# Viticulture and Enology Extension News

Washington State University

Viticulture and Enology Program

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**Michelle M. Moyer, Ph.D.**



## NOTE FROM THE EDITOR

When I sit down to write these opening remarks, I always find it interesting to reflect on past VEEN "Notes from the Editor". Given that this is the 7th fall issue I have had the pleasure of working on (where has the time gone?), I thought it might be fun to highlight themes from past notes: 2011 - cool and slow, 2012 - nearly "average", 2013 - random weather, 2014 - the start of the "hot years", 2015 - Exceptionally hot and dry, 2016 - Early, early, early, followed by not-as-early harvest.

I've learned (and relearned) over these last few vintages that there really is no such thing as "average". We've had "hot" and "cool" seasons, "wet" and "dry" seasons, "early" and "late" seasons. Through all of that though, the WA industry has continued to thrive and produce premium grapes and wine. This has taught me that while we like to give credit to the site and climate, it's your management decisions that are really driving the industry forward. While we might describe 2017 as "challenging", Washington still has a remaining constant: talented and informed growers and winemakers who can turn challenges into opportunities for growth. So as 2017 comes to a close, hopefully we can look back on this vintage for those opportunities to learn, reflect, plan and change. Happy harvest!

Michelle M. Moyer
Associate Professor-Viticulture Extension Specialist
WSU-Prosser

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# A Note on Smoke Taint - 2017

*By Tom Collins, WSU TriCities*

The 2017 growing season in eastern Washington has been characterized in part by periodic episodes of poor air quality from various Pacific Northwest wildfires. During the first half of August (2nd-12th) smoke from wildfires in British Columbia drifted southward into both eastern and western Washington, with the effects lingering for a few days longer east of the Cascades. A second instance of poor air quality (eastern Washington) began over Labor Day weekend, originating from the Jolly Mountain and Norse Peak fires in the Cascades and the Eagle Creek fire in the Columbia Gorge. The poor air quality in this episode continued until 7 Sept. (Thursday), when a weather front cleared the worst of the smoke in most areas.

While the air quality warnings for many areas of the state have been lifted, concerns remain about the potential effects of these events on grape and wine quality. The note on smoke taint published in the Fall 2012 issue of VEEN is still relevant in its overview of the basic information about smoke taint and in its suggestions for how to handle fruit and wines that may have been affected by wildfire smoke. This note will reiterate some of the key points from the 2012 article, highlight some additional information that has become available since 2012 and provide an overview of the smoke taint research project started at WSU in 2016.

Smoke from wildfires contains a wide range of volatile phenols, including cresols, guaiacol, 4-methyl guaiacol, syringol and a number of others. The free and glycosylated (sugar bound) forms of these phenols accumulate in the skins of grapes and can be extracted into wine during the fermentation process (1,2), giving the wine unpleasant "ashy", "medicinal", "cigar butt" and other similar aromas. Depending on the plant material being burned in the wildfire, as well as whether the wildfire is smoldering or flaming, there may be other distinctive aroma compounds present in the smoke, including a range monoterpenes, and di- and tri-terpenoids (3).

Early work on smoke taint in Australia focused on timing of exposure, as in many cases there, the exposure was due to controlled burns, the timing of which could be adjusted to periods of lower risk to vineyards. Pre-veraison smoke exposure has generally less risk, while the period immediately following veraison has the highest level of risk for development of taint, peaking at around 10 days post-veraison (4, 5). Exposure at any time post-veraison through harvest has relatively higher risk than exposures early in the season. The intensity and duration of smoke exposure required to create smoke taint is still an unresolved question.

Assessment of smoke taint risk has largely focused on measuring guaiacol and 4-methyl guaiacol in the fruit or wine, in part because these compounds were the first to be associated with smoke taint (6). As further research has identified additional compounds associated with smoke taint risk, including o-cresol, m-cresol, p-cresol, syringol, 4-methyl syringol, 4-ethyl guaiacol and others (1, 7), these compounds are now also frequently monitored as additional indicators of smoke taint risk. Guaiacol, however, is naturally present in some grape varieties, especially Syrah (8), and 4-methyl guaiacol is also present in wines aged in oak barrels, complicating their use as markers for smoke taint potential.

The development of analytical methods of the glycosylated forms of the volatile phenols has added to smoke taint risk assessment. The presence of low levels of free guaiacol or 4-methyl guaiacol does not necessarily mean that fruit or wine is unaffected by smoke, as the concentration of free guaiacol and 4-methyl guaiacol is poorly correlated with the concentration of their corresponding glycosides (1, 8). Despite of improvements in analysis of both free smoke-related volatiles and their glycosides, the ability to predict the sensory perception of smoke taint is elusive.

An understanding of the glycoside pool in fruit and wine is important, however, as the bond between the sugar(s) and the phenol is acid-labile. During wine aging, hydrolysis of this bond in mildly acidic wine conditions will result in an increase of volatile phenols in the wine (9). Similarly, removal of free volatile phenols using reverse osmosis treatment or using activated carbon will have only short term benefit – the hydrolysis of the retained glycosides will eventually result in smoke taint returning to the wine. Any long term solution to reduction of smoke taint in grapes and wines will need to address either removal or reduction of the pool of glycosides of volatile phenols, to avoid that eventual return of smoke taint after an otherwise successful treatment.

## WSU SMOKE TAINT RISK ASSESSMENT PROJECT

In 2016, the Washington State Grape and Wine Research Program funded a proposal (Collins and Keller) to assess smoke taint risk based on the composition of the smoke exposed to grapes (and wines). The objectives for the project included:

1. Develop a system for exposing vineyard trial blocks to moderate levels of smoke for extended periods of time, to mimic smoke

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# Smoke Taint, con't

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exposure from natural wildfires

2. Develop analysis methods of leaves, grapes and wines
3. Monitor the extraction of free and glycosidically bound smoke related compounds from fruit in wine during fermentation
4. Evaluate techniques to mitigate smoke related compounds in wines, including the glycosides of the free volatile phenols.

***Figure 1*** *- Portable hoop-house covering two rows of 30 vines each (60 vines total), with modified side firebox smoker to simulated wildfire smoke.*

In the first year of the study, three smoking trials were carried out in hoop houses (Fig. 1). The trials used particulate matter (PM) counters to measure $PM_{2.5}$ (particulate material less than 2.5 μm in diameter) to monitor the intensity of smoke applied. The time weighted average $PM_{2.5}$ was between 1.2 and 1.5 $mg/m^3$ for each of the 18 hr trials conducted in 2016. For the 2016 trials, a mixture of western red cedar, hemlock and Douglas fir bark and wood pieces was used as fuel for generating the smoke. Wines were made from these smoke-exposed grapes at the Chateau Ste Michelle/ WSU Wine Science Center. These wines have been used to evaluate methods for the analysis of volatile phenols and their glycosides as well as for initial trials using reverse osmosis for the mitigation of smoke taint in wines. The goal of the initial mitigation study was to establish a base timeline for hydrolysis of the retained glycosides against which other treatments can be compared.

