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Anticipated Impact of January 2024 Cold Event on BC Wine Industry

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**WINES OF
BRITISH COLUMBIA**

Context

Summary: An extreme cold event in January 2024 caused substantial damage to grapevines in British Columbia and will severely disrupt production in 2024, eclipsing the impact of the cold event which occurred in December 2022.

Between January 11th and 15th, an extreme cold event swept across British Columbia, including the majority of the province's wine growing regions. Temperatures plunged well below -20°C throughout the Okanagan Valley, with regions in the North Okanagan experiencing more than 50 cumulative hours below this threshold. These conditions are a known risk factor for grapevines, particularly following a period of relatively mild winter temperatures as was observed throughout December and early January.

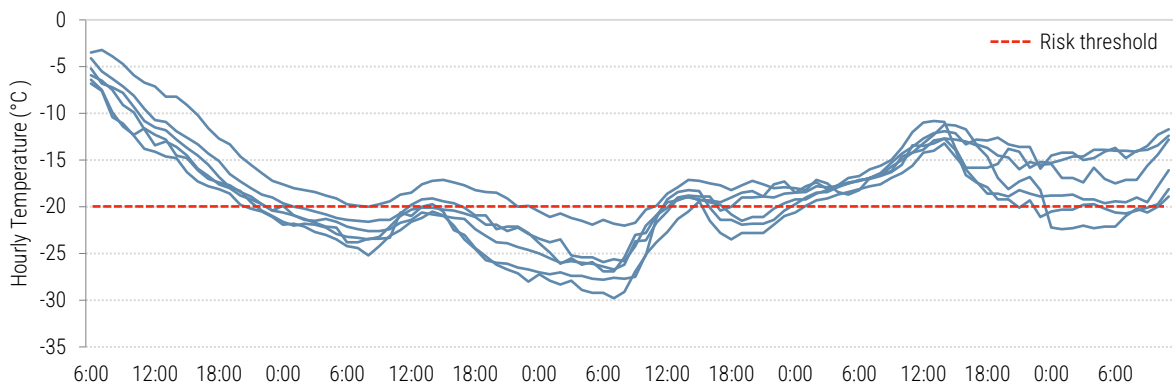
Following the cold snap, industry experts worked diligently to collect and test thousands of bud dissection samples from across the industry. These samples provide a snapshot of the health of grapevines across the province, with 32 grape varieties and 9 regions represented amongst them. Unfortunately, the results confirmed the industry's worst fears, with the vast majority of samples showing no signs of life in their primary or secondary buds. Due to the extent of damage, appropriate pruning practices will be ineffective at mitigating against severe crop losses.

This is the second consecutive year that local vineyards and wineries are facing severe cold-related crop losses. According to preliminary crop assessment figures from the BC Wine Grape Council, last year's cold event – which reached similarly low temperatures but was shorter in duration – resulted in a 58% reduction in industry-wide grape and wine production in 2023. This year's outlook is even more severe, with much more extensive damage to secondary and tertiary buds (which replace primary buds after they have been killed) observed in the lab results for these bud dissection samples.

This report provides an early projection of the impact of the January 2024 cold event on this year's grape harvest and, by extension, the economic outlook for the industry. The research methods employed mirror those which successfully predicted crop losses of up to 56% last year in response to the December 2022 cold event (just 2 percentage points below the BC Wine Grape Council's soon-to-be-announced figure).

By shedding light on these impacts, this report aims to enable stakeholders from across the province to discuss effective and appropriate supports for vineyards, wineries, and other stakeholders impacted by severe bud damage.

Figure 1: Hourly temperatures between January 11th-15th at select weather stations in British Columbia's wine growing regions.



Impact on BC Wine Industry

Due to the extent of damage to primary and secondary buds observed across a wide range of regions and grape varieties, the January 2024 cold event is anticipated to result in catastrophic crop losses within the BC wine industry. Preliminary industry-wide estimates are that the crop will produce just 1-3% of typical yields, with the majority of that coming from unaffected regions such as the Fraser Valley and Vancouver Island. This means that the production of 100% BC grapes and wine is projected to be 97-99% lower than usual in 2024.

