



2019 Wine grape fall ripening report

Kentville Research and Development Centre (KRDC)

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The fall of 2018 in Nova Scotia was cool and damp. The winter of 2018 / 2019 saw average winter temperatures, but below average insulating snowfall accumulation meant freezing temperatures were able to penetrate deeper into the soil than normal. This, along with other climatic factors, meant cool soil temperatures persisted longer than normal and the vines had a late start to the season. Summertime temperatures failed to make up for this slow start; as a result, wine grape °Brix levels heading into fall lag those observed in past years. The good news is the majority of vineyards (though not all) have managed to escape a killing frost to date and recent fall temperatures have been above average. A killing frost is an event where leaves are damaged and the vine's ability to ripen fruit is compromised; a severe killing frost will see a complete and irreversible loss of leaf function and the plant's ability to accumulate photosynthates, including sugars, will cease altogether. While other factors, such as insect damage, nutritional imbalances, disease, mildews and other fungi can also hamper a plant's ability to ripen fruit in the fall, sugars continue to accumulate in vines with healthy canopies.

At the Kentville Research and Development Centre (KRDC) vineyard, we have been tracking a number of parameters across several vinifera and hybrid varieties ('Chardonnay', 'Riesling', 'Pinot Noir', 'L'Acadie', 'Vidal' and 'Marquette') for the past few weeks. The trends for min., max. and average temperature (Figure 1 top), potential carbon fixation levels (Figure 1 middle) and sugar accumulation (i.e. °Brix) (Figure 1 bottom) are found below. The acidity levels for the last two weeks, which remain high, are found in Table 1. Even though our potential carbon fixation level measurements are compensated for temperature, the trend suggests the temperature history in the days leading up to each measurement is influential: for example, note the drop in carbon fixation levels on September 19, the morning of our first light frost. However, also note how permanent damage was not done as fixation levels recovered in the days that followed. In general, for healthy canopies, potential carbon fixation levels are not much less than those we observed in the summer months; however, the shorter fall days and lower light

Table 1. acidity levels (%) for the past 2 weeks across various cultivars

cultivar	3 Oct	9 Oct
Chardonnay	1.82	1.69
Riesling	2.51	2.01
Pinot Noir	1.39	1.38
L'Acadie	1.36	1.29
Vidal	2.07	1.91
Marquette	1.65	1.52



intensity mean approximately 40% less photosynthates can be generated now compared with late June. Declining canopies and potential carbon fixation levels in the plot below is evident in our 'Pinot Noir', which is variable and likely in decline prematurely as a result of disease (primarily believed to be crown gall and the red blotch virus in this case), and the 'Marquette', which we believe has begun to decline for phenological reasons.

Significant sugar accumulation occurred between Sept. 19 and Oct. 3., with an average jump of 2.2 °Brix per week across all cultivars. Despite some warmer weather over this past week and respectable carbon fixation levels, all cultivars continued to improve in terms of sugars, but at a more modest rate, with an average of only 0.7 °C per week. In the weeks that follow, we will determine whether the previous trend of higher sugar accumulation recovers or, with the gift of hindsight, we recognize this marks the point in time where the grapevines begin to invest a greater proportion of their photosynthates into ripening the wood as opposed to the fruit.

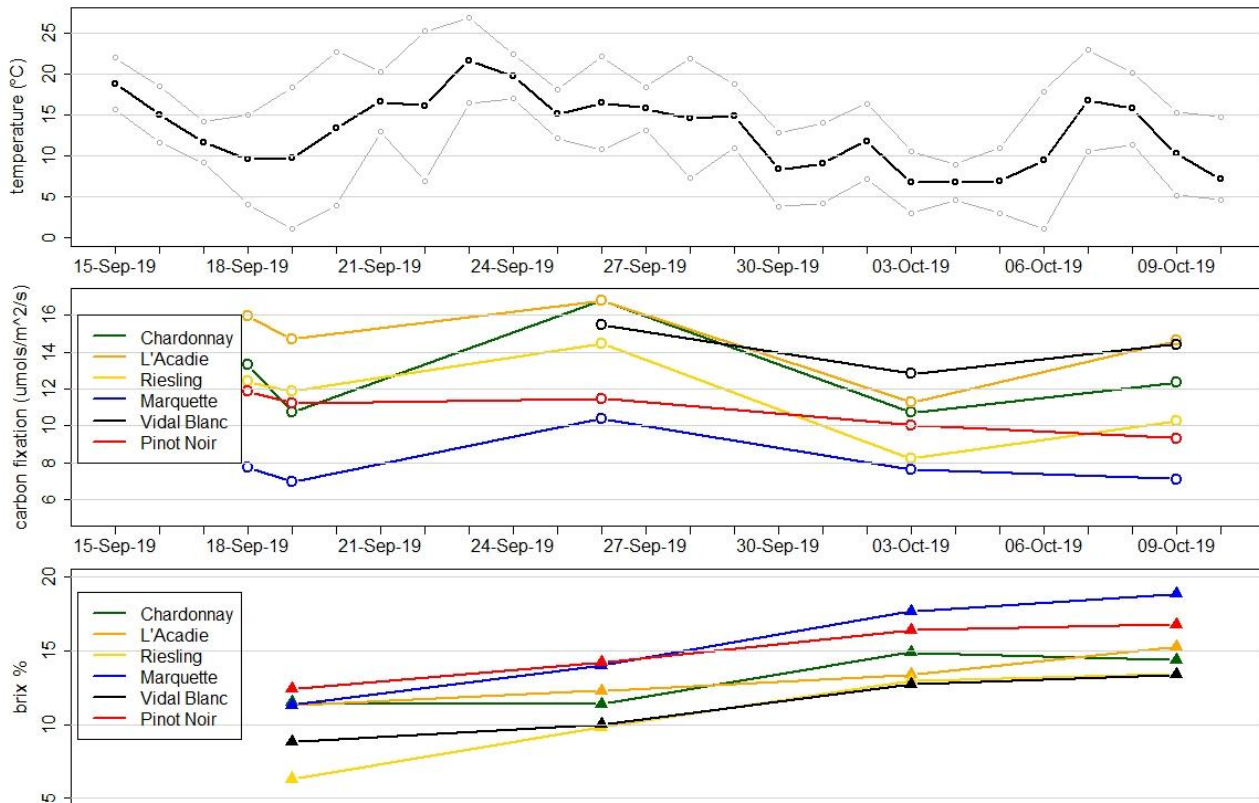


Figure 1. Plots showing the min, max and average temperatures (top), potential carbon fixation levels (middle) and sugar accumulation (bottom) from September 18, 2019 to October 9, 2019 at the Kentville Research and Development Centre vineyard.

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