WINE BUSINESS MONTHLY

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The Future of Resistant Grape Varieties

Plus:

New Insights into Bound SO_2 and Wine Oxidation

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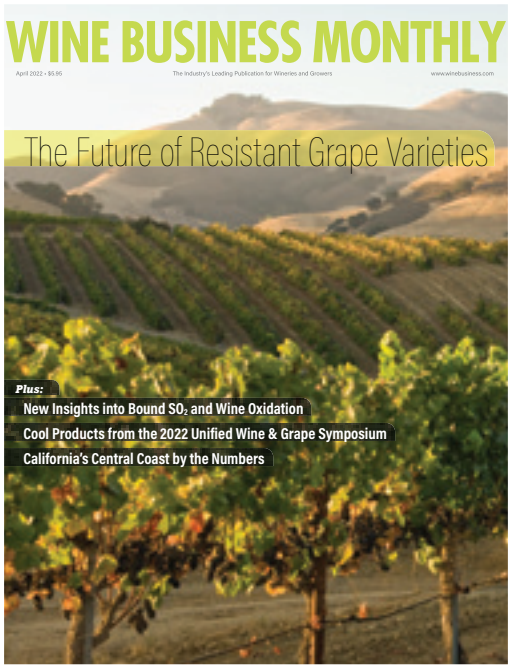
AS THE APRIL ISSUE heads out to subscribers, the *Wine Business Monthly* team is gearing up for the WiVi Central Coast trade show. After a two-year hiatus, we're excited the event is back and are looking forward to seeing many of you there. An article in this issue looks at the role the Central Coast plays in context of the overall wine business through the lens of the data. There are currently 945 wineries in the Central Coast, but one of the hallmarks of the Central Coast is its diversity—from Paso Robles to San Luis Obispo, Monterey to Santa Barbara, Cabernet to Pinot Noir, Chardonnay to Viognier. We're keeping a close eye on all that's happening in the area.



This issue highlights innovative products from the recent Unified Wine & Grape Symposium. There's a lot going on in terms of vineyard automation and with improvements to presses, sorting machines, wine analysis, and more. Unified wasn't as well attended as it was way back in 2020 (for obvious reasons), but the mood was upbeat. The glass was at least half-full: more than 6,000 people showed up and seemed quite happy to be there.

This issue has a lot of material one can sink their teeth into. I particularly liked the discussion about clonal selection and new rootstocks. Winemakers will probably enjoy (maybe that's the wrong word—they'll at least want to read) the article about new insights into bound SO_2 and wine oxidation, even if it gets technically challenging for the lay reader.

Sparkling wines are increasingly popular with consumers and more wineries are making them, but *méthode Champenoise* production is time consuming and expensive, which is why a lot of wineries work with custom crush facilities for their bubbles, if they make any. Sparkling is trending in Oregon, where there are nearly 900 wineries and 197 make sparkling wine according to Wines Vines Analytics. One of the reasons for this is that there's a company helping local wineries make their own sparkling wines. This month's technical review focuses on a venture that takes most of the difficulty out of *méthode Champenoise* production while helping wineries create their own style. They've been doing this for some time but have mostly flown under the radar.

Making great wines is about terroir and style. This month, a winery owner in Virginia shares what he's learned about producing wines with terroir expression and what it requires.

Making great wine is one thing—but selling it is another. The April issue sheds light on retail sales trends, digital marketing, packaging, and wellness for wine professionals.

Cyril Penn – Editor

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CONTENTS

April 2022 ▪ Volume XXIX No. 4 ▪ The Industry's Leading Publication for Wineries and Growers ▪ **winebusiness.com**

winemaking

TECHNICAL REVIEW

WINEMAKER TRIAL

BUYER'S GUIDE

ASEV 2021 Keynote Lecture:

grape growing

sales & marketing

PACK DESIGN SHOWCASE

RETAIL SALES ANALYSIS

technology & business

Departments

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Ann Mukherjee

CEO and chairwoman, Pernod Ricard, "Is Wellness for Wine Professionals the Industry's Achilles Heel?" page 72

"The mental wellbeing of our employees is a top priority for me. As we continue to move through and beyond this pandemic, it is not only about keeping our employees physically safe but keeping them mentally safe as well."

Loni Lyttle

author, "Resistant Varieties: The Next Step Toward Sustainability," page 54

"A recent blind tasting of 52 hybrid varieties showed that more than half of the reds were equivalent or superior to the reference Merlot wine. Almost a third of the whites measured up to or were better than the reference Chardonnay."

Shane Moore

winemaker, Gran Moraine, "Technical Review: Radiant Sparkling Wine Company," page 12

"Willamette Valley sparkling wine is becoming a real category—without Radiant, this would have maybe taken an extra 20 years or maybe never would have happened at all. I know for a fact if Radiant wasn't providing the service that they do, Gran Moraine would not be making bubbles."

Maryam Ahmed

co-founder, Diversity in Leadership Forum, "Is Wellness for Wine Professionals the Industry's Achilles Heel?" page 72

"It starts with the understanding that not everyone is coming at the topic of DEIB from the same level of understanding but holding people accountable at the organizational level of everyone who is making the commitment is key."

Jim Law

owner and vineyard manager, Linden Vineyards, "Terroir Winemaking at a Virginia Winery," page 58

"We found that adding cultured yeasts allow for a better terroir expression. With uninoculated fermentations, we ran into too many problems with stuck fermentations, stinky reduction, and volatile acidity."

Jane Richards

owner, Eight at the Gate, "For These Wineries, Digital Marketing is Serious Business," page 78

"If we compare the amount of money we could spend on a tasting event, we get a much higher return using digital with a lot less physical time required."

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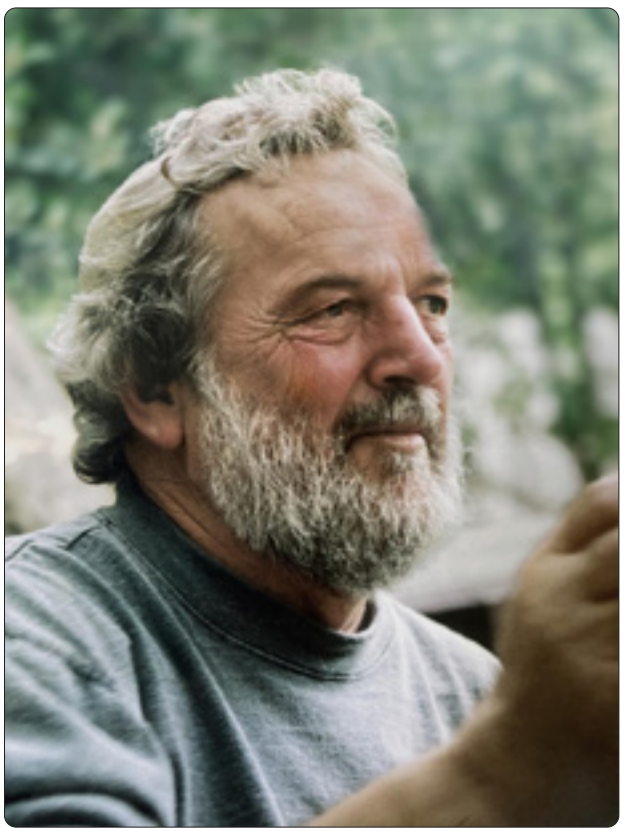

Larry Walker 1936 - 2022

Bay Area journalist and wine writer Lawrence E. Walker, familiarly known as Larry, died February 2 at his home in Sonoma, California. He was 85 and had been diagnosed with multiple myeloma, complicated by a 2018 infected knee replacement surgery.

Named at birth Orville King, Junior on May 8, 1936, in Monet, Missouri, he was raised by his maternal grandparents on a farm outside Joplin, near the Ozark mountains. He was always called Larry and he selected the E to fill out his name when at eleven, his mother married a man named Johnny Walker, who adopted him, and moved his new family to Tulsa.

It was Larry's maternal grandmother who encouraged his wish, starting at age five, to be a writer. Following graduation with a BA in English Literature and Journalism from the University of Tulsa, Larry eventually worked for at least seven newspapers, including the *San Francisco Chronicle*. There, his jobs included copy editing as well as writing a wine column called One Man's Wine. That work led to writing for *Wines and Vines* magazine, and a successful freelance career as a writer for multiple publications in the United States and Europe. Meanwhile, with his wife (Mary) Ann Walker, he wrote popular food and wine books: *A Season in Spain*, *Best of California, Tequila*; the book, *Tapas*, *The Pleasures of the Canary Islands*, and most recently *The New Pink*, about rosé. On his own, he also wrote *The Wines of Napa Valley*.

Apart from his prolific work writing about food and wine, Larry's passion as a writer are found in his poems, dozens of which he wrote to his family. His many advocations included photography, reading — lots of reading — and hiking, camping, and swimming, whether in creeks or rivers, the ocean by his earlier home in Stinson Beach, or in the Mediterranean. His family and friends remember Larry Walker as a gifted listener and conversationalist, a man of great humor and generosity, an open-minded father, a lover of good food and wine, a man who died as he lived: peacefully and considerate of others.

Larry Walker is survived by his wife of 57 years, Mary Ann Walker of Sonoma, David Walker and Tene Nash of Waldorf, Maryland, Jude Walker of San Francisco, and daughter Vandy Walker of Little Rock, Arkansas. Larry's and Mary Ann's son Morgan Walker died in 2014.

The Walker family suggests an appropriate way to honor Larry is to plant a tree.

Plans for a memorial have not been finalized. **WBM**

In December, Larry wrote the following poem.

Directions for Dying

Read Carefully:
It is important
That you get it right the first time.
There are no second takes.
You understand that, surely?

First, be sure all the bills are paid
Or there is money in the bank
To pay them.
Your terminal credit report
Means nothing to you
But could be important to your heirs, if any.

Second, you must (and this is essential)
Resist the impulse to write long and maudlin letters
To friends and relatives about your life
And death and what it all means.
No one, repeat after me, no one gives a shit.

In the same spirit, do not
Under any circumstance
Leave directions for music to be played
Or poems to be read at your funeral.
That is simply embarrassing for everyone.
(If you really must
You can request particular flowers.
Daisies are a cheerful choice.)

Finally, keep in mind
That your death is not about you.
I think that covers the main points:

Now:
Get Ready.
Get Set.
Go.

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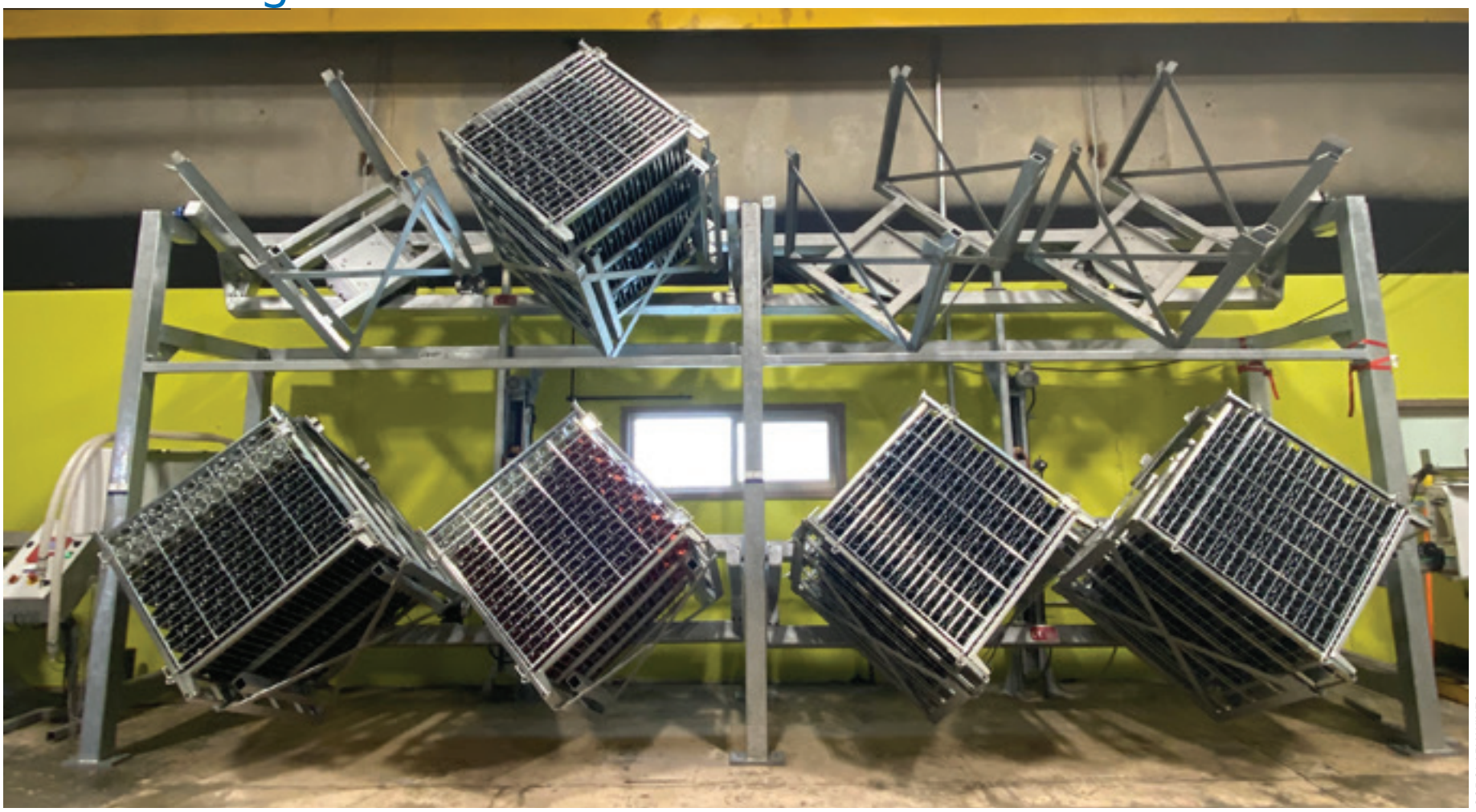

COROLARY WINES

TECHNICAL REVIEW

Radiant Sparkling Wine Company

Mobile bottler offers Oregon bubbles producers equipment, ease and expertise

L.M. Archer

BEFORE ANDREW DAVIS FOUNDED Radiant Sparkling Wine Company, only a few Oregon winemakers dared produce sparkling wine.

"Quality sparkling wine production is very complicated and expensive compared to still wine production," said Rollin Soles of ROCO Winery, the Willamette Valley sparkling wine producer who founded Argyle Winery in 1987. "Some of the highest bars to entry are the expertise required to cultivate a successful tirage/second fermentation program for riddling, disgorging with well-calculated dosing and then all the packaging. Bottling, riddling, disgorging and labeling require very specialized and expensive equipment to do it right!"

Satisfying a Need

To fill this gap in specialized infrastructure, sans the costly capital outlay, Davis founded Radiant Sparkling Wine Company in 2013. Funded, in part, with seed money from Rollin and Corby Soles, Davis purchased a sleek mobile bottling unit, riddling gyropalette and assembly line for disgorging, topping off, corking, wire caging (called a "muselet," the French term for "muzzle") and labeling. He houses it all in a no-frills, 7,100-square-foot warehouse in downtown McMinnville.

"Radiant was born of a desire to see more sparkling wines coming from this perfect region for sparkling," Davis explained. "Radiant represents an opportunity to get the expertise, the best possible machinery and a pool of trained experts to help facilitate these smaller sparkling wine lots and ensure that no mistakes will be made in their production."

Initially, Davis started with a handful of select clients. Today, he and wife Isabelle Meunier (both own the company outright) count more than 40 top-tier sparkling wine producers on their roster, including Sokol Blosser Winery, Gran Moraine, Pashey by Trisaetum, Corollary Wines and ROCO Winery.

Radiant's clients are notably two distinct types. "Most of them are the full cradle-to-grave-type package, where we're working with wineries from the very beginning through to finished products," said Davis. The other category prefers making the base wines, bottling and finishing secondary fermentation themselves. "Most of the wineries we work with feel comfortable making their own base wine because it's very similar to just making a dry white wine, but picking parameters are a little different."

"Radiant takes most of the difficulty out of méthode Champenoise production while leaving enough 'space' for each winery to create their own style," summed up Soles.

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Radiant Sparkling Wine Company

1206 NE 11th Way, McMinnville, OR 97128 | *radiantsparkling.com*

Owner/Principal Andrew Davis **Year Bonded** 2013

Building the Winery

Year Built 1983/2015 **Size** 7,100 square feet

Winery Equipment Bottling Line
OenoConcept gyropalettes - 3x Quadra, 1x Duo
Fimer RU-16 16 spout bottle filler
GAI 4142CH crown capper/biduler
Champagel R240 neck freezing table
Perrier GCDD 2.14 disgorging machine
TDD Champagne cork orientor
OMBF 2005 corker/wirehooder
OMAR Optima 1 bottle washer
Robino & Galandrino Miniblock capsuler
Cavagnino & Gatti TL5/2-3RPS Labeler

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Clientele

Many clients contracted with Radiant from the outset. "We started talking early on with Andrew when Radiant was just at its infancy," stated winemaker and co-president Alex Sokol Blosser of Sokol Blosser Winery. "We really wanted to see this type of business, client-based, sparkling-focused production facility, exist here in the valley. And we were on a mission to support Andrew and his concept—it's good for him, good for us and good for the Oregon wine industry."

"Meeting Andrew was critical in enabling us to start Corollary," agreed Dan Diephouse and Jeanne Feldkamp, co-owners of Corollary Wines. "We knew we wanted to create a winery focused exclusively on sparkling—but it wasn't feasible for us to purchase all the riddling, disgorging and bottling equipment ourselves. Radiant has not only the equipment but also deep expertise that helps its clients make world-class sparkling wine."

"They've basically gotten sparkling wine production off the ground in the Willamette Valley," added Shane Moore, winemaker at Gran Moraine. "Before Radiant existed, there were maybe a dozen estates producing sparkling wine—today my guess is that there are 50. Willamette Valley sparkling wine is becoming a real category—without Radiant, this would have maybe taken an extra 20 years or maybe never would have happened at all. I know for a fact if Radiant wasn't providing the service that they do, Gran Moraine would not be making bubbles."

