ABSTRACT

Frost Bitten: An Opportunity to Build a More Resilient Future for BC's Wine Industry
The Impact of the 2024 Extreme Arctic Outflow Event in British Columbia, Canada

Motivation for Choosing this Topic

British Columbia's wine industry has become deeply woven into the cultural and economic identity of the Okanagan and Similkameen Valleys — a region I have followed closely as both a wine professional and as a proud Canadian. When the January 2024 frost event destroyed over 90% of the vintage in a matter of days, it was not only an agricultural disaster but a moment that laid bare the vulnerabilities of an industry that had grown quickly, broadly, without real direction and perhaps without sufficient attention to the climate realities that are rapidly becoming the norm.

What drew me to this topic was not only the scale of the crisis but the opportunity it presented for meaningful change. With 27% of vineyard acreage requiring replanting, the industry faces a rare chance to make deliberate choices about its future — choices about which varieties to grow, what styles to pursue, and what kind of regional identity to build.

Objective/ Problems

The objective of this thesis is to examine the impact of the January 2024 extreme cold event on British Columbia's wine industry and to consider whether the crisis presents an opportunity to reshape the region for a more resilient and focused future.

The problems:
The 2024 frost did not occur in isolation. It was the most severe in a sequence of compounding climate disasters: the 2021 heat dome, the 2022 cold event, and the 2023 wildfires.

The industry that existed before 2024 — with 102 varieties under cultivation, heavy reliance on Merlot and Cabernet Sauvignon, and no widespread extreme cold protection strategy — was not designed for the climate it now faces nor did it have a clear identity.

The event exposed vulnerabilities in regulatory frameworks, agricultural insurance systems, and trade supply chains.

The temporary reliance on imported grapes from outside the province raised concerns about regional identity, VQA integrity, and the long-term implications of a trade relationship that has since become politically uncertain.

Methodology

This thesis draws on industry reports, government documentation, regulatory publications, climate science, and viticultural research. Primary sources include the Cascadia Partners impact report prepared for Wine Growers British Columbia, the Terroir Consulting Replanting Guidelines and Recommendations prepared for the BC Ministry of Agriculture and Food, BC Wine Grape Council crop assessments, and vintage reports for 2024 and 2025. These are supplemented by trade and industry journalism and academic research into cold hardiness and climate adaptation.

Content

Introduction:

An overview of the Okanagan and Similkameen wine regions, their cultural and economic significance, and the industry's position within the Canadian wine market.

January 2024 and the Aftermath:
The climatic causes of the freeze, the compounding effect of successive climate events between 2021 and 2024, the scale of crop loss and vine mortality, and the immediate financial impact on producers.

The VQA and Regulatory Response:
The role of the BC Wine Authority, the temporary relaxation of VQA regulations to permit imported grapes, the Wine Sector Support Program, and the Enhanced Replant Program — including the significant gap between available funding and total replanting costs.

Cross-Border Collaboration and Trade Vulnerability:
The role of external growers as emergency suppliers, the CUSMA trade framework, the political uncertainty introduced by deteriorating Canada–US relations, and the case for greater domestic self-sufficiency.

Rebuilding with Intention — Varieties and Replanting Strategy:
The performance of Vitis vinifera varieties in the frost, ERP funding priorities, the case for cold-hardy hybrid varieties including Seyval Blanc, Marquette, and Vidal, and market strategies for introducing unfamiliar varieties to a discerning consumer base.

Vineyard Management:
Soil health, vine vigour control, rootstock selection, site design, multi-trunk training, grapevine trunk disease, pruning strategies, and passive and active frost protection methods.

Conclusion:
Whether the 2024 frost is remembered as a disaster or a turning point depends entirely on the decisions being made right now

Conclusion

The 2025 harvest delivered 32,582 tons from a significantly reduced vineyard base — a result that surprised even experienced growers and confirmed that the biological foundations of the industry remain intact. BC's wine industry now faces choices that will define it for decades: which varieties to plant, what styles to pursue, how to build a regional identity strong enough to carry it through future climate extremes, and how to reduce its exposure to geopolitical risks that have made cross-border supply chains newly uncertain.

The replanting now underway is an opportunity. The varieties best suited to the region's future — Chardonnay, Pinot Noir, Pinot Gris, Riesling, and carefully selected hybrids — happen to align with the wine styles most in demand globally. The decisions being made right now, in vineyards and government offices and regulatory bodies across the Okanagan, will determine whether this industry emerges stronger or merely scarred.