wines. The early 100% leaf removal led to higher levels of bound form grape-derived aroma compounds in wines compared to the standard practice (E side only leaf removal at fruit set by machine). While leaf removal increased bound grape-derived aroma compounds, it did not impact fermentation-derived volatiles as there were no significant differences in these compounds between treatments. This study suggests early leaf removal may lessen the effect of red blotch disease on grape anthocyanin content and potentially improve aroma composition.

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