"Radiant Wine Co. provides the infrastructure to do what we couldn't do on our own," said James Frey of Trisaetum's Pashey Sparkling Wines. "Without Andrew's investment in bottling, riddling and disgorging equipment, we could never have added sparkling wine production to our portfolio."

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Total annual production among each project differs. For example, Pashey crafts 800 to 1,000 cases for six different sparkling wines while Sokol Blosser assembles approximately 3,500 cases across several SKUs. Other wineries average between 1,000 to 2,000 cases annually, including Corollary, ROCO Winery and Gran Moraine.

Davis' choice in specialized equipment proves equally select. "The vendors for sparkling wine equipment are a very small group indeed and, as such, not much diversity in my vendors," noted Davis. "The OMBF corker is repped by Prospero Equipment Corporation, the Fimer [bottle] filler and TDD cork orientator no longer have U.S. representation, and the rest of the equipment comes from Collopack Solutions."

Cradle to Grave

Cradle-to-grave assistance can encompass everything, from picking decisions and pressing protocols, to blind tastings, dosage and packaging. "Andrew was onsite and coached us quite a bit with the 2013 vintage—from evaluating picking decisions, understanding an ideal pressing protocol up to assemblage," said Alex Sokol Blosser, whose parents founded Sokol Blosser Winery in 1971. "Now he does not come onsite for these decisions but is a resource as questions arise between harvest, aging and assemblage."

"Early on in our process, we worked closely with Andrew to ensure that we were selecting appropriate vineyards, making sound picking decisions, pressing intelligently and approaching our in-cellar practices from the right angle," explained Diephouse, who started working with Radiant in 2017. "We make our wine at Winter's Hill, where Andrew also makes wine for Lytle-Barnett."

COROLARY WINES

Corollary resides adjacent to Winter's Hill Estate in the Dundee Hills. "Working alongside Andrew and his team has been fantastic," Diephouse added. "We are able to absorb knowledge by observing them in action, taste each other's wines throughout the process and bounce ideas off Andrew regularly. We love having Andrew's input in the later stages of the process too. He is involved at our dosage trials, providing input as we taste our wines blind. He also sometimes sits in when we do blending trials. One of the great things about Andrew is that throughout this process, he does a fantastic job of sharing his expertise while not trying to impose a style or personal views. He takes time to understand our goals and works with us to help achieve them."

Even the most seasoned winemaker seeks Davis' savoir-faire. "Andrew will often join us for our final blending session," said Frey, who learned wine-making from Josh Bergström in Oregon and Jacques Lardiere in Burgundy, and crafts his own base wines. "It's been a real benefit to have Andrew's insightful feedback on our blends and dosage levels before we rack barrels for our tirage bottling."

Choreography

Sparkling wine production requires intricate, careful choreography. Harvest typically occurs in late August or early September to ensure high acids, low sugars and low pH required for lean, bright base wines. Ideal acid levels fall between 8 and 11, pH below 32, and sugars between 18° to 20° Brix.

Once picked, the grapes experience gentle pressing, which minimizes extended skin contact, thus avoiding coarse phenolics that can impart disagreeable aromas and astringent flavors. Excess phenolic load can also compromise the quality of the bubbles, creating a coarser bead.

After pressing, base wine production is tailored to each client's desired styling. Some winemakers induce secondary fermentation to transform tart, green-apple malic acid from initial fermentation into rounder, creamier lactic acid.

Others forego malolactic fermentation to retain a brighter fruit character and retain a focused acidity. Fermentation and aging vessels offer another option in the winemaker's toolkit. "The use of oak opens up the palate, makes it broader, rounder but at the cost of some of the wine's fruit profile," said Davis. "When fermenting and aging in stainless steel, the difference is that the wine is more linear and focused and plays more on bright and fruitful notes…it's just amazing what that shift in vessel will do."

For all start-to-finish clients, once the base wines are ready for bottling, Radiant visits the winery four days prior to bottling with a set of instructions. Davis also collects a portion of base wine, which he uses to craft a unique yeast inoculum, customized for each specific wine.

"The set of instructions is really straightforward," Davis noted. "It's basically that the line needs to be filtered, ideally sterile-filtered; it needs to be warmed to 65°F to 68°F; it needs to have the sugar brought up to 23 grams per liter to achieve the pressure we're looking for—each winery has a specific pressure they're trying to hit, but that's to achieve essentially the champagne standard of six atmospheres."

A final step—adding a nutrient—varies case-by-case, according to primary fermentation outcomes. "Usually, it's just a nitrogen source for that yeast because that's the quickest thing that's going to be depleted in that first fermentation," he continued. "So, you need to give back that nutrient, or else the yeast is unhappy, and begins to create off-flavors and aromas."

After the client completes the list of instructions, Radiant returns with the mobile bottling line. "We add the yeast to their tank," said Davis, "and we bottle, we get it closed under a crown cap, and then we leave it there at the winery for them to hold because it needs to be maintained at a slightly higher temperature than your standard wine storage."

Wines remain at the client's winery for the first month, after bottling, to complete secondary fermentation in slightly warmer conditions. As secondary fermentation wraps up, Radiant returns to the winery and pulls a few bottles of wine for sugar analysis. If testing confirms successful secondary fermentation is complete, the client gets the "green light" to move the wines to storage for aging. Clients oversee their own wine storage and aging protocols. Aging varies, but most opt to leave in bottle, on lees, between two to five years, sometimes more.

As aging in bottle nears conclusion, clients re-contact Radiant to finish the wines. "I'll go back to work with them," Davis said, "and together with the winemaker, work on creating the 'liqueur de dosage.' This 'dosage liquor' replaces the wine lost in the neck at time of disgorgement and acts to balance the wine's natural acidity.

"It's the last opportunity the winemaker has to put their thumbprint on the wine," added Davis, "both with the sweetness balance, as well as whatever vehicle is carrying that bit of sugar, allowing them to create a little bit more nuance." Sometimes dosage incorporates portions of the base wines, often creating wines that better reflect what the winemaker wants to achieve in the end product.

With the dosage configured, the client ships the aged wines to Radiant's McMinnville facility for riddling in cages. Historically a manual task, Radiant's riddling process uses a mechanical gyropalette that manipulates over 7,000 bottles in five days, compared to hand-riddling, which would take several weeks.

The gyropalette's motion emulates that of hand riddling, with a sharp rotation of the bottles at a slight inclination, followed by hours of resting, then counter-rotation and inclination. This slow tilting of the bottles from a horizontal position moves the dead yeast cells created during secondary fermentation into the neck of the bottle, allowing for easy, clean, compact removal at disgorgement.

Following riddling, the team chills the wine bottles, placing them neck down on a Champagel neck freezing table filled with a salt brine solution at -25°C until the yeast plug (compacted in the neck of the bottle from riddling) freezes, along with a small bit of the wine above it. At this point, the bottles return upright without fear of the yeast backwashing into the solution, and the slushy sediment is cleanly ejected in the disgorging process.

Next, the bottles enter a Perrier disgorging machine for removal of the crown cap under bottles-aging. Here, the wine's natural pressure ejects the frozen yeast plug, with minimal loss. Finally, the machine tops off each bottle with the dosage liquor, inserts the cork, affixes the wire cage and/or applicable capsule, neck band and label, before boxing and sealing. "We only tirage bottles from January until June," Davis explained. "And throughout the year, disgorging and packaging are going on."

Proactive

Davis' meticulous, mindful, quality-first approach pays dividends for the company. "The Radiant Sparkling Wine Company has the distinct advantage of sparkling wine's nature—the wines must age in bottle to develop their full potential," said Davis. "That has given Radiant Sparkling Wine Company the longer view and the ability to see what is coming down the pipe, adapt and make changes accordingly. This has allowed us to time expansion, new equipment purchases and increase staffing in a timely way, rather than a reactionary way."

Proactivity proves equally providential in client planning. "One of the advantages that we have with sparkling is that the die is sort of cast early, I know how much wine we tirage-bottled in 2019. I know what 2022 is going to look like. I have three years' lead time to see that train coming down the track. So that's given us a great advantage. As Radiant has grown, I've been able to forecast that and stay ahead of the ball so that we're caught off-guard much less and prepared for things as they evolve, which is what has made us successful and able to expand in a reasonable way."

ROBIN HAWLEY

However, sparkling wine production, by its nature, presents some unpredictable challenges. "Challenges are always just that," Davis noted, "because sparkling is a mysterious thing at some level. And you never know how each bottle is going to behave; you can always hope, but you're never completely sure."

Bubbles also require greater hands-on involvement. "When you're looking at a still wine, you have hands touching those bottles twice," he said—once during bottling and labeling, then again during packaging. "By the time you work through the sparkling wine cycle, you have about a dozen handling each bottle—most of those are done within the Radiant facility."

Labor offers obstacles, too—particularly the tedious, repetitive process required when making sparkling wine. "I think that that's one of the challenges, just finding a rhythm to keep up with all of those manual movements for both team and business and finding a crew that's happy and willing to do that," he admitted.

Despite the challenges, Davis remains unflappable. "Radiant offers the very best in expertise and backs

this expertise up with the very best sparkling wine equipment," marveled Rollin Soles. "Andrew Davis has far exceeded my expectations. His enthusiasm and penchant for perfection are truly inspirational."

ROBIN HAWLEY

Global Challenges

Additionally, recent unexpected global supply chain challenges tally up more levels of unpredictability. "At every level, there seems to be linch-points, limiting production and transfer of goods. The wine industry is no different," noted Davis. "We're finding it this year."

Case in point, Davis orders his champagne standard bottles from Europe. However, orders now extend well beyond six months. Conversely, decreased glass supplies find the same number of producers chasing a limited number of suppliers. Other glass sources prove problematic, particularly stateside. "I really wish there were better U.S. production, but there really isn't.…They don't feel right; you can't get even fill heights; they have glass imperfections that are unappealing visually."

Sustainability adds another wrinkle of complexity. Current consumer trends demand lighter glass bottles to reduce carbon footprints. Unfortunately, sparkling wine can't withstand lighter glass bottles. "It can't be lighter because it won't take the pressure," said Davis. As for other sustainable packaging options, he added, "You can't really use cans; you can't use Tetra-Paks; you can't do growler kegs because it's just a nightmare to try.… So, unfortunately, the sustainability of packaging is limited."

Global gas shortages further aggravate the situation. "This all gets translated back into the price of the bottle of the wine."

Despite these pressures, Davis hasn't altered his pricing…yet. "I know that for us, in nine years of being Radiant, the price hasn't changed. Part of that's because we've just become more efficient as a business. But that can't persist forever if you see 20 percent increases in pricing year on year on."

For those considering their own sparkling wine program, Davis offers some advice. "The easy answer to give to any winemaker, thinking of making their own sparkling in house—and I do not dissuade this option," he noted, "is: do they have time, space, staffing and equipment to make their sparkling wines a technical, as well as a financial, success? With so many details and so much specialized equipment, going into the production of méthode traditionnelle sparkling wine, unless it is a larger-scale focus of a winery, production can be a very difficult thing to take in-house, which is why, historically, there have been so few producers in the Willamette Valley."

Legacy

After nearly 10 years, Radiant Sparkling Wine Company leaves a lasting legacy upon Oregon's sparkling wine industry. "There were sparkling wine pioneers in the Willamette Valley, like Argyle and Soter," said Frey. "But the rapid expansion of producers here, making really good sparkling wines, is due to Andrew's expertise and Radiant's investment in the necessary equipment. To make sparkling wine at the levels most of us do would be economically unfeasible without someone like Radiant."

"So much of the new wave of Oregon sparkling wine is thanks to Andrew and Radiant," concurred Diephouse. "They opened the doors for new wineries, like Corollary, to appear—both from a practical standpoint, by making riddling and disgorging available as a service to smaller wineries, and from a knowledge sharing and encouragement perspective as well. As Oregon becomes increasingly known for its sparkling wine, it will be in no small part thanks to Andrew and the Radiant team."

"The greatest impact is that now several producers can have a sparkling product to offer their customers and diversify their SKUs," underscored Sokol Blosser. "Unless you have a production size that can support having your own equipment, it is both functionally and cost-prohibitive to make this style of wine. Andrew and Radiant have given all producers here in the Willamette Valley the opportunity to learn and create another wine style. And who doesn't love bubbles, and then to have your own, that is fun…and challenging and frustrating and agonizing…? "

Andrew's legacy includes intangibles, too. "Andrew freely shares his knowledge with other winemakers in the Willamette Valley and, by doing so, has raised everyone's game as it relates to sparkling wines," state Frey. "He, and his organization, have become an invaluable resource you can trust and rely upon."

"Radiant is kind of a nexus for the small sparkling producer community," added Moore. "For example, during the pandemic, they have helped to facilitate wine trades and information sharing."

"Andrew is a connector," concluded Diephouse. "He makes sure that all of us who are making bubbles know each other, talk regularly about what we're doing and what's working well, and share resources when we can. Working with Radiant has given us access to a whole community of sparkling winemakers, which has been absolutely critical in helping us get off the ground."

Ultimately, Davis remains circumspect about the success of Radiant Sparkling Wine Company. "There were sparkling wine producers before—and very good ones at that," he observed. "But now there are enough sparkling wines being produced to actually make the claim that the Willamette Valley is a sparkling wine producing region! That's pretty cool!" **WBM**

What's Cool at the Unified Symposium in 2022

Richard Carey

IN 2022, THE UNIFIED WINE AND GRAPE SYMPOSIUM returned to the SAFE Credit Union Convention Center in Sacramento, Calif. for the first time since COVID-19 affected our ability to assemble as a wine community. Although some companies still prohibited employees from attending, it was a good show for those who participated.

As is *WBM*'s goal at every tradeshow, we scoured the floor for things that were new and/or different. *WBM* is always looking out for those suppliers who create products to improve and enhance our ability to make better wines. Their efforts help us create wines that test the boundaries of what we can do as an industry. We hope you will find these products worthy of further investigation to learn more about how they may help you in the production and marketing of your wines.

That's the purpose of "What's Cool."

BarrelWise FS1

Barrel management has been one of the choke points in many wineries' process controls and is one of the most important reasons that wine in barrel is difficult to maintain at the proper level of quality on a consistent basis over the full life of a wine's existence in barrel. In addition, barrel-to-barrel differences in oxygen ingress and SO_2 variability can lead to indeterminant results when blending the lots of wine ascribed to that barrel group.

Why it's Cool: The portable free SO_2 analyzer designed by BarrelWise provides a unique method to check barrel-to-barrel wine quality right in the cellar that is both fast and efficient. This instrument can pull a sample directly from a barrel and analyze it on the spot. The whole process takes approximately one minute per sample and provides results that are comparable to the aeration oxidation method long favored by the industry. The system can also be adapted for measuring free SO_2 in tanks. Unlike traditional winery lab equipment, the FS1 uses just one widely available reagent, and cellar crews can easily use it after minimal training. The data the instrument collects is automatically linked to relevant barrels or tanks, and it is possible to use it to guide SO_2 additions as part of regular cellar workflow.

BarrelWise Technologies
778-986-3187 *hello@barrelwise.ca* *www.barrelwise.ca*

Bucher Oscillys XM and 50 Destemmer

Grape crushing has almost universally combined the destemming function and the reduction of the fruit to broken berries to facilitate the fermentation process. The advent of high-speed optical sorters has offered a chance to separate this normal protocol into a serial selection of processes.

Why it's Cool: The Oscillys system uses one of two methods for destemming the fruit. On the smaller system, they use a cage that is similar to traditional destemmers, but it does not rotate. Instead, it bounces up and down from the attached end. On the larger units that produce 15 tons or more per hour, the cage is flattened to cover the width of the unit. This device flips up and down from the attached end, bouncing the clusters in the air and back down on the berry separating device. For both sized pieces of equipment, the berries fall through to the separating platform, which consists of a series of rollers separated by spacers that are adjustable from one line of rollers to the next. The operator can adjust the space between rollers to allow berries to fall through either to a conveyor, a bin or directly into a crusher. The movement of the rollers transports the MOG that is too large to fall through the spaces to the end of the equipment, where it falls into a waste bin.

Bucher Vaslin North America, Inc.
707-535-0581 www.bvnorthamerica.com

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Bioenologia Atecnos

The addition of live yeast to wine has not been used as a widespread technique within the wine industry, but it is a staple for beer production. The beer industry has consistently used live yeast cultures to initiate fermentation, with the understanding that the more delicate flavors of a low-alcohol product and small differences in strains will have a large impact on the beverage—therefore, the industry has been built around consistency of flavor profiles.

Why it's Cool: Bioenologia, an Italian company, has released a line of active cream yeast products that have had no GMO or allergen products used in their manufacture. In the production of these yeasts, the company uses only natural product source materials and pharmaceutical-grade glucose to allow an organic identification. Their process implements a high degree of sterility to ensure no bacterial or other yeast agents are present in the finished culture. This results in yeast with a relatively long shelf life of more than 90 days when held at 2° to 4° C. One strain will convert malic acid to ethanol. There is no lactic acid produced by this strain of yeast.

Bioenologia, U.S. Office
707-835-7875 *jessica@cortina67.com* *www.cortina67.com*
Bioenologia, Main Office *www.bioenologia.com*

Creative Oak Wood Terroir

Oak alternatives are finding more support as winemakers discover expanded offerings that impart subtle aroma and flavor adjustments to bring out the best balance of those components in a wine. This sector has gained a greater degree of respectability as technology has improved the quality of oak alternatives.

Why it's Cool: Creative Oak has identified a group of three specific oak forests in France and has created a system of terroir profiles for those oak forests. The three forests, named Fontainebleau Royale, Jupilles Fleur and Tronçais Forte, offer an array of interesting flavor profiles for the company's oak alternatives. The production of these oak alternatives follows a 24-month seasoning regimen. Each forest follows a specific toasting process to bring out the best of the flavors that that forest can contribute to the wines. The oak alternatives from the three forests enhance the wine styles from Bordeaux/Burgundy for the Fontainebleau Royale to California Cabernet/Chardonnay for the Tronçais Forte. Other oak alternatives enhance the more delicate flavors of Syrah, Merlot and lighter style wines.