This initial finding represents an enormous challenge for the BC wine industry in 2024 and beyond. Facing an almost complete write-off of the 2024 vintage, BC wineries will struggle to keep 100% BC wine stocked on retail shelves, to supply hospitality channels, and to fulfil wine club subscriptions. Vineyards and wineries face revenue losses of \$340-346 million as a result. This decrease in production will also have knock-on effects elsewhere on the supply chain, with a further \$97-99 million in anticipated revenue

losses for industry suppliers, logistics providers, and distributors. In total, the anticipated losses to British Columbian businesses in the wine industry are estimated to be between \$440-445 million.

Longer term impacts on grapevine health – including the need to replant – are also anticipated but cannot be precisely estimated until later in the year. These impacts not only amplify the revenue losses above, but also require significant capital outlay from vineyards and wineries to rebuild their agricultural foundation.

Summary of Impacts



97-99% decrease in grape and wine production



\$440-445 million decrease in vineyard, winery, & supplier revenues

More information on the models used to estimate these impacts can be found in 'Methodology'.

Methodology

Estimated Production Impact

Thousands of samples of dissected grapevine buds were collected from across the BC wine industry following the cold event from January 11th-15th, including samples from thirty-two (32) grape varieties and nine (9) geographical indications (GIs). These samples were then individually-tested in labs to determine the mortality rate of primary, secondary, and tertiary buds in each sample. The crop potential (%) for the sample is estimated based on these mortality rates. These samples were collected and confidentially shared by the Summerland Research & Development Centre, and a number of private vineyards and wineries.

These samples represent a subset of the regions and grape varieties present in the BC wine industry. To estimate the industry-wide production impact of the January 2024 cold event on bud mortality from this sample of dissections, we exploit both weather data and information on the cold hardiness of grape varieties. The method is intuitive: While a bud mortality estimate may not be available for a specific grape variety in a specific region, an estimate from a similarly cold-hardy grape variety in a region that experienced similar cold extremes will provide should be an accurate estimate of the bud mortality for that grape variety in that region. Employed at scale, this method can help predict the industry-wide impact from a subset of bud dissection samples.

Hourly temperature data was collected from Environment Canada for weather stations across the province for the period spanning January 11th to January 15th. For each station, the absolute minimum temperature and the cumulative number of hours for which temperatures of -20°C or below were observed were tabulated. Each geographical indication was assigned the tabulation from its nearest weather station, and these tabulations were then used to identify groups of geographical indications that experienced similarly severe cold weather during the observation period.

Information on the cold hardiness of different grape varieties – sourced from a 2011 Grape-growers of Ontario report – was then used to identify the set of grape varieties that each can be compared to. Cold hardiness is evaluated on a 10-point scale, with 1 representing the most cold-hardy and 10 the least. For example, Riesling receives a cold hardiness score of 4 while Syrah receives a score of 8. We defined comparable grape varieties as those with cold hardiness scores of within 2 points of one another.

Based on this methodology for identifying comparable regions and grape varieties, we successfully modeled 94% of the industry's total production from the sample of dissected grapevine buds. The estimates impact on wine production was assumed to be proportional to the impact on crop yields.

Estimated Revenue Impact

To estimate the impact of reduced grape and wine production on revenues in the BC wine industry, we leverage data from the most recent economic impact assessment for the industry. This report demonstrates that revenues of BC vineyards, wineries, and their suppliers and logistics providers totaled \$396 million in 2019. This figure was then rescaled in line with growth in the industry's total acreage between 2019 and 2022 (as recorded by the BC Wine Grape Council's periodic acreage reports) to provide a more accurate picture of the industry's revenue-generating capacity at present. This estimate is \$453 million. Finally, this figure is scaled down in line with the anticipated production losses for the 2024 vintage.