

Practical Lab Procedures for the Small Winery

BRIX - TITRATABLE ACIDITY - MALIC ACID - GLUCOSE AND FRUCTOSE

AMMONIA AND AMINO NITROGEN

Presqu'île arose from a penchant for fine wines, an inclination for adventure, and the discovery of Santa Maria Valley's ideal terroir. The property includes 73 acres of certified sustainably farmed vineyards on 200 acres where they craft Santa Maria Pinot Noir, Chardonnay, Sauvignon Blanc and Syrah.

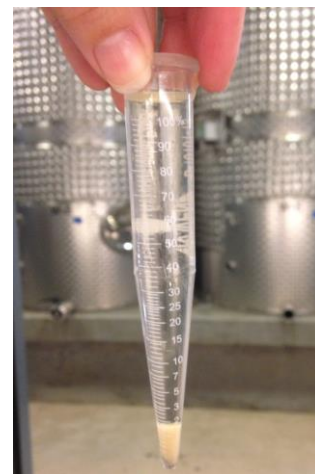
Anna Murphy, a member of the family that owns Presqu'île, is passionate about fine winemaking,



but also about the science behind fine winemaking. The closer the winemaking team gets to all aspects of the process, the more that passion blossoms in their wine. To that end, Anna and her colleagues took the initiative to set up a wine lab at Presqu'île. "We consulted with other winemakers in the area to find out what

procedures and equipment were necessary to get started."

One of the pieces of lab equipment that Anna was surprised to find so useful is a horizontal centrifuge. "I found that clarifying samples in the centrifuge prior to testing provides faster and more accurate results." She was referred by Ernst Storm, of Storm Wines, to Raven Process Control Instruments (ravenpci.com). Raven's F-10300 centrifuge is used in small wineries but also in the largest wineries throughout the world. To the right is an image of a centrifuge tube with 2014 Sauvignon Blanc after spinning in Raven's horizontal spin centrifuge. The wine in this picture is in the pre-finishing and pre-filtering stage. Notice the 1.8% solids compacted in the bottom of the tube and the clarified wine on top. A horizontal centrifuge ensures that the compacted solids form a horizontal interface between the supernatant (clarified liquid) and the solids. There is no chance the solids will encroach into the clarified wine or must. Wine or must clarified in the centrifuge is used in many tests throughout the lab. The centrifuge also can be used as a process control to verify fining and filtering effectiveness.



Sauvignon Blanc with 1.8% solids. Can this be correlated with flavor profiles?

These are the most practical lab tests that all small wineries should be performing.

BRIX:

Prior to harvest, they regularly check the sugar content of the grapes to help determine ripeness for the perfect time to pick. First, they gather a representative sample of each vineyard lot and send it back to the lab. In the lab, they crush the grapes to extract enough juice for the centrifuge. We spin the juice samples for 5 minutes in the centrifuge to separate the solids from the juice. This provides a clarified sample for the density meter we use to measure Brix. The meter only requires a couple milliliters of clarified juice to provide an accurate Brix reading. The centrifuge is crucial in this analysis because it is very



Anna Murphy, wine laboratory manager, loads a sample into the centrifuge for clarifying samples before testing.

important to have a clarified sample to avoid clogging or inaccurate readings caused by pulp or small pieces of grape skins from the berries.

TITRATABLE ACIDITY:

Anna measures titratable acidity in vineyard samples as well as finished wine using 1N sodium hydroxide, a pH meter and the centrifuge. Samples are collected and clarified in the centrifuge. 5mL of the clarified sample is added to a sodium hydroxide and H₂O solution that has been titrated using the pH meter to 8.2. An initial reading of mL of NaOH used is taken. After the clarified wine is added the pH drops and we titrate the solution back to a pH of 8.2. A second reading of mL of NaOH used is taken and the difference between the two numbers x 1.5 provides g/L of TA.

MALIC ACID:

Malic acid is measured to monitor the malo-lactic conversion of the wines. They use a test kit, spectrophotometer and the centrifuge to clarify wine samples. Anna prepares a working reagent from the test kit developed specifically for measuring Malic Acid concentrations. Then, 50 microliters of the clarified sample is added to the reagent and processed through the spectrophotometer. They record the initial absorbency reading, add a trigger reagent and run the sample through the spectrophotometer again. After 20 minutes a second absorbency reading is recorded and using a formula, she determines the g/L of Malic Acid in each sample.

GLUCOSE AND FRUCTOSE:

Measuring glucose and fructose determines the amount of residual sugar in the wine. The wine sample is clarified in the centrifuge for 5 minutes, added to a working reagent and then processed in the spectrophotometer. After both readings are taken the numbers are plugged into a formula to calculate g/L of residual sugar in the wine sample.

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The goal of these two tests is to determine Yeast Assimilable Nitrogen (YAN). YAN determines if the must needs any additional nutrients for a healthy wild fermentation. The centrifuge clarifies the samples to prevent possible skewing of test results. The clarified must is added to the working reagent and the initial results are recorded. A trigger reagent is added and a second reading is recorded. Using a formula they are able to accurately determine how much ammonia and amino nitrogen are present in the musts.



The winemaking team at Presqu'île includes Dieter Cronje, Matt Murphy, Anna Murphy and Jonathan Murphy. They all agree that getting real-time lab results has taken their passion for winemaking to a higher level.

“Our lab is the scientific link between the vineyard and the cellar to make sure the fruit is picked at the perfect time and the wine in the bottle is the best it can be. And you know what they say, knowledge is power.” Anna Murphy.