

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

Activity #18: Growing more resilient and hardy wine grapes in the face of climate change in an Eastern Canadian environment

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

The overall focus of this activity is to grow hardier and more resilient vines for the Canadian wine grape industry in the face of climate change. The four objectives associated with this activity primarily do this by expanding our understanding of hybrid vines: i.e., crosses between European (*Vitis vinifera*) and more resilient North American (*Vitis spp*) species. While understudied, hybrids make up less than 5% of the BC industry, but roughly 50%, 70% and 90% of the ON, NS and QC industries, respectively. The goal of the four objectives is to model bud hardiness (objective 1) and to determine the impact of common viruses (objective 2), vine balance (objective 3) and rootstock (objective 4) on hybrid vine performance and fruit composition.

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

Activities associated with the four sub-activities (i.e., 1. Bud hardiness survey / model validation; 2. Hybrid virus trials; 3. Hybrid vine balance trials; 4. Hybrid rootstock trial) were all completed on schedule. In addition, budgets were spent as planned and on time. The growing season in 2025 was defined by exceptional drought conditions in the Annapolis Valley, Nova Scotia. The rainfall received in Kentville, Nova Scotia (68 mm over the summer) was the lowest on record. This record dates back to 1913. For activities associated with Objective 1 (bud hardiness / model validation), bud hardiness levels were off this year in late fall; however, bud hardiness levels were near normal, and close to predicted, for measurements performed in the winter. For activities associated with Objective 2 (hybrid virus trials), the virus impacts were not greatly impacted by the drought. Cultivar and virus-specific differences in berry size, yield, sugar levels, dormant cuttings, nutrients and hardiness observed in 2024 were again observed in 2025. These results were reported at the 2026 International Cool Climate Wine Symposium (ICWS) (~ 500 attendees). One notable drought impact in the virus vineyard was, for the first time, vines were observed to shut down (i.e., decreased gas exchange in the leaves) on account of water scarcity.

For activities associated with Objective 3 (hybrid vine balance trials), results in 2025 were again similar to that observed in 2024, despite the drought. Modest differences in both berry size, sugar levels and vine nutrient levels were attributed to changes in both canopy size and cluster thinning. Minimal differences were observed between 2024 (normal year) and 2025 (driest summer on record); however, in 2023 (wettest year on record), berries were larger with lower sugar levels. For activities associated with Objective 4 (hybrid rootstock trial), nutrient differences observed in plants on account of root type in 2024, were not observed in 2025, assumedly the result of the drought, reduced transpiration / nutrient uptake and reduced growth.

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?

Hybrid grapes, crosses between American and European grape species, account for 50%, 70% and 90% of the wine grape production in Ontario, Nova Scotia and Quebec, respectively. However, wine grape research on hybrids trails that performed on European cultivars. There is value in knowing the impact of weather on wine grape bud hardiness (Objective 1 – bud hardiness survey / bud hardiness prediction model training). Improved bud hardiness information can be used to set the start up temperature setpoints for frost fans, signal to growers when they should check the health of their possibly-damaged buds and to make pruning adjustments, and to make predictions on how specific cultivars will fare under different climate change scenarios.

In addition, little has been reported on the impact of viruses on hybrids (Objective 2 – Hybrid Virus trials). Most hybrid vines, which only rarely display the classic visual symptoms associated with virus infections, do not visually respond to virus in the same way that many European cultivars do. As a result, there are few virus studies on virus in hybrids. Given the scale of hybrid plantings in Canada, a better understanding of the impact of virus on hybrids is needed to give wine producers information that will help them make informed decisions on quality and to give growers information that could impact horticultural and rogueing decisions.

There has been minimal study on the appropriate vine balance (vegetation / cropping level) of vigorous hybrids in a climate that typically produces ample rain and vegetative growth, such as that found in the Canadian Maritimes (Objective 3 – Hybrid vine balance trials). The results of this research will help growers make decisions on the canopy and cropping levels in their vineyards and the implications on yield, vine health, fruit and wine quality. Finally, while most European vines planted in Canada are grafted onto North American rootstock, primarily on account of the threat of phylloxera, most hybrid vines are not grafted onto rootstock as many

hybrids were bred with phylloxera resistance as part of the selection criteria. While there have been few hybrid rootstock studies ever performed, and no formal ones in Nova Scotia, rootstocks could benefit hybrids in other ways, such as improved nutrient uptake and climate resilience (Objective 4 – Hybrid rootstock trial). Information from this trial will give growers and industry members information on the potential benefits, as well as on the potential pitfalls, of grafting their hybrid vines.

- 4. Do you have any communications materials, publications, or other content related to this research activity that you would like CGCN-RCCV to share? If so, please provide a brief description here and either link it here or send the file as an attachment along with this summary.**

Five wine grape bud hardiness reports have already been submitted to the CGCN and are [posted on their website](#). Three wine grape presentations made at an event in Michigan (early 2025) still do not seem to have been posted (I followed up, again, with the organizer today, and will let you know if I hear anything back). I gave several talks in the last year – I could convert these into PDFs (though some animation will be lost) and share.