In 2017, we are evaluating the impact of fuel source on development of smoke taint. These trials have used a variety of native plants and invasive plant species that are typically found in the rangelands of eastern Washington to evaluate the composition of the smoke produced when these plants are burned. We are also characterizing the composition of free volatiles and their glycosides found in the exposed fruit and resulting wines.

We are also extending the duration of the smoke exposure to 26 hrs (Chardonnay) and 48 hrs (Merlot and Cabernet Sauvignon). With the portable hoop-house design, it is be possible to extend the duration of the smoke exposure to three to five days to provide a duration of exposure similar to that experienced during the recent episodes in eastern Washington.

We also took advantage of the recent air quality events to collect smoke intensity measurements using the particulate matter counters and to collect samples of fruit at the WSU-IAREC Roza vineyard north of Prosser, WA. During the BC smoke event in early August, the highest $PM_{2.5}$ concentration recorded was approximately 0.5 $mg/m^3$, on the afternoon of 4 Aug. (Friday). The time weighted average over the period from 2 Aug. through 11 Aug. 11 was 0.15 $mg/m^3$, or about 10% of level that was applied during our 2016 smoke trials. This relatively low level of smoke intensity, coupled with the fact that most vineyards in affected areas were pre-veraison, suggests that the associated smoke taint risk for that event is likely low, at least for the Roza vineyard where the data was collected.

Similar data and samples were collected during the more recent smoke exposure that started at the Roza vineyard on 2 Sept. (Saturday). The peak $PM_{2.5}$ measurement during that exposure was approximately 0.8 $mg/m^3$, on 5 Sept. (Tuesday) while the time weighted average $PM_{2.5}$ between 2 Sept. and 7 Sept. was 0.5 $mg/m^3$, although between 4 Sept. and 7 Sept. the average was closer to 0.6 $mg/m^3$, a level high enough to cause some concern for smoke taint risk, as the Roza vineyard was post-veraison for all varieties by the beginning of September. Fruit samples were collected daily during the course of both events and smoke intensity measurements were made, so we will be able to gain insight into the intensity and duration of wildfire smoke required to create the perception of smoke taint in the fruit exposed during these events.

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# Powdery Mildew in 2017

*By Michelle Moyer, WSU - Prosser*

One of the long-touted benefits of living in a hot and arid climate is the lack of powdery mildew pressure. For the most part, this has been true for Eastern Washington…but we do have our "cool" and/or "wet" years that throw us the proverbial curve ball (**Fig. 1**). Years such as 2010, 2011, and now 2017, have presented mildew challenges for our typically mild-mildew region. What made 2017 so challenging? How can we learn from this to keep mildew under control for 2018, and in future high-pressure years?

***Figure 1*** *- A variety of climate, vine, and disease issues aligned in 2017, making it a high-pressure year for grape powdery mildew.*

## VINE DEVELOPMENT

Before the growing season started, the stage was being set for mildew development. Remembering the 2016-2017 winter (most of us would prefer to forget), we had snow, and a lot of it (for this part of the country). That snow was a moisture reserve, providing our typically tightly-water-controlled vines with ample moisture to kick off early-season growth. Most locations saw excessively rapid spring shoot development, aided by the additional atypically timed precipitation (see "**Weather**" below). Our colder-than-normal winter temperatures also induced some bud damage in most locations. Many people saw excess sucker and latent bud growth which increased canopy density.

How does vine development influence mildew management? If shoots are growing fast, spray coverage with contact products (e.g., sulfur, oil, potassium bicarbonate, biologicals) becomes challenging. Sprays have to occur frequently (every 5-7 days). Systemic products, while having the ability to move throughout the plant, can be rapidly diluted throughout this excess growth, shortening the duration of efficacy for that spray event. Ultimately, when faced with rapid canopy growth, regardless of products used, the best approach is to use shorter spray intervals. The timing of the first seasonal spray may also have to occur earlier to ensure the first pass is completed before the vines have outgrown a manageable stage. When scheduling that first spray, consider factoring-in how long a complete vineyard pass takes. (See #1 in "**Spray Practices**" on the next page.) If the intention is to save a few sprays, and dollars, the best approach is to focus on when you can *stop* spraying mid-summer. There is too-much risk associated with focusing on how long you can delay the start of the spray program in the spring.

When canopies are dense, the ability for products (spray) to reach the target (leaves and clusters) is also diminished. This problem arises from the physical nature of leaves blocking clusters (and other leaves) from the spray. The only way to truly improve coverage in this case is to open the canopy up (shoot thinning and leaf removal), and/or increase air or water volume (or velocity) through the sprayer to ensure products are properly delivered and spread over the entire target (see "**Spray Practices**" on the next page).

## WEATHER

Weather is usually the first to blame for bad mildew—with good reason. Typically-bad mildew years are generally described as those with cloud cover, cooler temperatures (below 100°F), and high relative humidity for extended periods of time. These are not weather conditions typically used to describe eastern Washington. However, 2017, while not exceptionally cool or cloudy, had unusually high humidity thanks to the near-weekly small thunderstorms that moved through the area in June. Unfortunately, smoke coverage can, and did, act as cloud coverage in terms of humidity and temperature modification.

We cannot forget the microclimate immediately around the vines. Excess canopy growth results in increased transpiration, which increases the humidity inside a

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vine canopy. Excess canopy growth also blocks sunlight, creating cooler, shady conditions inside the canopy. This vintage had the perfect climate for mildew inside those dense, no-spray-penetration canopies. Since we cannot control the macro- or mesoclimate and associated weather conditions, we can only respond to those conditions with alternations in our spray programs -- higher fungicide rates and tighter spray intervals (typical label recommendations for "high pressure"). We can control the microclimate to some extent, through opening up the canopy with shoot thinning and leaf removal.

## SPRAY PRACTICES

When most of our vintages are easy-management years, poor habits and practices easily become the norm. Given the ease of disease management in recent vintages (2014, 2015, and to some extent, 2016), we became complacent with relaxed management strategies. Unfortunately, challenging years for mildew management tend to highlight our weaknesses in spray program design and execution. The most common less-than-ideal practices seen in 2017 were:

1. **Waiting too late to start the first spray.** Many people delayed their first spray until 10 inch shoot growth (or later, **Fig. 2**), and "10 inches" was generously interpreted. It is hard to get ahead of mildew once it gets a foothold. In high pressure years, we recommend completing the first spray between 3 and 6 inch shoot growth. In low-pressure years, the first spray can be delayed until 6 to 10 inch shoot growth. The challenge is determining when to start so your first block has been sprayed within those growth intervals. For larger growers, where it may take several days to complete a pass, consider that when scheduling your first spray. If shoots are growing rapidly, you may have to start when the first shoots reach 3 inches in order to have the first pass done before they reach 10 inches. Let the vine tell you when to spray, not the calendar.

