

**Virginia Wine Board Grant
Final Report**

5/29/2020

Joy Ting
Winemakers Research Exchange
P.O. Box 555, Ivy, Virginia 22945

Title: Virginia Winemakers Research Exchange Project Coordination and Sensory Sessions

Proposal Number: [Proposal Number]

Project Type: ☒ Research ☐ Education ☐ Marketing

Is this a multi-year grant? ☒ Yes ☐ No

If yes, which year does this report address? Ongoing

Original Funding Amount: \$152,700

Remaining Balance: \$47,941.04

Objectives and Results:

The primary objective of this project is to foster innovation in the production of high quality wine through practical research in wineries and evaluation through sensory sessions across Virginia. Specifically, the objectives of the 2019-2020 fiscal year were:

1. To identify 5-7 themes for repeated projects to allow for focus during sensory sessions
2. To support 40-55 practical research projects representing each of the 5 regions of the state.
3. To have 50% of the projects replicated within the winery or repeated at several sites to allow for greater transferability of results and greater depth to exploration of themes.

The WRE has exceeded each of these numerical goals, however, sensory analysis was completed for only some of the experiments due to the implementation of social distancing measures stemming from COVID-19.

At the beginning of the fiscal year (June 2019), nine themes were identified based on discussions with participants at sensory sessions during FY18-19. A survey describing each theme was sent to the wine producers on the WRE email list asking each respondent to choose up to 5 of these themes for further study in 2019-2020. From this data, seven themes were identified as having sufficient support to pursue finding partners to work on these projects. Table 1 contains a description of each theme as well as percentage of survey respondents who

chose this theme for exploration and the number of experiments that were eventually planned around this theme. Themes 6 and 9 were initially removed, however as participants proposed experiments, each of these was addressed in at least two experiments.

After the theme survey, a broad call for proposals was issued along with follow up contacts to each participant who had shown interest through discussions at sensory sessions, previous emails, or past experiments. An attempt was made to contact as many potential participants as possible. An additional theme (co-fermentation) arose organically from the interest of three experimenters. There were also individual projects planned, for a total of 84 projects, including participants from each of the 5 regions of the state. Emphasis was placed on soliciting participation according to the priorities identified prior to harvest and posted on the WRE website (<http://www.winemakersresearchexchange.com/criteria-for-funding>). In all 49, of these projects were directly part of themes, and 29 of the projects included planned replication. Table 2 lists summary statistics for the list of projects entering harvest in 2019 and a full list of planned projects can be found in Table 3.

Sensory sessions began in January of 2020. Originally, there were eight sensory sessions planned at locations around the state, each with 6-8 experiments for sensory analysis. Three of these were completed as planned. After restrictions on public gatherings due to COVID-19 were put in place, the remaining in-person gatherings were re-organized. When it became clear we would no longer be able to meet in person, several avenues were pursued to complete the experiments for the year and ensure effective dissemination of experimental results:

1. Each experimenter was contacted to determine if he/she could continue with the experiment. A few projects dropped due to lack of experimenter time (primarily owner-winemakers who needed to pivot the business) or furloughs.
2. Chemical analysis for each remaining experiment was completed.
3. Each experiment was assessed for the need for sensory analysis. Those for which the chemistry and/or protocol was sufficient for understanding were designated for alternative presentation through newsletters, panel discussions, or video-chats with winemakers using social media platforms. Experiments for which sensory analysis was crucial were scheduled for virtual sensory analysis. Two virtual sensory sessions have been completed at this time. Two additional sessions are planned in the coming months.
4. A small number of experiments were designated to carry over into the next year. These experiments were done on wines that would typically be longer aging, so sensory analysis on these wines is more appropriate in the late fall/early winter. Experimenters have agreed to keep these wines separate (rather than blend them) until after the 2020 harvest. Sensory analysis in this case may be in-person or virtual, depending on the recommendations of health officials at that time.

Though we still feel in person meetings have a unique role in fostering discussion and cooperation among producers, the use of digital tools to present information through panel discussions, video chats with winemakers and virtual sensory sessions has the added benefit of being recorded, and thus available for viewing at a later date. All virtual WRE events have been recorded, posted on a YouTube channel, with links communicated by social media as well as through email distribution and on the website. Several additional views have occurred with this ability.

