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

2022/2023 Report no. 7: February 22

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

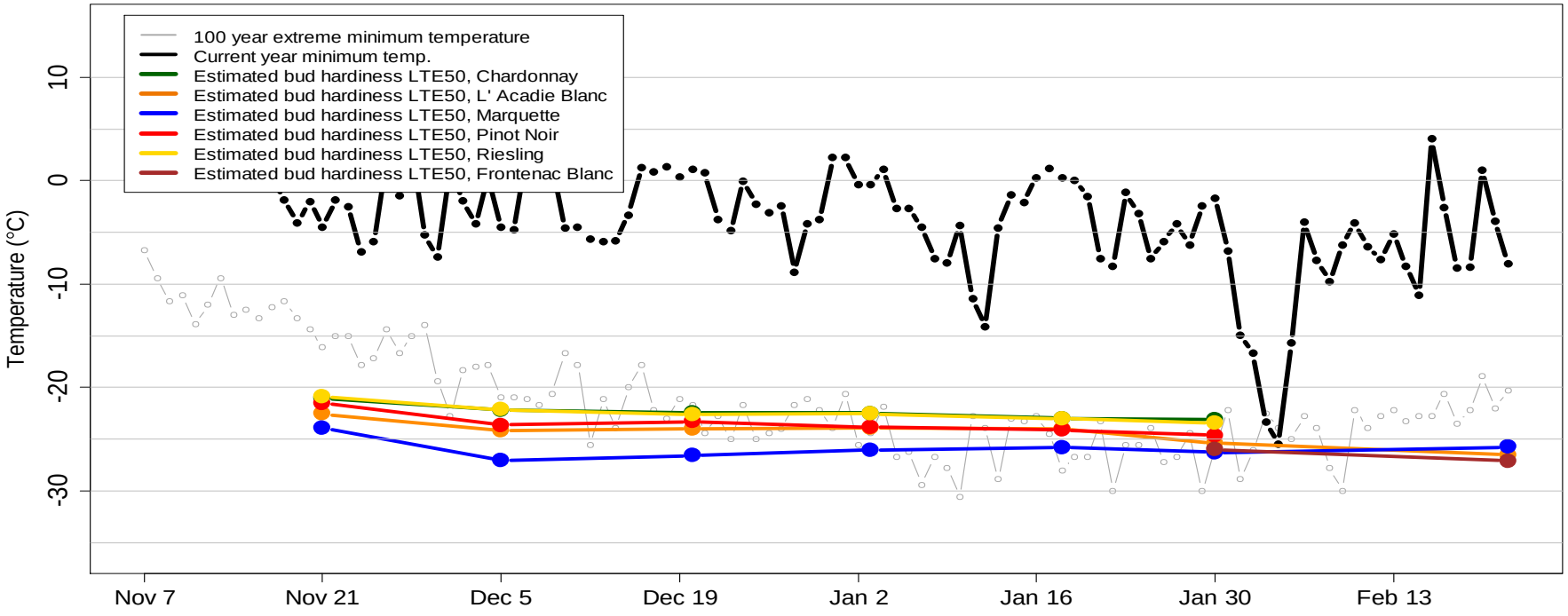

Figure 1. Plot showing the LTE50 values (coloured lines) for six wine grape varieties taken from Nova Scotia vineyards, as well as recent and historical temperature trends. Current observed minimum temperatures (black line) as well as the 100 year minimum temperatures (grey line) were recorded at the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

Current biweekly report

This is the first bud hardiness report since the deep-freeze event on February 3 and 4 which saw temperatures ranging from -23.3 °C to -27.7 °C across the grape growing regions of Nova Scotia. The impact of this event was significant damage to all varieties grown in our region. Bud viability for *vinifera* varieties has dropped to < 5% in both primary and secondary buds within the vast majority of Nova Scotian vineyards. There will be no appreciable *vinifera* grape crop this year. Bud viability for hybrid varieties was reduced to ≈ 30% / 50% (primary/secondary) averaged for all hybrid varieties and across the entire growing region; however, specific hybrid viability is dependent on both variety and region. In the wake of this very serious event, we have decided to go ahead with a scaled back survey for the remainder of the dormancy season. We have dropped all *vinifera* varieties from the survey as there is no longer a source of viable buds. We have dropped the number of L'Acadie sites from eight to three and added two Frontenac Blanc sites to the survey to give us an additional cold hardy variety (see Table 1, Figure 1). The three hybrid varieties in the survey have not showed any significant acclimation since the last survey at the end of January. Temperatures are forecast to be below average for the next five days which may force some of these varieties to acclimate further.

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

	Dec. 20 - 22			Jan. 3 - 4			Jan. 18 - 19			Jan. 30 - 31			Feb. 22		
Core cultivars and sites	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90	LTE10	LTE50	LTE90
Chardonnay (7 sites)	-19.2	-22.4	-24.3	-20.2	-22.5	-24.0	-21.6	-23.0	-24.5	-21.3	-23.1	-24.4	NA	NA	NA
L'Acadie Blanc (8 sites)	-21.5	-24.0	-26.0	-21.2	-23.9	-26.2	-21.5	-24.0	-26.2	-23.2	-25.4	-27.3	-24.0	-26.6	-27.9
Marquette (3 sites)	-24.3	-26.6	-28.1	-24.5	-26.1	-27.6	-24.0	-25.8	-27.8	-24.3	-26.3	-28.3	-24.4	-25.8	-27.3
Pinot Noir (4 sites)	-21.4	-23.3	-24.9	-22.2	-23.8	-25.3	-21.9	-24.1	-25.5	-21.7	-24.7	-25.8	NA	NA	NA
Riesling (6 sites)	-21.3	-22.6	-24.0	-20.0	-22.6	-23.7	-21.2	-23.0	-24.8	-21.8	-23.4	-25.2	NA	NA	NA
Frontenac Blanc (2 sites)	NA	NA	NA	NA	NA	NA	NA	NA	NA	-24.6	-26.0	-27.6	-25.7	-27.1	-28.6

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 November to 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-rccv.ca/site/cold-hardiness-and-climate-change.