

Plain Language Research Summary - AgriScience Grape & Wine Cluster - 2025-2026

Activity #13: Grapevine red blotch virus: insect vector biology and ecology

Principal Investigator(s): Dr. Justin Renkema (AAFC London)

1. What is the overall focus of this research activity?

Red blotch disease caused by grapevine red blotch virus (GRBV) is a new and important problem in grapes in North America. Secondary spread of GRBV is occurring in some regions, but the ability of insects to transmit GRBV is not well understood, particularly in Ontario. In this proposal, we will build on our previous research showing that a planthopper, *Melanoliarus*, and buffalo treehoppers, *Stictocephala*, can acquire GRBV. We will focus on determining the ecology and biology of *Melanoliarus*, and whether grapes are feeding and reproductive hosts, including for its soil-dwelling/root-feeding immature stages. Research has focused on insect adults transmitting GRBV to grape leaves and stems, but acquisition of GRBV through root feeding may also occur for *Melanoliarus*. We will conduct experiments with planthoppers and treehoppers to determine whether GRBV can be transmitted from GRBV-infected vines to uninfected vines, while focusing on insect-virus interactions that may inhibit the circulation of the virus within insects and thus its transmissibility. Finally, we will determine the phenology and movement of planthoppers and treehoppers to work towards recommendations for management of these potential GRBV vectors. Overall, the goal of the projects is to provide new insights about the secondary spread of GRBV by insects in Ontario so that the grape industry can take appropriate action to mitigate losses due to GRBV.

2. What are the main progress updates/milestones in terms of work that was done on this research activity this year?

We found that the buffalo treehopper is very likely able to transmit GRBV from grapevine to grapevine. Final tests on grapevines (post-dormancy) are underway, but since we found GRBV in the salivary glands of buffalo treehoppers, that means they should be able to transmit GRBV when they feed on grape plants. However, we had low survival (~25%) when buffalo treehoppers were caged on grape plants, meaning that grapes are not a preferred or good feeding host plant for buffalo treehopper. Therefore, we expect low transmission rates in the field, as we have never found many treehoppers in vineyards even though they are common around vineyards.

- 3. What is this research activity's intended impact on the Canadian grape and wine industry? What benefits could/will the growers, wineries, consumers, etc. see as a result of this research?**

Insect vector control and management may be helpful for preventing GRBV spread. The benefit will be less loss to GRBV and a more productive grape and wine industry in Canada.

- 4. Do you have any communications materials, publications, or other content related to this research activity that you would like CGCN-RCCV to share?**

Not at this time.