



Cool
Climate
Oenology &
Viticulture
Institute

Brock University

Vine Alert: Advanced Cold Hardiness Database

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Cool Climate Oenology & Viticulture Institute
GGO Annual General Meeting
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Overview



- Winter Injury is one of the greatest threats to the success of our industry
- Cold hardiness of grapevines is the main limiting factor for growing grapes in Ontario
- Research focused on cold hardiness identified as a priority by the Industry
- Project funding through Agriculture and Agri-Food Canada's (AAFC) Developing Innovative Agri-Products initiative (DIAP).
- Collaboration between AAFC, GGO, CCOVI

Background



- Grapevine cold hardiness is not static
- Species and cultivars differ
- Regional and climatic differences
 - Ontario's grape growing regions are very diverse
- Monitoring the changes in grapevine cold hardiness is an invaluable tool to assist growers in managing winter injury
 - i.e. when to use wind machines or other protection strategies



Profile of Grapevine Cold Hardiness

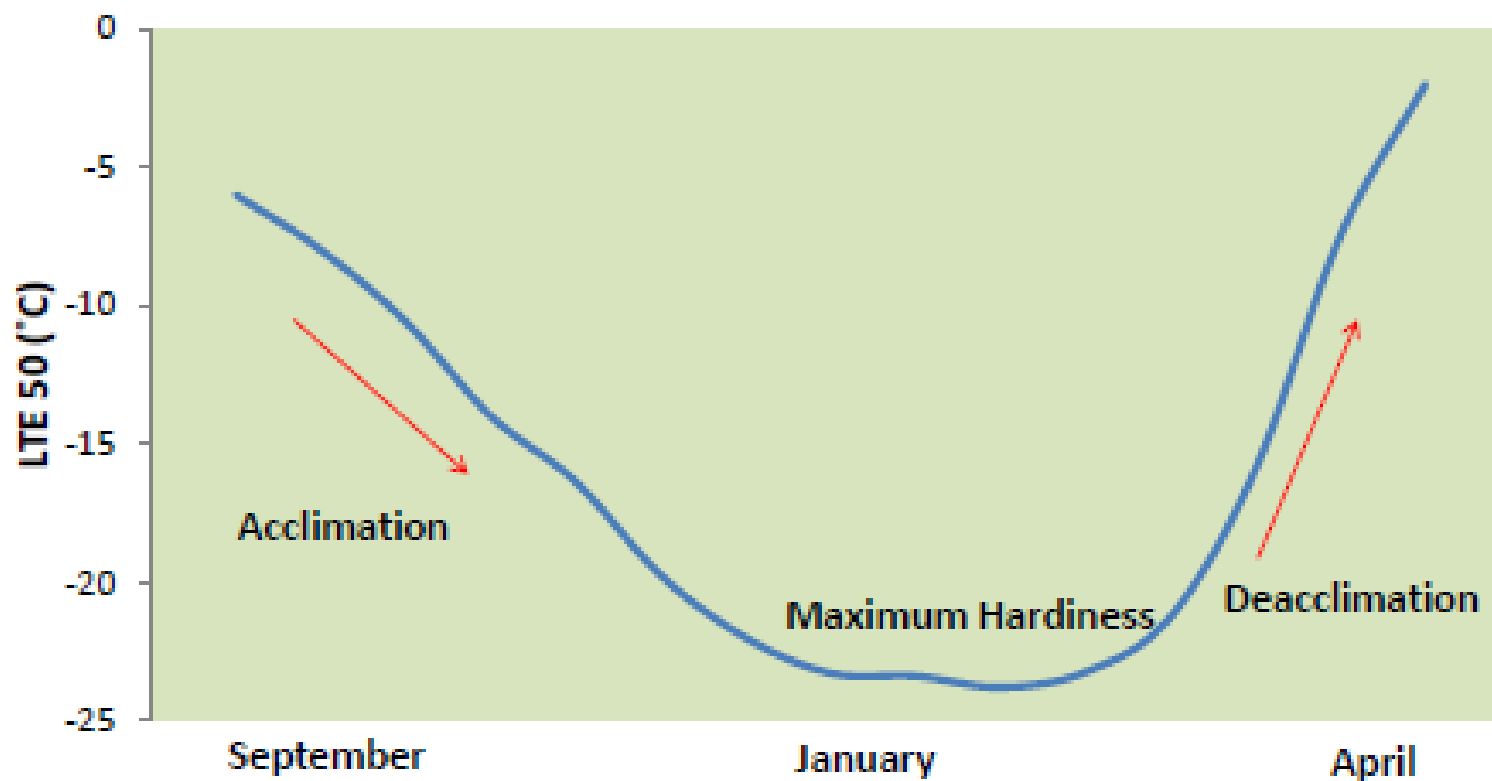


Figure 1. Profile of bud cold hardiness during the dormant season

What we are doing?



