



Brock University

Appassimento Wines for Ontario



Introduction to the Innovation

The Ontario grape and wine industry is a major player in the province's agricultural sector, contributing \$1 billion annually in benefits to the province's economy, and employing 7,000 Ontarians. Significant growth is forecasted, with everyone involved possessing a stake in its future, including grape growers, wineries, retailers, and the tourist industry. However, climate change affecting Niagara's climate structure and year-to-year weather volatility is expected to increase production risks that may jeopardize sustainability and growth opportunities for the local industry (Ontario Ministry of the Environment, 2011). Red wine production is particularly at risk as some red varieties are considered marginally suitable for the climate structure, and production lacks the consistency and quality demanded by domestic wine consumers (Agriculture and Agri-Food Canada, 2012). At the same time, however, the potential value to Niagara of sustainable high quality domestic red wine production is great. Red wine grapes represent only 40% of winegrape production in Ontario but red wine represents 68% of total Canadian consumption with 21% growth projected by 2014, outpacing white wine (Grape Growers of Ontario, 2012; International Wine & Spirit Research, 2011). Technologies that mitigate red wine production risks and improve red wine quality present enormous sustainability and growth opportunities for Ontario wine production.

Recent research initiatives to assess post-harvest grape drying methods in Niagara are particularly relevant to red wine production due to the success of the method in Old World cooler climates. Amarone Della Valpolicella in Italy permits the production of full-bodied, distinctive red wines using this technique (Paronetto and Dellagio, 2011). Prior to recent growth in the demand for these wines, little research had examined grape drying methods. Efforts to increase production and mitigate risks led to the use of climate controlled drying systems (Tosi et al, 2009). But what are the important factors to ensure the wines exhibit the typicity and quality of the traditional method (Tosi *et al.*, 2009)? Our research is focused on the composition and sensory characteristics of wines produced using traditional and climate controlled methods for varieties successfully grown in the Ontario climate. Simple dehydration and minimal microbial activity may overlook interactions between grape, microbes and the environment responsible for the quality and success of these wines (Tosi *et al.*, 2009). The relevance of this research to Niagara is clear in developing a unique wine style for the Ontario market.

Results to date

The goal of appassimento winemaking is to further ripen the fruit off-vine to concentrate sugars and flavours without increasing acidity to develop a full-bodied high quality wine. This project is investigating five different post-harvest drying techniques to assess the impact on final wine quality. We are analyzing the biochemical changes within and microbial population changes on the grapes during the drying process, along with the chemical and sensory characteristics of the wines after fermentation.

Cabernet franc (provided by Pillitteri Estates Winery) were dried to either 26° Brix or 28° Brix using five techniques that draw from other agricultural sectors: kiln-drying making use of technology from the tobacco industry (fast drying); greenhouse drying using technology from the floriculture industry (medium length drying); barn-drying with circulating airflow as a traditional appassimento technique (slow drying); a post-harvest temperature and humidity controlled drying chamber modeled after other horticulture industries; and prolonged hang-time on the vine to desiccate the fruit naturally, drawing from Icewine production. A portion was also vinified without drying to act as a control in assessing the impact of these drying techniques on wine composition and quality. Preliminary results indicate that the five different drying techniques varied greatly in the time required to dry grapes to the target end point. Kiln drying was the most rapid requiring only 2 days to reach 26° Brix and 4 days to reach 28° Brix. The longest drying treatment to reach 26° Brix was on-vine requiring 28 days, whereas both the on-vine and temperature and humidity controlled chamber required 42 days of drying to reach 28° Brix. Wine from the various drying treatments differed in their chemical profile and had distinctive sensory profiles.

Application of Technology

Investment in appassimento-style wine production capacity will allow our vintners to produce high quality wines even in growing seasons that do not allow the complete maturation of grapes. Further, this strategy will allow us to adapt and emerge as an even more vibrant, diversified and sustainable industry despite the challenges of climate change. New Ontario signature wine styles will help us grow the Ontario wine market share.

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