2. **Waiting too long between sprays.** As discussed above, when canopies grow rapidly, you have to spray more frequently. I reviewed many programs this year that had as many as 15-21 days between their first and second spray. That is entirely too long (even in a mild year!) given that the typical products used were oil and sulfur. Oil provides excellent "reach back" activity (killing young mildew colonies), but it doesn't have much (if any) staying power... certainly not 15-21 days as was the case with stretched spray intervals. Sulfur, at higher rates, has good "reach back" but does have a little staying power (2-5 days, weather and rate dependent). But like oil, it is not effective for 15-21 days. When using contact products such as these, you really have to consider vine development -- these products do not protect new shoot growth, and they do not have long-lasting residual powers. They are still very effective products, but you have to use them properly, which means weekly applications.

3. **Driving too fast / spraying every-other-row / not calibrating sprayer / using worn nozzles.** In other words, general poor spraying practices and maintenance of sprayers. Driving too-fast, especially if the tractor was not calibrated at that speed, results in less product per acre. Spraying every-other row also falls into this category. The alternate row never really gets sufficient coverage, even with "blow through". Routine sprayer maintenance such as calibration and changing nozzles ensures the sprayer is putting out what you think it is putting out. Nozzles (on those machines with changeable nozzles) should be routinely replaced. We strongly recommend changing them at least annually, especially if you are using spray materials that are abrasive. The cost of replacing nozzles, and the time spent to ensure a sprayer is working, is far cheaper/less than crop loss or having to do extra "catch-up" sprays when disease control is lost.

4. **Not using sufficient water for product coverage.** The development of low-water

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***Figure 2*** *- If your vineyard looked like this before your first spray occured, you waited too long. This is approximately 12 inch shoot growth (ranging from 10-15 inch).*

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sprayers has saved growers time and money. They reduce the number of tank fill-ups needed to cover a vineyard, and they help conserve this important resource. However, low water volume spraying is best suited for small (early-season) or moderate (lower-vigor mid-season) canopy sizes (**Fig. 3**). They come with certain challenges when used on large canopies, especially those seen in 2017 in Washington. While spraying 20-30 gallons / acre in the early part of 2017 worked, that water volume was insufficient to achieve full coverage by bloom (and beyond). This is the anecdote I have been using this summer: If you pour a cup of water (i.e., your 20 gallons per acre) into a sauce pan (early-season canopy), the water will effectively cover the entire bottom of that sauce pan (great!). But if you take that same cup of water, and pour it into the bottom of a kiddie pool (your large, mid-season canopy), there is not enough water to go around. You can try to spread it out (surfactants, charges, etc.), but there is simply insufficient volume to cover all of that area. Those growers who used 50 (and up to 100 gallons) per acre by mid-season generally saw improved disease control. Having enough water carrier is especially important if you are using contact product; contact products only work where they land. Not sure if you are getting coverage inside of your canopy? Water sensitive paper can be an excellent tool to see how canopy size influences coverage, and we recommend using them on a routine basis to see if your spray is going where you want it to go.

## FUNGICIDE RESISTANCE

This is the new factor for 2017 – the identification of FRAC 11 (QoI, strobilurin) fungicide resistance in vineyards. We likely have had some fungicide resistance for several years, but the recent low-pressure seasons have masked what would have normally resulted in control failures. That has led to the build of FRAC 11 resistant mildew populations. While eastern Washingtonians are generally quite good at fungicide rotation, the literature and recent studies are suggesting that it is likely only a matter of time, not rotation, for the onset of fungicide resistance. So while our rotation practices have bought us a good 15 years of strobilurin use here in Washington (as opposed to 2-3 years in places like New York), our time is up. That has led to the following questions this season:

- Can FRAC 11 fungicide still be used in the state? Absolutely, as not all mildew in all locations is resistant.
- Should they be used with specific strategies to avoid additional resistance development? Yes.
- If you have confirmed FRAC 11 resistance in your vineyard, should you continue to use FRAC 11 fungicides? Maybe. Spraying FRAC 11 fungicides on a resistant population has the same result as if you had not sprayed at all. If you tank mix with another product, then the other product is likely doing most of the work for you (which begs the question, why use both?).

The challenge is that FRAC 11 fungicides (when there is not resistance) are a great bang-for-the-buck. It would be a shame to completely lose them for mildew control. If you have confirmed resistance, and you must continue to use FRAC 11 fungicides for certification (i.e., you are limited in options for what you can apply) or cost reasons, the following strategies may help prevent the loss of disease control in the future:

1. **Consider an every-other-year rotation option.** The powdery mildew fungus overwinters in Washington in the sexual form. While we are currently conducting studies to determine how much fungicide resistance might also overwinter, and

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***Figure 3*** *- Low water volume works well for smaller canopies (left), but is generally insufficient for full coverage on larger canopies (right).*

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ways we can reduce resistance through management options, there is a strong possibility that some wild type (fungicide-sensitivity) is regained in this over-wintering process. Thus if you avoid FRAC 11 fungicides the following year (year 2), you might regain field-level sensitivity, allowing you to re-introduce FRAC 11 fungicides in year 3. This is still theory, but it is a start.

2. **Use FRAC 11 fungicides early if you cannot avoid their use, and apply with a product of another mode of action.** Following a similar line of thought as above, if some wild-type mildew is mixed in with the resistant mildew early in the season, the FRAC 11 fungicides would be effective on those wild-type populations. But the resistant ones would remain unaffected by the fungicide application, thus requiring the addition of another mode of action or contact product to maintain disease control. This type of strategy is likely best utilized as the second or third spray of the season, provided that time does not overlap with the timing mentioned in #3 below.

3. **Avoid the use FRAC 11 fungicides going into prebloom and through bloom if you have had confirmed resistance in your vineyard.** This is the critical window for fruit infection, and also the time when mildew tends to build in the vineyard. Spraying a FRAC 11 fungicide onto a potentially resistant population is akin to not spraying during this critical window. Save your FRAC 11 choices for earlier in the season, or another year.

Since the start of this growing season, we have been collecting mildew isolates across Washington to test for the gene that is associated with FRAC 11 fungicide resistance. This was done in partnership with Walt Mahaffee at the USDA-ARS in Corvallis, OR. While most of our testing has been in vineyards with disease control failures (so there is the potential bias of over-estimating total amount of fungicide resistance present), we have also been sampling from isolated blocks, as well as Concord vineyards across the state. Unfortunately, as of the end of August, 92% of our samples (n=160) have come back as having the gene mutation associated with fungicide resistance. Another 4% have come back as being a mixed population (i.e., some of the mildew in the sample had the gene, some did not). Only 4% of the samples came back as wild type (no resistance gene present).

## PREPARING FOR 2018

If you had a mildew problem in 2017, it does increase your risk of mildew in 2018. To best prepare your vineyard and spray program for regaining control, we recommend the following:

1. **Start early in 2018 – but you do not have to start before the vines do.** Nothing beats a regular, solid in-season spray program. Save your money on dormant sprays and invest it in-season. If you had bad mildew in 2017, start your spray programs at 3 inch shoot growth, ensuring your first pass is complete before the vines have reached 6 inch shoot growth. If you want a more thorough review on the use of dormant lime sulfur, see our Fall 2012 issue of VEEN.

2. **Watch your spray intervals.** The UC Davis Powdery Mildew Risk Index can be helpful during the beginning of the growing season until the onset of ontogenic resistance to help determine mildew risk. If risk is high, shorter intervals are warranted. If risk is low, those intervals can be extended (within the recommendation of the label. You can adjust these intervals as 2018 unfolds, and as you move past the critical window for mildew infection.

