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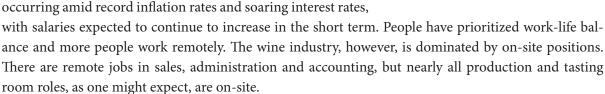
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Heat Waves and Harvests

As we're wrapping up this issue it's early September and it is more than a little hot. It's dangerously hot. We keep beating records with triple-digit degree days, and here in Sonoma County it reached 116 degrees, again. We're in the midst of harvest, so these high temperatures have had growers scrambling. A few months ago, we were talking about winemaking after winter frosts but now we're hoping the harvest workers and the grapes beat the heat.

This issue features WBM's annual salary survey report which indicates base salaries increased 6.1 percent from early 2021. We're hearing it can still be difficult to recruit and retain talent, even though the economy opened back up. This, of course, is occurring amid record inflation rates and soaring interest rates.



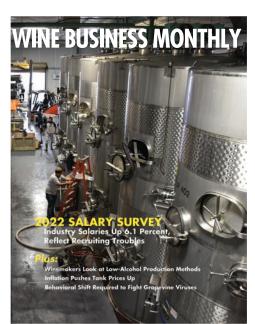
We often cover "big" winemaking in October and one of the directions larger wineries have been taking involves low alcohol wines, often with alcohol levels of 7 to 10 percent. How are producers creating wines with less alcohol that consumers still want to drink? We explore some options.

Computers continually get more powerful, relatively less expensive and smaller. We see the same thing playing out with laboratory equipment. We look at new instruments for analyzing free SO₂, L-Malic acid and glucose. They're faster, easier to use, and more portable.

One of the articles I found fascinating involves the use of AI to derive meaning from tasting notes. There's a company out of France already helping major wine competitions with this. During Robert Parker's peak, some people analyzed his tasting notes to learn what descriptors he used most often, and how likely they were to correspond with a high rating. It's early going but it appears that AI now can do this for every wine judge at a global wine competition and across multiple languages. This could have implications for wineries in terms of understanding consumer taste preferences across multiple markets.

We often hear the salutation, "stay safe" but these days that's shifted to "stay cool."

Cyril Penn – editor



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winemaking



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2022 WINE INDUSTRY SALARY SURVEY REPORT **Average Salaries Up 6.1 Percent from**

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Sam Parra, owner and winemaker, Parra Wine Co., Dallas, OR

COVER PHOTO: Scott Summers

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John Chuharski

principal, Wine & Spirits Recruiting, "2022 Wine Industry Salary Survey Report," page 64

"There is high demand for experienced general managers, sales, marketing and digital/e-commerce professionals. As a result, we have seen compensation levels increase to attract the best talent."

Heidi Scheid

executive vice president, Scheid Family Wines, "The Rise of Low Alcohol Wine Sales Brings Increased Winemaker Interest in Their Production Methods," page 12

"We remove a portion of the alcohol through a proprietary system based on reverse osmosis. We believe this is a gentler system than the spinning cone technology employed by many others to produce low-alcohol wines."

Norman Mitroff

founder and managing partner, Mitroff Consulting, "2022 Wine Industry Salary Survey Report," page 64

"You can't just attract people on money. Companies do have to pay employees fairly and appropriately, but most important, is the work culture."

Angelina Mondavi

winemaker, A. Mondavi Consulting, "Native Fermentations May Hold the Key to Maintaining Wine Quality Amidst Changing Growing Conditions," page 16

"If I were ever to do native, it would be at a brand-new facility where I know there are very minimal yeast strains and [I would] be able to have the strain that I really want, isolate it and focus on that. It's not easy, but it's been done."

Sylvain Thibaud

general manager, Wine Space, "Bordeaux Company Uses AI to Derive Universal Meaning from Scattered International Tasting Notes," page 56

"From the tasters' point of view, we have had nothing but positive feedback on the system. They feel much more useful by detailing their true feelings about the wine through the commentary. It also helps them to clarify their thoughts so that they can give a more accurate rating."



The guardian of aromas

5



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Top Stories from WINE BUSINESS.com – In Case You Missed It



TTB Approves New Winemaking Products and Processes for Export Use

The U.S. Alcohol and Tobacco Tax and Trade Bureau TTB issued a 25-page 'final rule' published in the Federal Register on Aug. 24, 2022, clarifying what can legally be added to U.S. wines bound for export markets. The ruling adds 15 wine-treating materials and processes that were already approved for domestic use to the official list. Some of the materials were already authorized but at lower rates while others were awaiting "full" authorization (as opposed to administrative approval) pending issuance of this final rule. The final rule will increase the acceptability in export markets of wine produced using these materials and processes, including under the U.S.-EU wine trade agreement.

Ste. Michelle Wine Estates Acquires A to Z Wineworks



Ste. Michelle Wine Estates announced the acquisition of A to Z Wineworks ("A to Z"), a top-selling winery in Oregon, the first strategic acquisition for Ste. Michelle Wine Estates under the ownership of private equity firm Sycamore Partners. Amy Prosenjak, president and CEO of A to Z, will join Ste. Michelle as president of Oregon Brands, overseeing the company's combined operations in the state. In addition, A to Z founding partners Deb Hatcher, Cheryl Francis, and Sam Tannahill will join Ste. Michelle as consultants. A to Z's founding partners started the company 20 years ago.



Largest Winery in Texas Closes

Built between 1981 and 1984 on 1,300 acres owned by the University of Texas, Mesa Vineyards, known for the Ste. Genevieve brand, at one point was the largest winery in the entire state. However, on Aug. 10, 2022, an online auction was held to liquidate all the fermentation tanks, wine presses, and bottling machinery to satisfy a bankruptcy filing. Mesa Vineyards was founded in Fort Stockton and built by a French company with the support of The University of Texas System, University Lands Office. Pat Prendergast, a veteran of E. & J. Gallo, purchased the winery in 2005. Ste Genevieve, the main brand, accounted for nearly 400,000 cases annually, and the winery provided custom crush services.



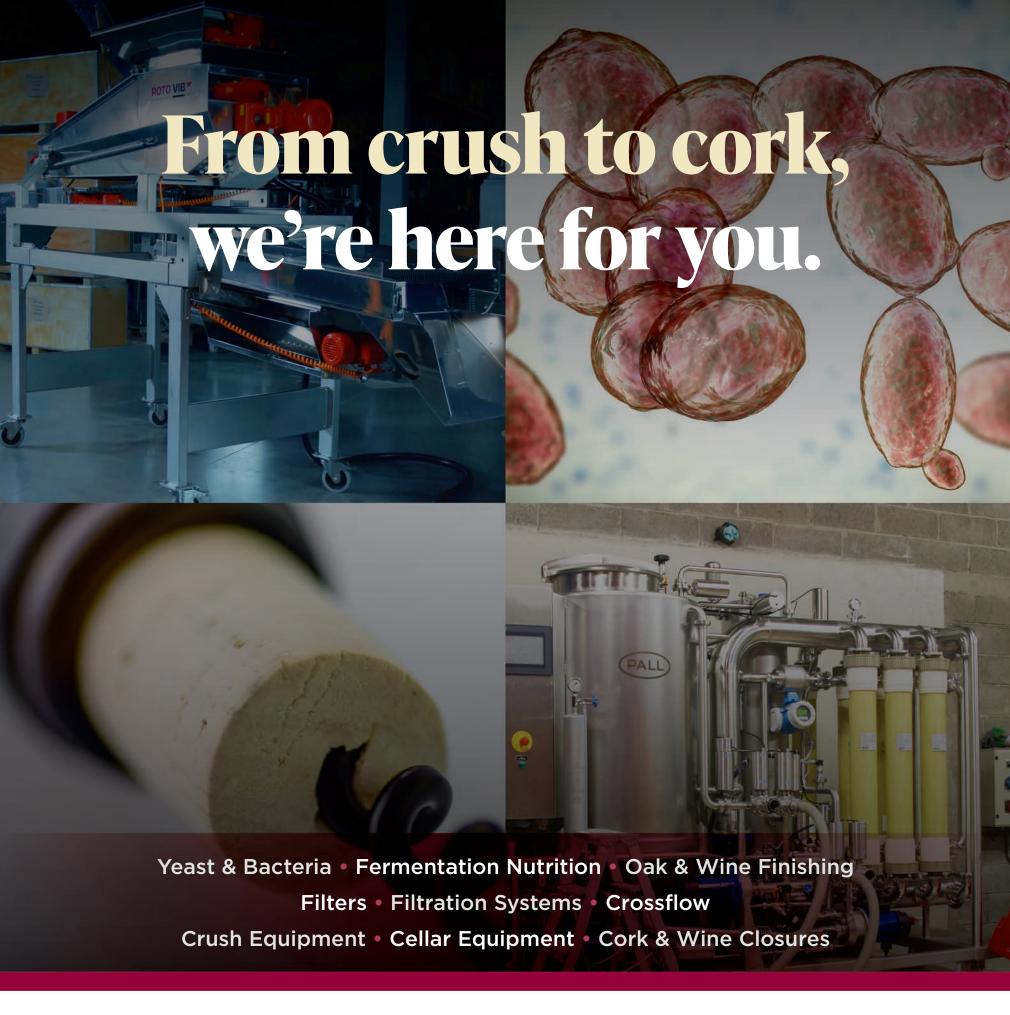
Napa Valley Vintners Gift 25,000 Square-Foot Healthcare Facility to OLE Health

The Napa Valley Vintners announced the gift of the 25,000 square-foot facility to OLE Health. The building, valued at \$17 million, is the largest ever single donation to a nonprofit by NVV. In 1972, OLE Health was founded by farmworkers and vintners to provide health care to low-income, uninsured individuals. The collaboration between OLE Health and the Napa Valley wine industry continues providing affordable care, serving one in four residents including more than 4,000 farmworkers. Over 40 years, NVV has given more than \$225 million to local nonprofits in the areas of health care and children's welfare and education including more than \$60 million to OLE Health.



Auction of Washington Wines Raises \$4 Million

The Auction of Washington Wines (AWW) celebrated its 35th year of hosting a series of philanthropic wine events increasing funds raised by 66 percent over the previous year. After a two-year hiatus, the majority of celebrations returned to in-person gatherings, including TOAST!, a new industry-focused honoree celebration recognizing individuals and organizations who have gone above and beyond to advance the Washington wine industry. More than 2,000 wine lovers attended the week-long celebration which featured more than 300 winemakers, vintners, and growers.



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The Rise of Low Alcohol Wine Sales Brings Increased Winemaker Interest in Their Production Methods

From simply picking early to proprietary technologies, winemakers are meeting demand in a variety of ways.

Michael S. Lasky

WINERY INTEREST IN LOW-ALCOHOL beverages has been a nascent curiosity for well over a decade—it wasn't until the Unified Wine & Grape Symposium's *first* seminar on its production in 2015 that the industry really acknowledged the category. Fast-forward seven years and the wine industry has certainly accumulated many reasons to offer new types of wine, from low-alcohol to low-calorie. This "Better for You" beverage category includes some of the newer, and sometimes more competitive, beverage choices, including a tidal wave of alcohol-infused flavored seltzers, like White Claw, Truly and Coca-Cola's AHA. Larger wineries, those producing at least 50,000 cases, have been the first to explore and expand their portfolios with low-alcohol and/or low-calorie wines, but the tipping point for this segment has yet to be reached. According to tracking by NielsenIQ [table 1 needs to be updated prior to sending to printer], the Better for You (BFY), low-ABV wine category, while gradually developing, is still less than 1 percent of all wine sales. Nevertheless, the wineries that have already entered the low-alcohol wine segment are forging ahead. Each uses different winemaking techniques and multiple, differentiated brand names to address the emerging consumer demand and still maintain brand reputation.

Low-alcohol Wine Production: Blending Tradition with Technology

Although there is no official definition of what "low-alcohol" wine is, the consensus among winemakers, as *WBM* reported online on March 16, 2021 (*bit.ly/ahyhMB*), is 7 to 10 percent ABV.

How this level of alcohol is achieved in wine involves choosing from several processes:

- **1.** Applying reverse osmosis, in which wine is passed through filters to remove water and alcohol.
- **2**. Using spinning cone technology, which is an advanced form of distillation. The wine is passed through rapidly spinning cones housed in a vacuum column, which gently produce a vapor-thin film of wine. Because just a portion of the wine is needed in this process, it eliminates any impact on the wine's organoleptic qualities.
- **3.** Contracting with a third-party proprietary alcohol removal service, such as BevZero (previously ConeTech), which, in addition to their spinning cone technology, now offers a proprietary advanced process called GoLo. GoLo removes alcohol from a finished product in a single

pass at lower temperatures than could be achieved with the original spinning cone systems, preserving the subtleties of aromatics without the added manipulation of multiple passes through the cones.

4. Using traditional winemakers' blending techniques, which essentially combine low sugar, early harvested fruit with harvest-ripe grapes to produce a lower-alcohol wine with the same aromatic ripeness as fully ripe grapes.

WBM reached out to winemakers who employed, in varying proportions, the first three processes to create their own low-cal, low-alcohol wines.

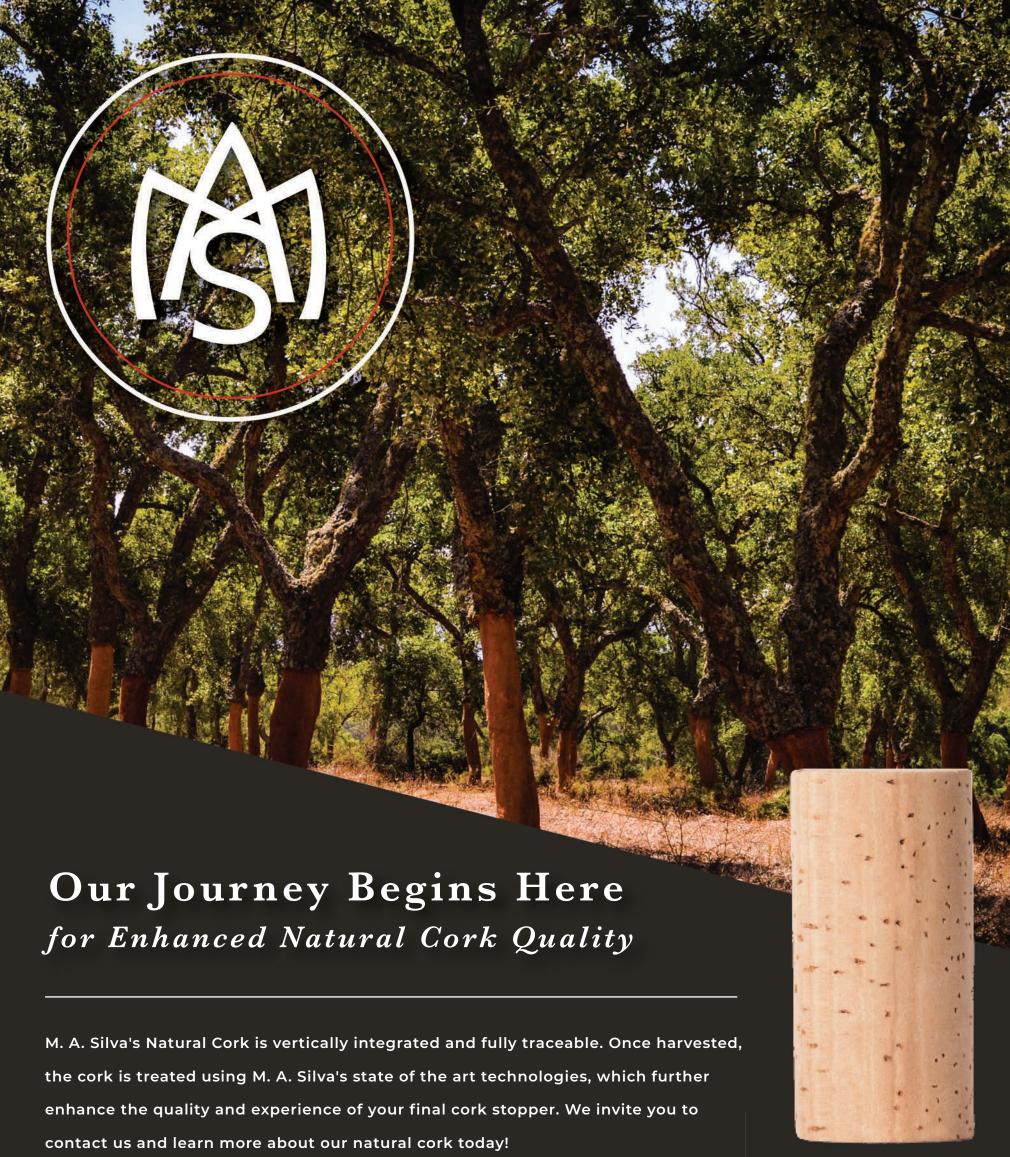
KENDALL-JACKSON'S "TRADITIONAL" LOW-ABV CHARDONNAY

Randy Ullom, the 25-year veteran winemaker at Jackson Family Wines' Kendall-Jackson Wine Estate & Garden, probably has the most prolific experience with lower-alcohol and low-calorie Chardonnay. As the original winemaker of KJ's Vintner's Reserve Chardonnay, still the best-selling Chardonnay in the U.S after 26 years, Ullom was asked to develop a low-ABV version of the company's popular white wine, capitalizing on the trend. Roughly a decade ago, Ullom was all-in on an experimental project to develop the first low-calorie Chardonnay, which was released under KJ's second label, Avant. (Avant in French means "before.") He wanted to use traditional winemaking methods to do so and didn't want to revert to spinning cones or reverse osmosis.

"I wanted to blend a selection of lots from our vineyards in Mendocino, Sonoma, Monterey and Santa Barbara. It's a complicated process, but the general gist of it is we pick a bunch of grapes from each AVA, at lower Brix and earlier in the season. We ferment these lots in stainless steel tanks relatively quickly. Then we take that and lower that aliquot," Ullom explained.

"These early picks are stored in stainless steel. Next, we wait for the grapes from the same vineyards to reach their normal ripeness for the Vintner's Reserve Chardonnay and

















The Rise of Low Alcohol Wine Sales Brings Increased Winemaker Interest in Their Production Methods

a portion of them with the already-fermented, lower-calorie, lower-sugar/alcohol wine to lower that juice level down to where we will get our 9 percent alcohol.

"With that, we ferment for three to four months the combined lot in barrels, mostly with older wood," Ullom continued. "This compares to the original Vintner's Reserve, which is 95 percent barrel-fermented in French and American oak."

After repositioning Avant Chardonnay from its low-ABV blend to a no oak, stainless steel wine, KJ released a Kendall-Jackson NV Low Calorie Chardonnay modeled after its popular Vintner's Reserve to take advantage of that wine's wide consumer recognition. When it was first released in 2020, Ullom says the winery produced 20,000 cases. This more than doubled in 2021 to 45,000 cases. KJ forecasts that 60,000 cases will be made for 2023, proving the growing demand for low-ABV wines.

SCHEID FAMILY WINES' PROPRIETARY REVERSE OSMOSIS SYSTEM

"Flavors are made in the vineyard—that's why the grapes for our low-calorie Sunny With a Chance of Flowers are harvested at peak ripeness from our sustainably-certified, estate vineyards in Monterey County, Calif.," Heidi Scheid, executive vice president of Scheid Family Wines, explained. "They are then brought to our estate winery and fermented to dryness, meaning that the natural sugar present in the grapes at harvest is converted to alcohol until there is none remaining. For wine, this is known as 'zero residual sugar'.

"Next, we remove a portion of the alcohol through a proprietary system based on reverse osmosis. We believe this is a gentler system than the spinning cone technology employed by many others to produce low-alcohol wines. With reverse osmosis, the alcohol is gently and gradually pulled from the wine while still retaining varietal aroma and flavor. We reduce the alcohol to 9 percent for all the Sunny wines we produce."





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The Rise of Low Alcohol Wine Sales Brings Increased Winemaker Interest in Their Production Methods

Currently the Sunny brand includes Sauvignon Blanc, Chardonnay, Rosé, Pinot Noir and Cabernet Sauvignon.

Scheid believes there are no shortcuts to producing 9 percent ABV/low-calorie wines. "In fact, making Sunny is a more intensive process than producing a regular alcohol wine in order to retain the aromas, flavors, mouthfeel and texture that make wine the ultimate beverage," she added.

While not directly targeting Millennials, 91 percent of the 35 to 44 age group, according to a commissioned research survey, found Sunny appealing for its core attributes of zero sugar, 9 percent alcohol, 85 calories per serving and sustainable certification.

"Alcohol is a really important factor in the wine because it gives us roundness, it's giving us sweetness, and it provides a lot of body, mouthfeel," she explained. "That's why almost all the lower-alcohol wines are whites or Rosés and not reds. Also, adding sparkling bubbles with carbonation really does cover up some of that lack of mouthfeel for no- or low-alcoholic wines." WBM

TRINCHERO FAMILY ESTATES CUTS ALCOHOL WITH SPINNING CONES

Mind & Body winemaker Allison Moore told *WBM* that she uses traditional winemaking methods to achieve rich flavor, alluring texture and excellent balance. The wine is cold-fermented and aged in stainless steel tanks to retain bright fruit.

"We then use a spinning cone column to remove alcohol from a small amount of the wine. This assists in preserving the wine's delicate aromas and flavors. Finally, we blend the traditional and dealcoholized wine to create Mind & Body wines," Moore said.

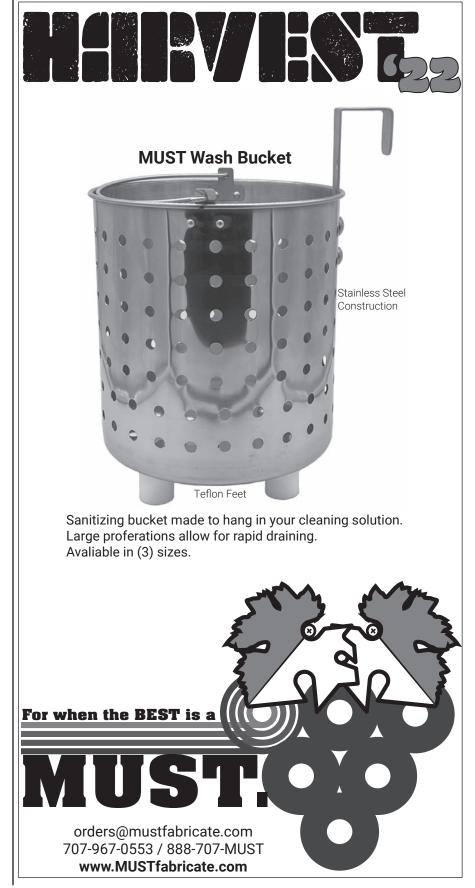
Currently Trinchero Family Estates (TFE) produces the 9 percent ABV brand in a trio of varieties: Pinot Grigio, Cabernet Sauvignon and Rosé. The brand is specifically created for "wellness-driven consumers looking to moderate their alcohol and calorie consumption." group, as noted by TFE, tends to be women in their late 20s to late 30s who appreciate wines with 90 calories per serving but want the flavors expected in regular strength alcoholic wines.