Creative Oak
707-752-6350 *info@creativeoak.com* *www.creativeoak.com*

Della Toffola Continuous Grape Press and Lees Wine Recovery

Tank presses have been a staple of quality wine making equipment for decades. There have been many small tweaks to these presses over the years that have offered significant improvements to their overall operation. Pressing times and programs have been modified, internal changes to the tanks have been streamlined to help both in cleaning and fruit pressing dynamics. The size and shape of the drain slats have been modified to minimize grape seeds and/or solids from plugging those slats.

One of the major differences between manufacturers has been whether the bladder used to inflate and press the grape solids against the tank wall is located centrally or on one side of the tank. The advantage of a centrally located bladder is that it allows more screen area to drain juice. A side-mounted bladder uses gravity on the downside of the bladder to enhance the gentle bladder pressure against a static grape mass so as not to macerate the grape skins into particles. These particles can either clog or get through the screen, either from a rolling tank and central bladder expanding or from a static tank filled to its maximum before expanding the bladder.

Why it's Cool: Probably the greatest limitation to tank presses previously was their batch-style process and production for many wineries would be enhanced if the pressing function was continuous. Della Toffola's Intelligent Press includes an augmented intelligence function that controls the entire continuous pressing operation.

In the Della Toffola system, as many as three presses can be connected and then operated by the central augmented intelligence processing system, which continuously monitors and controls all functions from must introduction to cleaning for the next cycle. This pressing process has several advantages. Because up to 70 percent of the extracted juice can be removed before pressing begins, softer pressing is required. There is less cloudiness, fewer lees, and slower and fewer drum rotations that break up the skins. Press time is reduced by 25 percent to 60 percent and there is less potential for oxidation. In addition, the onboard touch screen allows the user to select the color desired in the final juice.

The system uses one program that adapts to the grape variety being pressed automatically. Automation and sensors control the system to increase yield from an average of 75 percent to about 83 percent of incoming weight. Combining increased throughput, fewer manhours needed for operation

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and the increase of about 8 percent in average yield, the ROI of this system shows its great value. The most streamlined system is three presses connected. However, a winery can start with one press and then add a second to get most of the way to the final design and then complete the system by adding the third press.

Della Toffola USA
www.dellatoffola.us

Kingman Ag Driverless Tractor Kit

Driverless vehicles have stimulated considerable discussion about both the upside and downside of their operation. Any company entering this sector must be cognizant of both the rewards and the risks of "robots" entering a workspace.

Why it's Cool: Kingman Ag has developed the technology to transform many tractor brands into an autonomously operating vehicle for use in vineyards. Their pricing seems reasonable when compared to the cost of a similar piece of equipment operated by a person. The driver-less tractor is outfitted with Google-style equipment with 360° cameras and other types of sensors that control the tractor and make sure that it harvests or attends to the vines and does not harvest the vines themselves. They have programmed in great awareness of the environment to take care of the 99 percent static part, and to protect against the 1 percent of variable parts that could cause either damage or harm. For example, the tractor should stop if a vineyard worker is in the way or if it detects a pallet of chemicals next to the filtration system that wasn't there previously.

The current driverless tractors can mow and spray vineyards, and later this year the company plans to launch a new addition to the driverless tractor that can take over the job of handling grape gondolas. In this situation, the tractor matches the over-row harvester and, when the gondola is full, can automatically take it to the crush pad, drop it off and then return to the vineyard to pick up more grapes.

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Smart Plastic Technologies Bio-Assimilable Plastics

The environmental impact of plastic materials is of great importance to the entire world, especially as more useful materials continue to be made of plastic. One of the least regulated parts of this industry is end of life disposal of plastics since much of this material has a very long lifespan once it enters landfills. In addition, the use and disposal of plastic materials have been shown to have more unintended consequences than imagined. This is primarily due to the reduction of disposed plastic materials into smaller and smaller particles that stop at the nano particulate size (0.1 nm to 100 nm). Particles of this size can be assimilated directly into animals (including humans) and plant cells.

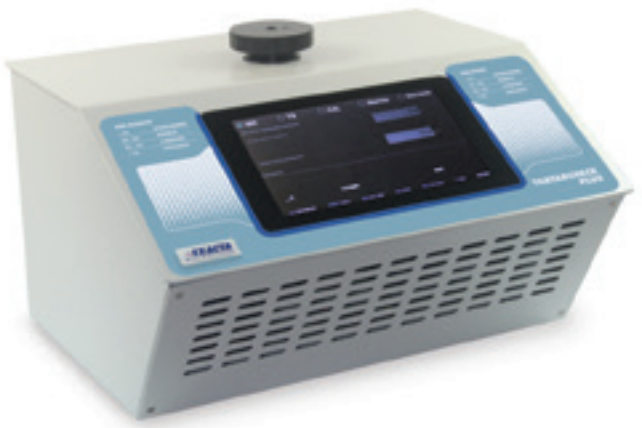
Why it's Cool: Smart Plastic Technology has developed a series of polymers that can dial in a material's expected end of life. The most important factor is the creation of a series of polymers that not only break down in a proscribed time period, but end up as bio-assimilable products, not nanoparticles. Thus, these plastic materials end up as food for microorganisms, rendering them safer for the environment. This is accomplished by producing the materials with a plasticizer that breaks the polymers down at a defined rate, based on the environmental conditions to which the materials are exposed.

For the wine industry, Smart Plastics' most important product is its Eclipse Stretch Film. This stretch film is 100 percent recyclable and will completely bio-assimilate in 6 to 24 months. Currently, plastic companies worldwide annually manufacture enough of stretch wrap material to wrap around the Earth 10 times per day for a year. Smart Plastic Technologies' goal is to change the world's plastic material to have a predicted shelf life and be bio-assimilable at the end of its life.

Smart Plastic Technologies LLC
info@changetheplastic.com *www.changetheplastic.com*

Enartis Tartarcheck Plus PD

Heat and cold stability tests are important quality steps winemakers employ to be sure that their wines will not turn cloudy or have crystalline precipitates in the bottle. There is no easy, completely error-free way to determine cold stability, as there are many factors that contribute to tartaric acids' annoying ability to be super-saturated in wine and fall out at the wrong time. Stabilab is currently the most sophisticated means of determining cold stability, but its cost is beyond the reach of most wineries. It also takes a considerable amount of technical expertise to keep the system running. The cost of determining cold stability is not inexpensive, because of both equipment and time.



Why it's Cool: Tartarcheck Plus, manufactured by Labcenter Exacta + Optech and distributed by Enartis, is a tartrate analyzer that will perform cold stability tests in different ways, depending on the winemaker's expectation for cold stability. It approaches the process more simply than Stabilab and is also less prone to needing realignment of the protocols. The touch screens are intuitive and show the progress of the test in real time. The amount of time for an analysis is relatively short for either protocol. Its only limitation is that the system is manual and does one sample at a time.

Enartis USA
707-838-6312 *orderdesk@enartis.com* *www.enartis.com/en-us*

FoodSafe Drains

It is not without irony that all wineries are built on drainage systems. Often not enough investigation is done about the construction and type of drains that will do the best job and maintain a semblance of sanitation in the winery. There are many functionally different system designs from which to choose, and some are better in one production environment than another.

Why it's Cool: Slot Drain Systems have been around for many years and the company has embraced the functional design of a large array of drain types that are built around the concept of sanitation. The slot drain system is a narrowly spaced pair of stainless-steel angle brackets separated by a variable distance, depending on the need for maximum drainage volume. They have added attachment systems that allow more fluid liquids to flush directly into the drain, which leaves the floor drier and requires less clean-up time. They have also developed security measures to minimize tampering with the drain systems, to keep the system operating flawlessly and to ensure it can sanitize a drain on a regular basis.

Global Drain Technology
204-410-2952 *www.foodsafedrains.com*

GOfermentor Real Time Ethanol Determination and Automated Blending Tool

GOfermentor has developed two new tools for the wine industry. One can calculate the ABV of a fermentation in real time; the other allows for automating the process of wine blending and offers a new way of serving wine samples in the tasting room. Currently, these tools are unique within the wine industry.

Why it's Cool: The blending device can use up to four separate wine components as starting materials. Each wine container is connected to a peristaltic pump suction tube set in the container of each component wine. Each pump discharges into a common manifold that delivers a sample of from 50 ml to 250 ml per component. The pumps are controlled by a tablet computer. In the process of setting up the device, the tablet can record many different attributes of the wine that are customized for the blend. Each blend is stored and can be retrieved. Another interesting feature built into the device is the ability to detect an RFID chip. When used in a tasting room setting, customers could purchase several "drinks" and the device will allow them to select which ones they want.

A second innovation is a closed space ethanol measuring device, named GOVENT, that is capable of accurately measuring a rate of gas flow from a closed container. The chip in the device is sensitive to CO_2. The chip is a version of the chip used in hospital ventilators, and consequently is an accurate measure of CO_2 gas. There is a stoichiometric relationship between CO_2 evolved and conversion of sugar into ethanol. By the end of fermentation of a tank, one can then predict the ABV as calculated to within 0.2 percent.

The GOVENT can be used with closed carboys and small tanks (< 250 liter). A winery can exchange an old bubbler or water trap with the check valve vent. There is no water to fill, and no worries about contamination or the trap drying out. An integral flow sensor with full color LCD display shows the cumulative CO_2 generated and the estimated ethanol concentration in real time. Remote access over the internet is available using the optional Android or iOS app.

GOfermentor.com
877-377-5959 *sales@gofermentor.com* *www.gofermentor.com*

Hanna Instruments Bluetooth pH Meter

Determining the level of pH is an ever-present issue in wineries, but for years it was impossible to have pH measurement instruments out in the winery because they were bulky and awkward. There were attempts to streamline the instrumentation in the past, but now technology is changing the parameters for this type of instrument. Miniaturization of electronics and the ability to do more in smaller spaces has changed instrument development and made it more portable.

Why it's Cool: Halo is a wireless pH meter that is optimized for both beer and wine. It should be a valuable tool both for harvest and for working in cellar processing where immediate results are necessary for good wine-making. There are Halo devices for several different purposes, including one meter that can be used in the vineyard for soil testing.

Hanna Instruments
800-426-6287 *sales@hannainst.com* *www.hannainst.com*

Lallemand Advanced Nutrition and Derivatives to Aid Fermentation

Supplying yeast and the support ingredients that they need is always a "growing" part of the wine business. Research constantly finds new ways to tweak what should be a straightforward part of wine fermentation. Some of the newer additions to this sector include adjuncts to stimulate desired outcomes in wines.

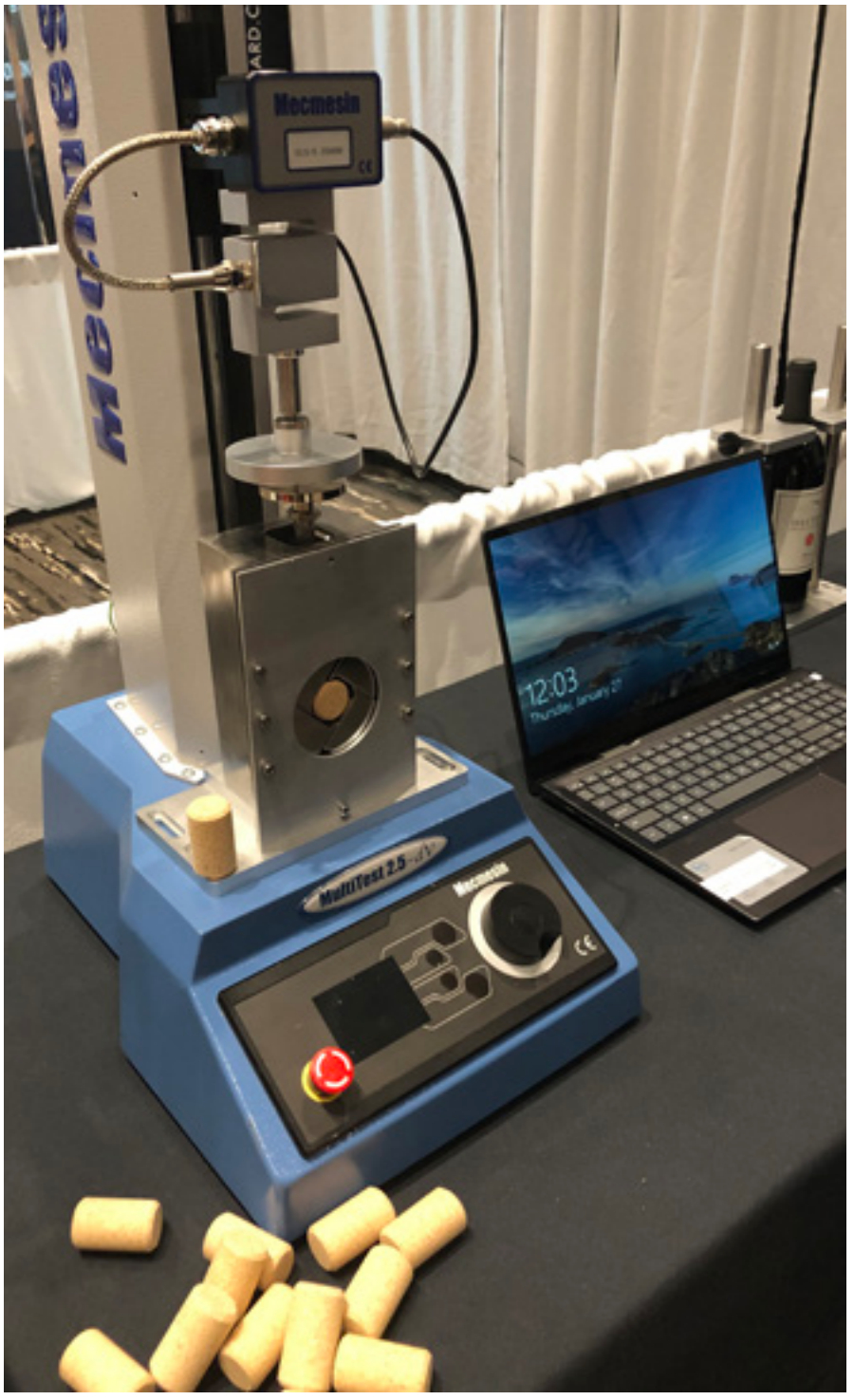
Why it's Cool: Lallemand has introduced a series of new adjuncts designed to modify the aroma and flavor profile of fermentations by extracting various fractions of autolyzed and/or inactivated yeast strains to add new aroma and flavor elements. The new components have names associated with the wine profile they are intended to emulate. For example, SAUVY will increase volatile thiol uptake through active yeast metabolism. Two others, Stimula Cabernet and Stimula Syrah, enhance complexity from inactivated yeast. The Cabernet version will reduce herbaceous characteristics, and the Syrah version is designed to promote floral, spicy aromas.

The company has also developed derivative stimulants such as Glutastar that are rich in antioxidant properties and polysaccharides.

Scott Laboratories
707-765-6666 *sales@scottlab.com* *www.scottlab.com*

Mecmesin Screw Cap Device and Cork Jaw Compression

There is a small world of equipment manufacturers that make specific devices for a specific industry. The testing equipment for monitoring quality control issues often must be designed to test for unique properties. Corks provide one of those opportunities for equipment suppliers. While the equipment for testing corks is primarily used by the cork manufacturers, many wineries would also like to have their own equipment to conduct tests on their supplies. The equipment used by the manufacturers is very sophisticated and is designed to automate the testing of representative samples of cork performance to ensure that the products meet ISO standards.



Why it's Cool: Mecmesin has introduced a simplified version of a piece of equipment that measures cork compressive qualities. This new equipment uses a corking head with four jaws to measure the forces required to reduce the diameter of a cork for insertion. Measuring this force in a time regulated dual measurement can give a good approximation of the resilience to permanent deformation due to the compression forces. This simplified version should be useful to wineries, although the equipment is not a substitute for the ISO standards of control for product quality. This equipment is designed to be used to monitor trends and pass-fail types of analysis.

PPT Group Corp.
703-433-9247 *info@mecmesin.com* *www.mecmesin.com*

Sentia Wine Analyzer

Several companies have introduced wine analyzers over the years. Technical instrumentation has advanced, and different approaches have matured as the cost of sensors has dropped and the ease of use increased. Reflectoquant created early versions of simplified instrumentation which were based on the concept that reflected light from a substance changes the quality of reflected light from a standard source and could therefore accurately calculate the concentration of a substance from a test strip sample of product. Their system was simple but had both production and precision issues that prevented it from taking off in the wine industry.

Today, sensors are much more robust and considerably more sensitive, which provides an opportunity for companies to make specific instruments for a particular analyte.

Why it's Cool: Sentia wine analyzer is a compact unit that can easily be carried into the winery to perform a test. The process is straightforward: a drop of wine is added to the test strip that is then inserted into the instrument, and in less than one minute, an answer is displayed. The company has set up a world-wide network of distributors. The cost of the instrument is about $2,000; the test strips, which must be refrigerated, have a shelf life of one year from the date of manufacture, and cost about $3.50 per strip.

Universal Biosensors

61-3-9213-9000 *info@universalbiosensors.com*
www.universalbiosensors.com

[Note: Enartis, 707-838-6312, is a local distributor on the West Coast; Wine and Beer Supply is a distributor in Ashland, VA, 844-482-9463]

TORR Packaging Bag-in-Box Wine Packager

Scholle first developed bag-in-box packaging for battery acid in 1955 and just 10 years later Thomas Angove first put wine in a flexible bag. Today, the bag-in-box wine business has grown to become a major player in wine packaging. Putting wine in a plastic bag may seem like a simple process, but in reality it is a major technical challenge to do and to do well.

All commercial wineries using bag-in-box packaging must address the issues of oxygen pickup during packaging, accuracy of the fill, sanitation of the fill, smoothness of operation so as not to damage the product, and speed of the process to keep cost of production low. All these tasks are difficult to accomplish with a packaging system that is so fragile that a tiny sharp point in the wrong place can ruin a whole pallet of wine if a bag on top leaks onto the boxes below.