3. **Calibrate your sprayer, and replace your nozzles.** Make sure your equipment is properly functioning. Do not *assume* that it is, ***ensure*** that it is.

4. **Implement timely canopy management for the training system you have.** Nothing hurts mildew more than high temperatures, high UV exposure, and quick-drying conditions. Do what you can to encourage that type of climate in the vine canopy.

5. **Pre-plan your spray program, including estimated gallons-per-acre and FRAC group rotation.** This will help you avoid quick-decisions, and will allow you to make sure you are rotating fungicides as the season progresses. It will also help you ensure you are using sufficient water to deliver products.

There is a silver lining to the mildew cloud – we can use it as a learning opportunity to improve our spray practices and choices. As we go into the winter season, let us continue the discussion on best management strategies as we plan for 2018.

# Pre-Emergence Herbicide Use in Vineyards

*By Lynn Sosnoskie, WSU - Wenatchee*

Weeds can directly impact grapevines through competition for water, nutrients, and light. Weeds may also affect vine growth and yield indirectly by serving as alternate hosts for insect pests and pathogens and by providing habitat for rodents. Physically, weeds can interfere with crop management and harvest operations when they block irrigation emitters, interfere with the deposition of other pesticides, or impede the movement of workers and equipment. Successful weed management can be achieved by employing a combination of strategies including: thoughtful site selection, proper weed identification, detailed record keeping, and utilizing a diverse array of tools to control weeds throughout the production season.

*Figure 1* - *Weed control is reduced and the potential for crop injury is increased when weeds get ahead of management efforts. The use of soil-applied, PRE herbicides can help to reduce the numbers of weeds that will require POST control in the spring and summer. This picture was taken in an apple orchard near Omak, WA, in July 2017.*

One such strategy is the use of dormant-season, soil-applied, pre-emergence (PRE) herbicide applications to provide residual weed control. An obvious benefit of fall- or early spring-applied herbicide treatments is that growers can take advantage of naturally occurring rain events to incorporate/activate these products. Additionally, cooler soil temperatures may help to reduce chemical loss through dissipation and degradation, thereby preventing the potential for reduced herbicide efficacy. Weed suppression resulting from PRE herbicide applications may also reduce the need for foliar-applied, post-emergence (POST) treatments **(Fig. 1**).

More than a dozen residual herbicides, representing multiple herbicide Sites of Action (SOA), are available for use in grape systems. These active ingredients include: flazasulfuron and rimsulfuron (Weed Science Society of America (WSSA) group 2; acetolactate synthesis inhibitors); oryzalin, pendimethalin, pronamide, and trifluralin (WSSA 3; mitosis inhibitors); simazine (WSSA 5) and diuron (WSSA 7; photosystem II inhibitors); norflurazon (WSSA 12; carotenoid biosynthesis inhibitor); flumioxazin, oxyfluorfen, and sulfentrazone (WSSA 14; protoporphyrinogen oxidase inhibitors), napropamide (WSSA 15; very long chain fatty acid inhibitor); dichlobenil (WSSA 20), isoxaben (WSSA 21; non-bearing, only), and indaziflam (WSSA 29; cellulose inhibitors) (**Table 1**). A more detailed description of herbicide SOAs available for use in grapes can be found in the Spring 2017 edition of the Viticulture and Enology Extension news.

The effectiveness of any residual herbicide will be impacted by multiple (and interacting) chemical, physical, and biological factors. To optimize product performance, growers should think about the following considerations before implementing a strategy:

What weeds are present? Not all herbicides are equally effective

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against all weed species. For example, the dinitroanilines (aka the 'yellow herbicides') are useful for controlling annual grasses and some small-seeded broadleaf weed species (such as pigweeds), but are ineffective against broadleaf species with larger seeds (such as puncturevine/goatheads). Given that PRE herbicides may have very different spectrums of activity, knowledge about the makeup of the existing weed community is a necessity prior to application. Although the seedlings of perennial weed species may be controlled by PRE herbicides, mature plants are unlikely to be impacted. If a variety of species is likely to occur, tank-mixtures may be appropriate to ensure that the entire weed spectrum is targeted.

**Table 1**- Residual herbicide SOAs available for use in grapes as detailed in the 2017 Pest Management Guide for Grapes in Washington. Herbicide numerical classification is according to the Weed Science Society of America (WSSA).

| WSSA Group | Site of action | Mode of action targeted |
|---|---|---|
| 2 | Acetolactate synthase (ALS) inhibitors | Amino acid biosynthesis |
| 3 | Microtubule inhibitors | Microtubule polymerization |
| 5 | Photosystem II (PSII) inhibitors (D1 protein) | Photosynthesis |
| 7 | Photosystem II (PSII) inhibitors (D1 protein) | Photosynthesis |
| 12 | Phytoene desaturase (carotenoid biosynthesis) inhibitors | Photosynthesis |
| 14 | Protoporphyrinogen oxidase (PPO) inhibitors | Photosynthesis |
| 15 | Very long chain fatty acid (VLCHA) inhibitors | Fatty acid synthesis |
| 20 | Cellulose inhibitors | Cell wall synthesis |
| 21 | Cellulose inhibitors | Cell wall synthesis |
| 29 | Cellulose inhibitors | Cell wall synthesis |

When and how will these products be incorporated? PRE herbicides must be incorporated (usually 1-2" deep) into the soil profile; incorporation is required because these herbicides are only active against newly germinated weed seedlings. Furthermore, incorporation is necessary to reduce or prevent volatilization and photodegradation, which can result in reduced herbicide performance. The length of time a herbicide can remain on the soil surface varies dramatically among products. For example, trifluralin (WSSA Group 3 herbicide) must be physically incorporated within 24 hours whereas pendimethalin (also a WSSA Group 3 herbicide) may remain stable for several days to weeks. Even if a herbicide does not require immediate activation to prevent product loss, an unincorporated herbicide is unable to control emerging weeds. How the herbicides are activated can also affect product performance. While many growers will time herbicide applications to take advantage of naturally occurring rainfall, uncooperative weather may require the use of irrigation for activation. It is important to note that the type of irrigation and frequency of irrigation events can impact the distribution and retention of soil-applied herbicides. For example, residual herbicides can break down more rapidly under emitters, leading to distinct patches of weeds that will require subsequent control.

What are the soil conditions like? How mobile is the herbicide? Soil-applied herbicides are often referred to as 'residual' herbicides because they persist in the soil following application to provide extended control of germinating weed seedlings. The length of time that herbicides may reside in a treated area will be influenced by multiple factors, including soil texture and organic matter content. Soils that are high in clay and/or organic matter allow for more of the herbicide to be bound up in the soil matrix, requiring higher application rates. Conversely, coarse soils are less adsorptive than fine soils, which enhances leaching potential, thereby necessitating lower herbicide rates to prevent crop injury and environmental contamination. Herbicide retention is also a function of herbicide chemistry. Some herbicides bind very tightly to soil particles (e.g. trifluralin) whereas others are more mobile (e.g. simazine) and prone to leaching.

