

Grapevine Red Blotch Disease 2013 Field Research Results

Rhonda Smith
Viticulture Farm Advisor, Sonoma County
UC Cooperative Extension

Red varieties of grapevines with leafroll-like symptoms that are not infected with leafroll-associated viruses have been found infected with grapevine red blotch-associated virus (GRBaV), a new virus first identified in 2011 and subsequently shown to be the causal agent of red blotch disease. Diseased vines have been identified in several counties in California and in other states. Effect of GRBaV infection on differences in berry composition over the ripening period have not been documented and foliar symptom development in red and white varieties has also not been characterized. A study was conducted in 2013 to clarify symptom development in foliage, fruit maturity and vine growth in Chardonnay, Cabernet Sauvignon, and Merlot. At each of the three sites, vines selected for the study were determined to be GRBaV positive or negative by qPCR assay as well as negative for all leafroll-associated viruses, vitiviruses and nepoviruses. To determine the effect of crop load on disease expression, crop was reduced at two sites by approximately 35% at the onset of veraison.

Foliar symptom expression in vine canopies increased with time and was greatest in older leaf tissue. The incidence of foliar symptoms varied greatly across the three varieties; however, on all evaluation dates, vines positive for GRBaV had significantly greater percentage of symptomatic leaves in the basal and middle regions of canopies as compared to the distal region that contained younger leaves. In addition, leaf blades in these regions had a larger area of interveinal red or chlorotic coloration in red and white varieties, respectively, than in younger terminal leaves. At harvest, the severity of interveinal chlorotic blotch symptoms in Chardonnay was greater than the interveinal red blotch symptoms in Cabernet Sauvignon or Merlot. In Cabernet Sauvignon and Merlot, initial leaf symptoms in GRBaV positive vines were predominately leaves on which only red veins were present. In Merlot, development of leaves with red interveinal tissue followed. In Cabernet Sauvignon, blades with only red veins remained the primary leaf symptom. In addition, reducing the crop at veraison in Cabernet Sauvignon may have resulted in an increase in symptom expression in leaves late in the growing season.

This project has allowed us to associate the presence of GRBaV infection with a consistent delay in fruit maturity. For all three cultivars, fruit maturity was delayed in GRBaV positive vines. Brix was significantly lower on all sample dates and titratable acidity significantly greater on half the sample dates yet always elevated on other dates. At harvest, juice samples in all varieties had significantly higher malic acid in GRBaV positive vines as compared to GRBaV negative vines. Reducing crop load in GRBaV positive vines in Chardonnay and Cabernet Sauvignon did not improve juice chemistry at harvest when compared to infected vines with full crop loads. However, juice from fruit on Cabernet Sauvignon GRBaV positive vines in which crop was reduced indicated a very slight improvement in fruit quality although differences were not statistically significant. Berry weights in diseased vines tended to be greater than in virus negative vines, and in Merlot, berry mass was consistently greater in diseased vines on all sample dates. Vine yields were not affected by red blotch disease.