

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

2021/2022 Report no. 8: February 15 - 16

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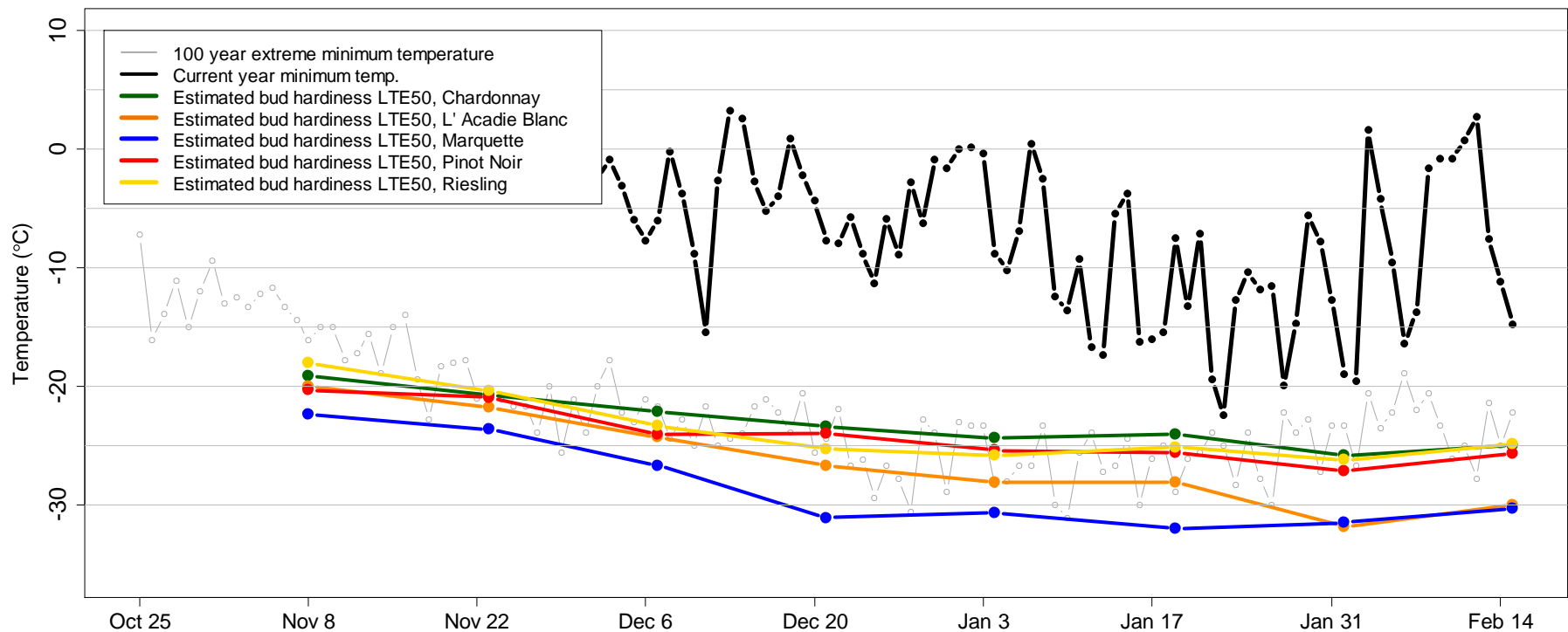


Figure 1. Plot showing the LTE50 values (coloured lines) for five wine grape varieties taken from Nova Scotia vineyards, as well as recent and historical temperature trends. Current observed minimum temperatures (black line) as well as the 100 year minimum temperatures (grey line) were recorded at the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



Bud hardiness estimates for all varieties in the survey have been fluctuating over the last few survey dates and the most recent survey shows a deacclimation of 1 to 2 °C compared to the previous date. As mentioned in the last report, the January 22 low temperature event may be responsible for the very low values seen on the February 1 survey. It is also possible that the variability in the bud hardiness estimates are a physiological response by the buds to the extended period of cycling temperatures that have been occurring since early January. The average temperature for the period from January 1 to February 18 of 2022 is -4.0 °C, which is that same as the 10-year average. In spite of this, we have experienced 12 days below -15 °C, this year, compared to the 10-year average of 6 days. As figure 1 shows, we have experienced many cycles of temperature fluctuations of 10 to 20 °C, with each cycle lasting 3 to 4 days. The effect of temperature cycles on bud hardiness is not known, but we have noticed that bud water content has increased slightly since the last survey. Bud water content usually decreases in early winter and remains low until spring. Given the levels of bud damage seen in some vinifera and less hardy hybrid varieties, we encourage growers to check bud viability prior to winter pruning.

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

Core cultivars and sites	Dec. 20 - 21			Jan. 4 - 5			Jan. 19 - 20			Feb. 1 – 2			Feb 15 - 16		
	LTE90	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90
Chardonnay (6 sites)	-19.7	-23.4	-26.0	-20.6	-24.4	-26.9	-19.9	-24.1	-26.1	-21.6	-25.8	-29.3	-22.0	-25.0	-27.7
L'Acadie Blanc (7 sites)	-23.3	-26.7	-29.5	-23.7	-28.1	-30.9	-23.7	-28.1	-30.5	-28.1	-31.8	-34.1	-27.1	-30.0	-32.6
Marquette (3 sites)	-28.0	-31.1	-33.0	-28.0	-30.7	-32.6	-31.1	-32.0	-33.9	-29.5	-31.5	-33.7	-27.3	-30.3	-33.2
Pinot Noir (3 sites)	-19.3	-24.0	-26.8	-21.0	-25.4	-27.3	-21.6	-25.6	-28.1	-22.7	-27.2	-30.2	-23.4	-25.7	-27.9
Riesling (5 sites)	-20.3	-25.3	-27.0	-20.1	-25.8	-27.6	-19.7	-25.1	-27.2	-23.1	-26.2	-28.6	-22.2	-24.9	-27.5



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>.

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