

VINTAGEREPORT
Paso Robles 2016

Tuesday, January 31, 2017



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The 2016 Paso Robles Vintage Report took place on January 31st, 2017, at Viña Robles in Paso Robles, CA.

The first Vintage Report conferences began in Napa, California and France in 2010, but this day's gathering was just the third iteration of the annual conference in Paso Robles since its beginning in 2014. The event aimed to provide an engaging environment for winemakers and grape growers to share their experiences with the 2016 Paso Robles vintage, and learn about new scientific research and technology at the forefront of vineyard management and winemaking practices. The Paso Vintage Report lasted through lunchtime, and conference content was arranged to follow the plant calendar for the growing year, proceeding from winter/spring to fall harvest.

Keynote: Eric Jensen

As the first speaker of the day, Eric Jensen began the 2016 Paso Robles Vintage Report with a thank you to everybody who was gathered for the event, and a brief overview of the 2016 Paso Robles vintage from his perspective. He highlighted that 2016 was another year of relatively low rainfall, where adjustments needed to be made in the vineyard to deal with the extended drought. The wines from 2016 appear to be steady in the cellar at the moment, showing great finesse, the end result of an overall steady year in the region. Eric outlined how Paso Robles is a unique wine region in California, with a great opportunity to grow and continue to improve. Paso has a rich farming history, but there can be a disconnect between the farmers growing the grapes and the winemakers. However, Paso Robles is built with people willing to share knowledge. As growers and winemakers, Paso needs to use this strength, and start asking the tough questions. Can you look at a vineyard and tell exactly what it needs? Maybe not. The great wine regions of the world are asking, "why"? Why is compost applied at this time and not that time? Why do we apply our first water? Why did the set year n not turn out how we expected? According to Eric the Paso Robles region needs to stop taking the grape growing process for granted, and start using the greatest wine growing commodity: information. Does Paso Robles want to continue to be just "like Paso"? Eric concluded his keynote address by challenging everybody in the room to strive to make better wines, and be better stewards of our land and resources.



Vintage Summary: Part 1

Throughout the Paso Robles Vintage Report, **Thibaut Scholasch**, PhD, co-Founder and VP of Research and Development at Fruition Sciences, provided his insights into the 2016 vintage based on data collected in the region. For the first take-home of his vintage summary, Thibaut focused on the winter before the 2016 bud break, from November 1st 2015 to March 1st 2016. Compared to the winters leading up to the 2014 and 2015 seasons, the rainfall in the winter before 2016 was continuous and steady, suggesting a high nutrient uptake in 2016 that will possibly affect the 2017 vintage. This does not take into account the extremely large amounts of rain experienced so far this winter leading up to the 2017 season, where we could see another burst in nutrient supply. Moving beyond March 1st, Thibaut then looked at the period from 0 to 400 growing degree days (GDD). Compared to 2014 and 2015, 2016 showed a slower heat accumulation during this period of shoot elongation. Additionally, the dryness index for the Paso Robles region saw a 20% to 30% reduction compared to 2015. However, an interesting trend shows that heat accumulation differs more across site locations around Paso than it differs within site year-to-year. This means that site-to-site geography/topography within the Paso Robles region plays a key role in determining plant phenological dates, shoot growth rates, or the onset of water deficit. In conclusion vineyard managers need to ask a couple questions: should we help trigger pre-veraison deficit when water supply is not limiting? And, should fertilization methods/plans be changed if high nutrient uptake in 2016 is confirmed during the 2017 growing season?