A full list of in-person and virtual sensory sessions can be found in Table 4. Due to the nature of virtual events, it is difficult to determine attendance or number of unique participants served. Instead, the number of attendees who RSVP'd for an event, if applicable, have been used for metrics. Additional YouTube views are also listed. Videos will remain online and may continue to accrue views, serving as a resource for many years to come.

Overall Benefit for Virginia Wine Industry:

The efforts of the WRE in FY2019-2020 serve the Virginia Wine industry in several ways. Several of the experiments completed in 2019-2020 have direct economic impact. For example, one experiment on co-fermentation using Viognier pomace showed significant additional yield from the pomace when co-fermented with Chambourcin. This had interesting chemical and sensory effects for Chambourcin that may be appropriate for a red blend. Viognier is known to have low press volumes, and an increase in yield of as little as 5% could bring significant economic benefit for a winery. Another study explored the effect of chaptalization in a low Brix Merlot block that could keep this block from being re-planted or relegated to Rose production. The Trump Crop Load study showed that there was very little sensory difference between Merlot wines from grapes cropped at 3 tons/acre vs. 4.5 tons/acre, again, a considerable difference in potential profit for a vineyard or winery.

Experiments in this season also included developing protocols that improve quality winemaking for Virginia fruit. One recent example is the development of a technique for whole cluster fermentation without the microbial spoilage often seen with this approach. After presentation, 5 winemakers messaged the research coordinator directly to express gratitude for this discussion as they were themselves planning to implement whole cluster fermentations in their wineries. Other such protocol-driven experiments included a series of experiments on ambient fermentations that revealed common difficulties with this technique and will allow for a larger discussion of solutions. (The sensory session planned for July will address ambient fermentations). A third protocol experiment on determining harvest dates using sugar per berry and phenolics completed its first year and will continue next year. One winery has already adopted this technique for all of its harvest decisions.

[Newsletters](#) and [posted research reports](#) serve as an ongoing reference library for winemakers in Virginia and beyond. The WRE website had 5,356 visits from June 1 2019 – May 29, 2020 including 15,300 page views. There were 7 newsletters distributed through the email list during this time. The email list currently has 322 subscribers. The email newsletter is also disseminated through social media channels.

Many other studies focused on quality improvement that will help raise the reputation of Virginia wine. Several studies looked at harvest dates and winemaking approaches in Petit Manseng, a grape that grows well in Virginia, but has been difficult to vinify as a table wine. The development of quality dry Petit Manseng would provide Virginia with a distinctive product on which to build an international reputation. Another line of inquiry examined how to measure phenolic compounds in the winery laboratory. Phenolics are a known measure of red wine quality, however currently these can only be measured by service labs at a high cost (\$110 per sample at ETS labs). The ability to track these in-house would be a valuable tool for quality improvement through better harvest, press, and aging decisions.

Publications and Activities Associated with Project:

A full list of sensory sessions and virtual events can be found in Table 4. Additional presentations/publications include:

[WRE Newsletters](#) (9)

Wine IQ, Napa California , Winemaker trial “Effect of hyperoxygenation and stabulation in Chardonnay”, Theo Smith, Rappahannock Cellars

Wine IQ, Napa California, Winemaker trial “Effect of whole cluster fermentation in Petit Verdot”, Matthieu Finot, King Family Vineyards

VWA Day 2: Experimental Wine Round Robin, included presentation of wines from 9 experiments

VVA Technical Meeting: Trump Crop Load Study, presentation and demonstration tasting

[The Grape Press, Virginia Vineyards Association Newsletter, Winter 2019, “Why Sugar Per Berry Matters”](#)

[The Grape Press, Virginia Vineyards Association Newsletter, Summer 2019, "Does Hedging Height Affect Ripening?"](#)

Loudoun County Wineries Association Meeting, January 9th, "Volatile Acidity"

Future Work:

With the continued support of the Virginia Wine Board, the WRE will continue to foster innovation through experimentation and education in the Virginia Wine Industry in 2020-2021. Each year, we build on our experiences and findings to plan follow-up experiments as well as explore new topics. In the coming weeks, themes for experiments for the 2020 harvest will be developed. Several experiments from 2019, such as the Trump Crop Load Study, will be repeated to determine if findings from one vintage apply to the next. Several others, such as the determination of phenolics in-house, will refine techniques based on findings from 2019. We will also continue to encourage experimenters to include replicates whenever possible.

