

Agriculture Research and Development

Wine Grape Varietal Trial

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Project Objectives

The overall goal of this research is to diversify the agricultural industry and develop a wine grape industry in Newfoundland and Labrador.

Specifically, the objectives of this project are to:

- compare the effect of rootstock on vegetative vigor and yield;
- evaluate Brix levels per variety; and
- determine which wine grape varieties will a) grow, b) mature and c) survive in various Newfoundland and Labrador climates.

Viticulture is the science, production and study of grapes. The viticulture industry contributes significantly to the Canadian economy and has the potential to contribute substantially to the economy of Newfoundland and Labrador.

Not only does wine grape production have the ability to expand the agriculture sector in Newfoundland and Labrador, it also has the opportunity to create employment, both in the primary and secondary processing sectors.

Viticulture in Canada is a nine-billion dollar industry. The volume of Canadian wine sales totaled 207 million litres nationally and the industry employs more than 3,700

Canadians. The diversity of jobs created from this industry has reached far more than just the production of grapes. Jobs range from tourism and retail to marketing and laboratory research.

Wine produced locally in Newfoundland and Labrador is fermented with native fruit such as blueberries, partridgeberries, cranberries and raspberries, thus providing the market solely with fruit wine. With wine grapes valued at \$5,800/acre fresh and \$32,800/acre when crushed and fermented, it is a perennial crop that has tremendous potential in the province.

If it is determined that wine grapes can be successfully grown, mature and achieve appropriate veraison (onset of ripening) in Newfoundland and Labrador, a niche market for a lucrative crop will be established.





Background

Commercial wine grape varieties fall into three categories: European or vinifera; American or labruscan; and hybrids, crosses between the two former categories. Hybrid grapes were developed to combine the hardiness and disease resistance of American species with the wine quality attributes of the European varieties; thus, hybrids are winter-hardy with excellent wine quality.

Typical hybrids grown in the Maritimes, specifically Nova Scotia, include Maréchal Foch, Lucie Kuhlman and Baco Noir, all of which are red varieties. Preferred white hybrid varieties are L'Acadie Blanc, New York Muscat, Vidal and Seyval. These hybrids, in addition to 11 others, are being evaluated in this trial.

Sites for successful wine grape production require a south-facing slope and soil pH of six. In addition, the soil must have good internal drainage, organic matter content of two to five per cent and a minimum of 850-900 Growing Degree Days (GDDs) with 150 frost-free days. Several locations throughout the island have microclimates that may be conducive to growing grapes.

For successful wine production, grape quality is imperative; thus, maturation of the grapes to the appropriate Brix levels is required. Brix (°Bx) is the sugar content of an aqueous solution (the liquid within the grapes). The optimum sugar content varies between white and red varieties. White grapes require 18°Bx and 22°Bx for reds.

When selecting and planting wine grapes, root stock is an important consideration. This trial will evaluate the performance of wine grapes that have grafted rootstock versus those grown on their own roots. Grafted root plants are said to perform better as they can have some disease/pest resistance and are thought to mature faster. Own root vines, however, are known to be more resilient and vigorous, and to overwinter better. This research trial will determine which is most suitable for the climate in Newfoundland and Labrador.

Technical Details

In 2013, the first experimental vineyard was constructed at the Western Agriculture Centre, Agriculture Research Station in Pynn's Brook. This project was put forth to determine if grapevines will grow and mature grapes to the appropriate Brix levels, and survive in various Newfoundland and Labrador climates. The first vineyard began modestly with 11 red varieties and five white varieties, for a total of 140 cold-hardy vines. Currently there are 331 vines at this site in their fifth year of growth.

In 2014 and 2015 a second and third site were added to this experiment in Brooklyn and Humber Village, respectively; 131 vines were planted in July 2014 at Brooklyn and 250 vines were planted at Humber Village. The same varieties were planted across all three sites. A total of 46 varieties were planted across all sites consisting of white and red varieties, and

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vines were planted as own-rooted plants or on 3309 rootstock. All vines were planted by hand with an intra-row spacing of one meter and an inter-row spacing of three meters.

Trellises were constructed in the first year of production and vines were trained in the Vertical Shoot Positioning System, whereby vine shoots are trained upward in a vertical, narrow curtain with the fruiting zone below, and can consist of four- six levels of trellis wire. Physical weed control occurred for the first two years, and was then managed chemically in year three. Flowers were removed in the first two years of production to encourage plant establishment and root growth. The fertility regime followed standard protocols, where vines were fertilized at planting and then every year at bud break and then again at bloom.

Preliminary Results

Vegetative vigour, timing of the bloom, frost-free days and date of last frost were significantly affected by site location. Rootstock had a significant effect on vegetative vigour when compared to own-rooted plants.

The red varietal, Maréchal Foch was the first variety to bloom across all sites. Frontenac, Maréchal Foch, L'Acadie Blanc,

Giesen, KW94-1, and Frontenac Gris bore fruit, reaching a high of 14°Brix for the summer of 2016.

The harvest of 2016 demonstrated that across all varieties evaluated, the red variety Maréchal Foch produced the highest yield of 5.1kilograms (203 grams per vine), followed by the white variety Giesen at 5.1 kilograms (510 grams per vine). A total of 19.0 kilograms (41.9 pounds) of berries were harvested at the Pynn's Brook experimental vineyard in 2016.

In 2017, however, yields at Pynn's Brook tripled resulting in a total of 120 pounds of grapes harvested. At Brooklyn, a total of 573 pounds of grapes were harvested, with most of the berries comprised of red varietals and exhibiting 14°Brix. This is promising given that 16°Bx is the goal for white grape varietals.

The final step of vineyard production is the secondary processing component – fermenting the berries into wine. In the fermented form, wine grapes are valued at \$32,800 per acre. Experimental wine batches were fermented and produced wine with an alcohol content of 12.1 per cent, which exhibits great promise for the viticulture sector of





Newfoundland and Labrador, as most wines have 11.5-13.5 per cent alcohol content.

Since the initiation of this project, farmers have taken the initiative and constructed their own vineyards on the island and a small viticulture industry is being established. There are currently six vineyards on the island, with interest increasing every season.

Recommendations

Based on preliminary results from this grape research program, L'Acadie Blanc, which is the industry standard white variety in Nova Scotia, does not establish well or overwinter in Newfoundland and Labrador.

However, the white varieties Geisenheim and Petit Milo have proven successful across all sites. Maréchal Foch, Marquette,

Frontenac, and Lucy Kuhlman are the recommended red varieties to date, that have yielded the highest and matured to an appropriate Brix levels across sites.

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