Effects of the timing of cluster thinning on Pinot Noir and wine quality

The next speaker of the morning, **Dr. Jean Dodson Peterson** of the Cal Poly San Luis Obispo Department of Wine and Viticulture, spoke about the traditions of dropping fruit in the vineyard, and a recent study looking into the effects of dropping fruit on Pinot Noir. Traditionally growers thin fruit with the thought that less fruit on the vine will help increase color and other sought-after compounds in the fruit that is still hanging. This cluster thinning is used across the industry to manipulate quality and yields. Often, environmental factors drive the need to adjust crop load in order to optimize fine health and fruit quality. However, cultivar traits can play a key role in determining how the vine reacts to thinning. In her research Dr. Dodson compared four thinning treatments on Pinot Noir, reducing the crop load by 50% at: bloom, bloom + 4 weeks, bloom + 8 weeks, and bloom + 12 weeks. She then examined a variety of traits in the resulting fruit and wine. The study revealed that crop thinning had no noticeable effect on titratable acidity and pH when compared to a control block. Additionally, there was actually a small downward trend (reduction) in total anthocyanin content as the thinning went further into the season. In conclusion, this study does not show a great benefit to thinning Pinot Noir in terms of improved berry chemistry or anthocyanin content. Dr. Dodson Peterson cautioned thinning Pinot Noir too much, and revealed that in a blind tasting test the wine made from the control (unthinned) vines was the most liked out of all the treatments.

Vintage Summary: Part 2

During the next segment of his 2016 vintage summary, **Thibaut Scholasch** focused on the period between bloom and veraison, or between 400 to 1,000 GDD, and the effect of nitrogen uptake during this period of the season. Moderate nitrogen uptake has been shown to boost anthocyanin levels at two ripening stages later in the season. However, a high nitrogen supply can lead to increased green aromas in the final fruit composition, and a delay in the moment of time when the vine transitions from growth to reproduction. If a high nitrogen uptake in 2016 is confirmed we expect to see a high yield in 2017.

Grape ripening and environment: from climate change to microclimate & cultural practices

Johann Martínez-Lüscher, PhD, of the University of California Davis, moved the Vintage Report discussion into the realm of climate change and its future impact on vine physiology. According to the Intergovernmental Panel on Climate Change (IPCC), by the year 2100 Earth could experience a 4 degree Celsius rise in surface temperature due to a predicted 700 ppm level of carbon dioxide in the atmosphere. This is coupled with a predicted overall reduction in precipitation levels for the western United States. In a recent study conducted at the University of California Davis, vines were subjected to differing levels of carbon dioxide within a climate controlled environment. The study revealed that under increased level of carbon dioxide, vines displayed increased sugar accumulation and yield. Additionally, anthocyanin began accumulating in the grapes sooner than under low carbon dioxide levels, but peaked at a lower level. Total acidity was also found to be lower in the vines grown under high carbon dioxide conditions, regardless of berry pick time. In terms of growing season temperature, each degree Celsius increase for the overall season (i.e. the result of climate change) is reflected by a 1.7 degree Celsius increase in ripening temperature (the fruit will mature under warmer conditions). In conclusion, carbon assimilation has a large effect on shifting vine phenology and grape ripening profiles toward earlier stages. In the future with a high carbon dioxide and high temperature environment due to climate change, leaf/crop ratios will need to be adjusted in order to optimize vine health and fruit quality.

Vintage Summary: Part 3

Moving further into the season, **Thibaut Scholasch** continued his analysis of the season with insight into the fruit ripening stage of the growing season, from 1,000 to 1,300 GDD. In an era of changing climate, it will be key to look at the timing of both sugar and color accumulation. According to recent research, warmer temperatures are leading to the decoupling of peak sugar and color accumulation. During this period of the growing season, we can't just rely on phenology alone, we have to take into account light exposure and various environmental demands. A high light regime will increase flavan-3-ol (tannins) and polymeric anthocyanin accumulation, although high temperature exposure can lead to anthocyanin degradation. In order to best understand the sugar and anthocyanin accumulation period, it is important to monitor vine water deficit, maximum vineyard temperature, and vapor pressure deficit.