- **Monitoring cold hardiness within Ontario's DVAs**
 - Subappellations of Niagara Peninsula, LENS, PEC
- **Chardonnay and Cabernet franc in all regions**
- **Additional cultivars:**
 - Riesling, Pinot noir, Merlot, Sauvignon blanc, Syrah
- **Cold hardiness measured throughout dormant period**
 - Differential Thermal Analysis (DTA) using programmable freezers
- **Comparative bud hardiness levels presented through VineAlert**

VineAlert -

<http://www.ccovi.ca/vine-alert>



Vine Alert: Overview

Grapevine management and monitoring system for cold hardiness and injury.

Overview

Recent

Bud Hardiness

Bud Survival

Alerts

Resources

Grapevine Bud Cold Hardiness Database

Overview

Welcome to the Ontario regional grapevine bud cold hardiness webpage. The information contained on this webpage is to provide grape growers with comparative levels of bud hardiness for cultivars at different locations throughout the dormant period. Monitoring bud cold hardiness throughout the dormant period is an invaluable tool to assist grape growers in managing winter injury. The data provided from this database will allow growers and researchers to see how cold-hardy grapevines are within a specific area. Cold hardiness is **not static** but varies throughout the dormant period and is determined through the grapevine's genetic potential and environmental conditions. Therefore, grapevine species and cultivars vary in terms of their cold hardiness. Bud sampling and testing will be done throughout the entire dormant season to monitor cold hardiness through the acclimation, maximum hardiness, and deacclimation periods. This ever-changing bud hardiness data can be helpful in determining when wind machine use or other freeze avoidance methods are warranted to protect the vines from winter injury.

This research is also fundamental to understanding when, during the dormant period, bud injury occurred and to the question of how growers can ensure that maximal grapevine cold hardiness is achieved for the dormant season. Conditions specific to each geographical area may vary depending on climate, soil and

Features of VineAlert



Vine Alert: Bud Hardiness

Estimating the lowest temperatures grape buds can survive in.

Overview

Recent

Bud Hardiness

Bud Survival

Alerts

Resources

Location:

Lake Erie North Shore

Colchester

Variety:

Chardonnay

Year:

2010/2011

Use Map »

[View Most Recent Data across all Varieties and Locations »](#)