We are facing the difficulties of a year with heavy frost in the spring, so we anticipate fewer number of experiments due to lack of fruit. We will work closely with winemakers to ensure that the experiments that are completed have the most impact possible.

We will also begin to build a database of analytical results from which to draw norms. Many of the values found in the literature for chemical analysis have been developed in other regions. Compiling our existing data into a searchable database will provide a useful tool for analysis moving forward. This project will include building the electronic platform to house the data, then compiling and entering data from 6 years of experimentation onto that platform. Preliminary summary data will be reported, and additional data will be added each subsequent year, adding value over time.

We also plan to continue the use of social media and other digital tools that have been developed in the past few months. Though we hope to be able to gather winemakers in person for sensory analysis in 2021, other types of presentation such as one-on-one Instagram chats and panel discussions by Zoom have allowed a lower-cost option when sensory analysis is not necessary or possible. If needed due to public health concerns, sensory sessions can also be conducted virtually, though these are not the preferred option.

Final Budget and Justification:

Item Type	Original Awarded Amount	Final Amount Spent
Personnel	85000	80806.79
Fringe	0	0
Travel	9000	7017.64
Supplies & Materials	11375	4792.60
Contractual	55325	21510.31
Other	4000	2631.62
Total	\$152,700	104,758.96

The WRE has a considerable amount of unspent funds as we have had to re-schedule a number of sensory sessions and temporarily cancel travel by the research coordinator. Sensory sessions include expenses from personnel (an assistant is employed to assist with setup) as well as materials and supplies and contractual services (host fees to sensory session hosts). We would like to ask to extend leftover funding for 12 months in hopes we can organize sensory analysis for these wines. Two virtual sensory sessions are already planned for the summer, and we hope to host a session, either virtually or in person, in the late fall/early winter of 2020. Additional chemical analysis will be needed for these wines immediately prior to any sensory analysis. Due to logistical concerns, virtual sessions evaluate fewer wines per session than in-person sessions, and therefore a larger number of sessions is needed to complete all the analysis.

We would also like to request a shift in funding from other categories to overhaul [our website](#). As we have not been able to communicate through in-person sessions and the research coordinator has not been able to travel to do site visits, the website has become an important hub of information and communication. We have been using the website in new ways to post videos from virtual sessions and communicate with producers about the digital offerings. Unfortunately, the site was not designed with this type of use in mind, leading to limitations in how we can present this information. We would like to shift funding to hire personnel to design and build a new website to showcase the growing library of reports, videos and newsletters in a more streamlined and user-friendly way.

Table 1: Experimental Themes for 2019-2020

Theme	% survey responses	# experiments planned
Investigating effects of canopy area on grape and wine characteristics	54	4
Assessing optimal grape maturity in red varieties: beyond Brix and acid	83	6
Harvest decisions in Petit Manseng: Sugar vs. acid	46	3
Reducing final bentonite addition with early interventions	46	5
Following progress and outcomes of ambient fermentations	50	7
Effect of Ethanol concentration on sensory characteristics: do findings from Washington State Merlot apply in Virginia?	42	3
Beyond SO ₂ : Exploring additional tools to reduce microbial spoilage at crush	58	8
SO ₂ management during aging	63	5
Improving sparkling wine base	42	5
Co-fermentation		3

Table 2: Experimental projects planned in 2019-2020 by region and type

Region	# projects	# participants
Northern	25	11
Central	39	14
Shenandoah	5	2
Southern	5	3
Peninsular	3	2
New	14	8
Vineyard	14	13

Number of projects	84
Number with themes	49
Number with replicates	29

Table 3: Complete list of planned projects for 2019-20. All projects presented through a sensory session, virtual sensory session, panel discussion or Instagram Chat will also be available through a full report on the website and may be featured in future newsletters.