Why it's Cool: TORR Industries has introduced several new components on their bag-in-box filling systems that answer the above issues that have been persistent irritants in the flexible packaging industry. The company has designed a new fill head that can reduce oxygen pickup to limit the pickup to about 2 ppm total oxygen in the bag after packaging. They have updated their packaging system so bags are automatically inserted into a box that is erected seconds before the bag is filled and immediately sealed. The line is fully automated, with the operator keeping the bags moved into place for filling and then removed offline onto pallets at a rate of up to 20 3L bags per minute.

TORR Industries

530-247-6909 *support@torrindustries.com* *www.torrindustries.com*

WBM

WINEMAKER TRIAL

Research: The Carbon Footprint Study of Cork

Life Cycle Analyses demonstrate the power of nature when producing natural cork from a carbon footprint perspective.

Bryan Avila

Bryan Avila is a formally trained enologist, seasoned commercial winemaker and wine production educator. He teaches best practices to the industry workforce and advises on advanced winemaking subjects to vintners via his company, Avila Wine. He is the trials liaison for WBM's Winemaker Trials section and would love to hear what you are doing in your vineyard and winery to overcome challenges, grow better grapes and make better wine. Contact: bryan@avila.wine

Research Lead: Peter Weber, executive director, Cork Quality Council

The Cork Quality Council (CQC) is a nonprofit organization comprised of leading US cork suppliers. The Council was formed to develop industry standards for quality assurance practices and to provide an educational resource for natural cork products. The CQC currently receives testing data from more than 30,000 samples per year, drawn from its members' incoming cork shipments. In addition to working with the Cork Quality Council, Weber operates Deerfield Associates, a Northern California consulting business focused on wine marketing. Weber transitioned to the wine business from mycological research in the commercial mushroom industry. Winery experience includes management positions with Windsor, Rodney Strong and Lockwood Vineyards.

BACKGROUND:

A few clicks and queries online with simple search terms show consistently how Gen Z and Millennial values and spending habits are not aligned with the current wine lover. According to The Deloitte Global 2021 Millennial and Gen Z Survey, "…Millennials and Gen Zs aren't just resilient—they're channeling their energies into holding themselves and others accountable." A top 5 takeaway from the Deloitte report as to "Ensure that the environment doesn't fall down the list of priorities for too long. It's appropriate right now for business leaders to prioritize recovery, resilience, and employee welfare. But a meaningful response to climate change is critical to protecting resources, generating long-term sustainable value, and attracting and retaining high-performing young employees." Accountability is the new sexy. So, when local recycling and waste services, such as those used by Napa County, clearly instruct their wine-friendly clientele to trash the synthetic corks, recycle the screw caps and compost the corks, know that these generations take notice.

In science and business, key performance indicators must be measurable. Unfortunately, treading lighter on the planet does not yet have any magic metrics for the monthly financials yet. However, they have been under development for quite some time. In 2006 the United Nations created ISO 14040 standards with the stated scope of: "Standardization in the field of life cycle assessment and related environmental management tools for products and organizations. It includes life cycle-based resource efficiency and eco-efficiency assessment and encompasses consideration of a life cycle perspective in the assessment of impacts from the extraction of raw materials to the final disposal of waste." Most importantly, minimum standards can begin to set a bar for industry best practices in sustainable measurement, namely carbon footprint measured in grams of greenhouse gases (GHG), further expressed in grams of carbon dioxide equivalents (g CO2e). These studies are referred to as a Life Cycle Assessment (LCA) and were used in the evaluation of these production reports.

OBJECTIVE:

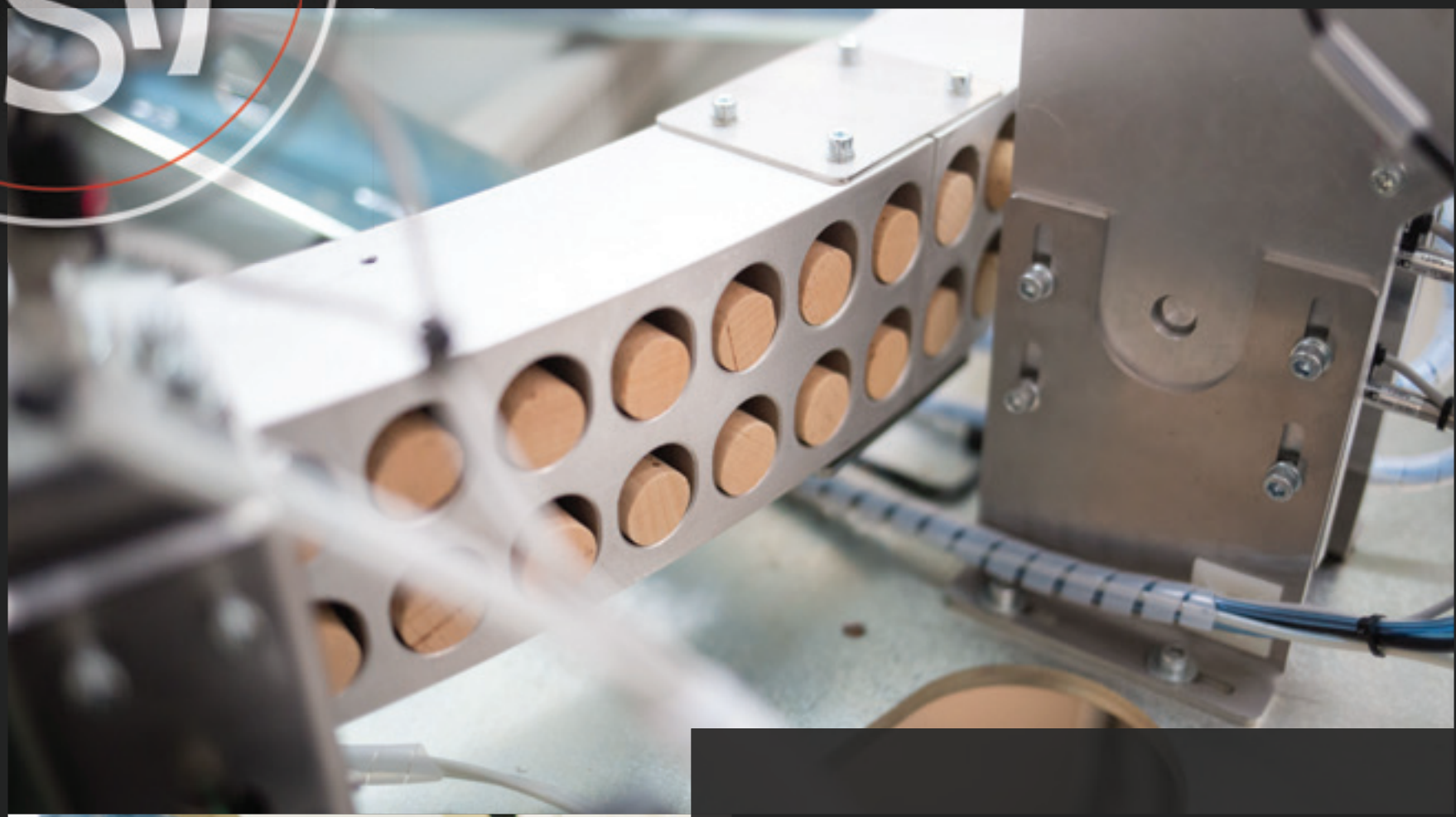
Peter Weber is the proprietor for the PR firm, Deerfield Associates, and the executive director for the Cork Quality Council. As research lead, Weber described the study, "Many wineries have recently launched campaigns to reduce their carbon footprint. It is an ambitious task that expands into all areas of operation, including production, agriculture and logistics.

"The choice of bottle closures can be an important factor in achieving a carbon-neutral position. All published estimates show that the production of natural cork has a lower carbon footprint than any other alternative. More importantly, if you calculate the carbon fixing effect of the cork forest, the net carbon footprint for natural cork shows that each cork acts as a carbon sink."

The EU Product Environmental Footprint Category Rules (PEFCR) for wine specify, "Carbon permanently stored in the soil and tree biomass of cork oak forests and vines shall be taken into account if this storage goes beyond 100 years." Their action reinforces carbon sequestration as a relevant environmental issue to distinguish natural cork from artificial stoppers.

In fairness to the competing industries, neither the screw cap industry nor the synthetic cork industry has had a chance to share LCAs of their production. Only cork producers with a sizeable share in cork production and much to gain on the growing "green" movement that adds the preservation of nature to the equation of producing a product have shared this data. Is it biased? Yes, and like the production of laws and sausage, before considering planet Earth in balance sheets and income statements, the making of global standards and policies can be equally hard to witness, especially for those that missed the window to purchase cork oak woodlands in the late 1800s.

MASILVA USA



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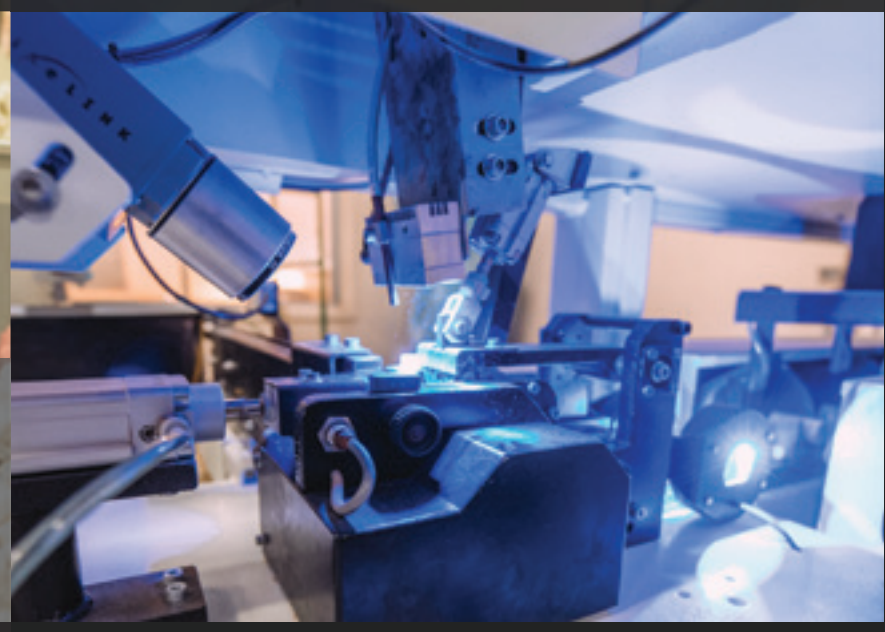

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(707) 636-2530 3433 Westwind Blvd, Santa Rosa, CA 95403

Research: The Carbon Footprint Study of Cork

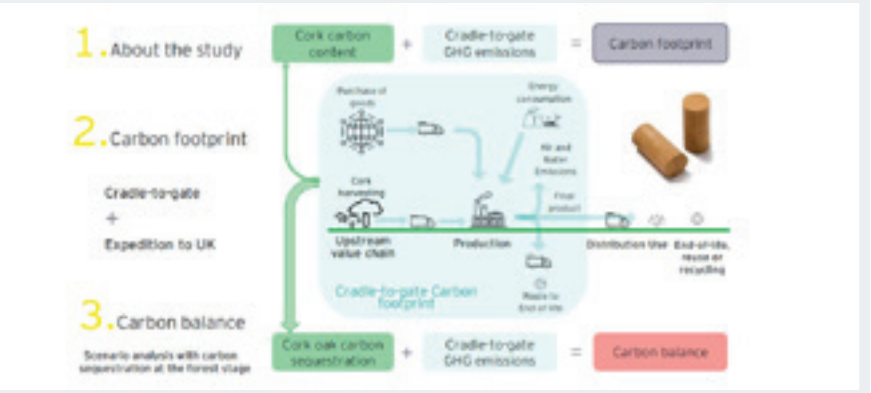
DESCRIPTION:

This study compares the three major closure types, cork, screw cap and synthetic cork, from three different independent studies taken within a 13-year period using ISO 14040 standards. Life Cycle Analyses were supplied by members of the Cork Quality Council who found it advantageous to share their findings. The carbon footprint associated with cork processing is based on two independent investigations funded and provided by cork producers:

Cork Data Sources

- **M.A. Silva** (2021) – *LCA Report* prepared by KPMG International calculated using the Footprint Expert software produced by Carbon Trust in accordance with the PAS 2050 standards.
- **Amorim** (2019) – *LCA Report* prepared by Ernst & Young compliant with ISO 14040
- The carbon footprint associated with cork processing are based on two independent investigations funded and provided by cork producers per 1,000 closures.

Flow Diagram Of A Life Cycle Analysis



This diagram, created by Ernst & Young, depicts the factors involved in a Life Cycle Analysis.

Synthetic Cork and Screw Cap Data Sources

- **Amorim** (2008) - Report prepared by Price Waterhouse Coopers, Ecobilan

  This 127-page study is available to the public and produced in accordance to ISO 14040 and ISO 14044 standards and reviewed by:

  - An independent Life Cycle Analysis expert (Mr. Yvan Liziard);
  - An independent specialist on cork (Mr. João Santos Pereira, from Instituto Superior de Agronomia of Universidade Técnica de Lisboa);
  - Plastic association (Association of Plastics Manufacturers in Europe).

Also, be advised that this report does not use proprietary information from the producers of aluminum or plastic closures, and an aluminum association was contacted but did not choose to participate.

CONCLUSIONS:

The average wine cork has a negative carbon footprint of about -5 grams; but when the biogenic carbon fixing value of the forest is included, the net carbon balance is -276 grams per cork whereas screw caps come in at 37 g CO_2e and synthetic corks at 15 g CO_2e.

This is a comparative study and, despite the obvious biases and differences between the years studied, represents a new type of information¬— the Life Cycle Analysis—that encourages producers and entrepreneurs to take more post-consumer responsibility in the design of consumer packaged goods (CPGs).

ON TOP OF THE TOP

SUSTAINABLE WINES

A SINGLE CORK STOPPER HAS A NEGATIVE CARBON BALANCE OF 70X ITS WEIGHT

WHAT'S TOPPING YOUR WINE?

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COMPETE 2020

PORTUGAL 2020

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According to the World Wildlife Fund, "Cork oak landscapes are one of the best examples of balanced conservation and development anywhere in the world. They also play a key role in ecological processes, such as water retention, soil conservation, and carbon storage."

The capture of carbon by the cork oaks, during the photosynthesis process, results in plant growth and transforms atmospheric carbon dioxide into oxygen and, in the case of organic matter, into cellulose and other forms of organic matter. For this reason, the forest habitat is considered an important carbon sink because it's alive, both above and below ground, it works for free and is off the grid. Not even artificial intelligence can compete with the efficiency of nature.

Post-Mort Q&A

Why are you comparing the carbon footprint of cork, screw cap and synthetic cork?

Weber: These are the top three closure types, so this comparison makes the most sense to present to package designers. Cork represents an environmental advantage for everyone. If people are serious about preserving the environment, reducing waste and having a sustainable product, then cork is the best. Cork is a plug of bark stuffed into the neck of a bottle. You don't have to be a scientist to know that wood is biodegradable.

What type of natural cork are you using for this study?

Weber: Natural corks, screw caps and synthetic corks are the big three types of closures used today. The data in this study refer to an average cork size of 44mm by 24mm long.

Did you encounter any complications or difficulties in finding numbers for comparison?

Weber: The biggest problem was trying to figure out how the math done with the cork forest is reliable. I interviewed PhD researcher, Filipe Costa e Silva, from the Technical University of Lisbon who teaches in the Center of Forestry Studies. They are the university that did the math, and I was happy with the way he broke down the numbers, such as eddy covariance and the software systems that produce them. When I first started working with the cork industry, this type of information was not mainstream. I had to wait six months for a study to come out. Now, thanks to global efforts in this area, obtaining reports like these are easier to come by. There are a lot more developed best practices and metrics to represent environmental impact, not just with corks but in pretty much any industry. I have been leading the charge at the Cork Quality Council for many, many years. I've always felt that cork was a wholesome industry, and now, decades later, it feels good to see that these reports show that cork is not only a great bottle closure with a rich tradition but good for the environment too.

Despite not having access to do completely unbiased comparisons, thanks to ISO standards there are still tools that can help us to fill in the blanks.

Who else is working with you on this trial?

Weber: We compared the difference in production from two of our member companies, M.A. Silva and Amorim. They hired large reputable accounting firms to perform ISO-compliant, life cycle analyses, and I took the average of the two. The studies of screw caps and plastic corks that I have are from 2008 when Amorim hired Price Waterhouse to perform an extensive peer-reviewed, third-party study.

Did you or your colleagues have any predictions about the conclusions?

Weber: I had seen some of the "shinier" comparisons about the carbon numbers that were considerably higher years ago. Now, there are more precise methods that evaluate the forest's contribution that probably did not exist before. I was happy to see that both cork reports were pretty close, so I am comfortable with those numbers. The environmental science industry has evolved significantly over the last decade with the development of agreed-upon methods of data collection and standards. While higher carbon numbers might get people excited in this emerging carbon credit economy, green washing is something the cork industry doesn't need to do. Consumer trust is far more important.

We do worry, however, that when people see this huge number and wonder "Why do you get to count the cork forest and not my vineyard?" Unlike grapes, cork is a foraged product. You can use carbon fixing if the biogenics are at least 100 years old and thriving with sub-foliage and animals rather than being tilled, sifted and devoid of life.

What are your conclusions for this trial?

Weber: Based on production averages, a wine cork has a negative carbon footprint of about -5 grams. When the biogenic carbon fixing value of the forest is included, the net carbon balance is far greater at -276 grams of carbon dioxide equivalents per cork. At that level, 1,000 cases finished in cork represent 3.3 metric tons of carbon dioxide emissions. To put this in perspective, 1,000 cases of cork contribute the same level of CO_2 offsets as 83 standard solar panels. Twelve cases of cork-finished wine represent an equivalent amount of CO_2 savings as the annual operation of one 250wt solar panel.

Did you learn anything new or interesting that you didn't know before?

Weber: I was delighted to see just how much biogenic value that the cork forest added to each cork. I think it is one of the few packaging items that you don't have to worry about post-consumer since it is biodegradable. It's an encouraging example that it is possible for humans to work in harmony with nature.

Will you conduct any follow-up studies next year? What would you do differently?