Whither Low-Alcohol Reds?

According to Kayla Winter, director of product services and winemaking at BevZero, there are a few wineries that have been able to produce red wines with lower alcohol, which in itself is a technological success. "Red wine is a lot harder to make taste like a full-bodied red when it has some or all of its alcohol reduced," she remarked.

ROSÉ

FREMIUM LOW CALORIE



Native Fermentations May Hold the Key To Maintaining Wine Quality Amidst Changing Growing Conditions

Gillian Allen

While opinions on native fermentations in Napa differ, one thing most can agree on is that the best tool in a winemaker's arsenal is increased biodiversity.

Gillian Allen is a technically trained winemaker and graduate of the Viticulture & Enology program at UC Davis. She has worked in production at Cakebread Cellars for three years and has experience working in labs at Domaine Chandon and the UC Davis Robert Mondavi Wine Institute. She created her blog, The Younger Wine, to intersect her love of winemaking with writing and encourage wine education and appreciation. She loves discussing all things wine and can be reached at *gillianallen17@gmail.com*.

NATIVE FERMENTATIONS HAVE BEEN known to drive unique flavor profiles and deepen the complexity of a wine. With the amount of yeast options available on the market increasing every year, native fermentations can act as a tool to distinguish a particular winery's terroir and potentially create a flavor profile that no other winery has. Considering that many native fermentations are initiated by the vineyard microflora on the grapes, native ferments are, theoretically, a great way to connect the consumer to the wine, which may appeal to a population that, post-pandemic, is more curious than ever about the products they consume. In a perfect world, clean, intact and undamaged fruit arrives from the vineyard and is processed in sanitized equipment. However, the conditions of each harvest seem to stray further and further away from perfect. From wildfires to frost events and power outages, so much is already out of a winemaker's control, and leaving the fate of a very expensive fermentation up to chance can seem ludicrous. For a winemaker with a lot at stake, taking this risk may not be a feasible option.

Consistency is Key for Angelina Mondavi

Winemaker Angelina Mondavi understands that she has been tasked with creating a consistent and quality product for her clients, and her business thrives on dependability. Mondavi is founder and winemaker for A. Mondavi Consulting, LLC and spends much of her time at Brasswood Cellars' custom crush facility, making wine for Brasswood as well as her other clients. She worked with native fermentations, as an intern, in Australia but really cut her teeth on this style of winemaking as the assistant winemaker for Pine Ridge Vineyards in Napa. She appreciates the extra level of character and personality that a native fermentation can add to a wine as well as the patience it requires on behalf of the winemaker. Mondavi has dabbled in partial-native fermentations with her Dark Matter Zinfandel. She lets it start natively for about two days then inoculates with her preferred yeast because she knows that this wine won't finish fermenting otherwise. Given that Mondavi has lost a lot of sleep working with native fermentations in the past, she currently leans toward inoculation to protect her lots from an unfavorable native yeast taking hold and potentially imparting negative characteristics onto her wine. "Every year is completely different," she said. "Some years, you have a lot

of bacteria and a lot of yeast on the grapes; other years you have minimal. Some years, the cellar conditions just aren't quite right. You can end up with a stuck ferment, or you can end up with a reduced wine or a wine that's gone kind of stinky." In addition, it can be questionable as to whether or not the fermentation that occurred spontaneously is truly "native" in a facility that has historically used industrial yeast strains. In a custom crush facility, major yeast strains are in circulation, and many different styles and varieties of wine are made simultaneously, adding to the unpredictability. There may be cross-contamination of unsanitized equipment, and oftentimes a more robust and commercial Saccharomyces cerevisae strain ultimately takes over. Mondavi understands these challenges, but that is not to say she would never choose to pursue a true native fermentation. "If I were ever to do native, it would be at a brand-new facility where I know there are very minimal yeast strains and [I would] be able to have the strain that I really want, isolate it and focus on that," Mondavi explained, adding, "which you can do. It's not easy, but it's been done."

Starting with a Clean Slate

This was exactly the case at Knights Bridge Winery. Prior to 2021, Knights Bridge made its wine at a custom crush facility in Napa. The winemaking team was interested in native fermentations, but the idea of having an in-house culture take over and transmit undesirable sensory characteristics was too risky. In 2021, their situation changed with the inaugural vintage of a brand-new facility in the Knights Valley AVA, nestled between Napa and Sonoma counties, and the possibility of pursuing native fermentations became a serious consideration.

Brand-new tanks, immaculate floors, drains and technology to eradicate any airborne microbes offered the perfect equation for the winemaking team to take their wines to the next level. They could now be sure that once they didn't inoculate a barrel, the resulting fermentation would truly be native.

"Up at the winery, we ended up going native on all of our red wines through primary and secondary fermentation. They went through, no problem," said Knights Bridge winemaker Derek Baljeu. "They didn't pause or have any slowing towards the end, which is really eye-opening. Once you go from 0 to





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Native Fermentations May Hold the Key To Maintaining Wine Quality Amidst Changing Growing Conditions

100 percent native fermentation, seeing that sort of success broke down any doubts that I had prior to this vintage."

Knights Bridge is a small-scale winery, and most of their fermentations are kept around 5 tons. This allows tanks to be well-mixed throughout the fermentation process, minimizing the potential for getting stuck. When it comes to native fermentations, patience is a virtue as is staying in-tune with each lot's progress. Knights Bridge has automated pumpovers controlled by the team's devices, but Baljeu stressed the importance of going to the top of each tank to assess the cap and check for off-aromas. The word "complexity" often comes up when a winemaker discusses the benefits of a native fermentation. For Baljeu, the complexity he sees in the Knights Bridge wines stems from the "biochemical warfare" taking place in the beginning stages of fermentation before the dominant strain finishes. Ben Montpetit, associate professor of yeast biology in the Department of Viticulture and Enology at UC Davis, elaborated on this concept further. His experience with native fermentations comes from years of research with a Napa Valley winery's Pinot Noir program. Montpetit said native fermentations allow more time for interesting non-Saccharomyces organisms to become active, and that fight for survival among organisms can lead to interesting complexities in the wine. He pointed out that while the vast majority of spontaneous fermentations end with Saccharomyces on top, there are considerable advantages to allowing nature to run its course.

"Advantages of that could be sensory compounds that are created," he explained. "It could be an actual consumption of some of the sugar that's present in a way that doesn't produce ethanol—so in a respiratory way—in which case your final wine is likely going to have a lower alcohol content as well."

The competition of several strains that exist and thrive at different times can also translate to a certain je ne sais quoi on the palate.

"Native yeast end up building out this big texture and make the wine really rounded in the mid-palate, which I like," said Baljeu. "You end up getting a horizontal wine versus vertical; instead of different shades of the same fruit, in native fermentations you get deeper expressions of fruit, chocolate, coffee. A wider variety of aromatic and flavor markers develops."

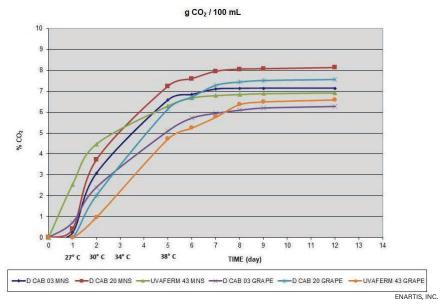
A clean facility and knowledge of home cultures is only half the battle of a successful and healthy native fermentation. As any seasoned winemaker can attest, great wines start in the vineyard. Knights Bridge's first line of defense in a healthy native ferment is their viticulture team. Sorting out damaged



MIKE LARSON PHOTOGRAPHY



${ m D20}$ graph showing ${ m CO}_2$ production, courtesy of Italiana Biotechnologie study "Technological Characterization DAOU Strains Non-D20 July 2021"



Data courtesy of Italiana Biotechnologie's 2021 experiment to identify other strains of technological interest among the isolates of the 2013 DAOU project. D20 performed best at high temperature (38°C)

or rotten fruit, during picking, is key; and according to Baljeu, it gives the indigenous yeast the first chance for success. Care and oversight in the vineyard gave him peace of mind this past harvest to experiment in the cellar and exercise the grape microflora's ability to express Knights Bridge's flavor. Baljeu likes the results from the native fermentation program and will continue with this stylistic choice as long as the winery continues to bring in consistent and clean fruit.

"The microbiology in our vineyard cannot be replicated, so that alone is going to make our wines more unique and true to place," he commented. "I think it's always good if the story is focused around terroir and the vineyard, which ours is. It speaks truly to that sense of place and site. I think anything that draws a product closer to where it comes from is always going to be received positively."

A Study Isolating Native Yeast in the Vineyard

When it comes to native versus non-native fermentations, it doesn't have to be an all or nothing situation. Labs now have the ability to isolate a winery's native microflora and potentially mass-produce it as a freeze-dried and commercially available product. Winemakers could then "inoculate" with their own in-house culture, allowing for all the benefits of a native fermentation with significantly less risk. This hybrid, "controlled native" fermentation uses the biodiversity that already exists in the wine and is becoming a more popular choice among winemakers, said Enartis president and CEO José Santos.

In 2013, Enartis began a project with DAOU Family Estates in Paso Robles after Daniel Daou asked the lab to isolate the natural microflora from a Cabernet block in his vineyards. DAOU's hope was to cultivate a "genetic patrimony" from their best blocks that they could use to retain their terroir, Santos explained. Enartis collected about 10 to 12 kilos of grapes in sterile bags just before harvest and sent them to their yeast lab in Italy. These grapes then began fermenting spontaneously in the lab under the conditions that Daou thought most suited his winemaking philosophy back in Paso, which were higher temperatures.





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Using temperature as a selection factor, 24 isolates in six different genetic groups of *Saccharomyces cerevisiae* were the result (the experiment only looked at *Saccharomyces* strains). Researchers then narrowed the study down to a winery-scale trial with liquid yeast that Enartis produced. The following year after doing lab characterization and winery trials, two isolates were chosen, D03 and D20. Ultimately, D20 was chosen as the most favorable isolate, and DAOU now uses this to inoculate many of its red wines. In addition, it is now a commercially available product in Enartis' yeast catalog, and other wineries can use it as well.

D20 has demonstrated its ability to thrive if winemakers wish to push the temperature up to promote color and phenolic extraction. In addition, it has been helpful in Spain, where wineries with limited temperature control have used it to avoid stuck fermentations. Enartis saw in trials with large wineries in Castilla-La Mancha that if fermentation temperatures climbed extremely high, say around 105°F, D20 was immediately able to restart fermentation when the temperature decreased. The yeast was inhibited but didn't die. Santos said this peculiar characteristic of D20 gives it great potential to be a high-end yeast for Cabernet Sauvignon and other Bordeaux varieties.

Using Native Saccharomyces uvarum to Fight the Effects of Climate Change

As temperatures in wine-growing regions increase, this affects the microflora in the vineyard every year and thus the predictability of a native fermentation. Inoculating allows for consistency from year to year, and certain large-scale wineries may not have the luxury of taking the risk to ferment spontaneously.

However, a cryophilic *Saccharomyces* strain called *Saccharomyces uvarum* has been isolated from spontaneous fermentations in Amarone della Valpolicella in Italy. Its properties may give winemakers a happy medium between the dependability of inoculating and the benefits of native fermentations. In Amarone, grapes are harvested and dried in the cellar, until late winter, when crush and fermentation occur. *S. uvarum* dominates in the early parts of these fermentations when the temperatures are quite cool; then *S. cerevisiae* takes over when ethanol and temperature increase.

"We have a lot of experience in using [S. uvarum] in blends," noted Santos. "You use the same amount of yeast, but you replace 20 or 30 percent of your Saccharomyces cerevisiae with S. uvarum. In that case, the feedback that we have is a big increase in terms of complexity because it will not only be one but two microorganisms, working in synergy during that fermentation. And the beauty of the S. uvarum is that it has a control switch ... you can allow the S. uvarum to dominate in cooler environments, which can be cold soak or the early part of a fermentation. Then just by increasing the temperature, you allow the cerevisiae to take over and finish the fermentation. This basically opens the door to controlled micro-diverse fermentations."

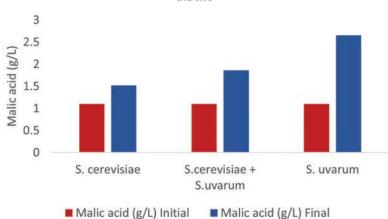
In addition to fostering a diverse microbiome to increase complexity, *S. uvarum*'s unique characteristics have proven to combat some of the adverse effects of climate change. Santos' colleague Jasha Karasek is the product manager for winemaking products at Enartis. At 2022's Enoforum USA, Karasek, in his presentation "New Technological Strain of *Saccharomyces Uvarum* for Addressing Climate Related Challenges in the Cellar," spoke about yeast that can metabolize glucose and produce other compounds besides just ethanol, and discussed how winemakers can harness this to maintain quality in their wines.

Native Fermentations May Hold the Key To Maintaining Wine Quality Amidst Changing Growing Conditions

"What we've found is that this particular strain is able to produce malic acid and succinic acid to a higher degree than *Saccharomyces cerevisiae*, and we think that could help off-set some of the situations we're seeing with climate change," said Karasek. "This particular strain of *uvarum* is producing wines with lower alcohol, which counteracts the higher Brix situation/higher malic acid, which helps counteract some of the situations we see with low organic acid and these really ripe grapes and then also lower pH for that reason as well."

Malic acid production in S. uvarum

Malic Acid Production during Fermentation By Enartis Strains of Saccharomyces cerevisiae, Saccharomyces uvarum, and a blend of the two



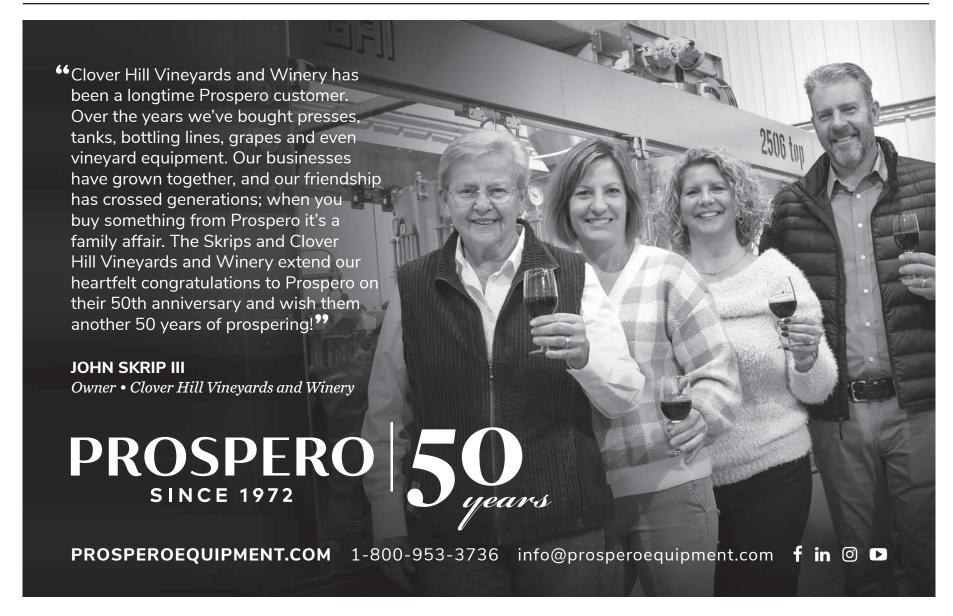
The above graph highlights the differences in organic acid production during fermentation, which is one of the challenges as temperatures increase in wine growing regions.

Interestingly, Karasek pointed out that this yeast has the ability to create an even bigger positive impact than just producing more malic acid in wine.

"Most of the organic acid used in winemaking for TA and pH adjustments is shipped from Europe," said Karasek. "If we can harness the ability of organic acid production by *Saccharomyces uvarum*, we might have a natural way of lowering the demand for organic acid from Europe, which would decrease the carbon footprint associated with its transport. It might be a drop in the CO_2 bucket, but we need to think of how we can reduce CO_2 emissions from every angle possible."

Understanding native yeasts gives winemakers more freedom to experiment in the cellar, and there is always the option to fall back on inoculating with a commercial yeast strain if things go sideways. To ferment natively or non-natively is ultimately a question of winemaker preference, but the beauty of continued research is that it gives winemakers more tools to achieve the best possible results and adapt to changing conditions in the vineyard.

"The quality of the grape material as well is going to change," Montpetit said. "Is it going to be using different types of yeasts, different fermentation patterns to try to augment those changes? Microbiology may offer an avenue to combat that." WBM



winemaking



Vendors warn wineries to order early to save money and receive tanks on time

Kerana Todorov

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WINERIES ARE LIKELY TO pay more for supplies and equipment this year as the U.S. faces runaway inflation and rising interest rates. That means spending more hard-earned dollars to produce wine as manufacturers spend more on materials, shipping and other expenses. Like many other producers, steel tank manufacturers have not escaped these trends.

Quality Stainless Steel reported higher prices for the stainless steel tanks the family-owned company ships nationwide from its Windsor plant. The company, whose clientele is primarily wineries, estimated prices have increased by 30 percent over the past two years. A large percentage of that is due to the cost of stainless steel, said Scott Dapelo, the company's sales manager. Adding to these costs are higher labor wages and transportation.

"We've seen the shipping costs go up substantially," Dapelo remarked in June. "The availability of trucks has been variable. The supply of materials we use to make our tanks has been sketchy. Pricing has been wildly fluctuating for years. So, it's been everything—and more."

Transportation has been, and remains, an issue, but the company has managed to find flatbed trucks and crane companies. Quality Stainless Steel works with three veteran brokers who find truckers to transport the tanks. "I'm lucky," Dapelo said.

Bouchard Cooperages imports and sells barrels and tanks, including stainless steel egg-shaped tanks known as Egginox, which are manufactured in Slovenia. Kris Konemac, general manager at the company, said Egginox stainless steel tank prices have increased between 30 and 40 percent, depending on the size, over the past year. That's primarily due to the rising costs of nickel and transportation.

Rising Costs, Wait Times

Dan Cotta, production manager at Santa Rosa Stainless Steel, reported that stainless steel tanks cost 30 to 40 percent more than a year ago, though the availability of stainless steel has improved this year. There is still some waiting, he added, but it is not as long as it was a year or two ago. If a winery needs a tank by harvest, he recommended placing the order by the previous fall or winter.

Michael Honig, president of Honig Vineyard and Winery, said the winery has spent more than \$200,000 on nine new stainless steel fermentation and storage tanks. The winery may have paid more money for the tanks had it waited longer to place the order, he noted. The tanks were ordered on Dec. 21 2021, just as prices started to increase, and the winery received its purchase this summer.

Defranceschi USA, which imports stainless steel tanks manufactured in Mordano, Italy and Chile, also reported higher price tags for all tanks, including stainless steel. Prices for stainless steel tanks have increased by about 20 percent over the past two years, estimated Matthew Brennecke, sales and marketing specialist for the Italian-based company. "The price of energy has been a cost factor for us too. Not just fuel costs, but the actual electricity to run our manufacturing facilities has gotten more expensive," Brennecke said.

Most clients are aware of what is going on, Brennecke noted. "They feel it at the supermarket and at the gas pump," he said, adding that the cost for other winemaking and packaging supplies, such as bottles and closures, has also increased. "I try to describe the challenge without making it their

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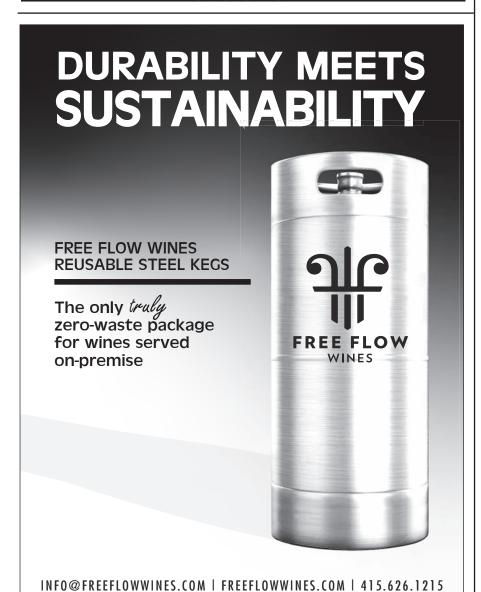
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problem and assure them that we are doing as much as we can to minimize costs and keep margins tight," Brennecke explained. "It is important to us to maintain good relationships with our customers. We aren't going to take advantage of a spike in costs to make profits."

That goodwill extends to order times. Brennecke advises clients to place their order for stainless steel tanks as soon as they know they will need a tank—even right after a harvest is complete. "If we can order the supplies we need early, we save money, and we pass those savings on by giving discounts on orders made prior to the end of January," he said. "Defranceschi will bend over backwards to try to bend all of the logistics in order to deliver on time; but when everything is volatile and subject to change, a longer lead time makes an on time delivery a sure thing. To the customer, the most significant increase in cost will be in shipping."

How Do Different Steel Materials Affect the Market?

Tim Collins, secretary-general at worldstainless, observed that, generally speaking, stainless steel is not one single material. It is a family of materials, all of which contain a minimum of 10.5 percent chromium.

There are more than 100 types of stainless steel in the world, but it's chromium, when it reaches more than 10.5 percent in content, that makes stainless steel corrosion resistant. The family of stainless steel regularly used in the wine industry is called "austenitic." These grades contain at least 18 percent chromium and at least 8 percent nickel, but molybdenum and other chemical elements can be added to improve corrosion-resistance, he explained.

"The type of stainless steel selected for an application is aligned to the operating conditions of each application, and highly corrosive environments demand more highly alloyed stainless steels," he said. "Austenitic stainless steels are also inert in that they do not impart any flavors to any materials they come in contact with. They also do not support the growth of bacteria or viruses on their surfaces."

These austenitic stainless steels are "highly formable stainless steels with good corrosion resistance," he added. "These grades are also perfectly aligned with all the global food/drinks processing and containment material standards."

WHAT ABOUT NICKEL?

Nickel is the key element from an overall costing perspective. That's because the price of nickel is "rather volatile on the trading exchanges (notably the London Metals Exchange)," Collins said. As of early July, nickel was trading at around \$22,000 (USD) per ton, according to Collins, though it was trading at around \$29,000 per ton just a month earlier.

