

Final Summary Report for CDFA Agreement Number 16-0615-SA

BIOLOGY AND SPREAD OF GRAPEVINE RED BLOTCH-ASSOCIATED VIRUS

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Accomplishments

- Limited information is available on the ecology of grapevine red blotch virus (GRBV), the causal agent of red blotch disease
- Analyzing the spatial incidence of GRBV over a four-year period (2014–2017) documented virus spread with a 1-3% annual increase of disease incidence in a California vineyard
- No evidence of spread was obtained in a vineyard in New York
- Potential vector candidates identified in a California vineyard in 2015 and 2016 were *Spissistilus festinus* (Membracidae), *Colladonus reductus* (Cicadellidae), *Osbornellus borealis* (Cicadellidae) and a *Melanoliarus* species (Cixiidae)
- Populations of the four vector candidates peaked from June to September in 2015 and 2016
- Viruliferous *S. festinus* culminated from late June to early July in 2015 and 2016
- The epidemiological relevance of *S. festinus* as a vector of GRBV was documented by a significant association between the co-occurrence and covariation between the spatial distribution of GRBV-infected vines and viruliferous insects in a California vineyard
- *S. festinus* transmits GRBV from infected to healthy plants in the greenhouse
- None of the four California vector candidates were found in a diseased New York vineyard
- No insect vector candidate was identified in a diseased New York vineyard in 2017
- A high virus incidence was found in free-living grapes in California but not in New York
- The incidence of GRBV was significantly higher in free-living vines from California counties with high compared to low grape production, and in samples near (< 5km) to compared to far (> 5km) from vineyards
- None of the nearly 500 legume cover crop samples, i.e. bell beans, field peas, vetch, clover, etc., from diseased California vineyard middle rows were positive for GRBV in spring 2017 and 2018
- Free-living *Vitis* species but not the legume cover crops can serve as reservoir of GRBV

Value of the funded research

- Insights into the spread of GRBV and population dynamics of *S. festinus* informed epidemiological features of red blotch disease
- The prevalence of GRBV in California free-living vines highlights the need for vigilance regarding potential GRBV sources in order to protect new vineyard plantings and foundation stock vineyards in California
- Optional disease control recommendations were developed based on vineyard management, i.e. roguing or vineyard removal, depending on the level of disease incidence, and removal of free-living vines proximal to vineyards
- Information from this project was communicated to the wine and grape industry at various venues