How much litter is on the soil surface? Standing vegetation (such as winter weeds) and crop residue (such as leaf litter) on the soil surface can interfere with the deposition and incorporation of PRE herbicides. To improve soil-herbicide contact, existing weeds should be controlled using POST herbicide treatments or some form of physical weed removal. Smaller weeds are easier to control than larger ones; younger plants have less surface area that requires treatment and are generally more succulent than older plants. Always follow

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# Herbicides, con't.

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herbicide label recommendations regarding rates, spray volumes, and adjuvant partners to maximize weed control efficacy. A blower can be employed to clear trash off berms prior to herbicide applications.

How old are the vines? Vine age can affect what herbicides are available for use in a production system. While competition from weeds is most severe in newly planted grapes, not all PRE herbicides are appropriate for use around young canes. For example, flumioxazin should not be applied to grapes established less than two years; indaziflam should only be applied to grapes that are five years of age and are showing good vigor. Growers should be aware of re-plants in mature vineyards before making soil-applied treatments. Regardless of vine age, residual herbicides should only be applied to soil that is settled and free of cracks to minimize the potential for crop injury. Avoid using herbicide-treated soil to backfill planting holes.

Dormant-season, soil-applied herbicides can be an effective tool for managing weeds in grapes. However, vineyard managers must be aware of the fact that multiple, interacting factors can affect the both utility and efficacy of herbicides available in grapes. Always read the most recent versions of herbicide labels, thoroughly, prior to application to ensure that the right product is being applied at the right time for the control of the weeds present in a vineyard. When factoring in costs, remember that PRE herbicide programs may be economical if the number of in-season weed control activities can be reduced or if weeds with resistance to commonly-applied POST herbicides are present. With respect to herbicide resistance, the use of multiple weed management strategies, including soil-applied products, can help to prevent the development and spread of resistant biotypes. Diversifying herbicides is only one component of a weed/herbicide resistance management program. When/if possible: cultivate, hand-weed, mulch or inter-crop, prevent weeds from going to seed, and prevent weed seed from being dispersed on farm equipment. Evaluate weed populations both BEFORE and AFTER weed control strategies are employed; this will allow you to detect potentially resistant populations early and manage them most effectively.

## DISCLAIMER

**No endorsement is intended for products mentioned, nor is lack of endorsement meant for products not mentioned. The author and Washington State University assume no liability resulting from the use of pesticide applications detailed in this report. Application of a pesticide to a crop or site that is not on the label is a violation of pesticide law and may subject the applicator to civil penalties up to $7,500. In addition, such an application may also result in illegal residues that could subject the crop to seizure or embargo action by WSDA and/or the U.S. Food and Drug Administration. It is your responsibility to check the label before using the product to ensure lawful use and obtain all necessary permits in advance**

**Sources:**

2017 Pest Management Guide for Grapes in Washington: http://cru.cahe.wsu.edu/CEPublications/EB0762/EB0762.pdf

Spring 2017 Viticulture and Enology Extension News: http://wine.wsu.edu/wp-content/uploads/sites/66/2017/04/2017-VEEN-Spring.pdf

Weed Science Society of America herbicide classifications: http://wssa.net/wp-content/uploads/WSSA-Mechanism-of-Action.pdf

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**This service allows you to customize the information you receive. Choose from topic areas, including:** Tree Fruit (apple, cherry, stone fruit, nursery, automation/mechanization), Grapes (juice, wine, table, winery), Other Small Fruit (blueberry, raspberry), Vegetables (potato, onion, sweet corn, peas, carrots, other vegetables), Cereals/Row Crops (wheat/small grains, corn [grain and silage], dry edible beans, alternative crops), Forages (alfalfa, timothy, other grasses/legumes, mint), Livestock (cattle, swine, sheep, goats, pasture management), Ag Systems (high residue farming, soil quality/health, organic ag, direct marketing, small farms), Water and Irrigation (center pivot irrigation, drip irrigation, surface irrigation, water availability/rights).

# Price Premiums & Certification for CA and WA Wines

*By Megan E. Waldrop, Jill J. McCluskey, and Ron C. Mittelhammer, WSU - Pullman*

Consumer expectations for environmentally sound and sustainable production practices are increasing. This has resulted in wines with claims concerning sustainable production characteristics, organic status, and other attributes. These claims address various environmental and social concerns, including organic practices, fish-friendly practices, humane treatment of animals, wildlife and biodiversity preservation, and sustainability. Some wines are offered with multiple certifications or claims in order to appeal to consumers who care about multiple concerns.

In this study, we analyzed the California and Washington wine market, which has a range of products from those with no sustainability claims to those with multiple claims. As a part of this analysis, we separated those products that had "self-claims" from those that had claims based on certification for organic, sustainable, fish friendly, and biodynamic practices. We also analyzed products with multiple certifications with hedonistic proce analysis. The results show that wines with organic, sustainable, and biodynamic-produced claims, certified or self-claiming can command higher prices. However, more is not better: having multiple certifications resulted in diminishing returns on the investment for additional certifications. The full study is published in Waldrop et. al [1].

Wine producers can choose to self-claim that organic, sustainable, and/or biodynamic practices were implemented or go through a certification process providing third-party verification that the practices were followed. The USDA oversees organic certification with two categories: 1) wine made with organic grapes and 2) organic wine.

> ***Sustainable wines do not have formal U.S. public standards, but there are many organizations that set private standards.***

For wine represented as being made with organic grapes, 100% of the grapes must be certified organic and sulfites may be added up to 100 ppm. For organic wine, all grapes and agricultural ingredients must be organic and no sulfites may be added. The majority of certified organic wine is categorized as made with organic grapes.

Sustainable wines do not have formal U.S. public standards, but there are many organizations that set private standards. A sustainable practice, specific to the U.S. west coast, is protecting the native salmon and trout populations. Vineyard certification for fish friendly wines requires reducing water runoff and using natural methods to control weeds and pests in order to promote native biodiversity. Depending on the size of the winery and vineyard, fees and annual dues for third-party certification can range from a few hundred to thousands of dollars.

Biodynamic practices extend the principles of organic and sustainable agriculture and were developed in the early 1920s. It is a holistic approach and includes spiritual elements in its guidelines. The entire property must be biodynamic, not just a particular vineyard. Demeter International oversees the certification process for biodynamic farming and wine making worldwide. Since Demeter expanded to the United States in 1985, at least 60 vineyards have been certified.

Switching from conventional wine making to environmentally conscious methods can be costly and time consuming. Choosing to become certified by at least one organization also adds to costs of production, so it is important to understand how environmental and sustainable claims and/or certifications affect wine prices. The effects of self-claiming these practices versus being certified is analyzed, in addition to the price effects from multiple certifications.

## DATA

The data set is comprised of 45,352 observations of California and Washington red wines published in Wine Spectator magazine from 1989 to 2014. The data set includes 2,958 California wineries and 463 Washington wineries, representing approximately two-thirds of wineries in California and half of the wineries in Washington. Vintage years range from 1984 to 2013. White, sparkling, rosé, and dessert wines are excluded from the data set because the product attributes for those products are valued differently and command different implicit marginal prices. Wines not sold in the standard 750 mL size are also excluded.