Therefore, if 8 percent of the chemical content of the stainless steel is nickel, then nickel contributes around \$1,760 per ton to the price of the material based on nickel's price as of early July. "There are stainless steel grades available that are nickel-free; however, these grades are not suitable for use in applications, like winemaking, because their key properties (including corrosion-resistance) are inferior," Collins explained.

Given that nobody can truly know how the price of nickel and other alloying elements will move, Collins said it is "impossible" to comment on future stainless steel prices. "There are many factors beyond the supply-demand balance that affect the trading prices of metals," Collins warned.

Higher Diesel Prices

The primary cost increase to customers comes from shipping, Brennecke said. To cut costs, Defranceschi ships its tanks with other products from its parent

Price of Stainless Steel Tanks Increases, Will Likely Continue to Rise

company, SACMI. "We try to do everything possible to combine shipping and save so that we don't have to pass as much of the increase in the cost of receiving a container on to customers," Brennecke clarified.

fuel costs and additional regulations, including California's new gig law, known as AB 5. The California Trucking Association strongly opposes AB 5. According to the trade association, which has fought AB 5 in court, once implemented, the new law will reclassify about 70,000 independent truckers as motor carrier employees and keep more trucks off the road. The implementation of the law was held off for months by the courts.

In June, however, the U.S. Supreme Court refused to consider the California Trucking Association's case that challenged AB 5, just as part of the increases through," Ramorino said. "This ultimately will cause another challenge hit its peak. "Gasoline has been poured on the fire that is our ongoing supply chain crisis," the California Trucking Association commented in a written statement.

The Supreme Court decision has led to protests. In July, truckers blocked the Port of Oakland, one of the major shipping destinations for wine industry-related products; these demonstrations could continue, making trucking even more difficult.

John Yandell, president of Yandell Truckaway, Inc., said the trucking industry is more regulated than it has ever been. His family-owned company operates in California but not in ports, where truckers are known to wait for Northern California. However, up to 25 percent of his fleet lacks drivers, hours for their loads. The port business, he noted in June, is "terrible, terrible."

Truckers are also concerned about the skyrocketing price of diesel fuel. Robert Ramorino, president of Roadstar Trucking Inc. and a member of the California Trucking Association, said diesel prices in California in June had nearly doubled in a year. As of June 15, diesel was more than \$7.10 a gallon; employees. Turnover is low. "We're very pleased right now with the group a year ago it was \$4.10 a gallon.

"I could not have envisioned even \$6.00 per gallon six months ago,"

Ramorino observed. Fuel surcharge agreements do not cover all the cost increases, he continued. "Additionally, the trigger mechanisms have weekly The trucking industry also deals with a continued shortage of drivers, high delays, so with large, sudden increases, our cash flows are reduced as recovery continually lags fuel payments."

> The Department of Energy in Washington, D.C. publishes a national average for gas and diesel fuel prices. The surcharge, based on the national average, adjusts weekly. However, California has the highest fuel tax in the country, and diesel prices average \$1.17 more per gallon than the national average.

> "Our customers are also shouldering the fuel cost burden as we pass shippers to pass increased transportation costs on to the public. I do not see a short-term resolution due to increased oil costs, as well as a shortage of refining capacity in the U.S."

> Ramorino and others predicted, even before the U.S. Supreme Court turned down any decision-making on the case, that the new law would result in fewer drivers in California. "The majority of independent contractors do not want to become employees. They may choose to move out of the California market," he noted.

> Ramorino operates a fleet of 25 trucks and 55 trailers, primarily in he stated in June. "Driver recruitment is extremely difficult." Young people enter other fields, such as construction, especially in metropolitan areas where the cost of living is high.

> Yandell said his company operates a program to educate and train of drivers that we have," Yandell said. "You have to recruit good people. And you have to retain good people." WBM





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A New Instrument for Wine Analysis

A review of how the new Sentia compares to other, currently available instruments

Richard Carey



A NEW INSTRUMENT FOR the analysis of free SO,, L-Malic acid new tests become available, the company will load them onto the device and and glucose is now available for the United States wine industry. Known as Sentia, the instrument is produced by Universal Biosensors, a company based in Australia. In this article I will review the first two analytes, free SO₂ and L-Malic acid, that this instrument can analyze. The company announced recently that Sentia will have the ability to analyze glucose, but not in time for comparative information to be included in this article. This review will compare analyses between the Sentia device and the CDR Wine Lab, Hanna Instruments mini-titrator 84500 and the Hanna 901 titrator. For the Malic acid analysis, the Megazyme MegaQuant analyzer was utilized (FIGURES 1A, 1B, 1C, 1D AND 1E).

The Sentia instrument is a hand-held device that can be easily used in the winery or in the laboratory. It is battery operated and connects to a Wi-Fi network, which allows the device to receive upgrades of its software. Since I started to use the device several months ago, the software has been updated three times, once to provide software "bug" fixes and twice to add first the capability to conduct malic acid analysis and secondly, glucose analysis.

Previous articles in Wine Business Monthly have discussed the functions of other analytical instruments in detail. References are included at the end of this article.

The hand-held Sentia instrument has a small screen for data input and operational parameters. Its principle of operation is based on reflectance of a small strip that is inserted into the device. When the instrument is first initialized, the user is advised to check for any software updates. It can join any Wi-Fi network and, as long as a good signal is maintained, it will search out software availability. Once an update is found, an icon will signal the user that the software can be loaded onto the device.

Universal Biosensors' development group plans to incorporate other analytical capabilities over the coming years, and that, in addition to the glucose test mentioned above, additional tests will be available in the coming months. Fructose, total acidity and acetic acid tests are currently in final development and will be arrive online over the next several months. As these

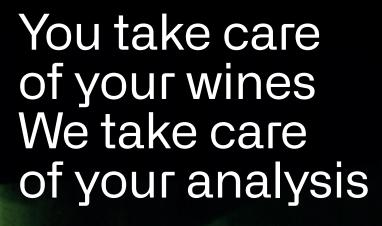
a notice of availability will appear on the user's home screen. The software for each new test will not include any additional cost to the user to download.

After the initial inputs to synchronize the instrument to the user's working environment, such as network and functional setup, the routine operation of the device follows a straightforward step process of on screen prompts. First, the analysis desired must be identified, as well as the wine color. A sample ID is entered into the input box. After entering the ID, a working test strip code is selected from the list shown on screen, or a new code can be entered, and a screen prompt will tell the user when to insert the test strip. The instrument prepares for the selected analysis and gives the user a time period to enter the sample on the reaction pad. The instrument senses the sample being added and completes the analysis. The result is displayed on the screen, with all the data parameters that are attached to the record. The instrument sends the data to a cloud location that is tied directly to the instrument serial number.

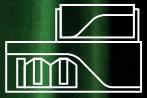
Each test strip has a code on it to identify the lot number and its expiration date that are found on the storage vial. Users are cautioned not to try to use a test strip beyond its stated expiration date, as the device will not allow the strip to be used beyond that date. This is a safety measure to lower chances of erroneous data being collected.

The Analysis: Free SO₂ and L-Malic Acid

With any new testing procedure, it is wise to try it on a wide variety of wines. It is also important to compare the results with those from known standard procedures to see how the instrument performs relative to other methods. The analytical procedures for SO2 used in this study include aeration oxidation, modified Ripper using Iodate, CDR Wine Lab Free SO, Test kit, and the Sentia Free SO₂ test strip kit. For the L-Malic acid test, the kits use an enzymatic procedure.

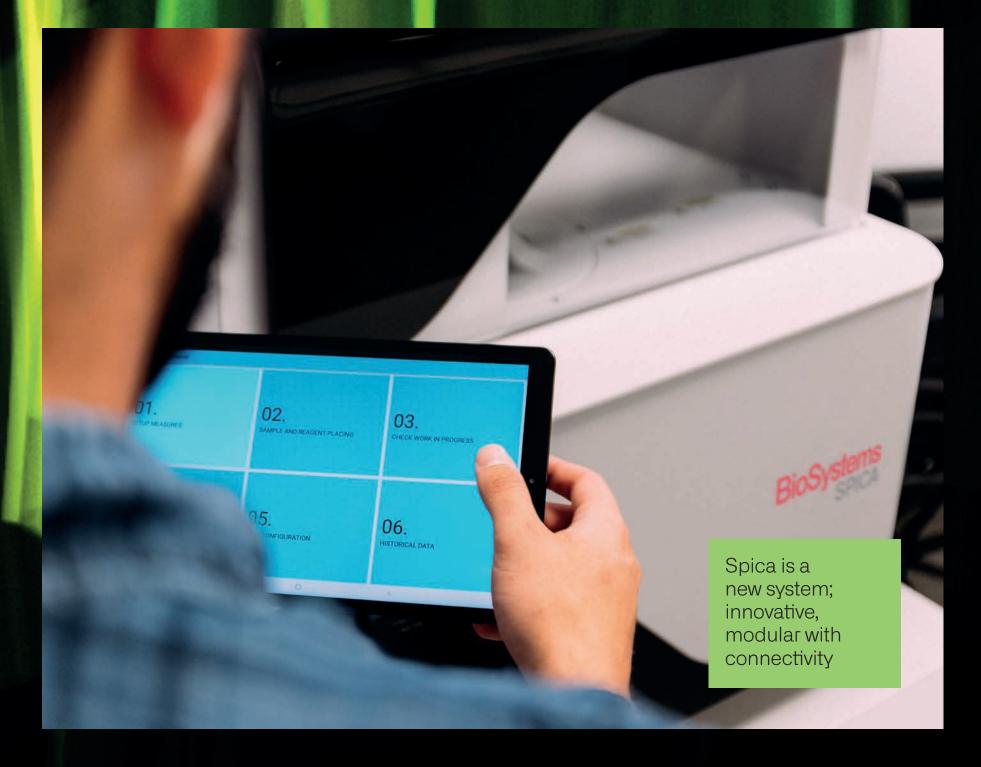


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The instruments for this portion of the test are: Sentia, CDR Wine Lab and Megazyme.

The specific details of the Sentia analytical process are proprietary to Universal Biosensors, as is the case with CDR Wine Lab kits. Hanna Instruments has developed procedures to automate the well-used modified Ripper method using Iodate analysis for free SO₂ instead of iodine, which does not need frequent determinations of elemental iodine standardization. This chemistry is well understood and provides a good baseline for comparison.

The stability of the Iodate reagent used in the analysis for free SO₂ lends itself to determination based on an ORP probe, not a visual color change where it is difficult to decern the endpoint, as is the case for the common Ripper method. Even though many use the aeration oxidation (A/O) method, I find the time and tedious nature of the A/O procedure provides little, if any benefit, and far outweighs the cost of the titrator used for the Iodate chemistry of the modified Ripper method.

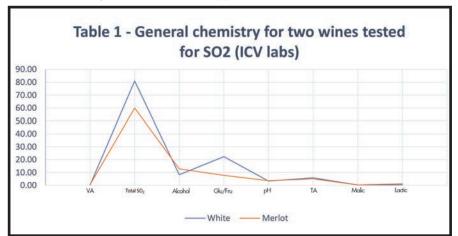


Table 2 - Comparative statistics for phase III of free SO, testing (mg/L) of two wines using aeration oxidation and the Sentia Wine Analyzer

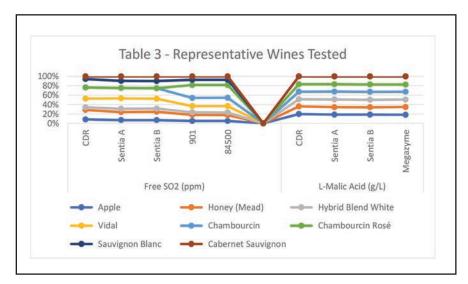
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	AO	Sentia	AO	Sentia
Mean	11.3	12.6	10.4	12.3
SD	1.2	1	0	1.7
Range	8.9 - 11.9	11.3 -14.2	10.4	10.7 - 15.4
Difference from ETS	-6.7	-5.4	-4.6	-2.7
CV	0.1	0.1	0	0.1

The aeration oxidation studies included here were performed by the Virginia Winemakers Research Exchange (VWRE) headed by Dr. Joy Ting. They were one of the early experimenters for the Sentia technology in the United States and provided the data shown on aeration oxidation in this article. Table 1 presents the general chemistry of the wines in their study. Table 2 has the results of the testing between the two methods of analysis for both a white and a red wine.

The results of the VWRE tests were early after the introduction of this testing technique, and the range of variability they found was wider than what I experienced in my investigation. The L-Malic acid test was not available at the time that their work was performed.

The interesting observation information provided by VWRE indicates that the Sentia instrument comes closer to the ETS Laboratories determination for free SO₂. This is an important observation with respect to the A/O method. In my experience, I have found a closer approximation of results by commercial labs with my results with the Iodate method, provided that the ORP probe is properly monitored for functionality and cleanliness. The fact that the Sentia instrument follows that trend is a good sign of the validity of its results.



Background Analysis of SO₂ and L-Malic Acid

Table 3 provides insight into the comparisons between analytical methods for a representative sample of wines across the types of fruit wines produced. In all analyses, the sample was the same for all instruments tested. The one point to take from this data is shown as the results from the Chambourcin Rosé. Note that the CDR Wine Lab and both Sentia devices all showed over range results. At this point, there is no accurate way to determine the actual amount over the range of the test for either of these instruments.

The Hanna instruments are capable of accurately determining higher amounts of free SO₂. The 901 can continue measuring until a limit is reached as part of the program determination for a maximum amount of reagent used. The smaller 84500 mini-titrator can also determine higher amounts with a work around by simply restarting the sample in the same vial, which is usually about 40 ppm, the maximum at which it automatically stops the run. Restarting the unit simply restarts the analysis as if it were a new test. By adding the final determination to the previous stopping point, a very close result to the 901's analysis is achieved.

Unfortunately, simple dilution for either the CDR Wine Lab or the Sentia does not give precise results. Dilution results are only indicative of the magnitude of the final result. For example, on one test I ran, the Hanna 901 indicated the Rosé analyzed at 58.9 ppm free SO_2 and the 1:2 diluted Sentia returned close to 72 ppm. The CDR Wine Lab measured 80 ppm. Sentia is actively investigating the possibility to modify their end point results to reach a greater range of results. They have not yet announced a date when that will be delivered.

Another point to consider with respect to CDR Wine Lab has to do with this instrument's capabilities at the lower end of its range, especially for SO_2 . There is a much wider range of variability at this low end of their curve. In most cases, at the lower end of the range, it is not as critical as at the higher end of the analytical range. The most winemakers need to know at the lower range is that the wine is low in SO_2 and it must be raised to protect the wine.



A New Instrument for Wine Analysis

For L-Malic determination, it was important to see the general conformity of analysis between the methods of analysis. A feature provided by CDR Wine Lab to build trust and efficacy of the testing procedure is a kit that provides a certified target sample of known quantity of L-Malic acid, and a test kit with 10 sample vials. In this kit, they recommend using five sample vials to which a quantity of the target material is added. The closer your results are to the target, the better your instrument is performing, and the narrower the range of your samples, the better your technique is in administering the test. Table 4 presents the results of that test on the CDR Wine Lab instrument. The analyses are a good indicator that the CDR Wine Lab equipment is operating well within the range of expected results. By extension, that should give confidence that other instruments returning similar results are also reporting correctly.

Comparative Analyses of Wine Types with Free SO₂ and L- Malic Acid

Examining a wide range of wines as presented above shows the ability of these instruments to return valid results when compared with one another. However, for accuracy purposes, it is just as important to understand the precision of those results. There are four tables to consider in this section, presenting data for Chardonnay, Seyval, Concord, and Brunello grapes. Each table is divided into two parts. One side presents free SO₂ on one side and the other side is data for L-Malic Acid.

It is also important that users understand the Malic acid test. Native Malic acid in fruit is NOT the same as commercial malic acid that can be added. Natural Malic acid has two forms, D and L. Most plants make only the L form. If commercially produced Malic acid is added to a wine, the analysis will show only half the amount added.

Chardonnay

Table 4

For this test series and the other wines included here, the procedure was the same. A series of five analyses were performed on the same wine for all instruments and within the time it takes to run the five analyses on each instrument.

One point to understand here is the slightly wider range presented by CDR Wine Lab. When questioned, the CDR Wine Lab team indicated that their recommendation is to run a duplicate test for each analysis, and if both results are close together and in line with expected results, then the average will be close to the correct result. If, in the case where the two are not close, then a third test should be run to determine which would be the better choice for that sample. With that understanding, look at the Chardonnay table for free SO₂ for CDR Wine Lab, and pick any two sets of results as if they were your first result from a test series. The likelihood of coming up with an average close to that from the larger number of tests presented is reasonably high.

Standard Deviation, confidence intervals and coefficient of variation (CV) are provided for this analysis and the rest of the determinations. These statistics should provide encouragement for the testing equipment that fits the needs of a winery's laboratory.

Two meters for Sentia were used to demonstrate the uniformity of analysis between instruments. This is a very good sign of the stability of the analytical response of these instruments. With the free SO_2 analysis, one might expect the Hanna 901 would have the tightest CV, narrowest range of results for SO_2 due to its robustness. However, the Sentia shows the comparable results between instruments.

L-Malic acid has a very good track record for this analysis as well. The range of analytical results for the L-Malic acid test is from 0.05 g/L to 5 g/L. This covers most of the wines to be encountered with this test.

Table 4 - CHARDONNAY

Free SO nom

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Sample 1	37	35.9	34.3	34.8	33.9
Sample 2	38	32.7	33.8	34.7	33.8
Sample 3	37	32.1	33.2	34.3	35.1
Sample 4	45	31.9	33.1	34.6	33.6
Sample 5	48	32.6	33.8	34.3	33.8

L-Malic Acid gr/L

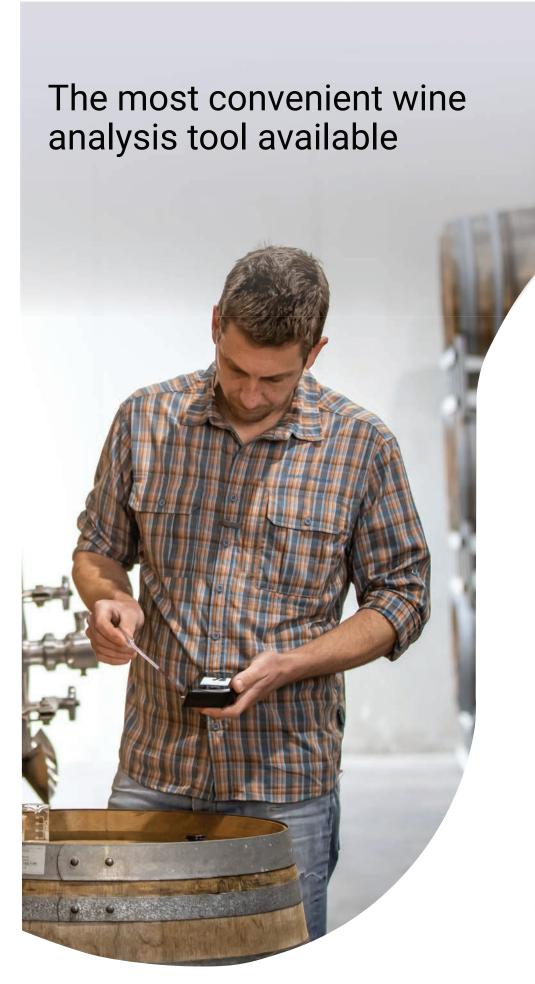
	CDR	Sentia A	Sentia B	Megazyme
Sample 1	2.95	1.84	2.04	2.03
Sample 2	2.90	1.82	2.10	2.09
Sample 3	2.85	1.92	1.99	1.98
Sample 4	3.08	1.88	1.92	1.95
Sample 5	2.84	1.87	1.93	1.99

Free SO₂ Summary Data

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Low	37	31.9	33.1	34.3	33.9
High	48	35.9	34.3	34.8	35.1
Average	41.0	33.0	33.6	34.5	34.0
Range	11.00	4.00	1.20	0.50	1.20
STDev	4.60	1.46	0.44	0.21	0.54
0.05 Con- fidence	4.04	1.28	0.39	0.18	0.47
cv	0.11	0.04	0.01	0.01	0.02

L-Malic Acid Summary Data

	CDR	Sentia A	Sentia B	Megazyme
Low	2.84	1.82	1.92	1.95
High	3.08	1.92	2.10	2.10
Average	2.92	1.87	2.00	2.01
Range	0.24	0.10	0.18	0.15
STDev	0.09	0.03	0.07	0.05
0.05 Confidence	0.08	0.03	0.06	0.04
cv	0.030	0.018	0.034	0.024







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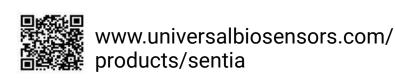




Table 5 - SEYVAL

(all samples from one wine

Free SO, ppm

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Sample 1	45	26.1	26.5	27.1	38.4
Sample 2	43	26.8	26.7	27.0	38.6
Sample 3	47	26.3	26.8	26.6	37.8
Sample 4	46	26.4	26.4	26.9	38.1
Sample 5	53	26.9	27.0	26.7	38.8

L-Malic Acid gr/L							
	CDR	Sentia A	Sentia B	Megazyme			
Sample 1	2.55	2.05	2.05	2.15			
Sample 2	2.11	2.11	2.06	2.14			
Sample 3	2.19	2.01	2.10	2.09			
Sample 4	2.72	2.03	2.11	2.08			
Sample 5	2.55	2.09	2.08	2.12			

Free SO, Summary Data

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Low	45	26.1	26.4	26.6	37.8
High	53	26.8	27.0	27.1	38.4
Average	46.8	26.5	26.7	26.9	38.3
Range	8.00	0.70	0.60	0.50	0.60
STDev	3.37	0.30	0.21	0.19	0.36
0.05 Con- fidence	2.95	0.27	0.19	0.16	0.31
cv	0.07	0.01	0.01	0.01	0.01

L-Malic Acid Summary Data

	CDR	Sentia A	Sentia B	Megazyme
Low	2.11	2.01	2.05	2.05
High	2.72	2.11	2.11	2.11
Average	2.42	2.06	2.08	2.12
Range	0.61	0.10	0.06	0.06
STDev	0.23	0.04	0.02	0.03
0.05 Con- fidence	0.20	0.03	0.02	0.02
cv	0.10	0.02	0.01	0.01

Seyval

Table 5

This Seyval table indicates one of the confusing characteristics of all instrumentation. The CVs for all types are within the expected range for good analytical results. There are two groups within this data set. The Seyval samples from CDR Wine Lab and the Hanna 84500 mini-titrator, as a group, measured higher than either the Sentia instrument or the Hanna 901. All of the instruments show good precision in their results, meaning that whatever the instrument is testing, it is testing it repetitively. That is good information. If it is ever determined that there is some bias of one instrument over another for a particular test, and that instrument provides data that is narrow in scope, it is then easy to create a conversion factor to understand the results provided by that instrument.