View as Table

View as Chart

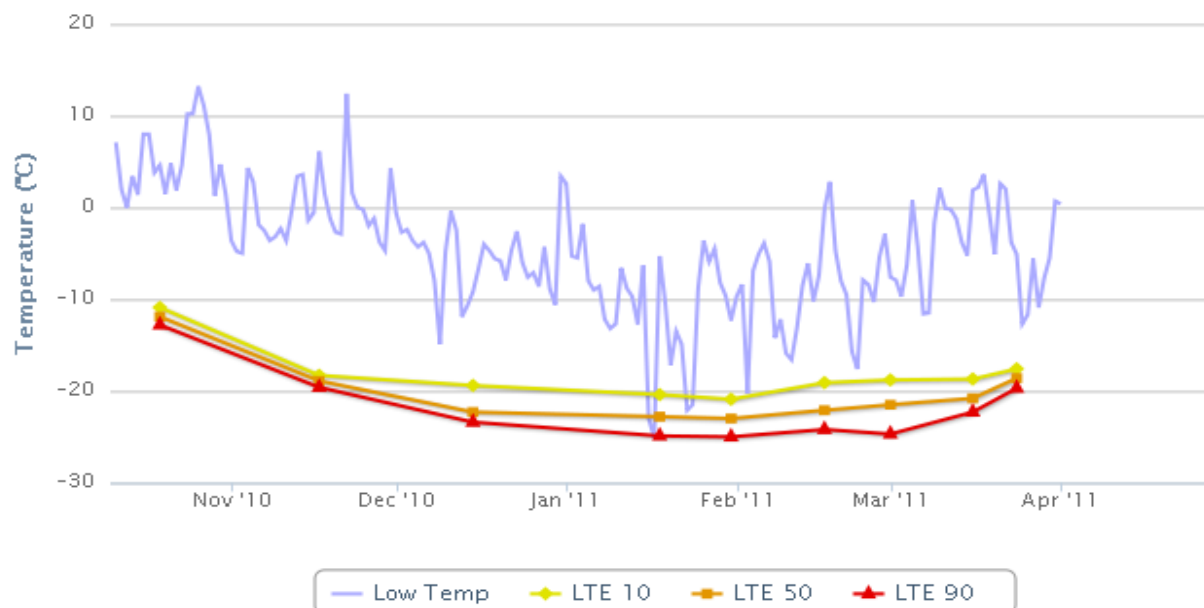
Bud Hardiness - 2010/11



View as Table

View as Chart

Bud Hardiness Data for Cab Franc at Creek Shores – 2010/2011



NOTE: Due to the geographic diversity of this region, winter low temperatures can differ considerably at different locations within the same appellation. The weather data displayed is courtesy of Weather Innovations Incorporated - Weather Station in [St. Catharines Third Ave](#) - Located on the north side of 3rd

VineAlert: Bud Survival



- Bud survival data gathered following a significant cold event

Vine Alert: Bud Survival
Tracking the survival rates of grape buds.

Overview Recent Bud Hardiness **Bud Survival** Alerts Resources

Location:
Niagara Peninsula
Creek Shores

Variety:
Cab Franc

Year:
2010 / 2011

[Use Map »](#)

NOTE: We also have [PDF versions of the Bud Survival Data](#) available.

Bud Survival Data for Cab Franc at Creek Shores - 2010/2011

Sampling Date	Survival Rate (%)
January 24, 2011	32.0
January 21, 2011	28.0
December 17, 2010	92.0

VineAlert: Alerts



- Free and easy sign up
- Get notified when data specific to you is updated
- Cold alerts and other messages related to current hardiness ratings and winter injury

Current Alerts for Jim Willwerth
You are currently set to receive the following types of alerts:

Location	Variety	Remove
Niagara Peninsula > Four Mile Creek	Chardonnay	Remove
Niagara Peninsula > St. David's Bench	Merlot	Remove
Niagara Peninsula > Beamsville Bench	Chardonnay	Remove
Niagara Peninsula > Beamsville Bench	Riesling	Remove
Lake Erie North Shore > Colchester	Cab Franc	Remove
Lake Erie North Shore > Colchester	Chardonnay	Remove

Add Alerts:

Location:

Variety:

[Use Map >>](#) [Add Alert](#)

VineAlert: Resources



Vine Alert: Resources

Logout

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[Grapevine cold hardiness](#)

[Glossary](#)

[Links](#)

[Niagara Sub-Appellation Boundary Descriptions](#)

Grapevine cold hardiness

Grapevine bud cold hardiness is a dynamic process and changes throughout the dormant period as shown in Figure 1. Beginning in late August, as the vine prepares itself for dormancy, the tissues begin to acclimate. This is a gradual process and in *V. vinifera*, acclimation is in response to shorter day length and cooler temperatures. It is complex in nature and involves many factors and mechanisms. As temperatures drop to sub-freezing levels, the vine becomes more cold tolerant and achieves maximum cold hardiness during the coldest periods experienced mid-winter. Once temperatures begin to increase and the vine has

Conclusion

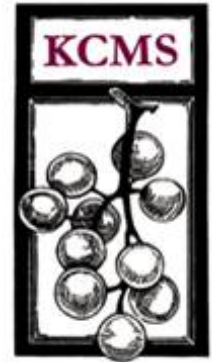


- This database of information will assess varietal and regional variations in cold hardiness over multiple years and assist growers and researchers across Ontario in developing effective and efficient winter protection strategies.



Agriculture and
Agri-Food Canada

Agriculture et
Agroalimentaire Canada



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Thank you