Weber: We are going to look more closely into the end of a cork's life cycle. I think most counties accept cork into the compost bin, but we don't know for sure what the statistics are. There is a new California State law (AB 1201) that will require companies to put their money where their mouths are by 2026. I am planning a survey on how the California counties implement these composting mandates statewide. I am also considering a composting trial of various closure types to measure their biodegradability over time in biologically active soil. In a previous life, when I worked in the mushroom industry, I once used ground cork in the medium, and you could tell by looking at the soil that it really helped retain water and created quite an active biological mat in the soil. **WBM**

Reference

https://www.thedrinksbusiness.com/2021/07/cork-maker-ma-silva-achieves-carbon-negative-status/

WINES&VINES

BUYER'S GUIDE

Select Closure Venders

This list of select vendors is generated using the Wines & Vines Buyer's Guide. To see a full list of vendors please visit: *winesvinesanalytics.com/buyersguide*

OVER THE LAST FEW DECADES, cork manufacturers have had to deal with the problem of cork taint caused by Trichloroanisole (TCA) in their premier product, natural cork. The economics of producing natural cork at the quality levels demanded by the wine industry have led to the development of several alternative cork products.

The premier product continues to be natural cork. However, when these corks are punched out of the bark of the cork oak, a significant amount of cork material remains that can be remanufactured into other usable products. The most valuable use for cork manufacturers—and for wineries—is other versions of corks for wine bottles. Technical corks (sometimes known as one-plus-one corks) became popular because the body of the cork could be formed with ground cork granules, and then a thin slice of natural cork was glued onto one or both ends of the cylindrical cork body. These corks provided a cost savings over natural corks for wineries, and the cork manufacturers had the ability to screen the thin layers of cork to reduce the possibility of TCA in that thin layer.

Manufacturers also developed a product known as agglomerated corks, which are simply ground cork granules glued together in various ways. Agglomerated corks had the lowest cost for the wineries but also had the highest potential for small amounts of TCA in the cork granules. Many wineries—or at least those where cost was the driving force—chose that option and were willing to take the risk that low levels of TCA taint outweighed potential adverse consumer complaints for the ability of the winery to meet price point competition.

As of 2022, natural corks continue to comprise the predominant percentage of overall wine cork sales. However, the ratio for sales of technical corks and agglomerated corks has changed. In the past, the ratio of sales for technical cork versus agglomerated cork was in the 60/40 range. More recently, there has been a vast change in the ratio of these sales. Depending on the individual cork suppliers and distributors and the markets they serve, the agglomerated corks now represent from 70 percent to 90 percent of total sales for this segment of the market, and one-plus-one, technical corks constitute the remainder of sales. This change occurred because of the significant improvement in the mechanism of TCA removal by cork manufacturers.

Because of this new development in cork sales, *Wine Business Monthly* is now changing the tracking of cork sales in their chart for the distribution of attributes for winery review. Instead of keeping these two parts of the cork review joined together, the two will now be separated so that each will have its own category for review.

Amcor American Canyon

American Canyon, CA | 877-783-5846 | *www.Amcor.com*

COMPANY DESCRIPTION: Stelvin® screwcaps, tin, aluminium and polylam capsules for still and sparkling wines.

CLOSURE TYPES: Screw Caps (STELVIN®)

Amorim Cork America

Napa, CA | 707-224-6000 | *www.amorimca.com*

COMPANY DESCRIPTION: Eradicating TCA is Amorim's commitment, with all our new technologies: NDtech®, Naturity® and Xpür®, our performance is unmatchable. Sustainability is our nature. Amorim Cork provides multiple closure solutions for all your winemaking needs.

CLOSURE TYPES: Natural Corks, Technical Corks, Glass Stoppers, Bar Tops

Berlin Packaging

Fairfield, CA | 707-389-7600 | *www.berlinpackaging.com*

COMPANY DESCRIPTION: Berlin Packaging is a leading supplier of bottles, closures, capsules and packaging to the wine market. From popular in-stock bottles to complete custom-design and branding capabilities, our team has decades of experience helping clients succeed.

CLOSURE TYPES: Natural Cork; Screw Caps

ColloPack Solutions

Napa, CA | *www.collopack.com*

COMPANY DESCRIPTION: ColloPack provides turn-key solutions for winemaking and packaging equipment with excellent support from design to installation. Our dedicated service technicians work closely with our customers to solve every repairing, installing or engineering need.

CLOSURE TYPES: Sparkling Wine Closures

Cork Supply USA

Benicia, CA | 707-746-0353 | *www.corksupply.com*

COMPANY DESCRIPTION: Cork Supply provides premium closures to the wine industry, including natural and technical corks, capsules, screwcaps, synthetic and sparkling closures. We also offer DS100 and DS100+ processes for natural corks and invidual TCA guaruntees.

CLOSURE TYPES: Natural Cork, Optimum Colmated Cork, Mirco Agglomerated, Technical Cork (1+1), Agglomerated Cork (1+1), Sparkling Wine Closures (0+2, 0+1, Micro), Technical Corks for Wine and Sparkling Wine (VINC and DS100)

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GUARANTEE

We stand behind our DS100 Inspection Process. If you receive a cork taint claim on any bottle sealed with our 100% Inspected DS100 Natural Cork, we will buy the bottle back.*

Cork Supply

DS100 — 100% Inspected —

*OUR LABORATORY WILL TEST BOTH THE WINE AND THE CORK TO DETERMINE IF TCA IS PRESENT AND AT WHAT LEVEL. IF WE FIND THE BOTTLE TO HAVE TCA PRESENT AT GREATER THAN 1.0 NG/L, CORK SUPPLY WILL REIMBURSE THE WINERY FOR THE RETAIL RELEASE PRICE OF THE WINE.

www.corksupply.com

WINES&VINES

BUYER'S GUIDE

Select Closure Venders

Diam Closures USA

Modesto, CA | *www.g3enterprises.com*

COMPANY DESCRIPTION: DIAM is a clean, consistent cork offering aging options for winemakers. Origine, sustainable cork made of natural ingredients, offers the same promise with different OIR and OTR options. Mytik Diam for sparkling wine allows for consistent aging and improved preservation of CO2 pressure over time.

CLOSURE TYPES: Wine, Sparkling Wine and Spirit Closures

G3 Enterprises

Modesto, CA | *www.g3enterprises.com*

COMPANY DESCRIPTION: G3 provides integrated packaging solutions from grape to glass: harvesting services and winemaking equipment, packaging and bottling solutions, transportation and warehousing. G3 Packaging include stock and custom options: corks, caps, capsules, labels, bottle etching, bottles and kegs.

CLOSURE TYPES: Screw Caps, Sparkling Wine Closures, Micro Agglomerated

Global Package, LLC

Napa, CA | 707-224-5670 | *www.globalpackage.net*

COMPANY DESCRIPTION: Global Package is distinguished through highly creative approach to sourcing, working with innovative products, bottles corks and metallic labels, sourcing from around the world.

CLOSURE TYPES: Bar top closures for dessert wine and spirits

Guala Closures North America

Fairfield, CA | 707-425-2277 | *www.gualaclosures.com*

COMPANY DESCRIPTION: Guala Closures Group has more than 4,850 employees and operates in 5 continents through 30 production plants and markets its products in over 100 countries. Thanks to a policy of continuous business development and technological innovation, the Group is recognized as a global benchmark in the production of spirits safety closures and it is a leading manufacturer of aluminium closures and luxury closures for spirits, wines and beverages.

CLOSURE TYPES: Roll-on closures for spirits/water/olive oil& condiments/non-alcoholic beverages, Roll-on closures for wine, Safety closures for spirits, Luxury closures, Connected Closures (our range: NeSTGATE) and Sustainable Closures (our range: Blossom).

Herti US

Capitola, CA | 916-260-6959 | *www.hertius.com*

COMPANY DESCRIPTION: Herti manufactures aluminum and composite closures for the wine, spirits, olive oil, pharma industries. It offers different design options: offset print, matt, semi-matt and glossy finish, hot- foil and emboss. The most popular wine closures: 22x15; 22x30; 25x17; 25x43; 28x44; 30x24; 30x60.

CLOSURE TYPES: aluminum screw caps, composite closures

Lafitte Cork & Capsule, Inc.

Napa, CA | 707-258-2675 | *www.lafitte-usa.com*

COMPANY DESCRIPTION: Lafitte is a global family-owned business with an emphasis on sustainability and continuous improvement. We have been providing high end closures to the wine and spirits industries for over 100 years and our service platform is unrivaled.

CLOSURE TYPES: Lafitte currently offers the following closure solutions: natural cork, agglomerated, agglo 1+1, sparkling wine corks, colmated, molded micro agglomerate and bar-top closures. Lafitte also offers PVC, PETG, polylam, aluminum and tin capsules.

MA Silva USA

Santa Rosa, CA | 707-636-2530 | *www.masilva.com*

COMPANY DESCRIPTION: M. A. Silva USA is the leading and award-winning manufacturer of premium corks, glass, and packaging for North American markets. It is our mission to demonstrate impeccable integrity, consistent customer service, and continuously commitment to upholding sustainable and eco-friendly operations.

CLOSURE TYPES: Cork (Natural, Sparkling, Agglomerated, Micro-agglomerated)

Portocork America

Napa, CA | 707-258-3930 | *www.portocork.com*

COMPANY DESCRIPTION: All natural cork products- straight natural cork, technical wine cork, champagne corks and bartop corks for spirits and port wines

CLOSURE TYPES: Natural Corks; Sparkling Wine Closures; Technical Cork (1+1); Technical Cork (Agglo); Tehcnical Cork (Composite Cork); CWINE Super Critical Treated Micro Agglomerated Stoppers

Scott Laboratories

Petaluma, CA | 707-765-6666 | *www.scottlab.com*

COMPANY DESCRIPTION: For almost 90 years, Scott Laboratories has provided best-in-class fermentation, filtration, equipment, and packaging products to the wine and specialty beverage industry. We believe in education, honesty, and doing the right thing.

CLOSURE TYPES: Natural Corks, Screw Caps, Sparkling Wine Closures, Technical Cork (1+1), Technical Cork (Agglo), Technical Cork (Composite Cork)

Waterloo Container Co.

Waterloo, NY | 315-539-3922 | *www.waterloocontainer.com*

COMPANY DESCRIPTION: Waterloo Container is your premier packagaing provider, with unrivaled inventory of glass bottles, corks, caps and closures. Customization services like glass bottle printing, high speed shrink sleeve application, and repack services.

CLOSURE TYPES: Corks, PVC and Polylaminate capsules, Screw Caps and BarTops from industry best like STELVIN, TAPI, Battistella, M.A.Silva, Amorim and Supercap.

Lafitte

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It's the latest innovation by **Lafitte**. This dual phase cork sterilization system utilizes pressure, dry steam, temperature, and time to produce natural cork closures free of off aromas and TCA.

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PRACTICAL Winery & Vineyard

ASEV 2021 Keynote Lecture:

New Insights into Bound SO_2 and Wine Oxidation

Gavin L. Sacks, Patricia A. Howe, John C. Danilewicz

Gavin Sacks is a professor at Cornell University, Department of Food Science, in Ithaca, NY. Patricia A. Howe is a post-doctoral researcher at the University of California, Davis, Department of Viticulture & Enology, in Davis, CA. John C. Danilewicz is a retired chemist, at a private laboratory in Ash, Kent, United Kingdom.

In the forward to *Understanding Wine Chemistry* by A. Waterhouse, G. Sacks and D. Jeffery, we are reminded that "Wine is a mixture of hundreds of different molecules in a constant state of flux, a feature that gives it the quality of a living, breathing thing." The interaction of sulfites with other compounds in wine serves as a prime example of this idea. Our understanding of this topic has been subject to radical reevaluation in the 21st century, and the take-home message might be "it's not as simple as we once thought."

This article contains material that may be challenging to the lay reader, but the editors have nevertheless chosen to print it in its unedited form. Ambitious readers will find material here that dramatically enhances their knowledge of an important aspect of modern winemaking. — *Peter Bell*

WINEMAKERS ROUTINELY ADD sulfur dioxide (SO_2) as a preservative. Of the many roles of SO_2, its singular ability to limit appearance of oxidized aromas and browning in wine has been one of the hardest to replace. Recent work by our team and others has provided a better understanding of the role of SO_2 in redox reactions, as well as new opportunities for research to prevent the appearance of oxidized character while limiting the use of SO_2.

SO_2 Forms in Wine – Terminology

FIGURE 1 Summary of different SO_2 fractions.

Among winemakers, SO_2 (often referred to as "sulfite") is used as a blanket term to refer both to sulfur dioxide (a pungent gas), and one of several related forms generated following addition of SO_2 to wine or juice. Winemakers add SO_2 to wine in the form of salts like potassium metabisulfite, or in its gaseous form from compressed gas cylinders, or in concentrated aqueous solutions made from either source, typically at 1 to 6 percent concentrations of dissolved SO_2.

- The preservative properties of dissolved SO_2 are primarily credited to free SO_2, which consists of the sum of the neutral, so-called *molecular* SO_2 form and its corresponding base, bisulfite (HSO_3^-).[18] These two forms exist in rapid equilibrium. At wine pH (3.0 to 4.0), bisulfite is the major contributor to free SO_2 (more than 95 percent), with higher proportions observed at higher pH.
- Bisulfite is the primary form responsible for the anti-enzymatic and antioxidant activity of SO_2. Winemakers typically target 20 to 40 mg/L free SO_2 in stored or packaged wines to limit unwanted oxidation reactions and/or release of bound odorants with oxidized aromas.
- Antimicrobial activity is credited to the molecular SO_2 form, and winemakers generally aim to have 0.4 to 1.0 mg/L molecular SO_2 to prevent microbial activity. The higher end is typically used for sweet wines at greater risk of refermentation. As mentioned above, the proportion of free SO_2 which exists as molecular SO_2 increases with decreasing pH, so the two forms (molecular and free SO_2) must be considered separately.
- A portion of bisulfite will reversibly form adducts (*bound* SO_2) with a range of wine components. SO_2 binders in wine include the more strongly binding acetaldehyde ("walnuts, bruised apple" aroma) as well as weaker binders including other "oxidized" smelling aldehydes (e.g. methional). Other compounds which reversibly bind but have little to no aroma include sugars in sweet wines (glucose, and to a lesser extent fructose), anthocyanins (in red wines), and other carbonyl compounds of microbial origin such as pyruvate (yeast metabolism) and glucuronic acid (from rotten grapes).
- The bound and free SO_2 fractions are in equilibrium, such that as free SO_2 is consumed by oxidizing reactions, bound SO_2 dissociates to maintain the equilibrium between the pools.[18] Unlike the near-instantaneous equilibration of molecular SO_2 and bisulfite, equilibration of free and bound SO_2 pools requires hours or days.
- The sum of bound and free SO_2 is referred to as *total* SO_2, which is the form of SO_2 regulated in the U.S. (limit = 350 ppm) and most other wine producing countries.

Free SO_2 and Wine Oxidation: The Basics

Work over the last two decades has demonstrated that the antioxidant form of SO_2 is bisulfite, and that its role is not to directly react with oxygen, but rather to react with wine oxidation products.[4] Two wine oxidation pathways have been identified, an "iron-phenolic" pathway and a "copper-sulfhydryl pathway,"[11] of which the iron-phenolic pathway appears to be the major pathway responsible for oxygen consumption. A summary of the pathway is shown in **FIGURE 2**.

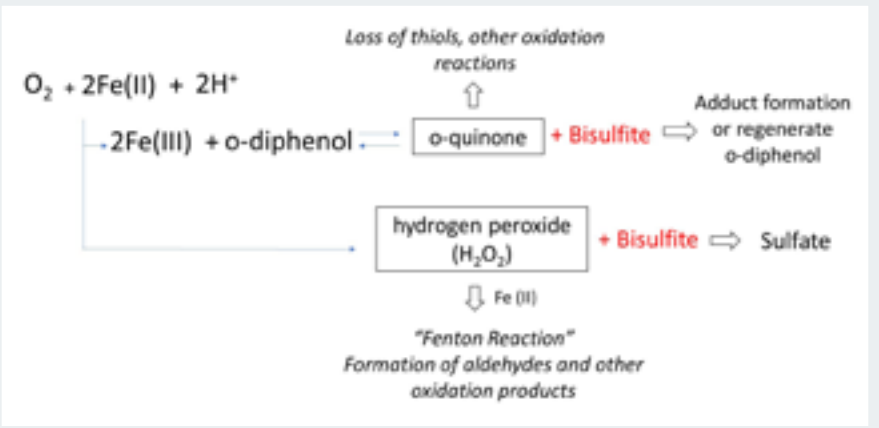

FIGURE 2 Overview of "iron-phenolic" oxidation pathway. Bisulfite limits to appearance of oxidative changes to wine (browning, aldehyde formation thiol loss) by reacting with initial oxidation products (hydrogen peroxide, quinones).

The key steps in the iron-phenolic pathway are:

- Oxygen reacts rapidly with the reduced form of iron (Fe(II)) to produce its oxidized form (Fe(III)) and hydrogen peroxide. Fe(III) then oxidizes phenolic compounds to produce quinones, and so is returned back to Fe(II). Iron is therefore an important oxidation catalyst as it cycles between its two forms, allowing oxygen to function as an oxidant.
- Quinones may undergo several reactions, including forming adducts with desirable thiols like 3-sulfanylhexanol ("citrus" aroma).[14] However, bisulfite rapidly reduces quinones back to their phenolic form, and prevent their participation in other wine oxidation reactions.
- H_2O_2 may undergo the "Fenton reaction" in the presence of Fe(II) to produce hydroxyl (·OH) free radicals. These free radicals can readily oxidize alcohols to generate compounds with oxidized aromas or which contribute to browning. For example, oxidation of ethanol by the Fenton reaction results in formation of acetaldehyde ("bruised apple" aroma).[9]

Bisulfite can, therefore, prevent the manifestation of "oxidation" and "oxidized" characters (loss of desirable odorants, formation of off-odorants and browning) in wine through three methods:

i) Bisulfite will consume H_2O_2 and quinones to prevent their further reaction with wine components.

ii) The rapid reaction of H_2O_2 and quinones by bisulfite accelerates the consumption of oxygen by wine,[5,7] which should in turn limit participation of oxygen in other reactions (e.g. "copper-sulfhydryl" pathway, which will result in loss of thiols.[11]

iii) Bisulfite may also bind with odor-active aldehydes and other oxidation products to yield non-odorous forms.