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Table 6- CONCORD

L-Malic Acid gr/L

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Sample 1	38	36.1	35.9	43.8	46.9
Sample 2	43	36.5	35.8	43.8	45.8
Sample 3	37	36.7	36.1	44.1	45.5
Sample 4	40	36.2	36.4	44.3	45.9
Sample 5	35	36.5	36.6	44.5	45.9

	CDR	Sentia A	Sentia B	Megazyme
Sample 1	<0.05	0.21	0.18	0.09
Sample 2	<0.05	0.18	0.13	0.11
Sample 3	<0.05	0.20	0.13	0.14
Sample 4	<0.05	0.19	0.16	0.13
Sample 5	<0.05	0.17	0.15	0.16

Free SO, Summary Data

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Low	35	36.1	36.1	43.8	45.9
High	43	36.5	36.6	44.5	46.9
Average	38.6	36.4	36.2	44.1	46.0
Range	8.00	0,40	0.50	0.70	1,00
STDev	2.73	0.22	0.30	0.28	0.47
0.05 Con- fidence	2.39	0.19	0.26	0.24	0.41
cv	0.07	0.01	0.01	0.01	0.01

L-Malic Acid Summary Data

	CDR	Sentia A	Sentia B	Megazyme
Low	NA	0.17	0.13	0.11
High	NA	0.21	0.18	0.16
Average	NA	0.19	0.15	0.13
Range	NA	0.04	0.05	0.05
STDev		0.01	0.02	0.02
0.05 Con- fidence		0.01	0.02	0.02
cv		0.07	0.13	0.19

Table 7- BRUNELLO

L-Malic Acid gr/L

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Sample 1	45	48.1	47.4	51.0	47.4
Sample 2	49	48.1	47.6	51.4	47.1
Sample 3	47	48.1	47.3	51.9	46.8
Sample 4	48	47.9	47.2	50.9	48.6
Sample 5	45	47.8	47.8	50.9	47.5

	CDR	Sentia A	Sentia B	Megazyme			
Sample 1	<0.05	0.13	0.14	0.11			
Sample 2	<0.05	0.13	0.14	0.11			
Sample 3	<0.05	0.13	0.11	0.15			
Sample 4	<0.05	0.15	0.14	0.14			
Sample 5	<0.05	0.18	0.16	0.11			

Free SO Summary Data

	CDR	Sentia A	Sentia B	Hanna 901	Hanna 84500
Low	45	47.9	47.2	50.9	46.8
High	48	48.1	47.8	51.4	48.6
Average	46.8	48	47.46	51.22	47.48
Range	3	0.2	0.6	0.5	1.8
STDev	1.60	0.13	0.22	0.39	0,61
0.05 Con- fidence	1.40	0.11	0.19	0.34	0.54
cv	0.03	0.003	0.005	0.01	0.01

L-Malic Acid Summary Data

	CDR	Sentia A	Sentia B	Megazyme
Low	NA	0.13	0.11	0.11
High	NA	0.18	0.16	0.15
Average	NA	0.14	0.14	0.12
Range	NA	0.05	0.05	0.04
STDev		0.02	0.02	0.02
0.05 Con- fidence		0.02	0.01	0.02
cv		0.136	0.116	0.141

Concord & Brunello

Table 6 & 7

The Concord and Brunello data for free SO, are consistent with the previous round of analyses in that the Hanna instruments show a slightly higher average reading when compared to the other two instruments. All the CVs are low, and therefore the results should provide good information.

With respect to the L-Malic acid test, there is one point that needs to be investigated with respect to the CDR Wine Lab results for these two particular wines. The range of the test extends from 50 ppm to 5 grams per liter of L-Malic acid. The Megazyme and Sentia instruments could measure close to that level as well, but for some reason on this round of testing, the CDR test results did not appear to be sensed. The CDR Wine Lab is known to have a wider range of differences at the lower end of a range, and that may account for this anomaly.

Conclusions

It is always an interesting to have a new type of instrument come on the market. It is even better when the results of the instrument are found to agree with instruments that have been around for a while and have been useful to many customers. One of the clear benefits of the Sentia instrument is its portability. This is a device that can be taken into the cellar and conduct tests with very little impact on sample collection and data management. With a cup and an eyedropper, a sample can be collected and analyzed on the spot. The data is also collected and then transmitted to the cloud for later retrieval.

The workhorses of the industry will still have their place. This review shows how well all of them are performing. **WBM**

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WINEMAKER TRIALS

Troubleshooting Dissolved Oxygen When Bottling T-Topped Piccolos

Winemaker employs NomaSense technology to troubleshoot root cause of elevated dissolved oxygen while adapting T-Top closures to a 750ml bottling line

Bryan Avila



Bryan Avila is a formally trained enologist, seasoned commercial winemaker, ACUE Credentialed Educator and Co-Founder of the Vintners Institute. The Vintners Institute is a grassroots, next-gen effort to bring wine industry producers and allies together, online and in-person, to Innovate with nature, educate the workforce and inspire good leaders. A freelance writer for *WBM*'s Trials & Troubleshoots section, Bryan wants to hear what you are doing in your vineyard and winery to overcome challenges, grow better grapes and make better wine. Contact: bryan@vintnersinstitute.com

Trial Lead: Matt Smith, winemaker, In Good Taste Wines

Matt Smith is the head of winemaking for In Good Taste wine company and a veteran winemaker who has produced more than 60 wines with 90-point scores or higher from the major wine publications. A Michigan native, born in Detroit and raised in Grosse Pointe Park, he attended the University of Michigan (B.A. 1990) where he received his degree in political science and French language and attended the Masters of Viticulture & Enology program at the University of California at Davis (2001-2003).



Background

While most single-serve wine producers deliver their daily-drinkers in a screw-capped format, In Good Taste (IGT) has taken a different approach: the 187.5ml, piccolo-sized bottle, sometimes referred to as a split. IGT curates "flights of single-serve bottles to discover which wines you love" to offer an elevated wine tasting experience that helps consumers explore their wine preferences in their own homes. Once consumers find what they like, they can return to the IGT website to purchase a full bottle of their

favorites. To set the mood, the vintners have chosen a premium glass package and a closure that goes "Pop!" A 2017 University of Oxford study by Charles Spence and Qian Wang hypothesized that "if participants hear a cork being pulled versus the sound of a screw-cap bottle being opened, then these two sounds will likely



FIGURE 1 Pre-closure Nitrogen Tunnel

set different expectations that may then affect people's judgment of the taste/quality of the wine that they are rating." The results of this 140-person study showed that "the quality of the wine was rated as higher, as was its appropriateness for a celebratory occasion, and the celebratory mood of the participant was also higher following the sound of the cork pop."

Splits, however, don't easily transition to a bottling line that also handles 750ml bottles. Similarly, the T-Top-style cork does not lend itself to traditional vacuum corking. The wider, heavier bottle helps to stabilize these bottles down the line, but the T-Top closure does not allow for vacuum corking. This means that whatever gas is in the headspace at the time of closure will be compressed into the bottle and dissolved into the wine. Most winemakers measure dissolved oxygen (DO) as a critical process control point during bottling, because, simply put, oxygen dumbs down aromas and dulls the palate.

Knowing that there would be unique challenges from the start, Matt created a nitrogen-sparging tunnel that would replace any oxygen in the headspace with nitrogen gas and set up a quality program to taste and document any oxidative issues post-bottling at monthly intervals in small test bottlings. This article discusses winemaker Matt Smith's approach to making this new single-serve packaging work.

The Problem

It was noted by the winemaking team upon tasting retention samples that bottled samples were pre-maturely oxidizing post-bottling, when the effects of regular bottle shock should have worn off. Since oxidation was a concern with this packaging method, tasting lot retention samples identified that further investigation into the matter was needed.



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Troubleshooting Dissolved Oxygen When Bottling T-Topped Piccolos

The Quest for the Solution

the process in a systematic manner such that all other possible mechanisms of failure are eliminated. In this case the T-Top closure was the starting point before tracing the path of the wine from the bottling tank on through the system, testing for dissolved oxygen at each step of the way.

"IS IT THE CORKS?"

With the heightened awareness that the non-standard closure, the T-Top, The process of eliminating DO, from bottling tank to filler. would be the most likely point of failure, the first step was to check if the T-Tops were creating an adequate seal or perhaps letting oxygen in after bottling. Matt initiated a study and invited Vinventions' director of sales and wine quality, Don Huffman, to participate. A study was designed, and Vinventions brought



FIGURE 2 The NomaSense P300 DO meter uses luminescence to test oxygen in the headspace without popping the cork.

in a NomaSense P300 DO meter, which claims to use "luminescence, combined with the use of remote sensors and accessories," to analyze both the gas and liquid phases. This means that the difference between a 19.5mm and a 19.7mm diameter cork can be measured on both Rosé and red wines, in both the headspace and in the wine itself.

Bottle Tests - T0; T0 + 60 days bottle aging

WINE TYPE	CLOSURE- DIAMETER (MM)	HEAD- SPACE O2 (%O2)	Dissolved O2 (mg/L)	Head- space O2 (%O2)	Dissolved O2 (mg/L)
Rosé 01	19.5	15.8	5.1	7.6	6.9
Rosé 02	19.5	16.2	5.9	7.9	7.3
Rosé 03	19.7	18.3	5.1	7.4	6.7
Rosé 04	19.7	16.9	5.5	7.7	7.1

Expectations

0.5 1 to 2 mg/L O2

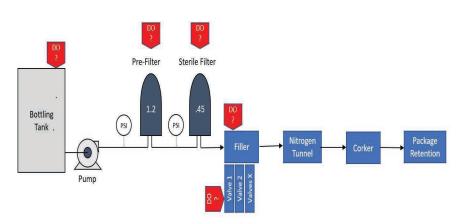
TABLE 1 19.5mm vs. 19.7mm cap diameter study results

A report provided by Vinventions yielded data that indicated a mechanism of oxygenation that was the opposite of what was expected. The tighter seals had higher DO levels because they let less oxygen escape from the bottle. Usually, it's the other way around. Based on this study and the magnitude of the DO level, two things were made clear. First, it is unlikely that an increase in DO of this magnitude, around 6 mg/L, happened by compressing the headspace by only approximately 3 cm³, even if the nitrogen gas chamber did not work at all. Second, it appears that the excess oxygen came from the wine since we know that the headspace was flushed with inert gas and the data show that oxygen was not seeping into the bottle. Rarely are numbers approaching the saturation point of wine, around 8 mg/L, seen outside the research laboratory. How is so much oxygen getting into the bottle?

"Back to the Drawing Board"

The first rule of troubleshooting is to start with the obvious then move through It was clear that the tighter seals held the oxygen inside the bottle, indicating that the problem with the oxygen started inside instead of outside the bottle. Is it cumulative or is it coming in all at once? The next step was to start from the bottling tank and search for sources of oxygenation to at least rule out where the DO is *not* coming from.

INFOGRAPHIC 1



Starting with the bottling tank, the wine measured at less than 2 mg/L; after the pump, the results were < 2 mg/L. Post-filtration, the DO increased to over 2.4. mg/L. Close inspection of the bleeder valve on the 30" filter housing yielded a damaged seal that was replaced; then the DO was rechecked, yielding <2 mg/L.

Beginning with the bottling tank, Smith and In Good Taste's assistant winemaker, Neely Ashley, traced dissolved oxygen levels, through each unit process, with a sample port until the wine reached the bottle, beginning with the feed tank to the sterile filters, then to the filler and beyond.

Finally, we come to the filler. The filler has multiple aspects that can affect an increase in dissolved oxygen. The filler bowl or the spouts could have leaks. While the filler bowl has a continuous blanket of nitrogen, the filler

spouts appeared to behave a bit strangely. It was noted that the wine in bottle seemed to be a little foamier than usual. Were the gaskets leaking? The DO in the wine was reading between 5.1 and 6.4 mg/L. Eureka, it must be failing gaskets! Nope, the gaskets were changed to tighter fitting gaskets (FIGURE 4), and at times the "Filler would actually lift the filled bottles off the pedestal while filling! That's some serious vacuum pressure." The DO postgasket replacement was between 4.3 to 5.1 mg/L. This was slightly better,



FIGURE 3 Damaged bleeder valve

but a massive amount of oxygen was still being injected into the freshly bottled wines. In fact, the vacuum pressure was so strong, it was presumed that the vacuum deformed the seals and allowed for direct oxygenation of the wines.

Closer observation of the filling process showed a large amount of bubbles that formed, which appeared to be far more than any dissolved carbon dioxide in the bottle (FIGURE 5). Air must still be leaking through the seals even though they are new. Perhaps the vacuum is oversized? To test this theory,

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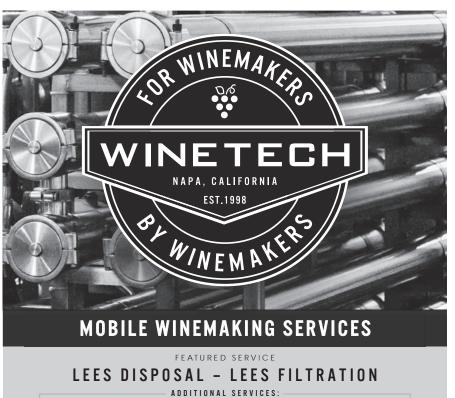
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FIGURE 4 Filler spout seals (Blue arrow)

Continuous Improvement

Once the nature of the failure was noted to be excessive vacuum pressure, corrective measures were taken to allow for future flexibility of the line to accommodate both 187ml bottles and 750ml bottles. Future work will continue to monitor DO at different points in the process, further strengthening this system and cementing the brand's competitive advantage.

Post-Mort Q&A

What was the motivation to troubleshoot your bottling process? What was failing?

Smith: In Good Taste Wines uses a bar top on its 187ml bottles, which means that we cannot use a vacuum corker to purge oxygen from the headspace. This packaging was a key component to the success of the brand, so we needed to find a way to make it work. Traditional packaging employs a cork closure that goes through a vacuum corker, which sucks the air out of the headspace. Without the vacuum corker, this means that I knew I was just going to compress a column of air in the headspace. To mitigate this issue on the bottling line, we created an inert gassing chamber for the wines to pass through so that the "air" in the headspace would be mostly comprised of inert gas, which would not cause oxidation. We also retained samples so that we could taste them

at monthly intervals to see how the wines were coming along once in storage.

A few months into the aging, we noticed that some of the wines were displaying oxidized characters. I assumed that since we were using a bar top, air was getting in through the sides of the cork. I was considering ordering bar tops with a thicker cork that would



FIGURE 5 Smith and Neely take note of excessive foaming post-filling.



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provide a more snug fit but decided to do a study on the system first to confirm my suspicion.

Which wines did you study? What was your criteria for selection?

Smith: We studied a white, a Rosé and a red wine, but we picked the lot based on our bottling schedule since it really wasn't about the wine as much as it was about testing our packaging and bottling process. In Good Taste Wines uses the T-Top for all 187ml bottles. The vintner wanted a non-traditional look that has weight and could convey a specific emotion to the package. We tried the Vinoseal glass stopper first, but it was just too expensive for our 187ml price point, not to mention not very easy to automate, so we moved to T-Tops.

What was your approach to troubleshooting? What parameters did you measure?

Smith: Maximizing shelf life and preserving wine quality have always been top of mind, and this trial helped us to achieve our goals. I had been anticipating complications from this T-Top, 187ml package, so we monitored them closely. Before working with Don, I recognized that after a few months, the corks were not maintaining enough elasticity because wine was creeping up the cork. I was hoping that a thicker cork would have a tighter fit. When we first had Don Huffman of Vinventions come out, we were looking to see if an increase in cork diameter, from 19.5mm to 19.7mm, would create a better seal and halt the oxygen ingress, leading to lower DOs.

We used the NomaSense Dissolved Oxygen (DO) meter to measure DO in both the wine and in the headspace. After checking samples one, two, three and six months down the line, we discovered that the total DO at bottling was super high—even close to saturation at times. It just didn't make sense that this much DO was coming from an imperfect cork seal.

Based on this information, we turned to our bottling to see where all the oxygen was getting into the system. We started with the bottling tank, then to pre-filtration, on to post-filtration and finally, after the filler. Bingo, we found that we were getting the major portion of our oxygen at filling.

Who else worked with you on this trial?

Smith: Assistant winemaker Neely Ashley administered the test, designed the trial parameters, set up the bottles, stored them and maintained the tasting schedule. Her work and attention to detail were key to the success of this trial.

Don Huffman of Vinventions began helping me troubleshoot the problem, initially focusing on the cork diameter and providing the DO technology that would ultimately help identify the major root cause. He brought in the NomaSense technology that is able to read DO, using laser technology rather than direct measurement with a probe that requires opening the bottle. This technology was important to this effort because we did not have to pop the cork to get a reading. This means that we could study one bottle in successive fashion without the added error of DO fluctuation from bottle to bottle. We met about four years ago when consulting for a winery in the Central Coast.

Did you encounter any difficulties during the trial? If so, how did you address these complications?

Smith: Yes. Most of the time when a wine has too much oxygen, it is due to the failure of either the cork, its method of insertion or the seal between the cork and the bottle and the internal pressure.

The first time that Don came out he was investigating what the O_2 was post-cork application. What we found was quite a different story. While we

Troubleshooting Dissolved Oxygen When Bottling T-Topped Piccolos

knew the problem was too much dissolved oxygen, what we thought was the root cause of it in the beginning turned out to be a different root cause in the end. Because we were running DOs, tasting and analyzing retention samples, we were able to identify and locate the true root cause of the oxygenation. Especially since the amount of DO was so high, it just didn't seem like a closure failure.

We found that the root cause of that magnitude of dissolved oxygen was not so much from a failure of the T-Top closures, but rather a vacuum pump that was oversized for our 187ml bottles. This vacuum pump was so oversized that the filler seals failed, allowing oxygen to bubble up through the bottles and causing an unusually rare failure and super high DOs. In fact, it would sometimes hold the bottle on the filler spout even when the pedestal dropped!

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What was the most important outcome of the troubleshooting process?

Smith: Most importantly, once we discovered the real problem, we replaced all the filler seals, changing the previous seals, which were conical, with flat seals that kept a stronger seal. Second, we reduced the vacuum pressure of the vacuum, taking some of the pressure off the seals. We have since throttled back the vacuum pump. We opened the vacuum bypass, and we even used a butterfly valve with a notched and locking handle to further throttle it back. These issues dwarfed any oxygen ingress that the closures would create.

What was your and your team's impression of the resulting wines?

Smith: It's still a little too soon to tell, but our initial Free Sulfite analyses and sensory evaluations, after one month in bottle, show improvement.

Do you plan to conduct a follow-up trial to re-test these results?

Smith: We can conclude that we fixed this initial problem, and we are continuing to learn about our system with this new NomaSense DO technology. My next steps are to do individual measurements on each filler spout to see if there is any variation between spouts now that they all have new seals. WBM



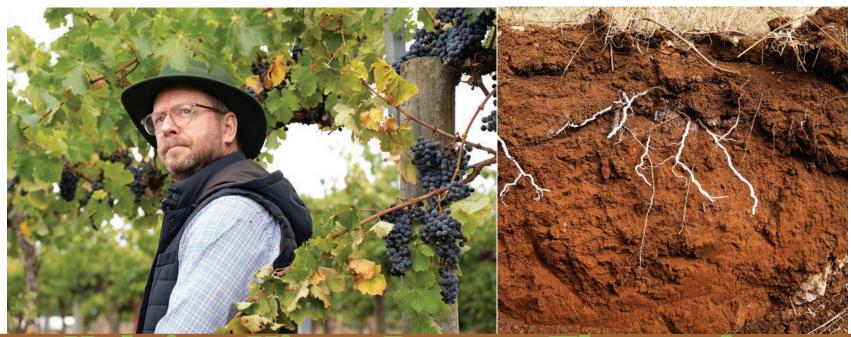
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Protect Themselves

Rootstocks are becoming more and more widely adopted by Australian and New Zealand growers as ways to better protect their vines from pests and help them respond better to their environments. Journalist Harrison Davies attended a rootstock field day in Coonawarra to understand more about how growers are using rootstocks to help improve their long-term vineyard sustainability.

This article originally ran in the May 2022 issue of Australia's Grapegrower & Winemaker Magazine.

Harrison Davies

"These conversations are all about

'how do I match my soil total

available water, my climate, my

rootstock, and my scion variety,

to my desired yield and quality

specification?' I'm aiming for

this, the Holy Grail."

Rootstock growing was developed in France in the late 19th century as a way to protect vines from phylloxera, which had recently been introduced to Europe by way of the New World. The pest had not been found in Europe before and the vines were particularly susceptible—meaning

many producers would watch their livelihoods fade away before their eyes.

The idea to graft North American roots to the base of European vines was toyed with as a way to keep Old World vines safer from phylloxera and growers quickly found it to be effective. Over a dozen clones of rootstock have been developed in the last century, all of which respond to different conditions and provide protection from a variety of disorders.

I attended a rootstock field day, hosted by Vinehealth Australia, where they demonstrated some of the rootstock research that had been conducted at Wynn's in Coonawarra.

On a chilly April morning I huddled into a bus with a bunch of viticulturists, winemakers and winegrape growers to get a first-hand look at the research being evaluated by David Hansen of Hansen Consulting Group.

The aim of the research was to expand on how different rootstocks respond to similar soil conditions and how these affect the vigor and yield of the vines and, ultimately, the quality of wine they would produce.

A Look Underground

David Hansen

The group wandered into the vineyard and were met with a series of soil pits that would provide a rare look at the cross section of the rooting patterns of these various rootstocks, where the roots had been painted to help demon-

strate the size, density and depth of the root

The study measured rooting density, root volume and grape yield for each rootstock growing under the same management, and discussed potential suitability of each of rootstock to different climate and soil conditions and desired wine quality and yield.

The study monitored CW44 clone Cabernet Sauvignon grafted onto eight different rootstocks against an own rooted control.

Management techniques such as irrigation and vine spacing were also discussed as each vine was presented. While the ability of root-

stocks to tolerate or resist phylloxera has been well documented, this is among one of very few trials studies in Australia set up with the aim to help growers understand inherent differences between rootstocks and their contributions to wine quality.

