

## **Final Plain Language Research Summary - AgriScience Grape & Wine Cluster 2018-2023**

Activity: *TanninAlert: Improving Ontario red wine quality and consumer acceptance through winemaking techniques by grape variety and tannin level*

Principal Investigator(s): Debbie Inglis (Brock University)

Over the last decade, the increasing popularity of red wines has driven consumer market growth in Ontario and Canada. Red wine, both foreign and domestic, represents 53% (\$4.17 billion) of the \$7.85 billion of wine sales in Canada in 2020 (Statista, 2021). However, foreign imports still dominate the red wine market, representing 73% (\$3.04 billion) of the red wine sold in Canada (\$4.17 billion) in 2020 (Statista 2021). Similar trends are reported in Ontario. Given the overall trend of increased red wine consumption in Ontario and Canada, there is a tremendous opportunity for domestic growth in red wine sales and production. Strategic initiatives that are focused on developing product and process innovations to improve quality are the key to meeting consumer demands and subsequent growth of the industry.

The main objective of the overall Tannin project is to improve Ontario red wine quality by ensuring grape phenolic ripeness is incorporated into harvest decisions. Tannins are one of the most defining components of the quality of red wine. Understanding how to best manage winemaking techniques based on tannin values in the fruit are important steps towards improving red wine quality. This project is developing a unique precision oenology tool for winemakers that measures the maturation of red grapes based on tannin development, specifically “TanninAlert”. The tool analyzes tannin concentration in skins and seeds, separately, for red grapes to evaluate phenolic levels in these grapes. The values are bench marked against tannin measurements from Ontario red grapes collected over the past eight years between 2015-2022 and available in a database of skin and seed tannin. Red winemaking guidelines based on tannin concentrations will also be available from the TanninAlert database.

In this past year, the skin and seed tannin values during ripening and at harvest in 2022 were determined for Pinot noir, Cabernet franc, Cabernet sauvignon, Merlot, Syrah, Gamay for addition into the TanninAlert database. Histogram plots of tannin distribution, grouping the tannin into low, medium and high skin and seed tannin values based on the 33rd and 66th percentile of the distribution, are available for all red varieties tested including Pinot noir, Cabernet Franc, Cabernet Sauvignon, Gamay, Merlot and Syrah. All red varieties were also grouped together and presented as one histogram for seed tannin and one histogram for skin tannin so that tannin values could be compared across all varieties. The tannin commercial testing service, based on these distribution values, was launched by CCOVI in October of 2022 in partnership with CGCN and OGWRI.

Tannin management techniques for winemaking in 2022 for Merlot and Syrah tested different amounts of extra small oak chip preparations (Arobois) during the fermentation to determine if tannin extraction and stabilization was improved compared to a control. There was no benefit with respect to tannin extraction and stabilization for the treatments tested at the six month post-fermentation time point for either variety tested.

The tannin stability of wines made in 2021 was also completed in 2022 for Merlot and Syrah. The Merlot treated with Flash Détente continued to have the highest tannin value at the 6 month testing timepoint compared to the control with no treatment. The wines that contained a mix of fruit not treated with flash detent and treated with flash détente had tannin values midway between the control and the 100% treatment. Tannin stability was retained over the 6 month testing trial which was a significant finding as many of the tannin trial treatments over the course of this program did not show stability over time. For Syrah, a liquid tannin addition to maintain tannin in wine was trialed post fermentation and post filtration compared to a control wine with no liquid tannin addition. Tannin stability was only found in the wines that had tannin added post filtration. The tannins appeared to drop out of solution if they were added post fermentation but pre-filtration.

The extractable tannins in the Gamay wines of 2021 were below the detectable level in the wines using the MCP assay so tannin stability tests could not be run.

Due to COVID 19 restrictions with concerns with aerosol transmission of COVID 19, no sensory or consumer tests could be performed in 2022 on wines from prior years.