Following loss of free bisulfite, bound SO_2 forms will dissociate to partially replenish bisulfite and re-establish equilibrium. Theoretically, the ratio of total SO_2 loss to O_2 consumption is expected to be 2:1 on a molar basis if bisulfite fully reacts with H_2O_2 and quinone and no new binders are formed.[3,6] This corresponds to a 4:1 ratio if converted to milligrams per liter of bisulfite to dissolved oxygen.

Where Do Malodorous Aldehydes Come from During Wine Oxidation? Formed or Revealed?

The oxidized aromas of wines are due largely to an increase in free (i.e., not SO_2 bound) aldehydes and related oxidation products. These aldehydes include the aforementioned acetaldehyde, although other more aroma-potent aldehydes like phenylacetaldehyde ("honey") and methional ("baked potato") may be more important due to their low sensory thresholds and weaker SO_2-binding properties.[10]

From the previous section, the increase in free aldehydes could occur through two pathways (**FIGURE 3**):

Option A - The Fenton reaction could generate new aldehydes from iron-catalyzed oxidation of alcohols by H_2O_2. These aldehydes would be newly formed through chemical oxidation.

Option B - Following loss of bisulfite, bound SO_2 dissociates to release free aldehydes, such as those formed during fermentation. These aldehydes already existed but would now be odorous through dissociation from the loss of SO_2.

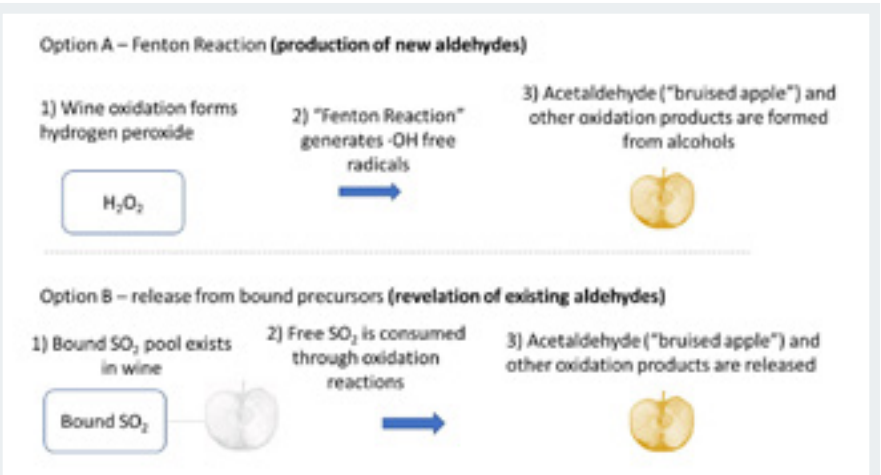

FIGURE 3 Two options for producing free aldehydes following oxidation via the iron-phenolic pathway. In Option A, hydrogen peroxide formed from wine oxidation undergoes the Fenton Reaction to yield free radicals, which subsequently react with alcohols like ethanol to yield aldehydes. In Option B, aldehydes are initially present in bound forms, and are released following consumption of free SO_2 and re-equilibration of bound and free forms.

Which matters more during typical wine oxidation, the Fenton reaction forming new aldehydes or loss of bisulfite revealing existing aldehydes? Recent work on model wine systems with typical wine Fe concentrations reported that the Fenton reaction and acetaldehyde formation can occur even in the presence of 0.6 mM (38 mg/L) free SO_2.[13]

In contrast, work on real wines reported little evidence of the Fenton reaction as a source of aldehydes during oxidation even at negligible SO_2 concentrations, based on the lack of correlation between aldehyde increase and corresponding alcohols.[2] However, this latter study and many others on wine oxidation have involved non-steady state conditions in which a wine is saturated with oxygen (~8 mg/L, depending on temperature and other factors). These conditions are more convenient for evaluating changes in oxidation markers (e.g. total or free SO_2 loss; browning; increases in free aldehydes), but may not allow for equilibration of the free and bound SO_2 pools as would occur during long-term storage.

In most packaged wines, the rate of oxygen ingress is slow as compared to the rate of oxygen consumption, such that commercial wines typically achieve a "steady-state" with very low concentrations of dissolved O_2 (less than 1 mg/L).[6,17]

A Natural Experiment for Evaluating "Steady-State" Oxidation: Bag-in-Box Storage Trials

Our team had access to a commercial trial involving three wines (Merlot, Chardonnay and Cabernet Sauvignon) stored in different bag-in-box (BiB) packaging materials at either ambient or elevated temperatures for up to 400 days.[16]

The high oxygen transmission rates (OTRs) of some types of BiB packages can allow for the near complete oxidation of SO_2 in one year or less.[8] In this experiment, total and free SO_2 were measured throughout storage, and oxygen was measured at the beginning and end of storage for some wines. Representative SO_2 data for the Chardonnay wine is shown in **FIGURE 4**, left.

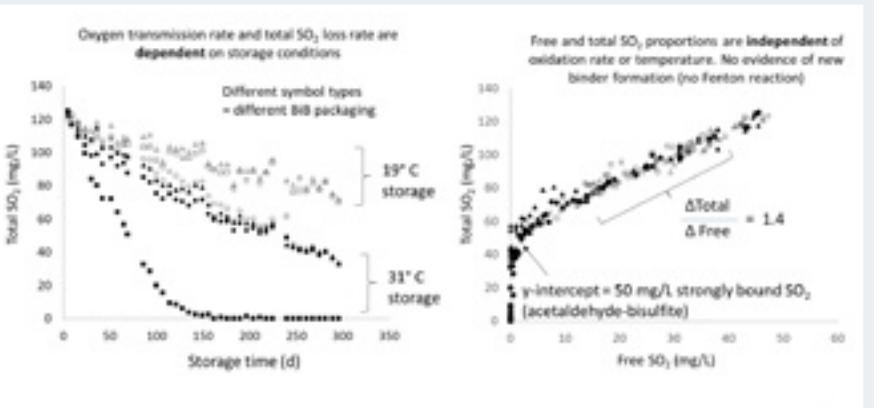

FIGURE 4 (left) Total SO_2 vs. storage time in Chardonnay wine stored in different BiB packages at room and elevated temperature; (right) Total SO_2 vs. free SO_2 plots for BiB wine storage treatments. Plots adapted from (Sacks et al. 2020).

The total SO_2 loss rate varied from 0.13 to 0.91 total SO_2 mg d^{-1} L^{-1} as a function of package type and storage temperature. The fastest rates of SO_2 consumption were observed at elevated temperatures (closed symbols), likely because of faster oxygen transmission. Assuming all oxygen entering the package will indirectly consume total SO_2 at a 2:1 molar ratio, these values equate to oxygen transmission rates (OTRs) of 0.03 to 0.26 O_2 mg d^{-1} L^{-1}, or about 10 to 1,000 fold greater than OTRs reported for glass packaging. However, OTRs were sufficiently low such that steady state oxygen concentrations are below saturation, similar to glass-packaged wines.

The "Revelation"

Constant total SO_2 loss even with undetectable free SO_2 indicates negligible Fenton reaction, and release of both weakly and strongly bound SO_2. Originally, we hypothesized that the Fenton reaction should become increasingly important as wine oxidation proceeded and free SO_2 (mostly free bisulfite) approached zero. Under these conditions, acetaldehyde and other aldehydes would accumulate, and the loss of total SO_2 should slow (**FIGURE 5**, left). Instead, we observed constant rates of total SO_2 loss even after free SO_2 was undetectable (representative data for a Chardonnay stored at 31 °C shown in **FIGURE 5**, right).

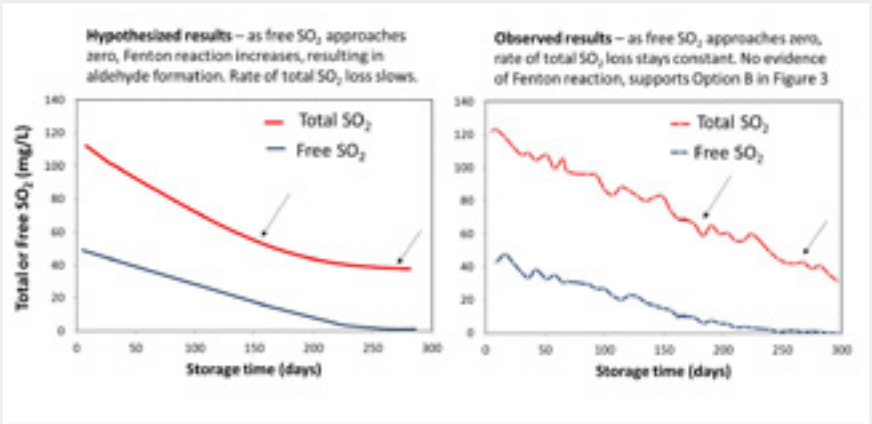

FIGURE 5 (left) Hypothetical total and free SO_2 versus storage time if new SO_2 binders are generated during oxidation; (right) Observed total and free SO_2 over time for a representative Chardonnay wine. Data replotted from (Sacks et al. 2020).

We draw the following conclusions from this real-world wine data:

- Only trace levels of free SO_2 are necessary to react rapidly with H_2O_2 and prevent the Fenton Reaction. For the Chardonnay, we observe a linear rate of total SO_2 loss for total SO_2 concentrations as low as 10 mg/L (**FIGURE 4**, left). Assuming all SO_2 exists as acetaldehyde-bisulfite at this point, the expected concentration of free SO_2 is ~1 mg/L based on the literature binding constant for acetaldehyde-bisulfite.[18] This concentration is below typical analytical detection limits for free SO_2, but apparently still sufficient to prevent the Fenton reaction in these wines.

- The rate of bound SO_2 dissociation is faster than the rate of oxygen ingress, even for strongly bound acetaldehyde-bisulfite adducts or anthocyanin-bisulfite adducts in reds, and even in high OTR packages like BiB. All bound SO_2 forms are in equilibrium with free SO_2, and will eventually be consumed through oxidation reactions–even bisulfite which is bound to acetaldehyde, which is erroneously referred to as "irreversibly bound" in some publications.

Further evidence of a lack of Fenton reaction-free and total SO_2 proportions are not dependent on oxidation rate or storage temperature. Additional insight can be gained by plotting total SO_2 versus free SO_2 for the same wine across all storage conditions (packaging and temperature combinations). Data is shown for the Chardonnay in **FIGURE 4**, right, and similar results were seen for the other wines (Merlot, Cabernet Sauvignon). All plots have three discernible regions.

- The first region is linear, and extends over the free SO_2 range of 5 to 50 mg/L. The slope of the line is approximately 1.4 for the Chardonnay, which indicates that a 1.4 mg/L decrease in total SO_2 results in only a 1 mg/L decrease in free SO_2 because a portion of weakly bound SO_2 will dissociate to partially replenish the free SO_2 pool. Higher slopes (1.8 to 2.1) were observed for the red wines, indicating they have a greater concentration of weak binders.

- A second region intercepts and runs along the y-axis. At this stage, the wine contains measurable total SO_2 but no detectable free SO_2. In this region, it can be assumed that the bound SO_2 fraction consists almost entirely of strongly bound acetaldehyde-bisulfite. The y-intercept (50 mg/L for the Chardonnay shown in **FIGURE 4**, right) should be proportional to the total acetaldehyde concentration, which we calculate to be 34 mg/L based on a 1:1 molar ratio.

- The first two regions are connected by a non-linear region at free SO_2 = 2 to 5 mg/L.

Remarkably, the curves for all storage treatments of a given wine overlap, indicating that the free and total SO_2 proportions do not vary with storage temperature or oxidation rate. If the Fenton reaction was occurring, we would expect the reaction (and concurrent aldehyde formation) to show temperature dependence, and the proportion of total versus free SO_2 should depend on storage conditions. The temperature independence of total versus free SO_2 proportions further supports our conclusion that the Fenton reaction is of little importance in real wine systems, even after free SO_2 is no longer detectable.

Practical Implications to a Winemaker

Why Does it Matter That Your Aldehydes are "Revealed" and Not "Formed"?

At the end of our study, BiB wines with free SO_2 concentrations less than 10 mg/L smelled "aldehydic" and "oxidized." However, the behavior of total and free SO_2 during storage suggests that the Fenton reaction was not occurring, nor other aldehyde-forming reactions like "Strecker degradation" of amino acids in the presence of quinones.[15] The most likely explanation for the increase in aldehydic character following oxidation is the release of bound aldehydes from bound SO_2 forms (**FIGURE 3**, Option B), in agreement with the observations of other authors.[2]

Why might a winemaker care about this conclusion that aldehyde aromas in "oxidized" wines are revealed from previously existing levels rather than formed anew during storage? Below are a few possibilities of winemaking considerations to ponder:

1. **If we limit the accumulation of potent aldehydes like methional at the end of fermentation, can we have wines that avoid smelling oxidized even without SO_2 additions?** Many of the key malodorous aldehydes like methional are produced through amino acid metabolism (Ehrlich pathway) during fermentation. These aldehydes will then be bound following addition of SO_2 at the end of fermentation. Successfully decreasing the concentration of these aldehydes at the end of fermentation should result in wines that can possess lower free SO_2 without smelling oxidized. Storing wines *sur lie* before sulfite addition has been shown to decrease acetaldehyde, and is part of the rationale behind "lagering" by brewers. Possibly, a similar effect could be achieved for other aldehydes.

2. **How do we get aldehydes when we want them, like during micro-oxygenation?** In red wine production, winemakers will often intentionally introduce low to moderate levels of oxygen to facilitate production of acetaldehyde and related compounds, which can eventually react with tannins and anthocyanins to yield "polymeric pigment." This acetaldehyde has been assumed to arise from ethanol oxidation and the Fenton reaction. If the source is instead SO_2-bound acetaldehyde, should winemakers be trying to increase this pool? The early initial use of SO_2 after fermentation may also need to be reconsidered.

3. **Can a wine smell oxidized even without oxygen?** Recent work has shown that SO_2 may be consumed by other wine components even in the absence of oxygen, including tryptophan derivatives,[1] and tannin hydrolysis products.[12] If the main source of malodorous aldehydes is released from SO_2-bound forms, this suggests that a wine could lose free SO_2 and smell oxidized even without being exposed to oxygen.

WBM

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Sensing and Automation for Vineyards

What it is and how to plan for it

Mark Greenspan

Dr. **Mark Greenspan** has more than 30 years of scientific viticulture research and viticultural field experience. He specializes in irrigation and nutrition management, yield and canopy management, vineyard climate and microclimate, vineyard design and vineyard technologies. He is the founder of Advanced Viticulture, Inc. based in Windsor, California (*advancedvit.com*), providing consulting, technology and automation, vineyard management and vineyard development for wineries, winemakers and wine growers devoted to producing premium wines. Please direct queries to *mark@advancedvit.com* or 707-838-3805.

SO, YOU SAY YOU want to automate your vineyard. Why? Do you want to do things in your vineyard more accurately and more cost effectively? Or is part of it to show off a shiny high-tech vineyard to your colleagues and friends? Hopefully, your motivation is oriented more toward what's best for your business and in the interest of sustainable farming. There are some very good reasons to automate a vineyard. But let's be realistic. Vineyards are not really easy to automate.

Mechanization Isn't Really Automation

Let's start with mechanization. Mechanization is not really automation. I prefer to think of the two separately. Mechanization involves doing things mechanically that have traditionally been performed by humans or non-human animals. Mechanization has been around for a long time. The modern plow came about in the late 18th century, which was a leap in improvement over the ancient digging stick. But in viticulture, we do more than dig the dirt. In fact, we've been moving away from tillage practices, which can be detrimental to soil health when practiced as intensively as it has been in the past.

But the vineyard requires other complex operations that are best done by human beings. Pruning, suckering, shoot thinning, cluster thinning, shoot positioning, leaf removal and, of course, harvest are all practices that have traditionally been done by field labor. Of those, only trunk suckering, leaf removal and harvest have been close to perfected in my opinion. The current methods for mechanized pruning are rather crude ways to circumvent the fine aspects of skilled pruning, and it's perfectly suitable for many large-scale operations. But let's face it; it's not really pruning as much as it is a trimming of dormant wood. Trunk suckering is easily done with brush-type implements that knock off the tender shoots. Harvest is a no-brainer and is being readily accepted by even the finest of wineries. On the other hand, the other practices I mentioned—shoot thinning, cluster thinning and shoot positioning—can be mechanized, but the methods are crude and often require that the trellis be designed to accommodate those machines.

Automation Requires "Smarts"

But, again, mechanization is not really automation. In my mind, automation requires some smarts in the system. Automatic smarts. The autonomous tractor has arrived—some are powered by electric motors and batteries and others powered by good old stinky diesel. The goal is driverless operation and vineyards are ideally suited to this type of automation, being that they are laid out in straight rows (usually), which can serve as a guidance system in conjunction with GPS-guidance. Using a map-based interface, they can be programmed to cover specific blocks as needed. Autonomous tractors are in their relative infancy—when they grow to be teenagers, watch out. It'll be a while before those infants walk, and in the meantime some early adopters are getting in on the excitement.

Will these robotic tractors really be a benefit or are they just cool? Well, cool they are. Just as cool as getting behind one of those autonomous-driving vehicles on the road. The idea is thrilling in a Jetsons kind of way, but frankly I'd rather be behind one of those than in front of one. For vineyard tractors, the benefit isn't there yet. I doubt any vineyard owner is going to let their tractor run amok with a mower just yet, let alone a vine trimmer. But it will happen.

The more immediate benefit for now seems to be in spraying. Spraying is usually done at night to avoid spray drift due to wind. Tractor drivers are usually paid a premium to work those cold and lonely nights, so this is an opportunity to reduce that cost. However, the law requires that a human operator be there during the loading and spraying operations, so that eliminates much of the benefit of an autonomous tractor. Likewise, I can't really envision tractors operating alone at any time, day or night. It's just too risky.

That said, the true benefit may be realized when growers have multiple units operating simultaneously. If that can be managed with a single operator, then the labor savings is there, and tractor automation starts to make sense. How much sense depends on how much these beasts cost relative to standard tractors. If the cost is similar, then the benefit starts to show.