Hansen stood in the first of nine pits that displayed the makeup of various rootstocks in the calcium rich soils of Coonawarra.

He explained that vine roots would generally aim to grow as deep into the ground as possible, but that in the soil profiles at Wynn's they had been restricted to a depth of around 10-40cm below the surface.



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"They're in sort of 10 to 30 range," Hansen said. "They're limited by this calcareous layer, and they're limited by the surface, [where] we often see the herbicide and the sun.

"We're also seeing the effects of soil compaction by machinery, with a general lack of root growth in the wheel tracks in all soil pits."

Hansen, along with fellow researchers Nick Dry of Foundation Viticulture and Suzanne McLoughlin from Vinehealth explained that many of the vines would seek out moisture more than anything else, and that the similar activity between

different rootstocks was more dependent on soil moisture and soil density.

Dry explained that the Wynn's vineyard had dense soil as well as a calcareous layer that all contributed to the shape in which the roots would grow and also pointed out that some of the root systems of these rootstocks are inherently different.

"The 5489 [Merbein clone] had area to work into volunteer work into on the shallow side," he said. "So that speaks to the fact there are differences between rootstocks. Some will explore and some will be a little bit closer to the surface.

"Some rootstocks are more efficient at taking up certain minerals [like] nitrogen and excluding salts such as potassium, sodium and chloride. But then there are then some rootstocks with antagonistic relationships between

potassium and magnesium. So, if they take up magnesium more readily, then they don't take up as much calcium and vice versa. Given that we have generally high potassium levels in our soils and potassium can impact on wine, one of the attributes that you're looking for is less potassium uptake.

"This was one of the reasons we have been keen to evaluate the Merbein rootstocks in this trial that have been bred specifically for low potassium uptake."

It was simple to see how the rootstocks that smaller, denser roots had would take up more nutrients and minerals from the soil and produce more luscious, fruitful vines.

"At the end of the day, denser root volumes create bigger canopies and heavier fruit loads," Hansen explained. "There might be a quality issue with this. "These conversations are all about 'how do I match my soil total available water, my climate, my rootstock, and my scion variety, to my desired yield and quality specification?' I'm aiming for this, the Holy Grail." The vines in the Wynn's vineyard were affected by factors like rainfall and vehicle use, as well as other things that would contribute to the compaction of the soil.

Questions remain about the effectiveness of the rootstocks had they been used from the start and were given more of an opportunity to establish.

Making Wines with Rootstock

One aim of the trial was to make wines and see how the rootstocks would affect the finished product, and the trial allowed us to try samples of Cabernet made in 2019 from each of the rootstocks used in the trial.



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Rootstocks Examined in the Trial

Börner - V. riparia x V. cinerea cv. Arnold

- A phylloxera 'immune' rootstock developed in Germany.
- Low vigor and low yield across all three seasons of data collection.
- Open canopy/good vine balance.
- Performed well in wine quality measurements.
- Should be considered for further commercial evaluation.
- Need to establish and manage with consideration for the 'riparia' parentage i.e. water and lime issues.

2022 Observations:

- Lower vigor, some basal leaf yellowing
- Possibly needs deeper soils, closer planting

M5489 and M5512 - complex hybrids from V. berlandieri

- Australian rootstocks developed for local conditions.
- Medium vigor across all three years of data collection.
- Highest yielding treatments in V19
- M5512 = 8.8kg/vine & M5489 = 6.4kg/vine
- V19 field walk indicted that these two treatments looked to be in 'good balance'.
- Performed well in V19 wine evaluation.

2022 Observations:

- M5489- moderate vigor, high yields, no yellowing
- M5512- mod.-high shoot growth, moderate yield
- Both high root density and root length

110 Richter - V. berlandieri x V. rupestris

- A moderate vigor, drought tolerant option.
- Medium vigor across all three years of data collection (similar to M5512, M5489 and Ramsey).
- Ranked 3rd in yield in V19 (6.3 kg/ vine) behind M5512 and M5489.
- Grouped with 1103P and 140R in principal bi-plot analysis wine evaluation tended towards herbal/

higher methoxy characters.

2022 Observations:

- Moderate-high vigor (lower than 1103P and 110R).
- 'Well suited to red, limited soils as a drought tolerant option- not suited to black or sandy loam soils' replacement

1103 Paulsen & 140 Ruggeri - V. berlandieri x V. rupestris

- Drought tolerant, higher vigor options.
- Higher vigor and declining yields
- High wine potassium, high methoxy levels, lowest wine scores.
- Homogenous management appears to have impacted performance
- How should they be managed to get benefits from drought tolerance while still producing consistent quality?

2022 Observations:

- Both high vigor and high root density and volume.
- 'Too much vigor to control in wetter springs or where there is frost control required.'

Ramsey - V. champinii

- Drought tolerant, higher vigor option.
- Highest yield in V15, lowest yield in V19
- Medium vigor in V19
- Surprisingly paired with own roots in the principal biplot analysis.
- Shallow soils inhibited Ramsey's normal high vigor, high yield nature?
- Does it still display drought tolerance?

2022 Observations:

- Low-moderate vigor, some yellowing
- Horizontal thick roots

An immediate takeaway from the tasting was that the vines that grew with more vigor and produced larger yields were not the vines that created the most universally enjoyed wine. The highest scoring wine in the official tasting that was conducted was the German Börner rootstock that was developed to be resistant to phylloxera.

While the vine created disease resistant berries that were made into a very well-liked wine, these vines were less magnificent.

Börner rootstock had the second lowest density of roots and also the second lowest yield of fruit.

"[Börner] has been definitely on the lower end of the scale in terms of yield and vigor and the fact that it probably doesn't like the calcareous soils is probably impacting quite a bit on that," McLoughlin said.

"This rootstock came up the most preferred wine from 2019. "It's been good in this rootstock trial to have some different rootstocks not commonly available just to see how they might go."

On the other end of the scale was the Merbein 5489 clone, which had the largest yield of all the rootstocks and scored the second highest in the 2019 tasting.

It was noted on the day, however, that the conditions of the soil may have played a role in the vigor of the 5489 roots, as they were the only ones with a deep soil among those in the trial that did not appear to have a layer of calcerous soil directly below.

Still, the roots were only present between 10 and 40 centimeters into the soil. Hansen explained that the comparatively high vigor and yield might have had more to do with the access to moisture, as the absence of the calcrete layer offered more opportunities for the moisture to be absorbed by the roots.

"The majority of the roots are between 10 and 30 centimeters again, with few roots growing in the wheel tracks or into the midrow," he said. "We rated this one pretty high and I think we're reasonably high with root density in volume.

"I think probably the [rooting] volume we may have underestimated; there are some pretty chunky roots here."

The trial suggested that greater root density and access to moisture would result in a greater yield, but a correlation between yield and quality of wine still seems to be inconclusive.

"Factors like penetration resistance and soil strength play a role," Hansen said. "Certainly, even within those limitations we felt that some root systems were denser, which equated to a bigger canopy and higher yield."

Interest in Rootstock

Viticulturists on the day were interested in the trial for several reasons, but a unifying factor was preparing for phylloxera.

"It's only a matter of time," one grower told me on the day. South Australia produces more wine than any other state in Australia and has managed to keep the pest away from its wine regions.

Coonawarra growers, who are only a stone's throw away from Victoria, where there have been the most recent cases of the pest, said introducing rootstock would go a long way in future proofing their vineyards. "I don't have many vines on rootstock at the moment but we are starting any new growth on rootstock now," the earlier grower said.

Rootstocks are quite a bit more expensive than own rooted vines, although Dry said that the cost of growing on rootstock would pay for itself as it greatly reduces the amount of tending the vines require.

"When you don't have to worry as much about nematodes or phylloxera you can see that the extra cost is definitely worth it," he said. Hansen and Dry said there needed to be more trials such as this across different locations in Australia.

The trial will continue into the future and more avenues around rootstocks will be explored. **WBM**



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Managing Grapevine Viruses is Possible with Sector-Wide Behavioral/ Technological Changes

Marc Fuchs

Marc Fuchs grew up in Alsace, France, and received his PhD from the Université Louis Pasteur. He joined Cornell University in 2004 with research and extension responsibilities on viruses of fruit and vegetable crops. Marc is leading multidisciplinary team efforts on red blotch, leafroll and fanleaf diseases. Reach him at *marc.fuchs@cornell.edu*.

VIRUSES CAN HAVE DETRIMENTAL effects on vine health, productivity, and grape quality. Management of viruses includes limiting their presence in planting stocks to restrict disease outbreaks in newly established vineyards and implementing tailored tactics to mitigate impacts in diseased vineyards. While solutions are often simple, their adoption is overall low, stressing the need for behavioral and technological changes, as well as cooperative approaches from multiple sectors.

in South Africa and New Zealand,⁹ and California.⁶ A perceived high cost of management solutions also prevents actions, despite studies that convincingly support economically-sound tactics.²

Another factor that contributes to a low adoption of management strategies is a lack of trust in policies aimed at limiting the presence of viruses in propagation material.³ It is often perceived that certification programs are not satisfactorily addressing the needs of growers. This is because detrimental viruses can

Viruses and Their Management

Grapevines host more than 95 viruses. This large number is explained by a very long history of domestication and coexistence; a sparsity of resistance sources; and an extensive exchange of germplasm on a global scale. Many viruses are associated with major diseases such as fanleaf, leafroll (FIGURE 1) and red blotch (FIGURE 2).²

Management of virus diseases includes prevention and reduction of virus sources. Preventing the introduction of viruses in new vineyard parcels is achieved by carefully selecting and establishing planting stocks derived from clean, virus-tested vines.³ In diseased vineyards, reducing the virus inoculum, eventually in combination with the control of insect vector populations (FIGURE 3), is achieved by rogueing or removal of entire parcels.

Virus Disease Management Uncertainties

Virus disease management strategies are often difficult to implement.² This is exacerbated if awareness of a virus problem among growers' communities is low, and solutions are poorly communicated. For instance, no action is often taken to mitigate the impacts of viruses in diseased vineyards because a crop is still harvested, albeit of potential lower quality.

The fact that chemicals are futile to combat viruses and no cure exists in diseased vineyards adds uncertainties on how to best manage viruses; this is more so because impacts on fruit production and quality can vary from vineyard to vineyard, and from year to year.⁸

Uncertainty about the success of a management tactic can also hinder the implementation of management actions. For example, applying insecticides against mealybugs is by itself not sufficient to control leafroll disease. An integrated response combining removal of the virus inoculum, vector control, and use of clean replants is needed. Successful examples of integrated tactics for leafroll virus management have been documented



FIGURE 1 Comparative fruit set of healthy (top) and leafroll infected (bottom) vines of Cabernet Franc.



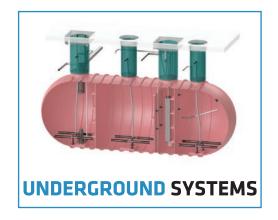
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Managing Grapevine Viruses is Possible with Sector-Wide Behavioral/Technological Changes





FIGURE 2 Comparative fruit set of healthy (left) and red blotch infected (right) vines of Pinot Noir.





FIGURE 3 The grape mealybug (right) and the three-cornered alfalfa hopper (left) transmit some leafroll viruses and red blotch virus, respectively.

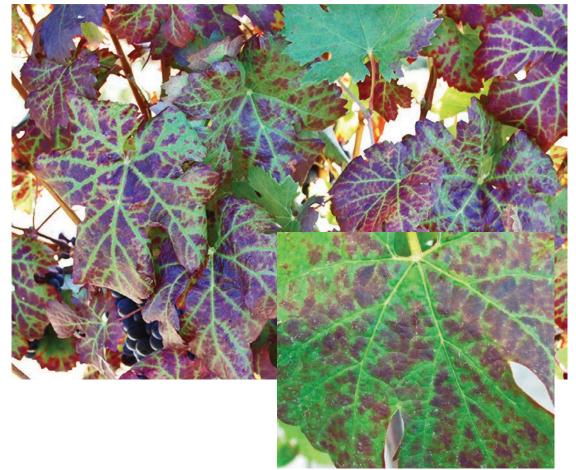


FIGURE 4 Test, don't guess! Similar leaf symptoms may be caused by leafroll (background) and red blotch (inset) viruses on Cabernet Franc.

still be present in certified planting material. Furthermore, a common misnomer that adds uncertainties relates to the alleged availability of virus-free certified material at nurseries. Certified vines are free from economically relevant viruses such as leafroll, fanleaf and red blotch viruses, but not from the more than 95 viruses that have been found to date in grapevines worldwide.

Behavioral Changes for Improved Virus Disease Management Strategies

A greater adoption of virus disease management strategies is possible with behavioral changes. For example, the next generation of certification programs may be imagined and built to increase confidence in the cleanliness of planting stocks. This requires cooperative efforts from growers, nurseries, researchers, and policy makers. Additionally, adoption of virus disease management solutions in diseased vineyards could be increased through sustained extension efforts to facilitate dissemination of information that resonate with grower communities, and to raise awareness on the need to coordinate regional efforts.⁶

Technological Changes for Improved Virus Disease Management Strategies

Improving the efficacy of virus disease management strategies requires fundamental changes from a technological perspective. Spatial rogueing was recently reported as a new option to reduce the incidence of leafroll viruses.⁵ It will be interesting to see whether spatial rogueing will be adopted by growers.

Another technological advancement could be development of onsite virus diagnostic assays to quickly circumscribe a virus disease, particularly in vineyards of white-berry cultivars for which virus disease symptoms are often not very apparent. Such an assay is available for red blotch virus.¹⁰ A similar assay would be helpful for grapevine leafroll-associated virus 3.

Hyperspectral imaging, a technique that analyzes a wide spectrum of light specifically emitted by virus-infected vines beyond the ability of the human eye. could be applied to aid the identification and mapping of diseased vines. Such technology has shown promise for leafroll disease. It is currently explored for red blotch disease. If validated, the technology could be deployed in commercial vineyards but also in nursery-increase

vineyard blocks, where it is most crucial to reduce the occurrence of economically significant viruses.

Canines have the olfactory ability to detect profiles of plant volatile organic compounds that are disease-specific.² Detection-dogs are successfully used to identify citrus trees infected with the bacterium causing greening disease.⁴ Canines could be trained to detect vines infected with leafroll or red blotch viruses and used to screen nursery increased vineyard blocks for early virus detection.

Takeaway Messages

Improving the efficiency of virus disease management strategies is possible with behavioral changes to envision the next generation of responses to viruses, including novel certification programs, and to enhance the quality of planting stocks. Behavioral changes are also needed to foster adoption of research-based virus disease management solutions in the vineyard. Concurrently, technological changes should be contemplated to facilitate identification of virus-infected vines not only in production vineyards (FIGURE 4) but also in nursery increase-vineyard blocks.

To ignite change, a relentless dialogue between researchers from varied disciplines, growers, vineyard managers, vintners, wineries, nurseries, extension educators, regulators and policy makers is critical. Such efforts will create new opportunities for addressing the unique challenges caused by viruses while advancing sustainable viticulture practices. **WBM**

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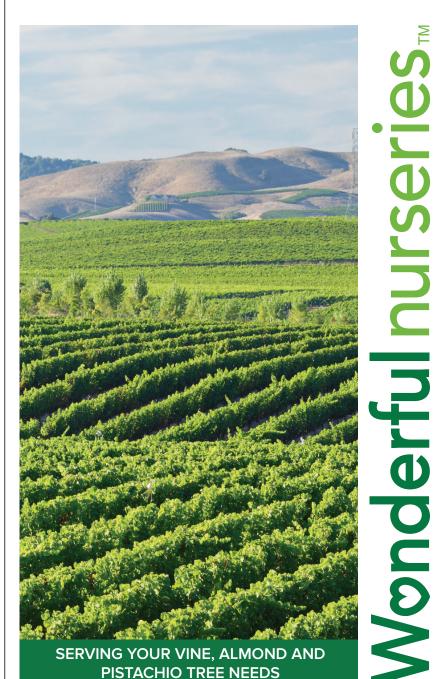
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J. LOHR MONTEREY COUNTY WHITE RIESLING







J. Lohr Vineyards & Wines \$13

FROM THE WINERY: This is separate from the J. Lohr Estates tier on the shelf and in our distributors' books—We're creating a fresh new identity to appeal to a younger, more informal consumer audience. Screen-printed labeling and a screw-top closure imply ease of style and use. The more "green" packaging/closure is also in-line with the wines' Certified California Sustainable status. J. Lohr Monterey Roots tier's new packaging has been extremely successful, both in terms of sales and publicity in various wine and trade publications.

Contributors

DESIGNER: Bergin Screen Printing and Etching **BOTTLE VENDOR:** Saxco International **CLOSURE VENDOR:** G3 Enterprises. **LABEL VENDOR:** Bergin Screen Printing and Etching

Alternative /Non-glass





Cooper's Hawk Winery & Restaurants

Blood Orange Pineapple Bubbly

Sangria \$24.99 / 250ml 4-pack

FROM THE WINERY: The sleek, minimalist designs VINT created for Cooper's Hawk Bubbly Sangrias feature bold, saturated gradients that allude to the fruits and flavors of this summertime classic without being literal. Our flirty, fun can designs are based on our Harper's Design Award-winning bottle designs. Blood Orange Pineapple was the first flavor released by Cooper's Hawk, followed by Blueberry Açaí, which needed to denote its deeper, richer taste while still complimenting its lighter sister label.

Contributors

DESIGNER: VINT - Lauren Gaynor **LABEL VENDOR:** Trysk Print Studios



Judges' Choice

1st PLACE

Classic

Onip

Luxury

S by Ray Signorello

Series

One Stone

Cabernet Sauvigon & Rosé of Pinot Noir

Redesign

Icon by Waterbrook Winery

Alternative /Non-glass

Wise Villa Winery

To view all entries, visit: wbmevents.com/pack/entries



Bordeaux Company Uses AI to Derive Universal Meaning from Scattered International Tasting Notes

W. Blake Gray



WINE TASTING NOTES ARE close to babble even under the best circumstances. Now imagine trying to learn something from notes in seven different languages. That's where a new artificial intelligence (AI) application can help.

Bordeaux-based Wine Space has created an AI-based system that it says will turn that flow of verbiage into useful feedback to wine buyers as well as wineries. It has rolled out its system at wine competitions produced by Belgium's Vinopres: first at a competition in Mexico, and then in May at the world's largest wine competition, the Concours Mondial de Bruxelles for red and white wines, held this year in Italy. The system was also used at Concours Mondial's sparkling wine competition in Portugal in Julyhe idea is to use AI to develop a coherent report on each wine based on the tasting notes of the judges—but the system can also be scaled up to sort through, for example, hundreds of consumers online tasting notes.

Julien Laithier, president of Wine Space, said the idea sprang from a project they had to build a wine-buying adviser for big supermarkets in France.

"To provide good a good digital adviser, we needed to have accurate tasting notes," Laithier said. "We have an issue with the wine world now, with thousands of wines. We cannot taste all these wines. But all these wines have been tasted. Maybe the taste of the wine is inside the comments. We need to take all the information we can from inside the text." Even just working with French-language tasting notes, Wine Space needed four years to develop the system.

"French is very rich in wine terms and vocabulary," said Sylvain Thibaud, Wine Space's general manager. "But wine tasting comments are not written in sentences. It's not written with subjects and objects. It's often just a series of words. We look for acidity, and we want to know how it is described in the comments."

Acidity and tannin level are two of the main aspects the system seeks to discern and understand them is trickier than it sounds. Personally, I use the word "grippy" for tannins that are, well, you're an English speaker, you get it.

Thibaud said French have an exact translation—"aggripant"—but they don't use it for wine. He said finding tannin descriptions was more difficult than acidity descriptions, but the system learns as it goes along. I first spoke to him immediately after the Concours Mondial red and white competition, which set the Wine Space AI loose on more than 40,000 professional tasting notes—notes about more than 7,300 wines which were each judged by five-or six-person panels. "The algorithm is good now, but it will be better in a week," Thibaud said.

Two months later, he said, "We still have a lot to learn from the data we have collected. Today, we have only analyzed the data per wine. In the coming months, we want to analyze it in other aspects—by flight, by appellation, by region, by taster—so more information will come in the future."

Beyond the wine's structure, the Wine Space system is designed to find similarities in concepts in tasting notes that may not immediately look similar.

"One taster says 'raspberry,' one says 'strawberry' and one says 'cherry," Thibaud told *Wine Business Monthly.* "They are not far from each other; they are all red fruit."

July's sparkling wine competition brought another opportunity for the system to learn. "The sparkling wine session was interesting because it asked us to integrate a new parameter that we did not take into account, which is the evaluation of the effervescence," Thibaud said. "We were also surprised to have such a wide diversity of feedback on sparkling wines."

Bridging Cultural Differences in Wine Notes

Wine Space chief technical officer Antoine Gérard says that currently the system first uses AI to do an automatic translation into French; it works with French from that point. The results can then be translated into English or any European language. But each time they add a language to the system, they must train it to recognize wine-specific words.

"We started with Vinopres in Mexico, with Spanish," Gérard said. "We had to learn a lot of new words from Mexico—some aromas we don't smell; some flavors we don't taste. People use aromas and flavors from their native culture. But we can learn these words. When you have five judges instead of one it's a bit more complex. But when you have more judges, you have more chances to find the words that agree."

One set of potential clients are large wine buyers that use a tender system, including UK supermarkets (like the original concept) and the wine monopolies of northern Europe. While the work Wine Space is doing for Vinopres uses only professional tasters, the system can also be set loose to extract meaning from the enormous pile of tasting notes posted online.

"The importer can say, 'We need red wine with these characteristics. This



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taste," "Thibaud said. He added that the system can also find wines that are similar to others, for sales promotions like "Want to try something like DRC, but cheaper?"

Right now, their main client is Vinopres. Quentin Havaux, 33, took over as general manager of the company from his father in September. Before joining the family wine-competition business, Havaux worked at Bank BNP Paribas for four years in digitalization. Wine competitions are a competitive business, and Havaux sees Wine Space as offering his company a competitive advantage.

"As a leader in this area, we really want to push and innovate," Havaux told *Wine Business Monthly*. "It's really important to give feedback to our producers. A lot of competitions give feedback, but only from one judge. Our core idea is to have a jury of international judges. If we have a consensus from professional judges from five countries, then we know what the wine tastes like."

Wine Space's system can create an aroma wheel for each wine, based on tasters' notes. But it can also create a tasting wheel for individual tasters. During Robert Parker's peak of influence, a few people put a lot of effort into crunching his tasting notes to learn what descriptors he used most often, and how likely they were to correspond with a high rating. Now, AI can do this for every wine judge at a competition, which has the potential to be useful for competitions in deciding who to invite to judge.