Experimenter	Winery	Project	Outcome
Michael Heny	Michael Shaps Wineworks	Co-fermentation of Chambourcin with Viognier pomace	Panel Discussion
Doug Fabboli and Karen Reed	Fabboli Cellars	Cofermentation of Chambourcin with Vidal Skins and Merlot pomace	Panel Discussion
Matthieu Finot	King Family Vineyards	Cofermentation of Petit Verdot and Petit Manseng	Panel Discussion
Michael Heny	Michael Shaps Wineworks	Comparing fermentation vessels: Tbin vs. Gofermentor	Report
Andrew Bilenkij	Pollak Vineyards	Comparison of destemmers for red wine quality	Dropped
Nate Walsh	Walsh Family Wines	Comparison of two clones in Cab Franc	Sensory Session
Nate Walsh	Walsh Family Wines	Comparison of two clones in Merlot	Sensory Session
Mizuho Nita and Tremain Hatch	VaTech/Zephaniah	Desiccation trial in Chambourcin	Dropped
Emily Pelton	Veritas Vineyards	Effects of water dilution in dry Petit Manseng	Sensory Session
Lee Hartman	Bluestone Vineyards	Effect of Barrique Regenerateur (AEB) on barrel aged Chardonnay	Dropped
Matthieu Finot	King Family Vineyards	Effect of chaptalization in Chardonnay (white vs. brown sugar)	Dropped
Matthieu Finot	King Family Vineyards	Effect of chaptalization in Malbec	Virtual Sensory Session

Matthieu Finot	King Family Vineyards	Effect of chaptalization amount and type of sugar in Merlot	Virtual Sensory Session
Lee Hartman	Bluestone Vineyards	Effect of different fermentation temperature in Cab Franc	Complete, Aging
Michael Heny	Michael Shaps Wineworks	Effect of micro-oxygenation on Cab Sauv	Dropped
Michael Heny	Michael Shaps Wineworks	Effect of micro-oxygenation on Merlot	Complete, Aging
Michael Heny	Michael Shaps Wineworks	Effect of micro-oxygenation on Tannat	Complete, Aging
Theo Smith	Rappahannock Cellars	Effect of skin contact on Sauvignon Blanc sensory characteristics	Dropped
Theo Smith	Rappahannock Cellars	Effect of skin Contact on Viognier sensory characteristics	Dropped
Matthieu Finot	King Family Vineyards	Effect of soil amendment products in Cabernet Franc	Report
Jessi Gatewood/Bubba Beasley	Barren Ridge Vineyards	Effect of soil conductivity on sensory properties of Petit Verdot in Ballerina trellis system, year 3	Report
Jessi Gatewood/Bubba Beasley	Barren Ridge Vineyards	Effect of soil conductivity on sensory properties of Petit Verdot in VSP trellis system, year 3	Report
Matthieu Finot	King Family Vineyards	Further studies in bentonite: agitation, double fining, temperature and suspension time	Dropped
Ben Jordan	Early Mountain	Harvesting Petit Manseng before and after the rain	Dropped
Theo Smith	Rappahannock Cellars	Hyperoxygenation in Chardonnay to improve ageability	Sensory Session