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SCAN TO RSVP

Soil and Plant Moisture Sensors

Now, let me talk about something I do know: irrigation and water system automation. There are few components of a vineyard more ready to automate than a water delivery system. Monitoring and control can be done easily and, thankfully, wirelessly now with current technologies. Allow me to work back from the vineyard to the water source.

Monitoring of the vines themselves is, well, more viticulture than system automation. But having information on the soils and vines is important since the whole purpose of irrigation is the assist in the process of growing grapes. I've written many times about using soil moisture sensors for irrigation management. I still feel strongly about their use and, frankly, would not manage vineyard irrigation without them. The way I use them hasn't changed in a long time. Looking way back to an article I wrote on the subject more than 10 years ago[1], the principles and practices are essentially the same. Soil moisture probes can, and should, be connected to some sort of data telemetry system, which ties into an automation system perfectly.

Plant water sensors are another story. There have been numerous *in-situ* or external sensors that have been developed to measure some aspect of plant water status. Most have shown themselves to be mediocre at best, at least in my opinion as I've tried most of them. For me, the only sensor currently appearing to have promise is a microtensiometer from a company called Florapulse that measures trunk/stem water potential. We've tested it for two years with some success. They continue to improve on their design and I hope to be installing a lot of them in the near future. And yes, they can be connected to telelemetry along with the soil probes. I could talk about other types of plant water status sensors, but frankly I haven't seen much to get excited about.

Irrigation System Automation

Moving back from the vineyard one step, we get to the irrigation valves, submains, risers and laterals (the true technical name for those drip hoses). The obvious automation point is the valve, which should not surprise anyone who has seen a landscape irrigation timer. Yes, automated valves, whether for a garden or a 6-inch irrigation line operate similarly and many are easily automated with little modification. When developing a vineyard, don't skip the automatic valves even if you don't immediately plan on automating them. And while we're discussing it, don't forget the manual valve either. Automated valves aren't foolproof and if one fails or leaks, you'll want to manually shut it off upstream while servicing or replacing it.

We do lots of automation work and when we see a bunch of single-valve manifolds, we cringe.

Another important tip for new vineyards is to group valves into as few manifolds as possible. PVC pipe is cheap, but controllers are pricey, so if you group as many valves together as possible, the number of controllers is minimized. We do lots of automation work and when we see a bunch of single-valve manifolds, we cringe.

Automated valves operate by pressure and are actuated with solenoids. There are two types of solenoids: those that open when powered with 24 volts AC and those that open and close with pulses of DC current. The AC solenoids are the most common and are what the valves usually ship with. However, unless there is a power source to the controller, they cannot work on solar power alone. As most of today's controllers are wireless and solar powered, they can only operate what are called DC-latching solenoids. Most AC solenoids can be replaced with a comparable DC solenoid without changing out the whole valve.

Another tip. In doing many of these operations, we have found that AC solenoid valves are nearly foolproof. They open and close valves with gusto. And we've found poorly-designed irrigation systems that lack either adequate pressure or flow to open and close reliably with DC-latching solenoids. I'm not even sure why, but it seems to be the case. Make sure that you install the proper valve and have the correct pipe diameter (and everything else for that matter) when the system is built. Otherwise, if you do have line power, the 24VAC solenoids will work wonders in operating even a poorly designed irrigation valve system.

Automation is not really automation without feedback. What happens if the system doesn't turn on when it's supposed to or if it is on while it's supposed to be off? It's easy to provide this information with either a pressure sensor or a pressure switch installed downstream of each valve under control. Pressure switches are simple and actuate when pressure is above a given threshold. A pressure sensor, on the other hand, will provide an actual pressure value, which is even better than an on/off indicator. However, those sensors are more expensive and are usually better suited to monitor pressure upstream of the valve manifolds.

Monitoring the Water Delivery System

Valve automation is relatively commonplace, but if the system isn't pressurized, you're not really automating the full system. Powering a pump is relatively easy. The same systems that actuate valves can flip a relay on and off to turn a pump on and off. But more commonly, growers are installing variable frequency drive (VFD) controllers to control their pumps. These are the perfect component for an automated irrigation system, as they respond to demand for pressure by operating the pump at the correct speed to maintain pressure levels at any flow rate (within a given range) or turn the pump off when no flow is needed (all valves off). I'm seeing these installed more and more and it's a welcome sight when we go to automate the rest of the system.

Any control system should be monitored at critical points. Flow, of course, can be measured, as can pressure. We usually monitor flow upstream of all valves. Not only will it tell us how much water we have used during a given time period, but we can also be alerted if there are excessive flow conditions that can occur with pipe blowouts, etc. We usually also measure pressure upstream and downstream of the filter. Most filters have automatic backflush controllers connected to them, but if that fails, how do you know if you're not measuring the pressure drop across it? Any or all of these systems will provide alerts and alarms if something isn't working properly, like a filter backflush.

Upstream of all of this is the water delivery system and we can monitor the heck out of that also. Static water depth of a reservoir or tank is usually measured with pressure sensor, often dropped to the bottom of the vessel, or mounted at the outlet. The static pressure is easily converted to a water depth. It's needed to monitor if your system is performing properly.

Well depth sensors have been around for a long time and usually have involved dropping a pressure sensor down the well. This is expensive because of the long cable needed, which must be vented to the atmosphere so that barometric pressure does not influence the measurement. Also, if that cable gets cut, you've lost your expensive sensor down the well forever.

We've recently started working with The Well Bubbler, a company based in San Luis Obispo, Calif. Their system works on air pumped through a small tube that is run down the well and left there permanently. The tube is cheap and won't harm the well pump if, for some reason, it gets cut loose. The unit pumps air into the tube and computes the air pressure needed to clear the tube—bubbling air into the water column above it. The higher the column, the more pressure that is needed. A simple concept used by well management professionals for a long time, but now its automated. The units can also measure power supplied to the pump so that the user and automation system know when the pump is running. You can save your pump if you know if water drops too low in the well while the pump is running. Pumps will overheat and be damaged if run dry, so this can be a good investment.

I mentioned telemetry. There is no need to run wires all over (really under) a vineyard anymore, since wireless telemetry is a mature technology. We work with two companies that provide this technology, Ranch Systems, out of Novato, Calif. and WiseConn, out of Fresno, Calif. (a Chilean parent company). These systems provide all the connectivity needed for an automated system with the ability to not only control and monitor, but to provide messages to users when the system has a fault or even if everything is running smoothly.

Yes, these systems are cool, and you'll want to show your friends how it works. But providing precise control of your water benefits your cost of operation, less waste of a precious and unpredictable resource, and lets you manage your viticulture the way you intend to. **WBM**

1 Greenspan, M. Understanding Grapevine Water Management: An Evolutionary Process. *Wine Business Monthly*. March 2011.

Resistant Varieties: The Next Step Toward Sustainability

Will consumers agree?

Loni Lyttle

Loni Lyttle began her viticultural journey in 2010, when she visited the bucolic hillsides of Piedmont, Italy, and decided to stay there. Over the next eight years, she worked as an assistant vineyard manager and cellar hand while earning a bachelors and master's degree in viticulture and enology from the University of Turin. She specializes in grapevine physiology, cold hardiness, and obscure Italian varieties. In 2019, she found a home at Advanced Viticulture Consulting in Windsor, Calif., where she works as a viticulturist and contributes regularly to the Advanced Viticulture blog.

ASIDE FROM A GOOD GLASS of white at the end of a long day in the field, I have a weakness for a particular snack food item: A Dangerously Hot one, if you know what I mean. Now I'm not trying to call anyone out (especially you, Mr. Cheetah), but I think it's interesting that there is a double standard that I, and many others, hold different aspects of the food and beverage industries to. Most corn in this country is genetically modified, and most wheat is Roundup-ready, meaning you can spray a bunch of herbicides on it and harvest it anyway. Both agricultural products find their way into the snack aisle at the gas station. The grapes, though? Those that went into my wine? Those had better be different.

Because of this drama that surrounds the wine industry, grapes have been pretty much backed into a corner. Over the centuries, ancient peoples selected the vines that made the best wine, blissfully unaware of things, like powdery mildew, that lurked on the other side of the ocean. The first run-in with the deleterious effects of globalization would be with *phylloxera* in the late 1800s. We found a relatively innocuous way to combat this pest by grafting onto American vines. Years later, the progeny of these first rootstocks are helping us fight nematodes, handle different soil types and improve water usage. There are some purists that prefer own-rooted vines, but for the most part people don't freak out too much about this phenomenon.

Chambourcin

Floreal

Seyval

Vidoc

The use of chemicals, however, is a major bone of contention, and *phylloxera* certainly wasn't the only gross little thing to hitch a ride back to Europe from the New World. Both downy and powdery mildew set up shop quickly as did viruses and insect vectors. While American varieties may have grown up with this disease pressure in their neighborhood, *Vitis vinifera* did not and so is extremely sensitive. Over the subsequent century, vineyards became one of the largest sinks for pesticide usage in all of Europe. The New World followed suit once its denizens got a taste for wine made with European varieties. No one likes the idea of pesticides being used in agriculture. It's worth pointing out, though, that even non-synthetic chemicals can be nasty, with sulfur and copper being some of the most common weapons that organic farmers have against mildew.

If we weren't talking about winegrapes, the decision to utilize the resistance present in American varieties would be a no-brainer. There are two ways to do this: you can cross the two and create inter-specific hybrids (meaning one parent comes from a species other than *vinifera*), or you can go in, grab the resistant genes and plop them into the *V. vinifera* genome. To be clear, I've got no beef with genetically modified organisms (GMO). This latter option would probably give us vines that were much more similar to the clones we all know and love with a fraction of the fungicides being needed. The market just isn't ready to accept this approach. This leaves us with good old-fashioned breeding.

The New Kids on the Block

Early attempts at creating resistant and tolerant grapevines explored the natural resistance of American varieties. Crosses with *V. labrusca* yielded disgusting results as that "foxy" characteristic becomes overpowering once the sugar isn't there to mitigate it as in juice and jelly. *V. labrusca* has since been eradicated from breeding programs, at least for winegrapes. Other American varieties, such as *V. amurensis*, *V. riparia* and *V. rupestris*, as well as Asian *Vitis* species, managed to produce foxy-free wines; however, the stigma of gross wines coming from non-vinifera grapes lives on.

On a side note, there are plenty of cold climate growers who exclusively rely on wild genetics in order to grow grapes at all. The University of Minnesota, for example, has created many hybrids that are bred almost exclusively for cold-hardiness with fungal resistance being a pleasant side-effect. Most wines produced from these grapes are from smaller producers that clear their inventory with local consumers. These consumers don't seem to care that the wine doesn't compare to *V. vinifera* wines and are happy to partake in tasting their local wine. Good on them, honestly.

For the wider market, however, getting something close to the *V. vinifera* flavor profile is important. Science has allowed us to do that. In 2007, scientists at the INRA research center in France, along with the University of Bordeaux, sequenced the genome of *V. vinifera*, making genetics-driven clonal selection possible. This research led to the identification of three genes for resistance to powdery mildew (*ren1*, *ren3*, *run1*) and four genes for resistance to downy mildew (*rpv1*, *rpv3*, *rpv10*, *rpv12*). These genes code for pathogen-specific-defense mechanisms that allow for the vine to better utilize its own defenses when faced with a mildew infection.[1]

Knowing which genetic markers code for resistance allows breeders to back-cross hybrid progeny with their *V. vinifera* parents with the aim of obtaining clones that mimic their European parents while remaining tolerant to disease. In 2019 Andy Walker of UC Davis released five cultivars with high resistance to Pierce's Disease. While the resistant genes come from *V. arizonica*, these resulting varieties are anywhere from 94 to 97 percent *V. vinifera*[2]. While you can't call a hybrid by its parent's name, those with a

genetic pedigree are 85 percent or more *V. vinifera* and classified as PIWI (coming from the German word *Pilzwiderstandsfähige*, meaning disease-resistant). Moreover, they are allowed to be marketed as *V. vinifera* varieties.

How do these new varieties stack up? It depends on who you ask. A recent blind tasting of 52 hybrid varieties showed that more than half of the reds were equivalent or superior to the reference Merlot wine. Almost a third of the whites measured up to or were better than the reference Chardonnay. This pool included the red varieties Cabernet Jura, Cabertin and Chambourcin and the white varieties Solaris and Saphira. A consumer study in Switzerland determined that 70 to 90 percent of wine drinkers thought the white varieties Solaris and Marechal Foch were on the same level as Riesling and Zweigelt, with as many as 30 percent believing them to be superior[1]. Personally, I find this hard to believe.

When I spoke to producers about their experiences, the results were mixed. Each of these varieties presents unique challenges in the vineyard, such as requiring more leafing or having shoots that break easily. As a grower, you have to pay close attention to rootstock selection as vigor can be a problem. When it comes to winemaking, these varieties yield deliciously fruity whites and Rosés. Reds, however, tend to be much lighter-structured and not suited for long-aging.

Why is This So Hard?

Clonal selection is hard to begin with, but we've had centuries to whittle down the entire breadth of any given cultivar into a few clones we like best. Adding in an entire other species is like going from the kiddie pool into the ocean or at least a big lake. (I'm sure some geneticist will correct me on my orders of magnitude.) *V. rotundifolia*, which is used in some crosses, has a whole extra chromosome than *V. vinifera*. The takeaway here is that there's a lot more genetic material and a lot more room to get wild variability in terms of vigor, production and all the other things that can go awry. A farmer knows what to expect from Cabernet Sauvignon but…Cabernet Cantor? It's going to be up to the same trial and error our ancestors went through as far as understanding optimal farming practices for each cultivar.

So much of what we look for in a wine depends on the vine's relationship with stress. Phenolics, for example, are a function of light exposure and water stress. Oxidative stress caused by excessive light and temperature causes the synthesis of glutathione, which is a major precursor to some of our favorite thiol aromas. That nauseating foxy aroma from *V. labrusca* is one of the reasons why Concord is such a hearty cultivar. Many of the things we love about *V. vinifera* wines are directly related to the cultivar's susceptibility to disease.

These resistance characteristics also make vinification more difficult. Those pathogen-related proteins that the new varieties produce in abundance are unstable and can bind with tannins before precipitating out. In this instance, the only recourse is adding tannins, which consumers often don't like to hear. A lack of mouthfeel is just one problem winemakers face. Wines may be higher in methanol as well, an unpleasant side-effect of thicker, pectin-rich skins. While this doesn't affect the flavor of the wine, methanol content is subject to limitations in some countries.

Who's Working on This and Where Are They Now?

There are several research facilities that are working on these varieties in Germany, Italy, Switzerland and France. The fact that so many of these programs are based in Europe is ironic. These are places where disease pressure is elevated and consumers on high alert about pesticide usage, yet they are also home to strict rules regarding wine denominations. Can Chablis contain anything other than Chardonnay? Barolo is Nebbiolo. Mosel is Riesling. It's not just about convincing wine drinkers. This is a legal battle.

I had the opportunity to speak to Laurent Audeguin, research and innovation manager at ENTAV International. This agency already has four tolerant cultivars on the market: Floreal and Voltis (whites) and Artaban and Vidoc (reds). A huge opportunity he sees for these varieties is their use in untreated buffer zones between inhabited spaces and treated vineyards. The agency has made some gains in the Champagne region, with one of their varieties approved for inclusion in sparkling wine production. For now, Audeguin sees them going more into blends, if anything, just to combat the fact that these varieties are unrecognizable to consumers on their own.

Diego Barison, who heads Herrick Nursery in Red Bluff, Calif., sees the American market as having much more potential in this regard. Average wine drinkers may know they like Pinot Noir but have heard of Barbera about as many times as they've heard of the resistant variety, Chambourcin. Why would they reach for one and not the other?

With climate change, Audeguin thinks that growers and consumers alike may be opening their minds. As far as the technology goes, "What's your letter to Santa Claus like?" In other words, what do you want your vines to be capable of? Growers affected by late frosts are asking for vines with greater fertility on the secondary and tertiary buds. Do you want vines that are tolerant to mildew? What about drought? When faced with no other alternative, producers and consumers alike may have to open their minds and reach for something different. They may even like it.

Where Does This Fit?

I think there's already plenty of space in the wine world for these new varieties. Laurent had me taste a wine made with one of ENTAV's mildew-tolerant varieties, Floreal. It was lovely! While I may still turn to a White Burgundy for a fancy dinner, I would happily have a glass of Floreal beforehand.

For high-end production, I still think that people are going to go with what's familiar, but frankly, high-end production isn't where tolerant varieties are needed most. In a vineyard that is still largely managed by hand for pricey bottles of wine for discerning consumers who know what they want, vines are usually meticulously fussed over anyway. For vineyards that produce bulk wine or even just "bulk-ish," the reduction in fungicide usage and tractor passes may be just enough to tip the scale. **WBM**

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Terroir Winemaking at a Virginia Winery

Jim Law

Jim Law, owner and vineyard manager of Linden Vineyards, purchased 76 acres at the northern end of the Blue Ridge Mountains, 60 miles west of Washington, D.C. in 1983. He chose the land because it had high elevations and east facing slopes. Linden Vineyards' first commercial vintage took place four years later.