Thibaud said judges were not bothered by the additional requirement to write notes on a device provided by Vinopres. I was a judge at the red and white competition. The first day, the pace of judging was noticeably slower, but judges got faster on subsequent days.

"From the tasters' point of view, we have had nothing but positive feedback on the system," Thibaud said. "They feel much more useful by detailing their true feelings about the wine through the commentary. It also helps them to clarify their thoughts so that they can give a more accurate rating."

One challenge is that for now, and possibly for a long time, the system only works in seven European languages (French, English, Spanish, Portuguese, Italian, German and Dutch), but no Asian languages. Judges from China, Korea and Japan have to write their notes in a second language. This wasn't a big issue in 2022 because Vinopres' competitions had fewer judges from Asia than usual because of pandemic travel restrictions, but if the world ever returns to normal, it will be.

"It's not only about knowing the language: knowing Chinese, for example," Thibaud said. "It's about having the specific vocabulary about wine for the Chinese people."

Havaux said that at least for now, Vinopres will give the AI-created tasting report for free to producers who enter the competition (to be clear, doing so costs Vinopres money.) The initial reports included a summary of each wine's main strengths and main weaknesses according to the judges, as well as a taster-generated aroma wheel.

"There are too many crappy competitions that are just there to give medals," Havaux said. "Maybe in the future we will make money with this but, for now, it is to innovate." **WBM**



Z2010 adhesive for Wine and Spirits





PACK DESIGN SHOWCASE

Classic Label Gets Trendy Twist

Andrew Adams

LE CIGARE ORANGE

Bonny Doon Vineyard Santa Cruz, Calif. Bonnydoonvineyard.com

ANNUAL CASE PRODUCTION: 35,000

AVG. BOTTLE PRICE: \$28

RANDALL GRAHM RELEASED the first vintage of Le Cigare Volant in 1986 and nearly 40 years later the latest iteration of the popular brand reflects its lasting popularity and tradition of innovation.

Entered in the Classic Category of the 2022 Pack Design Awards competition, the brand is Grahm's first orange wine, and a new release by Bonny Doon following its 2020 acquisition by WarRoom Ventures. "Bonny Doon Vineyard wines have either been 20 years too early or 20 years too late, but this orange wine is an anachronism and anomaly," Grahm said in the press release announcing the new wine.

In typically untypical fashion, Grahm goes on to question the very need for a new orange wine in the same press release touting a new orange wine. The vintner wonders if such a wine would be too "á la mode," and that consumers would drink it simply because orange wines have remained trendy without "really thinking about whether they're actually deriving a molecule of enjoyment from the experience."

Contest judges did derive enjoyment from the new wine that employs a clear glass bottle from O-I with

a steel grey label by All American Label that showcases the wine's orange was covered in detail by such mainstream media as The New York Times and hue. A strategic use of orange within the label designed by Josh McFadden further helps to highlight the wine's color and set the new release apart from other Cigare wines. "For fans of Bonny Doon, this will make them smile," one judge remarked. "This leverages the brand well while reaffirming the ol' Cigare Volant label."

The wine is produced with a 40-40 split of Grenache Gris and Grenache Blanc with the remaining 20 percent comprised of equal portions of Grenache and Orange Muscat. The grapes were picked separately at low Brix and then destemmed into rotary fermenters for a cold soak of four to five days before being fermented on the skins for more than a week. A non-Saccharomyces yeast added early to the must helped reduced the need for an early addition of sulfur dioxide.



PACKAGING VENDORS

DESIGNER: Josh McFadden **BOTTLE VENDOR:** O-I **CLOSURE VENDOR:** Amcor LABEL VENDOR: All American Label



The original inspiration for the wine came from a provincial law issued by the local authorities of Châteauneuf-du-Pape in the mid-1950s following a series of appearances of cigar-shaped UFOs in the region. To protect the local wine industry, officials decreed it illegal for such mysterious craft to land in vineyards.

Grahm credits Bonny Doon winemaker Nicole Walsh and the rest of the team "for pushing me into this new and unexpected (orange) space," and that move appears to have also worked in terms of packaging design. "Randall himself says he's late to the orange-wine party, but it's fitting that he jumped in," another judge noted. "His flying saucer label isn't shocking anymore, but it does seem new again with a very clearly orange wine behind the glass."

The new wine has also arrived on the market when UFOs or unexplained aerial phenomena as they are also known these days—are having a moment of renewed relevance in the wider culture. The latest film by phenom director Jordan Peele, Nope, features otherworldly visitors while the now famous "tik tac" video shot by U.S. Navy pilots in 2004 has been watched by millions and

An oversized tik tac and a flying cigar aren't too dissimilar and so it's fitting that a special release of the wine dubbed "Cuvée Oumuamua" was served at a recent conference of researchers associated with the new Galileo Project. Led by Harvard Professor Avi Loeb, who contends the interstellar object Oumuamua (that also looked like a cigar), which flew through the solar system in 2017 could be the first publicly documented evidence of intelligent life beyond Earth. Loeb is working with researchers around the world though the Galileo Project to create a network of instruments powered by AI to record and analyze other such unexplained activity. "We are honored to be included in the conference," Grahm said in a statement. "Along with the Galileo Project, we too have had a long-standing interest in volitational objects originating not from around here." WBM











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Retail Wine Sales Down 3 Percent in July

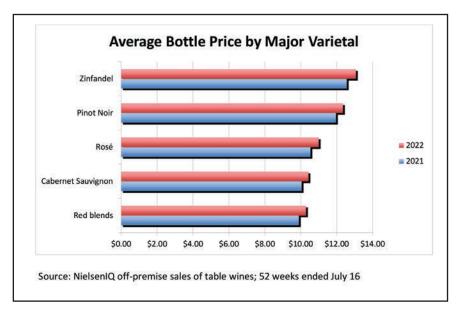
Wines Vines Analytics

Off-premise table wine sales fell 3 percent versus a year ago to more than \$1.1 billion in the four weeks ended July 16, NielsenIQ scan data showed. Sales in the latest 52 weeks approached \$16 billion, down nearly 6 percent from the previous year. Box wines priced at \$4-plus per 750ml showed the strongest growth, with sales up 4 percent in the latest four weeks. The second fastest-growing price tier during the period was \$20 to \$24.99 table wine at 2 percent.

Produced by **Wines Vines Analytics**, the *Wine Analytics Report* is the industry's leading source of market insights, objective analysis and data.

Sales Volume Down 5 Percent in July

Off-premise table wine volumes fell 5 percent versus a year ago in the four weeks ended July 16 to 11.1 million 9L cases. The decline contributed to a contraction of 9 percent in the latest 52 weeks to 155.7 million 9L cases. While overall sales volumes declined more sharply than sales value, the one exception were box wines priced \$4-plus per 750ml where volume increased faster than value. Indeed, it was the only price tier where volume actually increased during the period. Volume growth during the latest 52 weeks was limited to \$25-plus bottles, but the scant increase simply kept volumes even with a year ago.



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Zinfandel Tops in Retail Bottle Price

NielsenIQ retail outlets account for 26 percent of the value and 45 percent of the volume of wine sold in the U.S. And within these outlets, primarily the major chain retailers, Zinfandel had the highest average price of the major varietals during the latest 52 weeks. Sales totaled just \$209 million in the period versus \$3.2 billion for Cabernet Sauvignon, but Zin's average of \$13.07 a bottle, is 4 percent more compared to a year earlier. By contrast, Cabernet Sauvignon ranked fourth with an average bottle price of \$10.43, followed by red blends in fifth spot at \$10.29 a bottle.

The rankings point to the selective nature of Zinfandels sold through NielsenIQ outlets versus the greater selection of Cabernet and Cab-driven red blends available. Cabernet is the top-selling varietal sold in NielsenIQ off-premise outlets while red blends rank third (after Chardonnay). Plenty of expensive examples of these varietals exist but popular demand means value-priced, aspirational options abound for these well-known varietals. The breadth of selection gives them a dominant place on mainstream shelves while the selection of Zinfandels is limited to well-known but more expensive brands.

Of the top five most-expensive varietals, however, just one—Rosé—was not red. Rosé, at \$11 a bottle, saw the strongest growth in average price at more than 4 percent on sales of \$676 million. **WBM**

Methodology

Sourced from NielsenIQ, these figures represent off-premise retailer wine sales to the consumer aggregated across a variety of channels nationwide, including grocery, drug, mass merchandisers, convenience, dollar, military, as well as a selection of warehouse clubs, and liquor channel geographies and liquor channel retail chains. NielsenIQ figures are updated and released every four weeks.

NielsenIQ Table Wine Category Segments MARKET: Total US xAOC+Conv+Military+Liquor Plus PERIOD: Week Ending July 16, 2022

	MiologaTO	Dollar \	/alue	Dollar Valu	e % Chg YA	9L Equivalent	: Volume	9L Equival	ent Volume ng YA	Avg Equiva Per 7	alent Price 50ML
	NielsenIQ	Latest 52 Wks - W/E 07/16/22	Latest 4 Wks - W/E 07/16/22	Latest 52 Wks - W/E 07/16/22	Latest 4 Wks - W/E 07/16/22	Latest 52 Wks - W/E 07/16/22	Latest 4 Wks - W/E 07/16/22	Latest 52 Wks - W/E 07/16/22	Latest 4 Wks - W/E 07/16/22	Latest 52 Wks - W/E 07/16/22	Latest 4 Wks - W/E 07/16/22
	TOTAL TABLE WINE	15,967,065,754	1,136,012,966	-5.7	-2.6	155,740,918	11,077,259	-8.9	-5.3	8.54	8.55
	BOX	1,576,186,739	119,835,271	-4.8	2.6	35,267,781	2,641,362	-6.2	-0.1	3.72	3.78
S	\$0-\$3.99	556,689,694	41,978,931	-7.8	0.1	18,347,462	1,349,884	-9.4	-4.0	2.53	2.59
NER	\$4+	1,019,488,882	77,853,221	-3.0	4.0	16,920,234	1,291,447	-2.5	4.3	5.02	5.02
MA	Total Table Wine Glass	14,058,566,603	990,245,580	-5.8	-3.0	116,832,358	8,157,073	-9.8	-6.7	10.03	10.12
00/	Value Glass \$0-\$3.99	471,735,500	32,892,641	-14.8	-9.1	11,549,454	779,114	-16.3	-13.2	3.40	3.52
SB)	Popular Glass \$4-\$7.99	2,655,639,758	192,237,867	-11.3	-4.3	39,194,766	2,775,202	-12.6	-7.6	5.65	5.77
H	Premium Glass \$8-\$10.99	3,058,227,675	211,458,456	-10.1	-5.4	26,646,919	1,806,522	-10.9	-7.9	9.56	9.75
PRICE TIERS BY CONTAINERS	Super Premium Glass \$11-\$14.99 Ultra Premium Glass \$15-\$19.99	3,664,563,211	263,380,503	-4.2	-1.5 0.4	23,983,041	1,705,227	-5.4 -1.8	-3.6 -1.9	12.73 17.23	12.87 17.38
	Luxury Glass \$20-\$24.99	1,958,827,791 834,427,460	139,523,035 63,945,750	-0.5 1.2	1.8	9,474,416 3,149,262	669,031 241,844	-1.8 -0.1	-0.3	22.08	22.03
	Super Luxury Glass \$25+	1,406,473,576	84,776,502	3.2	-7.3	2,789,670	169,409	-0.1 0.4	-0.3 -9.9	42.01	41.70
	IMPORTED	4,381,820,805	324,832,742	-6.8	-2.4	41,350,750	3,006,035	-9.4	-5.1	8.83	9.01
	ITALY	1,439,027,273	98,111,517	-6.9	-2.4 -4.6	11,315,464	3,006,035 771,147	-9.4 -9.3	-5.1 -7.2	10.60	10.60
	AUSTRALIA	646,308,220	45,267,538	-12.5	-6.2	10,307,758	729,176	-12.5	-7.2	5.23	5.17
	FRANCE	628,847,885	55,845,746	-12.3	-1.9	3,351,419	298,386	-9.2	-7.6 -5.6	15.64	15.60
9	CHILE	360,976,920	25,854,950	-8.7	1.3	6,216,692	448,078	-7.7	1.5	4.84	4.81
)RTE	SPAIN	159,282,538	10,715,211	-4.7	-1.6	1,134,516	75,350	-8.3	-4.5	11.70	11.85
IMPORTED	GERMANY	78,628,956	5,483,507	-7.7	-4.3	667,364	46,257	-9.4	-5.6	9.82	9.88
_	NEW ZEALAND	650,637,574	55,244,339	0.9	5.5	4,423,523	368,692	-1.3	1.9	12.26	12.49
	ARGENTINA	302,033,840	19,655,563	-11.6	-8.8	3,004,248	197,466	-13.9	-11.9	8.38	8.30
	SOUTH AFRICA	25,783,784	1,876,515	-9.0	-1.7	215,089	15,685	-7.7	-4.2	9.99	9.97
	PORTUGAL	49,988,824	4,258,281	-7.8	3.1	483,804	40,844	-10.2	-1.6	8.61	8.69
	DOMESTIC	11,585,244,950	811,180,225	-5.3	-2.6	114,390,167	8,071,224	-8.8	-5.4	8.44	8.38
	CALIFORNIA	10,434,460,291	729,740,302	-4.8	-2.3	105,738,454	7,475,029	-8.4	-5.0	8.22	8.14
	WASHINGTON	581,643,100	41,305,114	-13.1	-6.9	4,562,070	320,086	-14.4	-10.4	10.63	10.75
TIC	OREGON	298,440,808	20,592,620	-5.1	-7.2	1,438,128	100,151	-7.6	-9.5	17.29	17.14
DOMESTIC	TEXAS	30,038,821	2,028,270	-14.5	-12.0	309,539	19,894	-19.6	-21.2	8.09	8.50
20	NEW YORK	44,153,023	4,639,975	0.2	18.6	453,768	34,599	-7.2	0.5	8.11	11.18
	NORTH CAROLINA	44,915,892	3,082,813	-3.0	0.2	443,042	29,622	-6.9	-7.8	8.45	8.67
	INDIANA	24,961,438	1,630,951	-6.8	-3.0	263,677	16,597	-8.6	-8.7	7.89	8.19
	MICHIGAN	25,692,071	1,642,155	-11.1	-7.8	252,715	15,168	-14.3	-11.9	8.47	9.02
S	RED	8,286,156,338	521,206,662	-6.4	-4.6	70,926,382	4,550,214	-10.0	-6.7	9.74	9.55
TYPES	WHITE PINK	6,511,293,980	509,135,942	-3.7	0.4	70,177,469	5,366,824	-6.7	-2.9	7.73	7.91
	TOTAL CHARDONNAY	1,162,394,762 2,709,463,381	105,605,401 207,287,392	-11.2 -3.9	-5.6 -0.8	14,568,514 28,723,828	1,159,640 2,170,091	-14.0 -6.8	-10.3 -3.5	6.65 7.86	7.59 7.96
	TOTAL CABERNET SAUVIGNON	3,166,102,100	201,318,883	-3.8	-2.7	25,293,333	1,642,941	-0.8 -7.3	-3.5 -4.3	10.43	10.21
	TOTAL PINOT GRIGIO/PINOT GRIS	1,470,295,789	117,035,024	-2.6	1.6	17,927,141	1,392,843	-4.8	-1.6	6.84	7.00
	TOTAL PINOT NOIR	1,334,302,456	84,907,879	-3.1	-1.5	9,004,790	576,558	-6.2	-3.2	12.35	12.27
	TOTAL MERLOT	619,073,644	40,057,989	-10.9	-8.2	7,758,147	511,126	-13.0	-9.7	6.65	6.53
	TOTAL SAUV BLANC/FUME	1,318,348,060	111,029,976	1.4	5.8	10,845,365	896,325	-1.1	3.1	10.13	10.32
S	TOTAL MUSCAT/MOSCATO	593,881,517	40,865,049	-13.2	-8.8	8,230,309	561,778	-15.5	-11.7	6.01	6.06
VARIETALS	TOTAL WHITE ZINFANDEL	222,134,191	16,063,652	-13.8	-9.1	4,280,860	304,441	-14.8	-11.4	4.32	4.40
WAR	TOTAL MALBEC	236,427,743	14,775,868	-10.6	-8.2	2,084,914	132,625	-11.6	-8.6	9.45	9.28
	TOTAL RIESLING	227,555,487	16,128,011	-11.0	-6.2	2,243,025	157,191	-13.1	-8.2	8.45	8.55
	TOTAL ZINFANDEL	209,910,536	12,954,399	-12.1	-9.9	1,338,483	81,907	-15.6	-12.9	13.07	13.18
	TOTAL SHIRAZ/SYRAH	110,233,539	7,005,557	-14.8	-9.1	1,119,678	71,663	-17.6	-11.9	8.20	8.15
	WHITE BLENDS (ex. 4/5L)	250,799,083	19,160,910	-7.5	-2.5	2,631,485	195,215	-10.4	-5.5	7.94	8.18
	RED BLENDS (ex. 4/5L + CHIANTI)	2,137,302,740	130,130,946	-8.7	-7.2	17,305,057	1,069,498	-12.3	-9.3	10.29	10.14
	ROSE BLEND	676,161,535	70,518,733	-9.7	-4.7	5,123,636	490,576	-13.5	-10.3	11.00	11.98
	750ML	11,939,405,443	837,202,471	-5.2	-2.8	82,422,168	5,722,627	-9.0	-6.3	12.07	12.19
ZES	1.5L	1,842,838,036	134,254,654	-9.9	-3.6	30,019,069	2,133,783	-11.3	-7.1	5.12	5.24
GLASS SIZES	3L	47,279,699	3,259,948	-13.3	-8.6	1,089,060	72,479	-17.1	-15.5	3.62	3.75
LAS	4L	65,305,275	4,613,527	-11.6	-6.2	1,971,927	135,877	-13.4	-9.8	2.76	2.83
5	187ML	87,066,567	6,147,624	-14.1	-11.5	975,861	68,854	-14.8	-13.4	7.44	7.44
	375ML	53,532,026	3,640,418	12.0	0.9	208,226	14,032	14.0	-2.4	21.42	21.62
	ex. 4/5L	1,112,591,318	84,601,075	-3.4	3.4	19,382,650	1,467,720	-3.3	3.2	4.78 5.00	4.80
ZES	1L 1.5L	34,932,627 18,255,267	2,695,335 1,236,266	2.3 -15.0	7.0 -10.2	494,987 333,041	38,038 22,269	2.2 -19.7	5.3 -13.5	5.88 4.57	5.91 4.63
BOX SIZES	3L	819,477,133	62,061,246	-15.0 -5.7	3.1	15,619,695	22,269 1,180,976	-19.7 -4.4	-13.5 3.5	4.37 4.37	4.03
B0,	5L	463,590,946	35,233,731	-5.7 -7.8	0.6	15,885,021	1,173,631	-4.4 -9.6	-4.0	2.43	2.50
	TETRA	275,195,906	21,301,276	4.6	5.2	3,429,366	263,775	3.9	3.3	6.69	0.00
	ce: NielsenIO	_, 0,100,000	_1,001,L10	7.0	5,2	5, 120,000	200,110	5.5	5.5	0.00	0.00

Source: NielsenIQ

2022 WINE INDUSTRY SALARY SURVEY REPORT

Average Salaries Up 6.1 Percent from 2021

Salaries rebound after pandemic lockdowns and employment shifts

Kerana Todorov

Kerana Todorov is a reporter based in Napa. She can be reached at kerana.todorov@gmail.com

THE ANNUAL WINE BUSINESS MONTHLY/Western Management Group Salary Survey Report indicates salaries rebounded in 2022 as the economy reopened after the pandemic-driven lockdowns.

The data indicate the average base salaries increased by 6.1 percent from early 2021. According to the report, the average base salary for an executive vice president of sales was a little more than \$288,200 in 2022—or 15.9 percent more than in 2021.

The *Wine Business Monthly*/Western Management Group Salary Survey Report collects data from wineries to record salary data, for a wide range of positions including chief executive officers to winemaking, viticulture, and sales and marketing representatives.

The pandemic-led lockdowns resulted in mass layoffs in 2020 and early 2021, particularly for those working in the tasting room or in the distribution space. In the wine industry, direct-to-consumer digital marketing and e-commerce grew dramatically as the only way to drive revenue.

Once business returned later in 2021 and into 2022, suppliers and distributors began to fund sales teams again, said John Chuharski, principal at Wine & Spirits Recruiting, though companies are still investing in digital marketing and direct-to-consumer roles. "Good people who deliver results are always in demand, and salaries have continued to increase in 2022 as the labor market continued to tighten," Chuharski said.

Norman Mitroff, founder and managing partner at Mitroff Consulting + Associates, said finance and marketing positions remain stable. On the other hand, hospitality salaries have increased due to the lack of qualified candidates for these roles—salary has become one of the strongest recruiting tools in this labor market.

Salaries for sales representatives, including direct-to-consumer positions, and managerial positions have increased, said Mitroff, who recruits for various industries, including the wine industry, from Washington state to Temecula, Calif., and other states. "The general overall operational roles remain fairly stable and consistent to what they have been over the last couple of years," Mitroff said.

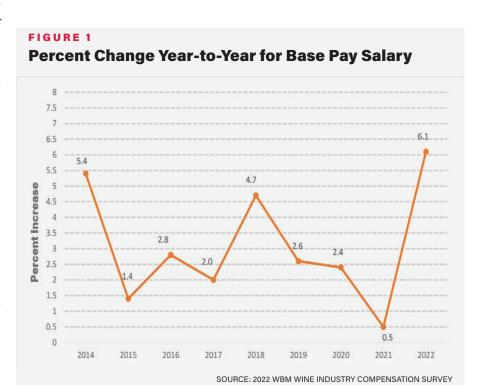
Hank Teahen, president at Teahen Group, said there are still fewer positions in the wine industry than before COVID-19. The on-premise need was high for candidates before the start of the pandemic, but that need evolved to off-premise candidates after so many on-premise accounts closed, he said. "Now we see the on-premise needs are rebounding," Teahen said. The main challenge for employers remains finding qualified talent, Teahen said.

It's Not Just About Salaries

At the time this issue went to print, the U.S. is facing the highest inflation rates in years as well as rising interest rates as the Federal Reserve tries to tamp down an overheated U.S. economy.

Potential candidates who are gainfully employed in managerial positions are not willing to leave their jobs because of ongoing insecurities about the economy, a potential recession and other woes that include the war in Ukraine and COVID-19, said Tom Hill, president of Hill and Associates.