Wine making practices for each wine are categorized depending on information found on the winery or vineyard website and/or lists found on each certification organization's website. Wineries are considered to self-claim as sustainable, organic, or biodynamic if these practices were advertised as taking place in the vineyards used in making the wine and/or at the winery but the wine was not certified by any third-party or government agency. Wines are classified as certified sustainable if the winery or vineyard was found to

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# Price Premiums, con't.

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**Table 1**- Count and percentage frequency of certifications and claims by year.

| Variable | 1984-1993 | | 1994-2003 | | 2004-2014 | |
|---|---|---|---|---|---|---|
| | Freq. | %* | Freq. | %* | Freq. | %* |
| Certified sustainable | - | - | 284 | 1.60 | 2,942 | 13.27** |
| *LIVE* | - | - | 171 | 0.96 | 312 | 1.41 |
| *CCSW* | - | - | - | - | 359 | 1.62 |
| *SIP* | - | - | 113 | 0.64 | 583 | 1.62 |
| *Napa Green* | - | - | - | - | 1,681 | 7.58 |
| *Lodi Rules* | - | - | - | - | 109 | 0.24 |
| Salmon-Safe or Fish Friendly Farming certified | - | - | 1,464 | 8.23 | 2,299 | 10.37 |
| Non-certified sustainable | 767 | 14.24 | 2,942 | 16.54 | 4,138 | 18.66 |
| Certified organic | - | - | 377 | 2.12 | 1,034 | 4.66 |
| Non-certified organic | 80 | 1.49 | 441 | 2.48 | 646 | 2.91 |
| Demeter certified | 159 | 2.95 | 431 | 2.42 | 390 | 1.76 |
| Non-certified biodynamic | 54 | 1.00 | 225 | 1.26 | 292 | 1.32 |
| No sulfite added wine | 5 | 0.09 | 11 | 0.06 | 25 | 0.11 |
| Multiple certifications | | | | | | |
| *CCSW and Napa Green* | - | - | - | - | 49 | 0.22 |
| *CCSW and SIP* | - | - | - | - | 38 | 0.17 |
| *Napa Green and certified organic* | - | - | - | - | 218 | 0.98 |
| *Certified sustainable and certified organic* | - | - | 4 | 0.02 | 261 | 1.18 |
| *Certified sustainable and Demeter certified* | - | - | 2 | 0.01 | 59 | 0.27 |

**1984-1993: out of 5,387 wines; 1994-2003: out of 17,790 wines; 2004-2013: out of 22,175 wines.*
***The total number of wines with sustainable certifications is less than the sum of the wines in each certification category because some wines have multiple certifications.*

have certification from at least one of the recognized organizations that provide third-party certification. Certified organic wines must have been certified by the USDA either directly or through a state-level organic certification organization.

The count and percentage frequency of certifications and claims segmented by vintage year time period is presented in **Table 1**. The sustainable certifications include: Low Input Viticulture and Enology (LIVE), Certified California Sustainable Winegrowing (CCSW), Sustainability in Practice (SIP), Napa Green, and Lodi Rules. Wines are classified as certified biodynamic if the Demeter Association provided the certification. Salmon-Safe and Fish-Friendly vineyards are categorized as a separate category from certified sustainable to isolate the effect of this specialized certification.

Since the number and type of claims and certifications change over time, we partition the data into time periods based on vintage year: i) 1984-1993, ii) 1994-2003, and iii) 2004-2013. All categories grow over the time periods except Demeter certified. The most frequent category is non-certified sustainable, which ranged from 14.24% to 18.66%. Demeter is the only certified label that was available in 1984-93, representing 2.95% of the wines. In 1994-03, Salmon-Safe or Fish Friendly Farming certified was the most common certification. In the period 2004-13, all certifications were available and 13.27% of wines have at least one sustainable certification. Almost 5% of wines were certified organic and 3% were non-certified organic.

In the analysis, we estimate price as a function of score, cases produced, and years of aging. Score represents the quality score given by *Wine Spectator's* expert blind tasting panel. The number of cases produced is included to serve as a proxy for rare or "hard to get" wines with an expected inverse relationship with price. We account for a number of wine characteristics, including region, the most common varietals, vintage year, other wine label information, wine making practices, and certification interactions.

## IMPACTS OF CLAIMS ON PRICES

The marginal impacts of claims on wine prices are presented in **Table 2** (see Waldrop et. al [1] for the technical discussion of the estimation procedures and additional estimation results). For the vintage years 1984-93, the only certification available was Demeter, with a marginal implicit price of $1.64 - this means that a wine with a Demeter certification will command $1.64 more than the identical wine that is not Demeter certified. Non-certified sustainable claims commanded price premiums, while all other non-certified practices and no-sulfite-added claims do not have statistically significant effects. For the period 1994-03,

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# Price Premiums, con't.

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the certifications LIVE, SIP, Salmon-Safe/Fish Friendly Farming, and certified organic were introduced and commanded price premiums.

All of the sustainable certifications were present in the period 2004-13. The LIVE and Napa Green certifications were statistically significant and positive; whereas CCSW and Lodi Rules were statistically insignificant. It may be the case that consumers were less familiar with CCSW and Lodi Rules because these certifications were less prominent in the marketplace. Interestingly, SIP was statistically significant in 1994-2003, when it was the only statewide sustainable certification available, but not for 2004-13 when CCSW was introduced in 2010. This suggests that the addition of the CCSW claim in the market place negatively affected the impact of the SIP claim.

Salmon-Safe and Fish Friendly Farming certifications are estimated to have a significant premium of $4.32 for vintage-year period 1994 to 2003 and $2.89 for the vintage-year period 2004 to 2013. This suggests that there is market for wines produced with specific environmental goals, which may be less costly to achieve than a full sustainability certification.

Certified and non-certified organic claims command statistically significant and positive price premiums for the vintage-year periods 1994 to 2003 and 2004 to 2013 (**Table 2**). The marginal implicit prices for certified and non-certified organic claims are not statistically significantly different from each other. This calls into question whether it is worth the cost of certifying the organic attribute for wine.

