

Kentville Research & Development Centre (KRDC) – Nova Scotia wine grape bud hardiness

2021/2022 Report no. 4: December 20 - 21

Prepared by Jeff Franklin (jeff.franklin@canada.ca) and Dr. Harrison Wright (harrison.wright@canada.ca), Plant Physiology Program, KRDC, Agriculture and Agri-Food Canada (AAFC) / Government of Canada; 32 Main St, Kentville, Nova Scotia, B4N 1J5.

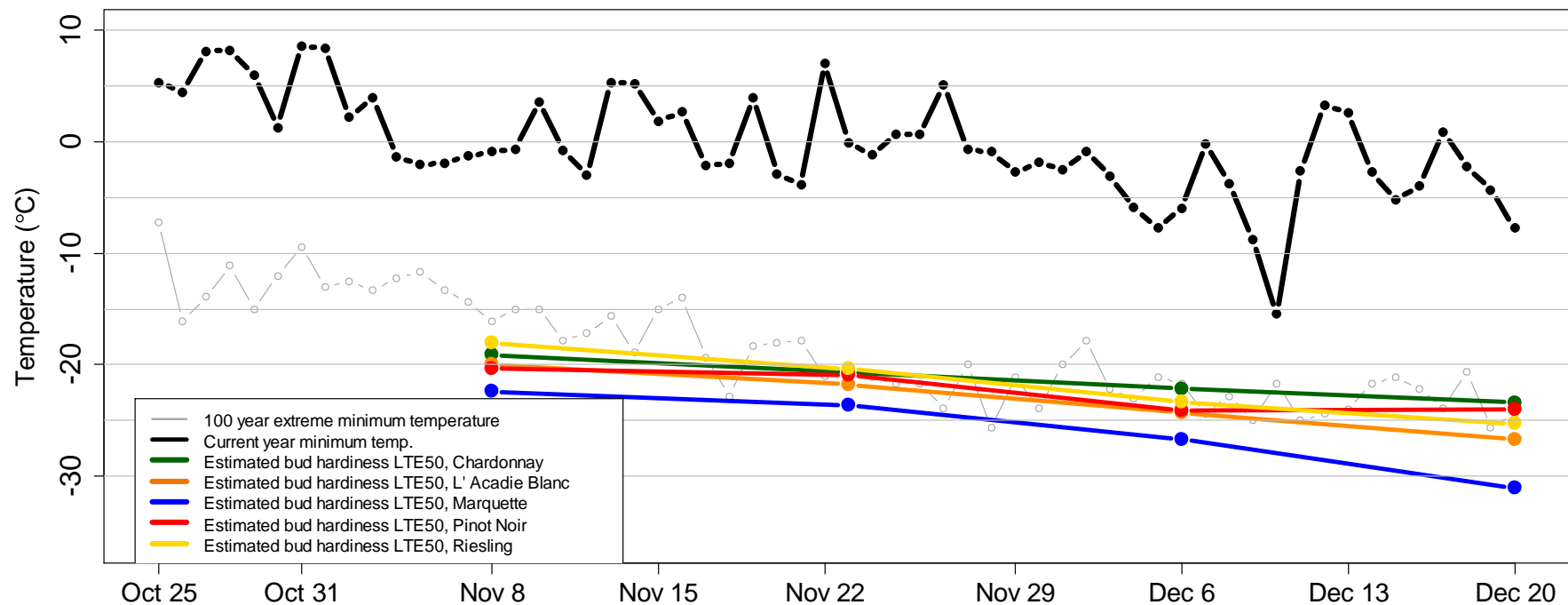


Figure 1. Plot showing the LTE50 values (coloured lines) for five wine grape varieties taken from Nova Scotia vineyards, as well as recent and historical temperature trends. Current observed minimum temperatures (black line) as well as the 100 year minimum temperatures (grey line) were recorded at the Kentville Research and Development Centre.



The winter hardiness of most varieties in our survey have continued to deepen. The exception to this is Pinot Noir, which has a current LTE50 value close to the value seen in the previous survey. Marquette showed the largest LTE50 change with a drop of 4.4 °C compared to the last survey date. All of the varieties in the survey have acclimated to values near or below those seen in previous years for this date. Both Marquette and Riesling are already at the deep winter values seen in previous years of the survey. The plot shows that on December 10, minimum temperatures reached -15.4 °C in Kentville. Although this temperature is below the seasonal normal (-8 °C), this event is not expected to have a significant impact on buds as it was above the LTE10 values for all varieties in our survey.

Table 1. LTE10, LTE50 and LTE90 average values (°C) for core wine grape cultivars, for current and previous reporting periods

Core cultivars and sites	Nov. 8 - 9			Nov. 22 - 23			Dec. 6 - 7			Dec. 20 - 21					
	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90			
Chardonnay (6 sites)	-16.0	-19.1	-21.6	-17.3	-20.7	-22.8	-18.9	-22.1	-25.2	-19.7	-23.4	-26.0			
L'Acadie Blanc (7 sites)	-14.7	-20.0	-22.7	-18.9	-21.8	-24.2	-21.2	-24.3	-27.2	-23.3	-26.7	-29.5			
Marquette (3 sites)	-19.3	-22.4	-24.4	-20.1	-23.6	-26.0	-23.3	-26.7	-30.4	-28.0	-31.1	-33.0			
Pinot Noir (3 sites)	-16.8	-20.3	-22.2	-18.0	-20.9	-22.4	-20.1	-24.1	-26.1	-19.3	-24.0	-26.8			
Riesling (5 sites)	-14.6	-18.0	-21.1	-17.4	-20.4	-22.8	-19.5	-23.3	-25.6	-20.3	-25.3	-27.0			



Research report description

The Nova Scotia wine grape bud hardiness survey generates a biweekly report of the low temperature exotherm (LTE) values over the dormant period (roughly from late October to late April). The LTE is the temperature (°C) at which a bud freezes and is killed: LTE10, LTE50 and LTE90 values denote the temperatures at which 10%, 50% and 90% of the viable buds freeze. The LTE values for a given variety and site are generated using five canes obtained from five vines; the compound buds from nodes 3 through 7 from each cane are measured via differential thermal analysis (DTA). It is important to note that the LTE value denotes a bud's susceptibility to acute, cold temperature damage; it does *not* necessarily reflect the bud's susceptibility to dehydration, poor vine health and other more chronic forms of stress that can result in bud mortality at temperatures above the LTE values.

Each report includes: (1) a plot showing the median LTE50 values for a group of hybrid and vinifera wine grape cultivars averaged over several sites located in Kings, Annapolis, Digby and Lunenburg counties as well as recent and historical minimum temperature trends (Figure 1); (2) comments on the current reporting period; (3) a table of LTE10, LTE50 and LTE90 values for the same cultivars shown in Figure (Table 1). This report is produced by the KRDC Plant Physiology Program. Funding for this work is through an AgriScience Program Cluster project (J-001930, "ASC-12 Grape Wine Cluster Activity 7 - Grapevine evaluation and cold hardiness program to ensure superior plant material for the Canadian Grapevine Certification Network and to improve the sustainability of the Canadian Grape and Wine Industry"). If you have any questions or comments, please feel free to reach out to the KRDC Plant Physiology Program using the contact information listed above. This report, and others, can be found on the Canadian Grape Certification Network (CGCN) webpage <https://www.cgcn-rcv.ca/site/cold-hardiness-and-climate-change>.

© Her Majesty the Queen in Right of Canada, represented by the Minister of Agriculture and Agri-Food (2021).