"A lot of people aren't willing to take that risk and go outside of their comfort zone, because there's just too many other external things happening that they have no control over," Hill said.



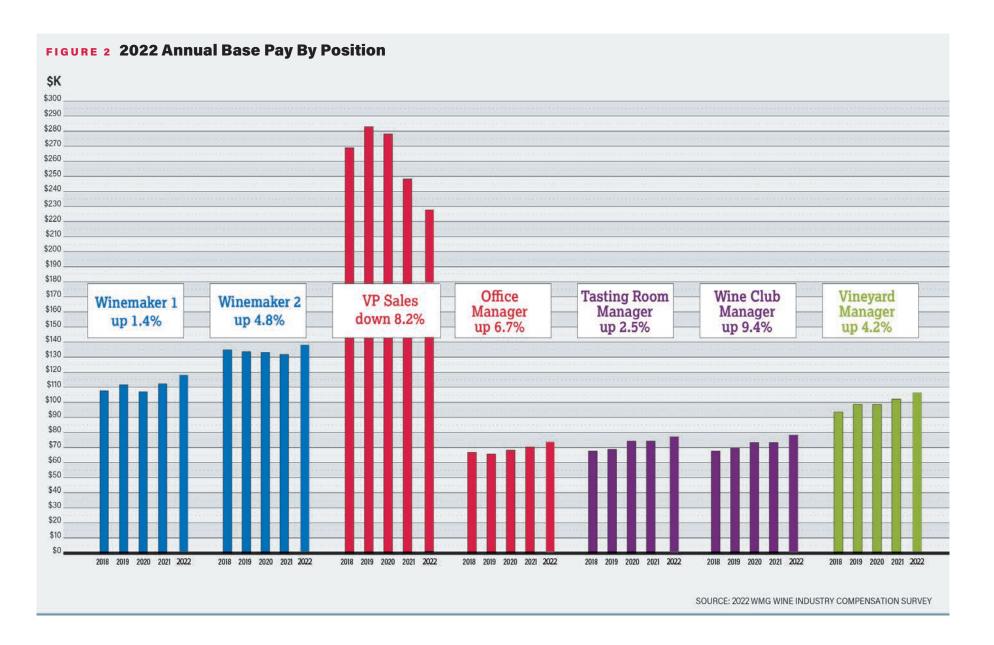
Companies are willing to pay sign-on bonuses simply because it is so difficult to fill these vacancies. Depending on the positions, these incentives rage from \$5,000 to \$10,000, Hill said. Two years ago, companies did not even need to offer sign-on bonuses, said Hill, who mostly recruits for executive-level positions.

A few years ago, employers could take their time hiring and interviewing many candidates, Hill said. "Well, now it's the other way around. It's a candidate-driven market. Candidates are more in control of their destiny," Hill said, adding that salaries are up because of this.

Chuharski said it is still an applicant-driven market for certain roles that did well through COVID-19. "There is high demand for experienced general managers, sales, marketing and digital/e-commerce professionals. As a result, we have seen compensation levels increase to attract the best talent."

Teahen said the biggest search category was for regional and national off-premise national account managers. "These positions are hard to fill because there is a need for candidates with buyer contacts, not just distributor management skills," Teahen said.





Region	Winemaker	Top Sales	Office Manager	Tasting Room Manager	Wine Club Manager	Vineyard Manager
Nationwide	\$98,041	\$85,978	\$57,953	\$60,711	\$62,880	\$70,707
Napa	\$120,780	\$119,696	\$61,132	\$75,778	\$76,847	\$104,870
Sonoma	\$114,790	\$100,196	\$68,592	\$72,000	\$72,697	\$80,154
California Other	\$90,750	\$97,750		\$51,000		
Central Coast	\$100,760	\$76,900	\$57,300	\$61,212	\$61,897	\$95,500
Virginia	\$86,455			\$58,506	\$56,566	\$61,447
Washington	\$90,583	\$73,298	\$58,940	\$54,650	\$57,631	
Oregon	\$160,069	\$96,318	\$68,820	\$62,944	\$61,526	\$55,000
Northwest	\$111,073	\$84,815	\$59,776	\$47,933	\$56,866	\$57,835
Midwest	\$64,639	\$56,614	\$52,524	\$51,189	\$47,000	\$55,235
Northeast	\$64,824	\$62,545	\$44,955	\$51,410	\$49,857	\$55,000
Mid-Atlantic	\$88,711	\$55,406	\$50,500	\$55,378	\$54,300	\$57,107
Pacific	\$108,519	\$104,394	\$64,632	\$69,289	\$69,989	\$89,680
Southwest	\$71,875	\$61,667		\$44,367	\$46,313	\$45,563



Inflation Aids in Salary Increases, Layoff Worries

Teahen also reported that salaries are rising to keep up with inflation.

Independently-owned wineries, unlike corporations, can adjust salaries as they need to attract the talent they want, Hill said. A winery seeking to fill a \$200,000 a year position, can offer \$230,000 to \$250,000—or whatever it takes to hire a potential candidate—for example.

Amy Gardner is the president of WineTalent and also fills executive and upper-management positions. She noted that there is some uncertainty about the future of the economy. "I think we are at a time of flux in the labor market," she said. However, while companies are still hiring, there is "a looming threat of potential layoffs."

To attract talent, companies used to offer candidates remote or hybrid jobs, Gardner said, but now more companies want their employees back to the office and prefer to limit remote and hybrid positions. The negotiating power is not necessarily on the candidate's side or the employer's side.

Some companies are "very open to wide salary ranges, while others are being conservative, keeping salaries closely within the budget the company built for the position," Gardner said.

Employers are recruiting from a smaller pool of available qualified candidates. "A lot of people moved out of wine country. And with high employment, there just are not a lot of job seekers for any job opening," she said.

What do those job seekers want? Higher salaries, positions that offer flexibility, a good work/life balance, career growth, remote/hybrid work opportunities, Gardner said. Workers are not willing to quit a job without obtaining an increase of at least \$10,000 in total compensation, she added.

Value-Based Positions

People have quit positions without new jobs lined up in numbers not seen in decades, Gardner said.

"Some people were wooed to a new job, just to find that the promises made at the new employer were empty," Gardner said. Recruiters can oversell a company and a vacant position, leaving new hires with "buyer's remorse,". In the end, some employees leave while others stay in the hope that the situation improves, she said.

Companies still pay bonuses to their employees, Gardner said. Sales employees "almost always" receive bonuses while hospitality employees, tasting room, wine club personnel and others in similar positions receive either commissions or bonuses, she said. Bonuses also tend to be paid to employees in management and executive-level positions, Gardner said.

Mitroff, founder and managing partner at Mitroff Consulting + Associates, said bonuses structures have remained in place for managerial and more senior management roles. His company advises clients that bonuses "should be predicated upon the employee meeting or exceeding the matrixes as stated in the position description," Mitroff said.

Teahen also said bonuses are still offered to employees in sales, marketing and senior managers. Companies also offer employees in senior positions long-term retention bonuses, he said.

Other incentives that have become "prevalent" include flexible hours and working remotely where possible, Mitroff said. Many wineries also offer wine allotment, he said. For example, each employee is allowed to have 12 wine cases annually.

Salaries by Winery

Administrative

Chief Executive Officer

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$	-\$
50,000 to 199,999	\$370,982	\$399,825
200,000 to 999,999	\$353,163	\$350,000
Over 1,000,000	\$790,627	\$500,000
Average of All Winery Sizes	\$504,924	

President

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$ 260,355	\$250,000
50,000 to 199,999	\$	\$
200,000 to 999,999	\$281,725	\$323,443
Over 1,000,000	\$	\$
Average of All Winery Sizes	\$271,040	

General Manager

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$190,030	\$175,000
50,000 to 199,999	\$292,991	\$282,149
200,000 to 999,999	\$177,366	\$178,592
Over 1,000,000	\$221,901	\$213,000
Average of All Winery Sizes	\$220,572	

Controller

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$144,138	\$140,128	
50,000 to 199,999	\$148,463	\$151,000	
200,000 to 999,999	\$163,350	\$165,000	
Over 1,000,000	\$159,770	\$150,000	
Average of All Winery Sizes	\$153,930		

Human Resources Director

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$	\$
50,000 to 199,999	\$169,775	\$178,500
200,000 to 999,999	\$132,714	\$138,000
Over 1,000,000	\$156,524	\$145,600
Average of All Winery Sizes	\$153,004	

Sales

Executive Vice President Sales

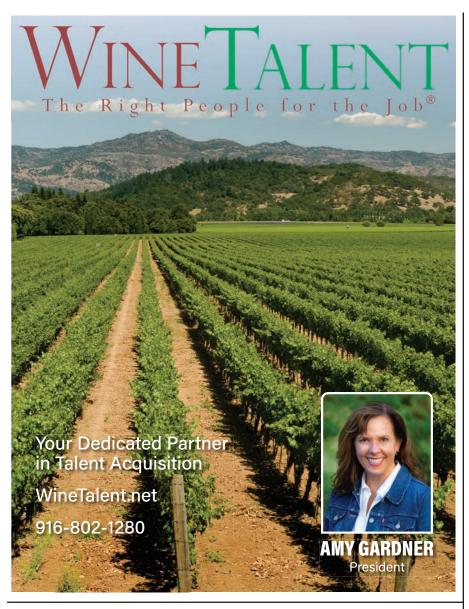
CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$	\$
50,000 to 199,999	\$262,450	\$250,000
200,000 to 999,999	\$253,883	\$242,295
Over 1,000,000	\$348,342	\$344,209
Average of All Winery Sizes	\$288,225.00	

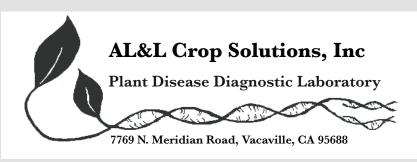
Case production categories with < 5 responses have been omitted.

Collaboration from manufacturing line to bottling line

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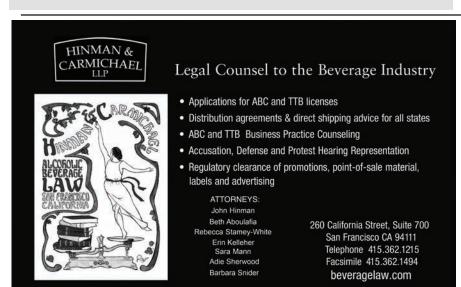






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Major Account Manager				
CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY		
Under 50,000	\$	\$		
50,000 to 199,999	\$146,331	\$127,447		
200,000 to 999,999	\$130,308	\$132,310		
Over 1,000,000	\$138,876	\$138,008		
Average of All Winery Sizes	\$138,505			

Marketing

Vice President Marketing

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$	\$	
50,000 to 199,999	\$	\$	
200,000 to 999,999	\$223,215	\$211,014	
Over 1,000,000	\$233,137	\$220,000	
Average of All Winery Sizes	\$228,176		

Public Relations Director

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$	\$	
50,000 to 199,999	\$	\$	
200,000 to 999,999	\$150,363	\$154,320	
Over 1,000,000	\$	\$	
Average of All Winery Sizes	\$150,363		

Wine Club Manager

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$76,380	\$72,800	
50,000 to 199,999	\$89,782	\$86,000	
200,000 to 999,999	\$71,401	\$73,500	
Over 1,000,000	\$82,135	\$81,689	
Average of All Winery Sizes	\$79,925		

Tasting Room Staff 2

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$44,942	\$48,568	
50,000 to 199,999	\$43,626	\$47,840	
200,000 to 999,999	\$38,974	\$38,480	
Over 1,000,000	\$43,852	\$43,930	
Average of All Winery Sizes	\$42,849		

Special Events Coordinator

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$52,490	\$50,357	
50,000 to 199,999	\$51,897	\$53,040	
200,000 to 999,999	\$47,200	\$42,432	
Over 1,000,000	\$53,142	\$56,000	
Average of All Winery Sizes	\$51,182		

Tasting Room Manager

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$74,481	\$72,000	
50,000 to 199,999	\$76,940	\$78,797	
200,000 to 999,999	\$79,499	\$80,250	
Over 1,000,000	\$72,424	\$74,000	
Average of All Winery Sizes	\$75,836		

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What are the Hardest Positions to Fill?

Hill, a headhunter for 37 years, said sales managers, presidents, vice presidents, general managers and directors of sales and marketing, are currently among the most challenging positions to fill. A search for a company president may only include four or five candidates, he said, but the search for a sales representative may attract 100 candidates, Hill added.

Gardner said the hardest positions to fill are those at companies with issues. "This could be difficult ownership, ill-defined goals for a position, or perhaps financial instability," Gardner said. Mitroff also stressed the importance of company culture in recruiting efforts. "The employer should be highlighting specific benefits and values of joining their winery," he said.

Winemaking

Assistant Winemaker

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$82,181	\$80,000
50,000 to 199,999	\$83,027	\$85,000
200,000 to 999,999	\$79,666	\$82,505
Over 1,000,000	\$78,254	\$78,218
Average of All Winery Sizes	\$80,782	

Winemaker 1

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$111,635	\$108,000	
50,000 to 199,999	\$121,427	\$123,000	
200,000 to 999,999	\$111,261	\$114,186	
Over 1,000,000	\$110,885	\$109,200	
Average of All Winery Sizes	\$113,802		

Winemaker 2

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$142,234	\$133,570
50,000 to 199,999	\$141,237	\$133,440
200,000 to 999,999	\$132,194	\$133,654
Over 1,000,000	\$133,598	\$131,840
Average of All Winery Sizes	\$137,316	

Winemaking Director

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$177,833	\$166,200	
50,000 to 199,999	\$169,789	\$170,080	
200,000 to 999,999	\$180,176	\$177,840	
Over 1,000,000	\$172,127	\$184,790	
Average of All Winery Sizes	\$174,981		

Enologist 2

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$67,640	\$66,997	
50,000 to 199,999	\$56,376	\$56,160	
200,000 to 999,999	\$62,401	\$60,316	
Over 1,000,000	\$62,147	\$60,980	
Average of All Winery Sizes	\$62,141		

Case production categories with < 5 responses have been omitted.

Lab	Technician	2
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CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY
Under 50,000	\$52,437	\$48,443
50,000 to 199,999	\$45,231	\$44,720
200,000 to 999,999	\$49,156	\$45,850
Over 1,000,000	\$50,613	\$55,003
Average of All Winery Sizes	\$49,359.25	

Lab Manager

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$	\$	
50,000 to 199,999	\$	\$	
200,000 to 999,999	\$83,696	\$82,400	
Over 1,000,000	\$98,690	\$92,691	
Average of All Winery Sizes	\$91,193		

Cellar Worker 2

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$46,721	\$45,760	
50,000 to 199,999	\$45,833	\$45,760	
200,000 to 999,999	\$43,616	\$44,096	
Over 1,000,000	\$48,919	\$47,840	
Average of All Winery Sizes	\$46,272		

Cellar Master

CASE PRODUCTION	AVERAGE SALARY	MEDIAN SALARY	
Under 50,000	\$79,694	\$77,500	
50,000 to 199,999	\$78,598	\$75,142	
200,000 to 999,999	\$90,357	\$90,560	
Over 1,000,000	\$91,642	\$91,785	
Average of All Winery Sizes	\$85,073		

Vineyard

Vineyard Manager

Case Production	Employee Weighted Average Salary	Median Salary	
Under 50,000	\$111,862	\$112,000	
50,000 to 199,999	\$105,188	\$100,200	
200,000 to 999,999	\$99,667	\$95,000	
Over 1,000,000	\$105,407	\$104,142	
Average of All Wine	ry Sizes \$105,531		

SOURCE: 2022 WMG WINE INDUSTRY COMPENSATION SURVEY

Case production categories with < 5 responses have been omitted.

Enologist 2 Under limited supervision, conducts and analyzes laboratory/ quality control tests. Supervise workers in the crushing and fermentation process, following legal and regulatory practices and record-keeping requirements. In smaller operations, they may do these processing duties themselves.

Lab Technician 2 Under limited supervision, conducts and analyzes laboratory/quality control tests. This is not an entry level position.

Cellar Worker 2 Under limited supervision, performs various work assignments. May direct less skilled workers. May assist in the training of less skilled workers. Sterilizes cask, tanks and other equipment

Case production categories with < 5 responses have been omitted.

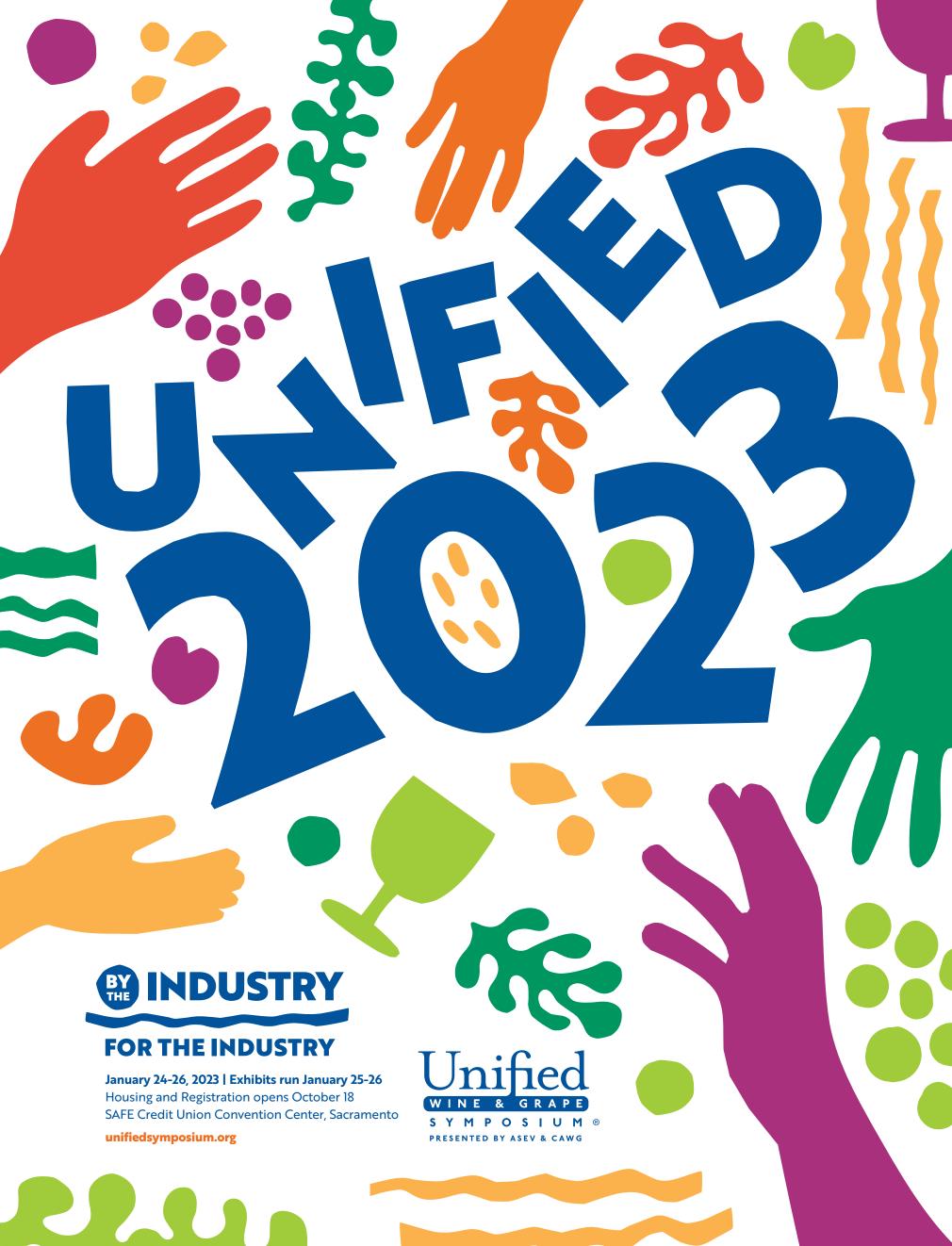


FIGURE 4 Average Base Salaries for Wineries Producing Fewer than 50,000 Annual Cases

Case Production	< 2,499	2,500 - 4,999	5,000 - 9,999	10,000 to 24,999	25,000 to 49,999
Winemaker	\$57,755	\$92,763	\$113,528	\$104,734	\$116,878
Top Sales (executive VP Sales/ national sales manager)	\$62,302	\$83,560	\$78,651	\$94,230	\$116,795
Office Manager	\$51,866	\$55,186	\$59,037	\$61,154	\$60,296
Tasting Room Manager	\$47,953	\$59,237	\$60,013	\$61,736	\$72,933
Wine Club Manager	\$44,719	\$63,985	\$59,433	\$63,822	\$71,755
Vineyard Manager	\$62,889	\$78,795	\$64,292	\$71,014	\$88,176

SOURCE: 2022 WBM Salary Survey

Some of the most successful, well-established wineries work to maintain their staff. They started working on their culture 20, 30 years ago. Others are learning.

"You really have to have a work culture that attracts the right kind of person," Mitroff said. "And unfortunately, there's still some wineries no matter how large or small they are, that don't understand that or they perhaps understand that they just don't want to accept it."

When hiring, conveying a company's work culture and performing culture-fit assessments "maximizes the probability" that a future employee will fit well at a winery, said Mitroff. Such assessments include standardized industrial psychological profiling tools.

Mitroff coaches clients and reminds them that money is not everything. "You can't just attract people on money. Companies do have to pay employees fairly and appropriately, but most important, is the work culture," he said.



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Mitroff Consulting & Associates	St. Helena, CA	(707) 963-8410	mitroffconsulting.com
NCKT Consulting	Santa Rosa, CA	(707) 254-5624	ncktconsulting.com
Nelson & Associates - Financial Recruiting & Consulting	Santa Rosa, CA	(707) 576-1662	nelsonandassociates.com
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Recruiting Associates Network	Santa Rosa, CA	(707) 931-4707	recruitingassociatesnetwork.com
The Cypress Group	Rutherford, CA	(707) 963-8455	cypress-grp.com
The Personnel Perspective	Santa Rosa, CA	(707) 576-5673	personnelperspective.com
The Teahen Group	Temecula, CA	(951) 587-2675	teahengroup.com
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"'Why do I want to stay and work here?" Mitroff asked, speaking from an employee's point of view. "'What do I enjoy? What's the pleasure of being here?' The most talented candidates are always in high demand," Mitroff said.

Does Covid Still Affect Hiring?

When it comes to Covid-19, Gardner said everyone has "pandemic fatigue." Covid-19 is not the business concern it was in the beginning of the pandemic, Gardner said. "Probably the issue is finding people that will come into the office if they were previously working remotely," she said.