**Table 2**- Estimation of the marginal implicit prices (additional premium or discout) for claims, segmented by year

| Variable | 1984-1993 | 1994-2003 | 2004-2013 |
|---|---|---|---|
| Low Input Viticulture and Enology (LIVE) certified | - | $3.56*** | $3.28*** |
| Certified California Sustainable Winegrowing (CCSW) | - | - | $1.18 |
| Sustainability In Practice (SIP) certified | - | $2.30** | $0.46 |
| Lodi Rules certified | - | - | -$0.32 |
| Napa Green certified | - | - | $4.40*** |
| Non-certified sustainable | $1.81*** | $2.04*** | $2.34*** |
| Certified organic | - | $1.91*** | $1.27** |
| Washington & certified organic | - | -$15.57*** | -$19.96*** |
| Non-certified organic | $0.56 | $1.63*** | $2.51*** |
| Demeter | $1.64*** | $1.47*** | $0.04 |
| Non-certified biodynamic | $1.73 | $4.50*** | $7.49*** |
| No sulfites added wine | -$2.26 | -$8.95*** | -$7.42*** |
| Salmon Safe or Fish Friendly Farming certified | - | $4.32*** | $2.89*** |
| CCSW and SIP certified | - | - | -$0.87 |
| CCSW and Napa Green certified | - | - | -$2.19 |
| Napa Green and organic certified | - | - | -$2.30** |

**Statistically significantly different from zero at the 90% level of confidence, ** at the 95% level of confidence, and *** at the 99% level of confidence.*

## Organic Certification

**It should be noted that the organic certified variable is capturing the effect of organic production in California. The dataset contains 54 wines that are certified organic in Washington, but 49 of them come from one winery. Therefore, we argue that the large negative estimate of the Washington and organic interaction term does not accurately represent the price effect of organic wine production for Washington wineries overall.**

Although the marginal effect of certified organic is $1.91 in vintage-year period 1994 to 2003 and $1.27 in vintage-year period 2004 to 2013, consumers may discount the value of the USDA organic certification due to pre-conceived quality ideas or lack of understanding of the label designation, mitigating the premium relative to when a winery only advertises organic practice. **[See "Organic Certification" sidebar]**

The impact of certified and self-claimed biodynamic practices are significantly different across the data from vintage years 1994 to 2003 and vintage years 2004 to 2013, with the non-certified biodynamic characteristic estimated to command a higher premium. For biodynamic wine, U.S. consumers

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# Price Premiums, con't.

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may be less familiar with the specific Demeter certification compared to the general term "biodynamic" [2,3].

The term biodynamic has been associated with some ultra-premium wines, and consumers may associate the term biodynamic with quality. It is interesting to note that while the implicit price of non-certified sustainable and non-certified organic are on average approximately $2, the premium for non-certified biodynamic practice has grown from $4.50 to $7.49. This could be due to the stricter behavioral guidelines of biodynamic practices and the overarching philosophy of the methodology. It has also been argued that the additional care and effort required for a winemaker to produce biodynamic wine results in closer attention being paid to the entire winemaking process and thereby results in higher quality [4]. These results suggest that switching from conventional to one of the environmentally conscious practices is beneficial for wine producers even without seeking certification.

No-sulfites-added wine has statistically significant negative marginal implicit prices for vintage. The absence of added sulfites could detract from perceived value because the amount of sulfites contributes wine quality. Sulfites are found naturally in wine, but additional sulfur dioxide must be added for anti-microbial and stabilization effects to be achieved. Flavor and aroma compounds continue to develop as wine ages, increasing the complexity and depth of the sensory characteristics [5]. Thus no-sulfite-added wines may be perceived as an inferior good. However, it may still appeal to consumers who are allergic to sulfites or perceive sulfites as unhealthy and/or unnatural [6].

**... wine producers need to be cognizant of how recognizable a certification is to consumers...**

The marginal effects of multiple certifications are negative, meaning that the full price benefit from adding an additional certification is not realized. While some producers may believe that 'more is better,' having more labels might dilute the signals contained in labels and confuse the consumer. There is an argument to be made that a saturation of sustainable claims results in the loss of effectiveness of some existing claims in the marketplace. This finding suggests that investing in multiple certifications may not compensate the extra effort and costs required in doing so.

## CONCLUSIONS

This study considers the market value of environmental and sustainability claims, including the value of certification versus self-claims and the marginal impact of multiple claims for wines. In some instances, the certified characteristic commands a lesser premium compared to the corresponding self-claimed characteristic. We confirm that many claims about environmental and sustainable wine production can command higher prices. However, adopting more than one certification can dampen the incremental premiums received by producers. These results suggest that wine producers need to be cognizant of how recognizable a certification is to consumers when deciding to invest in the cost of the certification. The ultimate decision to certify for a sustainable producer will depend on regional competition and cost factors.

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# Wine Microbiology Lab Updates

*By Charlie Edwards, WSU - Pullman*

Our laboratory continues to study two very important issues to Washington wineries; *Brettanomyces* infections and non-*Saccharomyces* yeasts. Specifically, our work focuses on (1) survivability of *B. bruxellensis* in winery waste such as grape pomace, (2) yeast penetration of different types of oak staves, and (3) potential commercial utilization of non-*Saccharomyces* yeasts isolated from Washington grapes.

Brettanomyces survival in winery waste such as pomace is currently being investigated by Zach Cartwright (Ph.D. student). *B. bruxellensis* could be recovered from Syrah grape pomace stored in two different vineyards even after 100 weeks of incubation. While these two vineyards are located in the Columbia Valley AVA, a third was added from the Walla Walla AVA in 2016. Overall, seasonal variation with better growth in spring and summer months were noted. Better recovery was noted in those pomace samples previously sterilized using gamma irradiation indicating that this yeast is a poor competitor when other microbes are present.

In addition to pomace work, Zach is also investigating methods to reduce populations of *Brettanomyces* in barrels. After disassembling 16-L oak barrels inoculated with *B. bruxellensis*, the yeast was found to penetrate the furthest in light or heavy-toasted French oak staves located at the bottom of barrels (5 to 9 mm from inside of barrel) compared to those prepared from American oak (0 to 4 mm).

Thermocouple data indicated that a range of 3 to 4 minutes was required for stave layers <9 mm to reach 55°C, a temperature which *B. bruxellensis* is thought to have a D-value of approximately 1 min (D-value is the time at a specific temperature for a microbe to reduce its population by 90%). Steaming staves for 6 to 9 min resulted in no recovery of *B. bruxellensis* from the 0 to 4 mm layer while an additional 3 to 6 min was needed to not recover cells from the 5 to 9 mm layer. Based on these results, steaming times of at least 12 minutes are needed to remove *B. bruxellensis* if yeasts are present in staves at depths of <9 mm.

Current research on non-*Saccharomyces* is being led by Jesse Aplin (Ph.D. student). He is examining the ability of these yeasts to reduce potential alcohol in wines, as well as overall impacts on wine quality. Initial inoculation of non-*Saccharomyces* yeasts followed by *S. cerevisiae* significantly ($p \leq 0.05$) reduced ethanol content compared to those produced by *S. cerevisiae* alone. Here, *Mt. pulcherrima* P01A016 achieved the greatest reduction, producing 11.7% v/v compared to 13.7% v/v by wines fermented only by *S. cerevisiae*. Ferments inoculated with *My. guillermondii* P40D002, *Mt. pulcherrima*, and *Mt. fructicola* reduced ethanol to yielded 12.1% to 12.27% v/v while *P. membranifaciens, P. kluyveri, Mt. chrysoperlae,* or *T. delbrueckii* strain reduced alcohol to 13.0 to 13.4% v/v.