Kirsten (Kiki) Apple	Monroe Bay Vineyards	Investigating use of endogenous grape skin and seed extracts in red wine fermentations	Dropped
Rob Cox	Paradise Springs	Maceration time in Cab Franc: Phenolic development and evolution of green character	Dropped
Ben Jordan	Early Mountain	Oxidative winemaking in Petit Manseng: low SO ₂ and hyperoxidation	Sensory Session
Joseph Geller/Jonathan Wheeler	Trump Winery	Reducing crop load to improve quality in Merlot	Virtual Sensory Session
Theo Smith	Rappahannock Cellars	Chemical and sensory effects of stabulation in Chardonnay	Sensory Session
Benoit Pineau and Preston Thomas	Stone Tower	The Impact of Agrothermal Systems Heat Blast treatments in Cabernet Sauvignon	Sensory Session
Benoit Pineau and Preston Thomas	Stone Tower	The Impact of Agrothermal Systems Heat Blast treatments In Sauvignon Blanc	Sensory Session
Shai Van Gelder	Barrel Oak	The Impact of Agrothermal Systems Heat Blast treatments on Cabernet Franc	Dropped
Shai Van Gelder	Barrel Oak	The Impact of repeated years of Agrothermal Systems Heat Blast treatments on Petit Manseng	Dropped
Corry Craighill/Silvia Leiggieri	Sunset Hills	Theme 1: Effect of defoliation through leaf pulling in Cabernet Franc	Sensory Session
Corry Craighill/Silvia Leiggieri	Sunset Hills	Theme 1: Effect of Defoliation through leaf pulling in Chardonnay	Sensory Session
Justin Rose	Rosemont of Virginia	Theme 1: Effect of hedging height on wine quality in Merlot	Sensory Session

Maya Hood White	Early Mountain	Theme 1: Effect of hedging height on wine quality in Merlot Rose	Report
Justin Rose	Rosemont of Virginia	Theme 2: In-house Phenolic monitoring on Merlot	Dropped
Jake Busching	Hark Vineyards	Theme 2: In-house Phenolic monitoring on Cab Franc	Complete, Aging
Andrew Bilenkij	Pollak Vineyards	Theme 2: In-house Phenolic monitoring on Cabernet Sauvignon and Cabernet Franc	Dropped
Nate Walsh	Walsh Family Wines	Theme 2: In-house Phenolic monitoring on Merlot	Dropped
Emily Pelton	Veritas Vineyards	Theme 2: In-house Phenolic monitoring on Merlot and Petit Verdot at Castalia	Complete, Aging
Matthieu Finot	King Family Vineyards	Theme 2: In-house Phenolic monitoring on Cabernet Franc	Report
Jake Busching	Hark Vineyards	Theme 3: Brix vs. Acid - Dual picks of Petit Manseng	Sensory Session
Ben Jordan	Early Mountain	Theme 3: Brix vs. Acid - Three picks of Petit Manseng	Sensory Session
Jordan Harris	Tarara Winery	Theme 3: Brix vs. Acid - Three picks of Petit Manseng	Sensory Session
Emily Pelton	Veritas Vineyards	Theme 4: Reducing bentonite by targeting polysaccharides	Dropped
Mark Misch	Ingleside Vineyards	Theme 4: Reducing bentonite use in Pinot Gris	Sensory Session
Eric Schenkel	Alta Vista	Theme 4: Reducing bentonite use in protein unstable wines	Sensory Session

Emily Pelton	Veritas Vineyards	Theme 4: Reducing bentonite use in Sauvignon Blanc	Sensory Session
Lee Hartman	Bluestone Vineyards	Theme 4: Reducing bentonite use in Vidal	Sensory Session
Corry Craighill	Sunset Hills	Theme 5: Ambient fermentation in Chardonnay	Dropped
Nate Walsh	Walsh Family Wines	Theme 5: Ambient fermentation in Chardonnay	Data only
Matthieu Finot	King Family Vineyards	Theme 5: Ambient fermentation in Chardonnay and SB	Virtual Sensory Session pending (July)
Robbie Corpora	Ramiisol	Theme 5: Ambient fermentation in grapes from non-conventional viticulture with characterization	Dropped
Matthieu Finot	King Family Vineyards	Theme 5: Ambient fermentation in red wine	Report
Todd Henkle	The Vineyards and Winery at Lost Creek	Theme 5: Ambient fermentation in red wine with microbial characterization	Dropped
Jordan Harris	Tarara Winery	Theme 5: Ambient fermentation in Viognier	Dropped
Kirsty Harmon	Blenheim Vineyards	Theme 7: Controlling microbes at crush with chitosan in Cabernet Sauvignon	Newsletter
Emily Belcher/Jason Crolley	Chateau Morisette	Theme 7: Controlling microbes at crush with chitosan and ozone in red grapes	Newsletter
Doug Fabboli and Karen Reed	Fabboli Cellars	Theme 7: Controlling microbes at crush with Enobrett Org and Egide in Cabernet Sauvignon	Newsletter