Light and canopy effects on aroma development in cabernet sauvignon berries

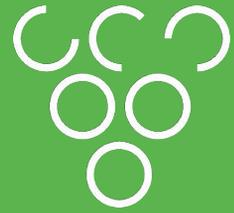
To build on the discussion of light's impact on grapes and wine, the next speaker of the day, **Alfredo Koch, PhD**, professor at Allan Hancock College, Coordinator for Agribusiness/Viticulture and Enology, and visiting professor at the Masters in Vineyard and Winery Management at Bordeaux Science Agro, discussed a light exposure study on grape aroma compounds. Today it is known that both genetics and vineyard management practices play large roles in aroma compound accumulation. When it comes to light exposure, we know that cluster shading slows berry growth, sugar accumulation, and flavanol accumulation. In a recent study, various shade cloth regimes were imposed on individual clusters from berry set to harvest, and various aroma compounds were analyzed using gas chromatography and mass spectrometry. In general higher light exposure increased berry growth, sugar accumulation, and color accumulation, confirming previous studies and hypotheses. Additionally, the study found that hexanal, a compound known to impart a "grassy" aroma, is reduced with increased light exposure; linalol, a compound known to impart a "flowery" aroma, increases with high light exposure. A side-study analyzed the effect of vine grafting on aroma compound development, and found that there is almost no apparent interference from the vine itself, meaning the impact of genetic variability on aroma compounds is mostly due to genetic reflection in the skin of the grapes. Finally, The shade cloth study also revealed that when it comes to timing: the light/shade regime from berry set to veraison has the most impact on aroma development. Early leaf pulling was able to reduce pyrazines by nearly 60% in final grape concentrations.

Vintage Summary: Part 4

To continue the discussion of light and temperature effect on grape compounds, **Thibaut Scholasch** summarized new methods for measuring and mapping temperature distribution across vineyards. The biggest contributor to light and temperature exposure is terrain, and specifically slope aspect. New approaches to vineyard study are using temperature sensors deployed in the canopy combined with numerical models of vineyard terrain to show effects of topography on temperature. In practice, vineyard managers and winemakers need to rethink their practices regarding cluster exposure to temperature and light in order to take into account the large impact of slope steepness, aspect, and elevation.

ETS Grape Phenolics

As the day's final speaker, **Steve Price, PhD**, ETS Laboratories, shared his insights on using ETS phenolic panels to study vineyard management effects on phenolic compound concentrations. In order to run phenolic panels, ETS uses a wine-like 15% alcohol solution to conduct its measurements. ETS phenolic panels provide measurements of catechin, tannin, polymeric anthocyanin, total anthocyanin, and quercetin glycosides. Steve provided common phenolic trend examples from samples of both highly vigorous and normal vineyard sites. Additionally, he highlighted some personal studies on cluster thinning and cluster trimming. In a section of Pinot Noir vineyard in the Willamette Valley, Steve studied the impact of leaving full crop, cluster thinning to one cluster per shoot, and cutting clusters (bottom 1/3 of the cluster) on grape phenolic content at the end of the season. For total anthocyanin, there was no difference between the full crop and the thinned crop. However, cut clusters showed an increase in total anthocyanin content. In the end, the study showed that there was more difference in phenolic content between rows than between thinning/trimming treatments. This means that the effect of vine location within the vineyard on phenolics, such as the effect of soil and water drainage, can have more impact than cluster treatments. In conclusion, laboratory phenolic panels can be utilized to study vintage variation, site variation, maturation trends, and personal vineyard experiments.



In conclusion

The 2016 Paso Robles Vintage Report unfolded during the day and followed the 2016 vintage from budbreak to harvest, with discussion topics covering cluster thinning, climate change, light and canopy management, and phenolic compound analysis. Overall the 2016 vintage started with a steady amount of rainfall, and saw a reduction in dryness index compared to the 2014 and 2015 Paso Robles vintages. The larger amounts of rainfall in 2016 could have a carry-over effect and play a role in determining grape yield and quality in 2017. It will be enlightening to follow the 2016 wines in the cellar and see how they continue to develop. We look forward to seeing you again next year to discuss the growing season at the 2017 Paso Robles Vintage Report!



What is the Vintage Report?

The Vintage Report brings together scientists, winemakers and industry leaders from all over the world to produce a one-day seminar that engages open minds within the industry to discuss the previous harvest in light of the most recent scientific findings and newly available data.

www.vintagereport.com