

How Does Geotextile Installation Height Impact Grapevine Growth in Cool-climate Conditions of Québec, Canada.



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Introduction

Growing grapes in cold climates has several challenges to overcome. Cold injury to grapevines is an important problem, especially at the northern limit of culture, where extensive damage to bud and cane tissues can result in severe economic losses. Protecting buds from winter frost damage is essential for vine production in northern regions (1). Several methods are available such as wind machines, insulation with snow, mulch, or soil, and geotextiles to reduce winter damage (1-3). However, the use of these methods must be adapted to specific regions or improved for specific grape varieties.

This project aims to acquire specific knowledge on the installation height of geotextiles to optimize winter protection.

Methods

Geotextiles were installed in autumn 2019 and several parameters were collected during the 2020 growing season. Two treatments were evaluated for installing the geotextiles: the fruiting wire installation height and insulation of the mid row posts. The trials were carried out on three grape varieties in four vineyards during the 2019-2020 winter months.

Fruiting wire	<ul style="list-style-type: none"> • 8" • 12" • 16" 	Parameters	<ul style="list-style-type: none"> • LTE after geotextile removal • Bud survival • BBCH stages • Yields (cluster weight, nb clusters, yield/vine, berry weight, berry chemistry) • Hardening • Climatic conditions and snow cover
Insulation around post	<ul style="list-style-type: none"> • Padding (F) • No padding (SF) 		
Varieties	<ul style="list-style-type: none"> • Chardonnay • Pinot noir • Vidal 		

Results and discussion

Preliminary results show that the installation height affects the temperature under the geotextile, but insulation does not. Installation height at 16" resulted in a lower mean temperature throughout the winter (Fig.1). However, this difference didn't have a significant effect on bud/vine survival because it is lower than 1°C. Moreover, snow cover also affected mean temperature under geotextile, higher mean temperature was observed for site with higher snow cover (Fig. 1). Winter survival and hardening were most affected by the vineyard site and grape varieties rather than geotextile treatments. (Fig. 1). Vine yields were not affected by the treatments either (Fig. 2). These results reflect only the first winter of the trial and additional data in the coming years will provide further insight. Several other projects are also currently underway at CRAM that assess several parameters (e.g. types of geotextile and their timing of installation and removal, fall vine pruning) which will help to optimize geotextile practices under the climatic conditions of Quebec, Canada.

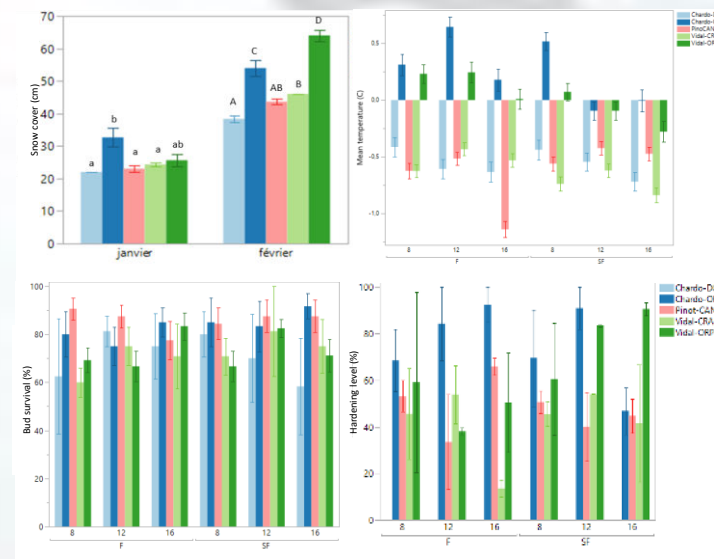


Figure 1: Winter snow height at each sites, and effects of installation height (8", 12", 16") and insulation (F, SF) on temperature under the geotextile, bud survival, and hardening. 2019-2020.

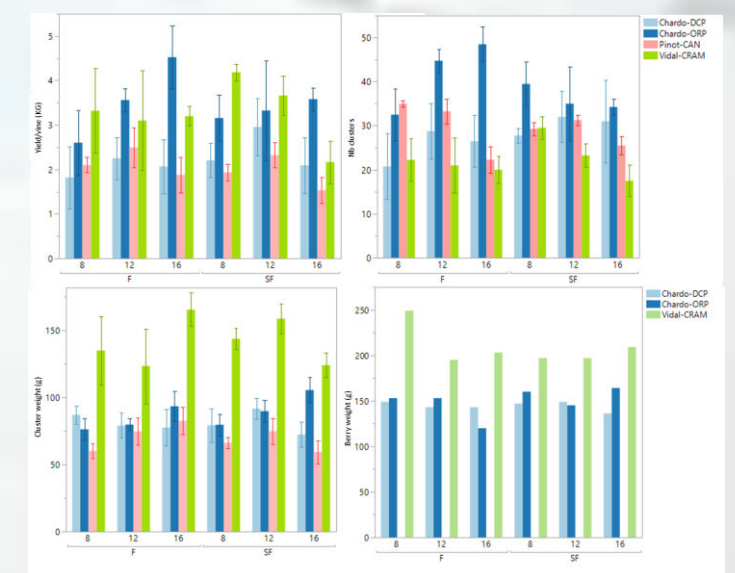


Figure 2: Effects of the treatments for three varieties on yield per vine, number of cluster, cluster weight and berry weight. 2019-2020.

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