All yeast strains tested produced acetic acid at levels below the sensory threshold of 0.7 g/L, although higher levels were noted for *Mt. chrysoperlae, T. delbrueckii* and *S. cerevisiae.* Based on reduced ethanol and acetic acid production, native strains *Mt. pulcherrima* P01A016 and *My. guillermondii* P40D002, as well as the industrial *Mt. pulcherrima* strain, were selected for further winemaking trials. Finally, several non-*Saccharomyces* species exhibited pectinase activity under a range of screening protocols. Of these, *Cr. adeliensis, I. orientalis,* and *P. kluyveri*, were chosen for winemaking trials including the determination of sensory impacts such as mouthfeel.

Other ongoing research projects in our laboratory include impacts of *Pediococcus* spp. on wine quality (Megan Wade, M.S. student), problems with alcoholic fermentation of peary/ciders (Robert Beezer), and use of *Lactobacillus plantarum* as an alternative bacterium to induce malolactic fermentation (Curtis Merrick).

**Recent Publications Related to Research:**

Petrova, B., Z.M. Cartwright, and C.G. Edwards. 2016. Effectiveness of chitosan preparations against *Brettanomyces bruxellensis* grown in culture media and red wines. J. Int. Sci. Vigne Vin. 50: 49-57.

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Von Cosmos, N., and C.G. Edwards. 2016. Use of nutritional requirements for *Brettanomyces bruxellensis* to limit infections in wine. Fermentation 2: 17; doi:10.3390/fermentation2030017

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# Washington's Wine Industry Helps Drive Research

***By Melissa Hansen, Research Program Manager, Washington State Wine Commission***

Viticulture and enology research and Washington's wine industry are closely linked. Research initiated nearly 80 years ago by Washington State University's (WSU) Dr. Walter Clore laid the foundation for Washington's premium wine industry. Today, research continues to be a cornerstone of the Washington wine industry.

Washington is one of the few states that has a viticulture and enology research program supported by the wine industry. Through assessments collected by the Washington State Wine Commission from each wine grape grower and each licensed winery, each of you help fund and support research. Additionally, important financial support for the research program also comes from the Auction of Washington Wines, WSU's Agriculture Research Center and a small portion of the taxes collected from all wines sold in the state. This year, the research program was issued more than $1 million in grants to support viticulture and enology research at Washington State University.

But Washington wine industry's involvement in research goes beyond having 'skin in the game'. Our industry helps guide the focus of research programming. This involvement has helped ensure that the research is relevant to industry needs.

Past industry-supported research at WSU has provided an invaluable return on the industry's research investment. Washington's growers and wineries use research findings every day, from using deficit irrigation to improve red wine quality and WSU's AgWeatherNet cold hardiness model to help make frost/cold temperature protection decisions to reducing wine spoilage and managing tannins in the vineyard and winery.

## Grape & Wine Industry Input Wanted

**The Wine Research Advisory Committee wants your feedback on research proposals!**

**For the first time, Washington wine grape growers and wineries who attend the 2018 Research Review will be asked to rank the research proposals. The information will provide direction to the committee when it makes funding recommendations. Last year, 23 proposals and final reports were presented at the Research Review, which is hosted by the Wine Commission. The review is free and includes lunch and a wine social on the first day.**

**More details will follow, but mark your calendar for:**

**Research Review – January 18-19, 2018**

**Walter Clore Wine and Culinary Center, Prosser**

## INDUSTRY DRIVEN

Washington's wine industry took a leading role when the statewide viticulture and enology research program—officially called the Washington State Grape and Wine Research Program—was established in the early 1980s. For more than 35 years, this committee has weighed in on research funded by the program. The industry committee, recently renamed the Wine Research Advisory Committee, became a subcommittee of the Washington State Wine Commission in 1998 and makes research funding recommendations for approval by the Wine Commission Board. Once approved, the Wine Commission gives the recommendations to WSU to implement.

The number of advisory committee members has recently expanded from 11 to up to 13. Many thanks go to two long-serving advisory committee volunteers, Joy Andersen and Mike Means, who both stepped off the committee in June. Three well qualified members were appointed last month by the Wine Commission to join the remaining nine members. The new members are:

- Dr. Russell Smithyman, director of viticulture, Ste. Michelle Wine Estates
- Francis "Linn" Scott, winemaker at Sparkman Cellars and Northwest Wine Academy instructor at South Seattle Community College
- Tim Jones, winemaker, Snoqualmie Vineyards

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# Industry and research, con't.

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## YOUR INPUT VALUED

For ways to get involved in the research process, the Wine Research Advisory Committee invites you to attend the annual Research Review. This annual meeting reviews research proposals and presents final reports. You have the opportunity to rank the proposals in order of your preference and your input will be considered by the committee when it meets to make funding recommendations.

Additionally, every grower and winemaker is urged to participate in the annual research survey and rank listed research topics. More than 150 growers, wineries and researchers took part in the 2017 industry-wide survey conducted by the Wine Commission. The Wine Research Advisory Committee used the survey feedback to refine the 2017-18 research priority list during its annual meeting in June.

The priority list is important because it drives the research focus. The list is shared with the research community to ensure proposals address the needs of the industry. This year's priority list includes a range of topics, from improving vineyard water use efficiency, developing sustainable and organic pest control strategies, managing grapevine viruses and mechanizing vineyard and winery operations to improving wine quality through fermentation management in the winery and developing methods to recycle/reuse/repurpose winery biomass from harvest.

## RESEARCH NEWSLETTER COMING

You spoke and we listened. More than 95 percent of the 2017 research survey respondents said they would open and read a research newsletter. Thus, a quarterly research newsletter will be launched by the Wine Commission in November. The newsletter will help promote research events like WAVE (Washington Advancements in Viticulture and Enology) and include research articles and reports. It will complement— not duplicate—WSU's Viticulture and Enology Newsletter.

To view the 2017-18 Washington Wine Industry Research Priorities, visit: 2017-18 Research Priorities .

To learn more about the research program, contact me (Melissa Hansen):

mhansen@washingtonwine.org

# Harmonizing Grapevine Certification in the PNW

*By Vicky Scharlau, Washington Wine Industry Foundation*

Established in early 2000 by the Washington Winegrowers, the Northwest Foundation Block Advisory Group (FBAG) provides regional influence to help ensure vineyard longevity with a focus on virus-free planting material.

Last year, through a grant awarded to the Washington Wine industry Foundation, the FBAG focused on grapevine virus certification by encouraging harmonization of quarantine pest lists and regulatory programs for grapevine nursery stock certification in Idaho, Oregon, and Washington. The project also examined a draft State-Level Model Regulatory Standard for certification of grapevine nursery stock developed by the National Clean Plant Network-Grapes as a potential national model.

This year, another grant was awarded to continue the work by focusing on agency rule development and quarantine alignment, along with a pilot of the certification rules in two states, and industry outreach to ensure participation.

The work is unique in that it is driven by stakeholders (FBAG) to create a regional approach to grapevine virus certification by harmonizing quarantines and regulatory programs for grapevine nursery stock certification in Idaho, Oregon, and Washington.

Check back for future updates on this project and process as the harmonization efforts move forward!

For more information, contact Vicky Scharlau at:

vicky@washingtonwinefoundation.org

*Harmonizing certification programs will ease challenges related to movement of nursery materials while maintaining quarantine standards across the PNW.*

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