Salespeople still work remotely as they have for decades, Gardner said. They travel less and have more virtual meetings than before the pandemic. Also working remotely are employees in marketing, some hospitality management positions and administrative roles. But tasting room, winemaking, cellar, vineyard jobs remain in-person positions and these candidates are not requesting remote work.

Conclusions

Teahen and other headhunters expect salaries will increase until the spring of 2023 to keep up with inflation. Positions remain difficult to fill, said Teahen, who maintains 4,000 résumés in his database. "That helps a lot," he said.

Gardner anticipates "some stagnation" on salaries, with employees staying with their companies, despite a lack of raises due to recession concerns. But "smart" companies also understand the need for appropriate cost-of-living salary adjustments. "I would like a crystal ball on this one," Gardner said.

Mitroff agreed. "Salaries will either remain stable or increase based on the political climate, economic health of the country and health factors."

Chuharski said top performers are always in demand. He expects the same n 2023.

"We'll continue to see that demand for creative, results-driven marketing people (across brand, trade/field, digital, e-commerce, DTC), proven salespeople, and other leadership positions that promote a positive culture and work environment, solution-minded problem-solving and ability to adapt to changes in technology and market patterns," he said. "This high demand will continue to support higher compensation for good people." WBM

Methodology

For this survey, *Wine Business Monthly* partnered with an independent consulting firm that specializes in compensation and salary surveys. The firm, Western Management Group, in Los Gatos, California, has conducted this salary survey since 1991. For more information, visit www.wmgnet.com or call 408-596-7372, to reach Donna Bowman, Survey Director.

The data was collected with an effective date of February 1, 2022. For the under 50,000 cases" data, this survey polled 244 cases, 19.3 percent produce under 2,499 cases, 22.1 percent produce between 2,500 and 4,999 cases, 21.7 percent produce between 5,000 and9,999 cases, and 23.0 percent produce more than 10,000 cases to 24,999, and 13.9 percent between 25,000 to 49,999.

Geographically, 22.1 percent of these respondents were from Napa County, 16.0 percent from Sonoma County, 8.6 percent from California's Central Coast, 4.5 percent Other California, 8.2 percent Oregon, 9.0 percent Washington, and 27.8 percent from all other states.

Regions include the following states: Mid-Atlantic (DC, DE, MD, NC, SC, VA, WV), Midwest (IA, IL, IN, KS, KY, MI, MN, MO, ND, NE, OH, SD, WI), Mountain (CO, MT, UT, WY) Northeast (CT, MA, ME, NH, NJ, NY, PA, RI, VT), Northwest (ID, OR, WA), Pacific (CA, NV), Southeast (AL, AR, FL, GA, LA, MS, TN) Southwest (AZ, NM, OK, TX).





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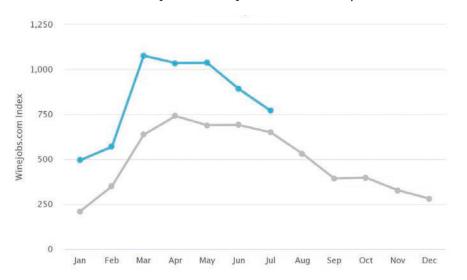
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Winejobs Data Reveal Recruiting Remains Strong

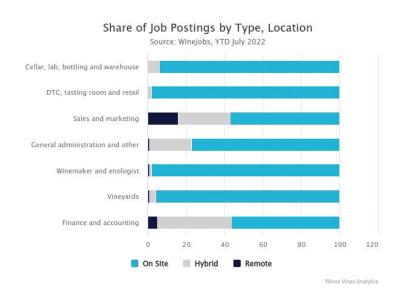
Andrew Adams

THROUGH THE TUMULT OF the past two years, *Winejobs.com's* Winery Job Index has steadily remained higher than normal, with the latest data putting it 19 percent above where it was in July 2021.

The winery hiring demand reflected by *Winejobs.com* postings follow the wider U.S. economy, according to iCIMS which provides recruiting services for over 4,000 companies that employ more than 34 million people around the world. In a June report, the company put the U.S. "still squarely in a red-hot labor market despite media reports to the contrary."



Led by an 8 percent gain in retail job postings, iCIMS found total job postings were up 3 percent since January 2022. While the tech sector has been the focus of many lackluster predictions for the rest of the year, iCIMS reported a 14 percent gain in tech hires with a 4 percent increase in job openings since the start of the year. Rather than seeing a decline in hiring and recruiting from the tech sector, the self-described "talent cloud company" found the applicants per opening for tech jobs had fallen from 32

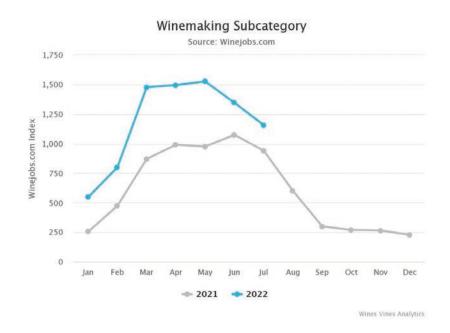


in May 2020 to 26 in May of this year, indicating an expanding gap between talent supply and demand for workers.

A similar trend appears to be in play in the wine industry as job postings tied to the index remain much higher than in 2021. Nearly 80 percent of all job postings are by wineries in California, and many of those are for companies in Napa or Sonoma counties where the cost of living has made winery recruiting challenging even before the pandemic. Higher gas prices are just one of several factors that may be dissuading someone who lives in Santa Rosa, for example, from taking a tasting room job in nearby Calistoga, yet those same costs may also be bringing people who dropped out of the labor pool, during the pandemic, back into the job market.

Even as seasonal hiring demand has slowed, winery recruiting remains strong, according to the latest Winery Job Index data. The index is tied to the number of postings and includes subindices by job function.

The main index for July increased 19 percent versus a year earlier to 769. Growth versus a year ago continued to moderate, but demand remained at



y, Bedell Cellars and Corey Creek Vineyards, Bell Wine Cellars, Ben y, Benziger Family Winery, Bergevin Lane Vineyards, Bergstrom Win Winery and Tasting Room, Black Hills Estate Winery, Black Stallion y, Blackbird Vineyards, Bogle Vineyards, Bouchaine Vineyards, Buc The Wine Industry's Leading Online Job Site Cakebre Cameron Hughes Wine Co., Castello di Amorosa, Caymus Vineyards, state Vineyards & Winery, Chance Creek Vineyards (Bock), Chappell harles Krug Winey, Chateau Bianca, Mateau Diar, Chateau Mont state Wines, Darioush Winery, Dashe Cellars, Darid Procedingry, I ards, Del Dotto Vineyards, Delicato Vineyards Custon Resource Gr ne Estates, Diageo Chateau & Estate Wines, Dierberg/Star Lane Vine ine Carneros, Ltd., Domaine Chandon, Domaine Serene Vineyards & on Sebastiani & Sons, Dono Dal Cielo Vineyard, Dry Creek Vineyard Vin Moretwinerieseuse wine obs.com at ne, Fantesca Estate & Winery, Far Niente Winery, Ferrari-Carano Vin y, ithanianyFotherionline jobisitery & V Family Wines, Francis Ford Coppola Presents, Frank Family Vineyar Sonoma Caves, Fritz Winery, Frog's Leap Winery, Galante Family Wi ra Wine Cellars, Goosecross Cellars, Grgich Hills Estate, Groth Vine y, Gundlach Bundschu Winery, Hagafen Cellars, Hahn Family Wine Created & Managed by ly Estate, Heitz Wine Cellars, Hess Co Vinery, Hudson Vinevards, Ironstone Vineyards, J.F.J. Bronco Winery ard: W.NEBUSINESS: MONTH LYick Neal & Son Vineyard Mgn ordan Vineyard & Winery, Joseph Phelps Vineyards, Justin Vineyards eller Estate, Kendall-Jackson, Kenneth Volk Vineyards, Kenzo Estate. Winery, Knights Bridge Winery, Korbel Champagne Cellars, Krupp s/Stagecoach Vineyards, Kunde Family Estate, La Crema, Laird Fam ambert Bridge Winery, Lancaster Estate, LangeTwins Winery & Vin n Winery & Vineyards, Lewis Cellars, Littorai Wines, Long Meadow y, Lucas & Lewellen Vineyards, Lynmar Winery, Marimar Estate Vin erv. Martinelli Winerv. Medlock Ames. Mendocino Wine Co./Parduc

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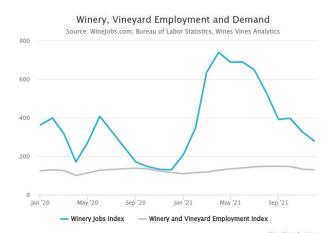
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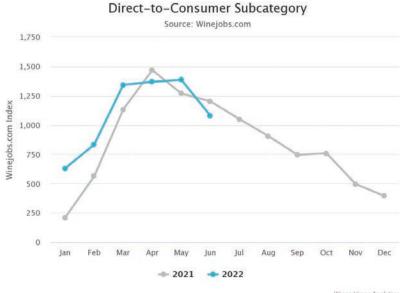
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historically high levels. This year and last saw the highest July index values on record as wineries sought to fill positions vacated during the pandemic.

Among the major subindices, winemaking and production roles remained the largest component of the overall index, with the subindex rising 23 percent versus a year ago to 1,157. DTC roles, including tasting room and retail staff, comprised the second most important component of the overall index, despite a scant 1 percent decline in the subindex versus a year ago to 1,046. Sales and marketing, the smallest component of the overall index, saw demand increase 19 percent to 319.



Wines Vines Analytics

The strongest demand was for vineyard labor, up 58 percent as wineries sought help for what was shaping up to be an early harvest. General administrative roles were close behind, with demand rising 55 percent. The strength of these sectors off-set the minor decline in demand for DTC roles, highlighting that labor requirements in the wine sector are broad-based and not simply driven by a return to pre-COVID consumer. Most important, the Winery Job Index is exhibiting typical seasonal patterns, even as index values remain elevated.

In addition to indicating winery recruiting demand, the *Winejobs.com* data also show how winery hiring has changed over the past two years—or hasn't.

While the wider U.S. economy continues to transition to more workers in remote or hybrid positions, the wine industry appears to remain largely on-site. Based on jobs posted over the past year through July, 83 percent were described as on-site positions compared to 13 percent for hybrid roles and just 4 percent for fully remote jobs. Most of those remote jobs fall under sales, administration and accounting while nearly all production and tasting room roles are understandably on-site. These on-site jobs, however, are the most likely to come with hiring bonuses, but only 3 percent of all jobs posted this year offered bonuses, and 80 percent of those were for production or DTC jobs.



The largest U.S. wineries claimed nearly 60 percent of all job postings to date in 2022, compared to 45 percent in 2021. Last year, small wineries, or those producing between 5,000 and 49,999 cases, accounted for 24 percent of all job postings, which declined to 18 percent this year. Compared to 2019, job postings by wineries that make fewer than 1,000 cases in 2021 more than doubled while postings by the largest wineries increased 37 percent, and those from wineries producing between 50,000 and 499,999 cases increased 68 percent.

That recovery from 2020 has been fueled, in part, by a reliance on data to support a greater range of winery positions, from production to e-commerce. Compared to 2020, jobs posted with "data, analyst or analytics" increased by 80 percent, and the total number of such jobs posted just through July 2022 is already 73 percent more than in all of 2021. These jobs still represent a small portion of all the jobs posted to *Winejobs.com*.

In both 2021 and this year to date, most of these jobs are for roles within administration, finance and accounting, but the most dramatic growth has come from data jobs within production. In 2019, there were less than two dozen postings for analyst jobs in production, but there have been more than 100 this year. **WBM**



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Wineries and Winemaking



Steven Urberg

Purple Brands appointed Steven Urberg as the director of winemaking for all brands including Raeburn, Scattered Peaks, Avalon, and Four Vines. Urberg's hiring comes as Purple Brands continues to increase sales and drive innovation. Urberg brings over 25-years of winemaking experience most recently as director of winemaking at Gloria Ferrer Winery & WindVane Wines in Sonoma, CA where he received over one hundred and thirty 90+point ratings from Wine Spectator and Wine Enthusiast. Urberg has experience directing winery and cellar operations, managing facility upgrades, sourcing, and planning.



Patrick Kerrigan

Scheid Family Wines welcomed Patrick "Pat" Kerrigan to its sales team as a regional sales manager. Reporting to national sales director Henry Politz, Kerrigan will lead the Southeast Sales Region covering Kentucky, Tennessee, West Virginia, Virginia, Maryland, North Carolina, South Carolina, Alabama, Georgia and Florida and strategically expand the Scheid Family Wines growing portfolio of global wine brands. Kerrigan joins the Scheid team with decades of wine industry experience. Most recently, he worked for Lipman Brothers of Tennessee for over 20 years in various roles including director of sales, wine business unit director, and private label wine development director.

Megan Schofield joined the team at Joel Gott Wines as director of winemaking, from Robert Mondavi Winery in Oakville. Schofield has had an impressive winemaking career with stints at Buena Vista, Simi Winery, Charles Smith and Hogue in Washington, and two stints at Robert Mondavi Oakville, initially as the white and Pinot Noir winemaker and most recently as the director of winemaking.



Alison Crary

Foley Family Wines, a family-owned wine company founded in 1996, hired Alison Crary Rodriguez as winemaker for Silverado Vineyards. Foley Family Wines acquired the Napa Valley winery and estate in July, expanding the company's luxury wine portfolio. Rodriguez oversees all winemaking activities for Silverado and its estate vineyards in the Stags Leap District, Coombsville, Yountville, and Napa AVAs. Rodriguez brings over 25 years of wine industry experience that began with global sales and marketing roles at E. & J. Gallo Winery and vineyard and enology positions in the Rheingau, Alto Adige, and California. Rodriguez's winemaking experience includes Acacia, Sterling, Beringer, and most recently The Hess Collection.

The Cakebread Cellars family appointed Gina Charbonneau as vice president of culture and talent development. Charbonneau arrives at Cakebread Cellars with an extensive background in human resources, as well as certifications in diversity and inclusion, training intervention procedures, and agile performance management. Previously, Charbonneau served as executive vice president, people operations at Francis Ford Coppola Winery, where she began her career in the wine industry in 2008. She earned her Bachelor's degree at California State University, Chico and her Master's degree in human resources and organization development from University of San Francisco.



Garrett Hales

Burgess named Garrett Hales as estate director. Prior to transitioning into his new role at Burgess, Hales was the hospitality manager at Heitz Cellar, leading the hospitality team at the newly re-opened Heitz Cellar Tasting Salon. Hales oversees all estate operations, including hospitality, membership, branding, and more. He graduated from the University of Colorado in 2014 with a Bachelor of Arts Degree in Political Science. Post-graduation, Hales made the bold decision to follow his passion and pursue a career in fine wine and hospitality.



Matt Ward

Pride Mountain Vineyards announced that Matt Ward, formerly of Atelier Melka, has joined the team as winemaker. Ward pursued his graduate degree in Viticulture and Enology from UC Davis. Upon receiving his Master of Science degree, he accepted a harvest position at Screaming Eagle and spent seven months in the cellar there before heading to New Zealand to lead a team making Bordeaux varieties at Craggy Range. Back in California for harvest 2017, Ward joined Atelier Melka, where he has been making wines for more than 20 clients.

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It's Just Wine



Jake" at the counter of Chuy Palacios' Carne y Caldo restaurant. For the first their wine, too many winemakers chase high scores and celebrity clients. time in eight weeks, Chuy's legendary pozole is being served. A three-day separately and later blended to produce an ethereal broth. Special heritage thing else will fall into place. You don't need to chase it. hominy, an incredibly complex red chili sauce and chopped-up bits of all loves Chuy's pozole, and I have missed it.

y Caldo almost weekly until the food critic from the big city newspaper izing, and heaven help you if that hose plugs up. There is something regal happened upon it and delivered a glowing review. Tourists descended upon about wine resting in stacks of oak barrels, especially when they are in a Carne y Caldo, like phylloxera in a vineyard planted to AXR-1 rootstock. never-ending cave. Even the monotony of a bottling line sometimes gives Chuy couldn't deal with the onslaught, so rather than deal with the hordes of way to the magnificent pleasure of watching a perfectly tuned mechanical tourists, Chuy disappeared his pozole.

"It's just soup," he whined, "but they all want to make it more than it is."

style empanadas. He massages amazing flavors from simple ingredients to life, what more do you need? concoct signature dishes, like Chipotle Smoked Avocado Ensalada, a Charred Octopus Taco or a Huitlacoche Risotto.

Chuy is a chef. Cooking food is what he does. That Chuy Palacios chooses to focus on Mexicano food and does a masterful job is good fortune for Jake Lorenzo and the rest of the locals who know about him. Coming up with an idea, sourcing the right components, working out the kinks and plating up a mouthwatering plate of food gives Chuy pleasure. Having a customer devour his creation and wipe the plate clean is the only critique he wants.

Chuy Palacios knows when he has made a good dish. He doesn't need a restaurant reviewer to confirm what he already knows. His food is subtly spend time as the center of attention can get swelled heads. Reading your own complex but not fancy. It is delicious in an effortless way that approaches press releases is no way to judge progress. Think back to what attracted you perfection. When customers take pictures of his food, he rants, "It's just an to winemaking in the first place and remember how proud you were of the enchilada. You're supposed to eat it, not photograph it. This is a restaurant, demanding work that turned grapes into magic in a bottle. Try to remember not a photography studio."

As much as he rebels against publicity and putting himself in the limelight, you could take pride. Chuy understands that a restaurant is also a business. A business must make it. It will come to me."

Producing an enchanting bottle of wine doesn't give most winemakers the Jake Lorenzo. supreme satisfaction Chuy gets from creating a delectable bowl of soup. Rather

IT'S A GOOD DAY for Jake Lorenzo, who is sitting in his "silla de than take satisfaction from the approval of regular people enjoying a bottle of

Wineries should make wine and focus less on being tourist centers or undertaking, Chuy's pozole uses pork feet, snout, neck and skin, all cooked wedding centers, concert halls or art museums. If the wine is good, every-

If you do it right, winemaking should be fun. Walking vineyards and the pork parts, swim in the bowl, awaiting your personalized additions of tasting grapes, while pulling samples, could be one of the most satisfying cilantro, shredded cabbage, sliced radish and Mexican oregano. Jake Lorenzo jobs on earth. Speeding around in a forklift, off-loading bins of grapes and dumping them into the hopper requires skill and experience. Watching grape The pozole has always been special, and it appeared regularly at Carne must pulsate through a six-inch hose on its way to a press can be mesmersystem operate correctly.

Reputation is more than scores in a magazine, and being famous is never as That got Jake Lorenzo thinking. Chuy's been making pozole for years. important as being good at what you do. If you set out to make wine and you Always delicious, it remains just one of his classic dishes. His barbacoa is have succeeded at putting that magic in a bottle, that should be satisfaction a perfect blend of spices and chiles slow-cooked until the meat is fall-apart enough. If the quality of your product is consistent and can be counted on tender. His cold cucumber/avocado gazpacho is remarkably refreshing on a year after year, then you are successful. If making wine remains a challenge warm summer afternoon. His simple enchiladas . . . perfection. Everything and still gives you joy, then you are lucky indeed. If your wine business is he makes is scrumptious, from his Chiapanecan tamales to his Argentinian- providing a living wage for your employees and allowing you to live a decent

> Winemakers that bask in adulation, surrounded by glitz and glamour, and spend time as the center of attention can get swelled heads.

Winemakers that bask in adulation, surrounded by glitz and glamour, and the taste of that first successful bottling. That was an achievement in which

Jake Lorenzo is a private eye, but I am also a winemaker. Making wine is enough profit to keep going, to pay the workers a living wage and allow the what I do. Sourcing grapes, picking them when perfectly ripe, fermenting owner to live a decent life. This responsibility sometimes seduces people into them in my little winery and patiently allowing them to age in barrels gives following social media and chasing publicity. Chuy has a different approach: this detective pleasure. My wines aren't entered in competitions or offered "If the food is good, everything else will fall into place. I don't need to chase at fancy auctions. This detective knows when he has made a good bottle of wine. I don't need some wine writer to give me a 95-point score. Having a Jake Lorenzo wishes more winemakers thought like Chuy Palacios. friend take a sip, smile, and reach out to clink glasses is praise enough for

It's just a bottle of wine. No need to make it more than it is. WBM

Sam Parra, owner and winemaker, Parra Wine Co., Dallas, OR

ABOUT PARRA WINE CO: I source varietals away from the norm here in the Willamette Valley, but I am also adding wine projects from other regions of Oregon and making bubbles in 2022.

ANNUAL CASE PRODUCTION: 550

CAREER BACKGROUND: My career background is in sales, wine distribution and marketing, but my career started at Pine Ridge Winery located in the Stag's Leap District. It was through them that I first got to visit the Willamette Valley in 2000 and fell in love with this valley immediately.

WHAT HAS BEEN YOUR BIGGEST PROFESSIONAL

CHALLENGE? My biggest professional challenge is happening now: the cost of products, the cost of everything, going up. It affects us, the boutique wine brands, more. We pay more for everything since we only place minimum quantities on labels, bottles, corks, grape contacts, etc. The cost of goods keeps going up and the wine market expects prices for Oregon wines to remain at value levels. This has to change since the Willamette Valley received PGI designation from the European Union.

I feel that the U.S. maker can still rely on Oregon-designated brands to stay low cost, but only when it comes to the Willamette Valley. We need more credit and recognition for what we are accomplishing across the entire state.

VARIETALS THAT YOUR WINERY IS KNOWN FOR: Coolclimate Syrah and Tempranillo on the reds. Riesling for the whites, plus my delicious Alsatian white dessert wine.



I happened to save this article, "Trends In Winemaking: Two new approaches to smoke taint mitigation" by Cyril Penn from April 22, 2021.

I happen to pay close attention to this in case if smoke taint continues to be the norm. The article highlights a disconnect between testing for smoke taint compounds and what people are tasting. I agree with this. Minimal smoke taint compounds are not a flaw on wines for certain smoke taint feared vintages. Some wine producers may use new treatment they are not familiar with and what will be the result. They may strip compounds that benefit aromas or flavors. Then the mouthfeel may change on the wine.

2020 was a true experimental year for smoke taint. One choice I made was to pick some of my varietals earlier than normal. I did end up with a lower alcohol percentage, but the acidity was beautiful.

As a result, my lower, moderate alcohol wines sold really well. Consumers were loving the natural approach I took that vintage. When my wines were released so were articles on trends for lower alcohol wines. My wine release was perfect!!



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