Andrew Bilenkij	Pollak Vineyards	Theme 7: Controlling microbes at crush with non-Saccharomyces yeast and Chitosan in Petit Verdot	Dropped
Corry Craighill	Sunset Hills	Theme 7: Controlling microbes at crush with non-Saccharomyces yeast and Chitosan in Tannat	Dropped
Mark Misch	Ingleside Vineyards	Theme 7: Controlling microbes at crush with non-Saccharomyces yeast in Cabernet Sauvignon	Complete, Aging
Katel Griaud	Slater Run Vineyards	Theme 7: Use of Primaflora yeast to reduce SO2 use in Cabernet Franc	Dropped
Daniele Tessaro	Barboursville	Theme 7: Use of Primaflora yeast to reduce SO2 use Petit Verdot	Newsletter
Kirsty Harmon	Blenheim Vineyards	Theme 8 SO2 management effects of dose in Cabernet Sauvignon	Virtual Sensory Session, pending (June)
Corry Craighill	Sunset Hills	Theme 8: SO2 management, effect of timing in red wine	Dropped
Emily Belcher/Jason Crolley	Chateau Morisette	Theme 8: SO2 management, effect of timing in red wine	Report
Jake Busching	Hark Vineyards	Theme 8: SO2 management, effect of timing in red wine	Dropped
Kirsty Harmon	Blenheim Vineyards	Theme 8: SO2 management, effects of dose in Cabernet Franc	Dropped
Emily Pelton	Veritas Vineyards	Theme 9: Improving sparkling wine base	Dropped
Emily Pelton	Veritas Vineyards	Theme 9: Improving sparkling wine base - Enartis protocol vs. SOP (from 2018)	Dropped

Theo Smith	Rappahannock Cellars	Theme 9: Sparling Wine - testing DV10 vs. QA23 for secondary fermentation (Chardonnay base)	Dropped
Scott Dwyer	Chemeketa Community College	Theme 9: Effect of tirage temperatures in sparkling wine sensory development	Sensory Session
Theo Smith	Rappahannock Cellars	Theme 9: Use of Oenolees in sparkling Rose	Sensory Session
Shai Van Gelder	Barrel Oak	Use of oyster shells as undervine weed control	Observational
Tim Gorman	Cardinal Point	Using Barrique Regenerateur to refresh Chardonnay barrels	Dropped
Matthieu Finot	King Family Vineyards	Using cold stabilization of red wine press fraction to reduce K ⁺ and pH during aging	Ongoig
Emily Pelton	Veritas Vineyards	Using potassium removal to moderate high pH in Petit Verdot	Dropped
Emily Pelton	Veritas Vineyards	Using potassium removal to moderate high pH in Viognier	Dropped
Damien Blanchon	Afton Mountain Vineyards	Whole cluster fermentations in Cab Franc	Dropped
Matthieu Finot	King Family Vineyards	Development of a technic for spoilage-free whole cluster fermentation in Petit Verdot (100%, 50%, all destemmed)	Instagram Chat

Table 4: Sensory sessions and virtual events to share background information, chemistry and sensory results. All virtual events were recorded and also posted to YouTube.

Date	Site	Theme(s)	#RSVP	# Attendees
29-Jan	Veritas Vineyard and Winery	Sparkling Wine Trials	33	31
		Protein Stabilization		
12-Feb	Rappahannock Cellars	Oxidative and Reductive Approaches to White Wine Production	35	30
		Strategies for Dry Petit Manseng		
4-Mar	Stone Tower Winery	Effects of Defoliation	33	30
		Other Vineyard Trials		
				Additional Views (YouTube)
15-Apr	Virtual	Co-fermentation Panel Discussion	35	25
20-Apr	Virtual	Trump Crop Load Study Sensory Session	33	6
7-May	Virtual	Whole Cluster Fermentation, Instagram Live	n/a	18
28-May	Virtual	Chaptalization Sensory Session	33	17
18-Jun	Virtual	SO ₂ Management Sensory Session	Pending	
July	Virtual	Ambient Fermentation and yeast strains in Sauvignon Blanc	Pending	