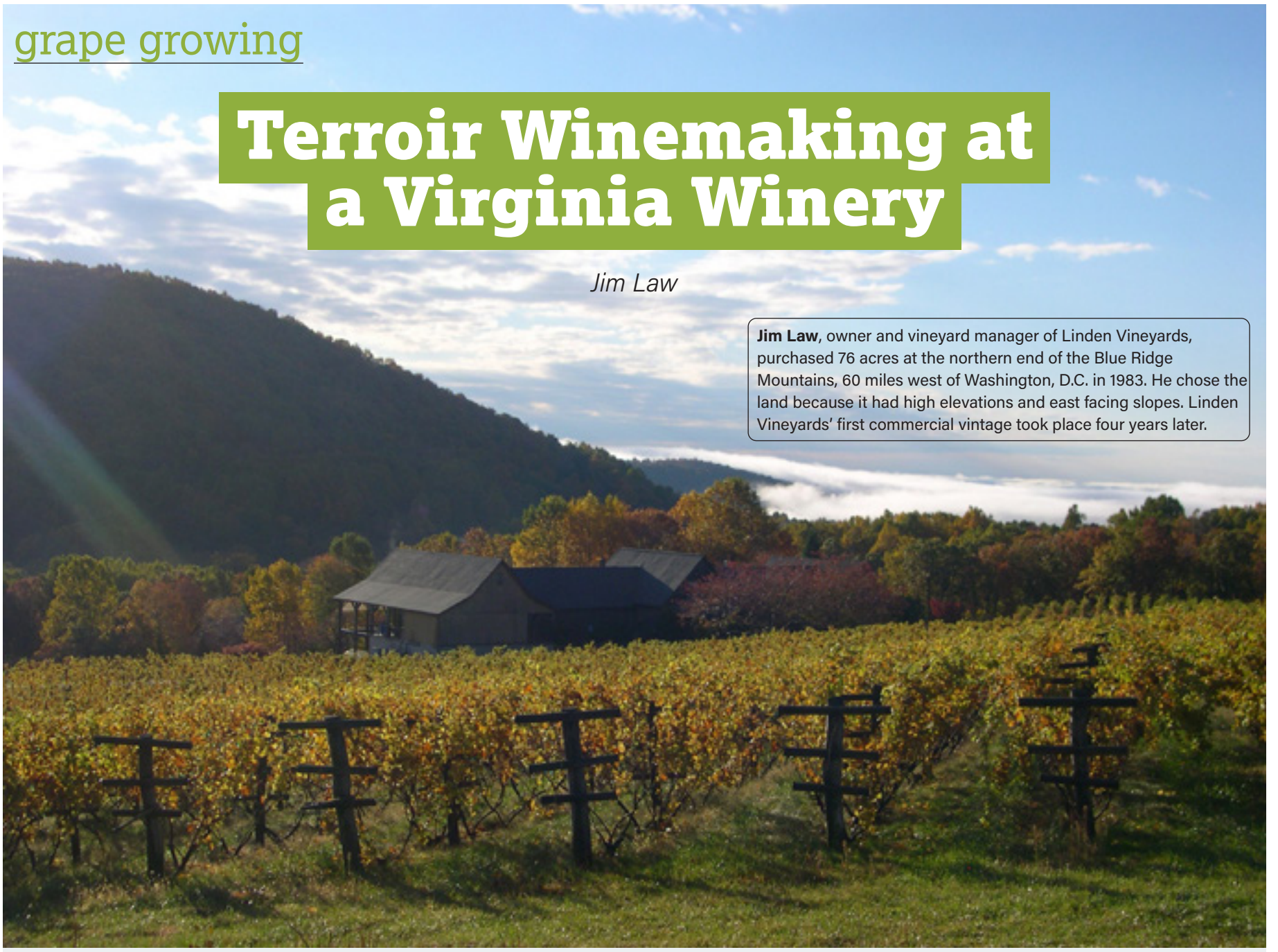

FIGURE 1: View of Linden Vineyards and the Blue Ridge Mountains in Northern Virginia.

"A great wine…will necessarily be uncommon and decidedly unique because it cannot be like any other."

Andre Ostertag [Alsace]

UNTIL RECENTLY, MOST WINE was produced in well-established wine regions, where winegrowers could build on a continuation of the work and discovery of previous generations. Newly emerging regions find themselves in a very different and unique position as we have no ancestral mentors. Our challenge is to unveil a virgin terroir. This goal has been both an attraction and a driving force to many of us in our nascent industry.

In the late 1970s, Virginia became home to a German owned and operated winery, Rapidan River Vineyards, and an Italian operation, Barboursville Vineyards. The owners and their viticultural and winemaking staffs brought with them their respective winemaking methods and philosophies. Their commitments encouraged other operations, and one of them hired me in 1981 to make their first vintage.

As an industry, we slowly became aware of geographical differences in varietal adaptation and growing conditions. It was too early to try to define regional wine styles, but that still didn't stop us from mapping out official American Viticultural Areas.

I became fascinated by cooler, high elevation sites (**FIGURE 1**). In 1983, I purchased an old, abandoned apple orchard on the northern end of the Blue Ridge Mountains to start my own vineyard. The vineyard was named Hardscrabble, which is the name of this part of the ridge (**FIGURE 2**).

Since my early days in the wine industry, I have been intrigued by the terroir expression of Chardonnay, which was and is Hardscrabble's largest planting. In this article, I'll use the example of Hardscrabble Chardonnay to reflect how changes and adaptations in the vineyard and cellar can lead to wines that become more terroir expressive.

When Hardscrabble Vineyard was planted in 1985, I had an idea of what generic Chardonnay should taste like. I had experienced tasting White Burgundy terroir, but Hardscrabble's terroir was a blank slate. My mission was to figure it out.

I learned that producing wines with terroir expression requires harvesting balanced grapes and practicing deferential winemaking. In the vineyard all decisions revolve around delivering balanced grapes to the winery. The grapes need to be harvested fully ripe with fresh acidity so that there is no need to make additions or manipulations to the juice or wine.

Most of these decisions are made during the establishment phase. Even with a high elevation (1,300 feet), Hardscrabble is on the warm side for Chardonnay, so we do everything we can to push ripening into the equinox sweet spot of mid to late September when the nights are cool. This is critical to retain acidity and freshness (**FIGURE 3**).

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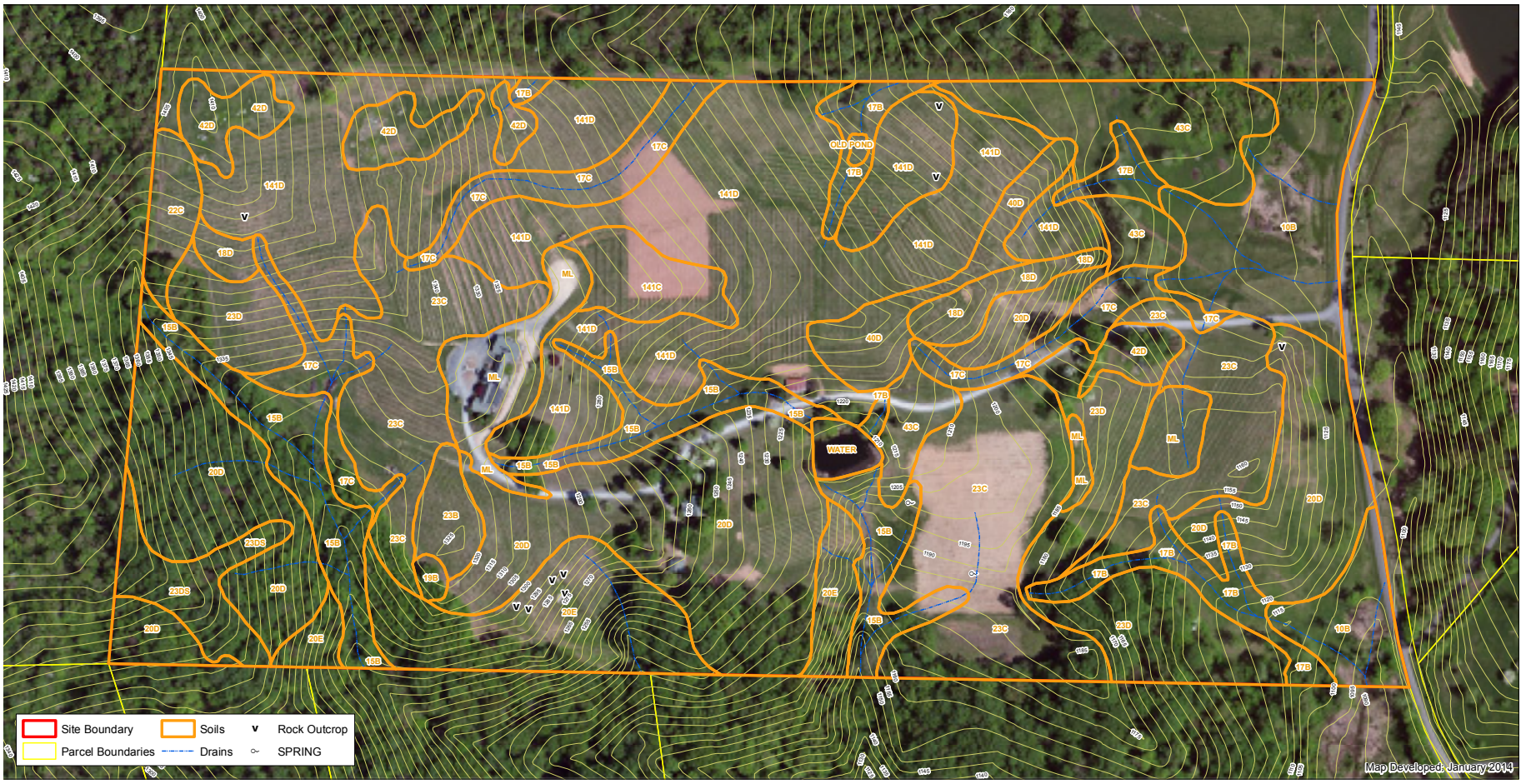

FIGURE 2: [Soils map] Chardonnay is grown on a ridge of greenstone soils that have a higher fertility and water holding capacity than granite-based soils, which at Linden Vineyards are reserved for Cabernet Sauvignon.

Soils with moderate water holding capacity and fertility work best, while lower capacity soils are reserved for the red grapes. A healthy canopy and avoidance of extreme hydric stress allows for slow, even, uninterrupted ripening. East slopes are the coolest and help delay ripening. We would plant on north slopes if we had them. The Wente #4 and Martini #72 clones comprise the majority of Hardscrabble's Chardonnay plantings, as they ripen later and retain more acidity than Dijon clones.

ANNE-CATHERINE FALLEN

FIGURE 3: Hardscrabble Vineyard's younger vines are planted at densities of 1,600 to 2,400 vines per acre.

As our climate warms, we are adapting by doing less leaf removal in the cluster zone and allowing for a larger canopy with less hedging. Limiting direct sun on the clusters gives more acidity and freshness to the wine.

Terroir winemakers have a long term and intimate relationship to the vines. They are vignerons, or deferential winemakers. There is no separation of duties. There is no revolving door. There are no egos. Winemaking decisions center around balance and texture. Aromas and flavors are entirely vineyard driven and the winemaker gets out of the way.

When to pick is the most important winemaking decision and it is rarely an easy one. Ripe with acidity is the mantra. We monitor acidity by taste and analysis. Ripeness is determined by juice mouthfeel, aromatic profile and skin astringency (phenolics). Grape integrity and weather forecast can also have a significant influence (**FIGURE 4**).

Brix plays a very minor role. The sugar content will tell us what to expect as far as potential alcohol and that's all. We've made balanced Chardonnay under 12% abv and above 14% abv.

Guiding the relationship of juice and skins is perhaps the second most critical winemaking decision. How one transforms the grape to juice has a significant bearing on the texture and finish of the wine. There are many influences: grape temperature, crush or whole cluster, pressing cycles, and most importantly, when to make the press cuts.

At Linden, three of us are involved with the critical decision of press cuts. During a typical crush day, Shari Avenius runs the presses (we have two antique Willmes bladder presses). Jonathan Weber, Linden's winemaker, can be found buried deep in the cellar surrounded by barrels, pumps and hoses,

ANNE-CATHERINE FALLEN

FIGURE 4: Jim Law picking Chardonnay clone #72. Small, loose clusters require much more picking time, which can be problematic if rain is in the forecast.

and I'm in the vineyard. But we are all involved at the critical stage of pressing (**FIGURE 5**). At about the fourth or fifth cycle, the juice starts to lose acidity and takes on more phenolic astringency from the skins. We taste at each squeeze and decide at which point to make the cut (**FIGURE 6**). In cool vintages where the grapes are harvested with high acidity, we might consider pressing longer in order to have more lower acid juice. The same might be the case if the astringency is of high quality. However, if bitterness creeps in early, then the cut is made early.

There are three decisions to be made during the juice stage: sulfur additions, oxygen, and turbidity. Several years ago, we stopped adding any sulfur to Chardonnay juice because we found the resulting wines showed better textural harmony. We may oxygenate the juice if we find that the phenolic load is on the high side. We prefer to ferment fairly cloudy Chardonnay juice, depending on the quality of the juice lees. The wines will age on their gross lees for about 16 months, so consideration needs to be given to the balance between textural weight, reduction and overt lees flavor influence.

ANNE-CATHERINE FALLEN

FIGURE 5: Shari Avenius and Jonathan Weber shovel the pomace from the press into manure spreaders parked below.

ANNE-CATHERINE FALLEN

FIGURE 6: Jonathan Weber, winemaker at Linden Vineyards, tastes the Chardonnay press juice.

Don't miss an issue.

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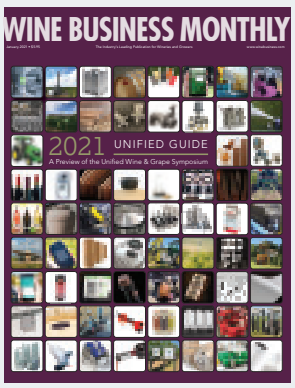

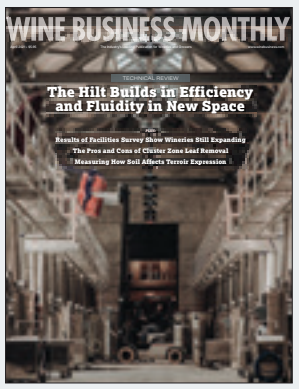

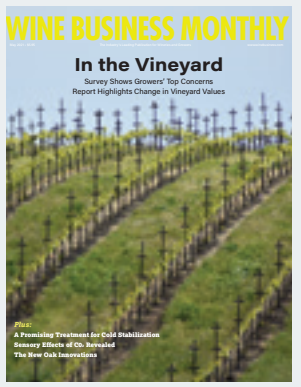

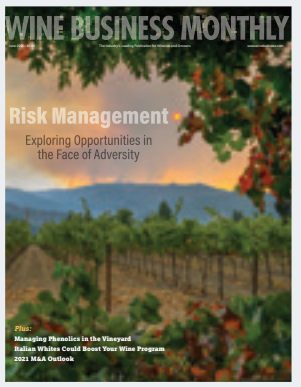

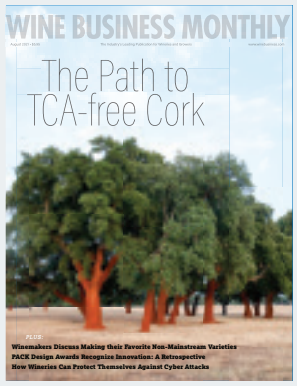

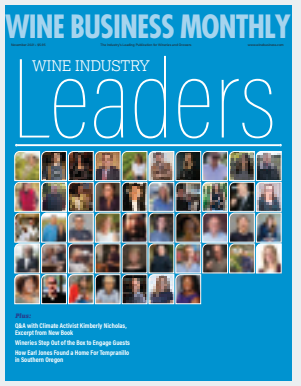

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FIGURE 7: Hardscrabble Vineyard is located on the top of the Blue Ridge Mountains at between 1,200′ and 1,400′ elevation.

After over a decade of uninoculated fermentations, we have now reverted back to adding cultured yeast. Counterintuitively, we found that adding cultured yeasts allow for a better terroir expression. With uninoculated fermentations, we ran into too many problems with stuck fermentations, stinky reduction, and volatile acidity. These are cellar issues and certainly take away from any terroir expression. We also found that trying to get those last few grams of sugar to ferment required perfect conditions for malolactic fermentation. Our wines often became flabby, as Hardscrabble grapes usually do not have enough natural acidity to support MLF. We could have decided to add tartaric acid and yeast nutrients to address these problems, but that would be detrimental to our goal of minimal intervention. The wines did not need any additions if we used a reliable cultured yeast (we use CY3079). Terroir winemaking shouldn't be dogmatic; it needs to be pragmatic and flexible.

In 2013, Jonathan and I traveled to Burgundy. We took barrel samples of our 2012 Chardonnay. On many visits we asked the winemakers to taste our wine and comment. Just in smelling the wine, they would inquire as to our fermentation temperatures. They were quickly able to isolate the cause of our concern that our white wines were too fruity, too estery and too varietal. Terroir expression was muted because our fermentations were too cool. We needed to relax and let them warm naturally. Now our fermentations typically peak in the 70s F (low to mid 20 degrees C).

Long élevage is the key to avoiding most additions and manipulations. Time and lees take care of most of wine's stability problems. Twelve months in barrel and then four months in tank, all on lees, also gives Chardonnay more textural harmony.

Hardscrabble Chardonnay is 100% Chardonnay from the same vineyard, but it is a blended wine (**FIGURE 7**). We have seven distinct blocks, each harvested, fermented, and aged separately, but they don't all make it into Hardscrabble Chardonnay. Blending is our final tool to harmonize the wine.

The foundation of terroir winemaking is the long-term relationship of the decision-makers with the vineyard. We've learned through experience and mistakes how far we can push the envelope of non-interventionist winemaking in order to let the vineyard speak. We still add sulfites and yeast as tools to make better wine, but we have eliminated all other additions. We have a deep understanding and expectation of the personality of our vines and how that is expressed in our wine. That gives us great satisfaction that we hope to pass on to the next generation. **WBM**

Wineries Find Success in Omni-Channel Marketing

A summary of the 360° Marketing session at the Wine Industry Financial Symposium

Kara Krushin

MARKETING WITHIN THE VARIOUS direct-to-consumer (DTC) channels has always been a critical component of a wine brand's strategy, and the pandemic only highlighted the importance of effective outreach, since consumers were stuck at home and online shopping became a daily habit—even a necessity. At the Wine Industry Financial Symposium, held in November 2021 in Napa, Calif., a panel of marketing veterans discussed the evolution of winery marketing and methods to integrate sales/marketing systems and staff for effective, targeted consumer outreach. Generating additional sales and acquiring new customers have always been the pillars of marketing, but how do wineries tackle this with new buying habits?

The panel was moderated by Anisya Fritz, owner, Lynmar Estate and included Andrew Kao, director of digital strategy, DuMol/Amicus Wine Holdings and Liz Lease-McCaffrey, SVP consumer direct and tasting rooms, Foley Family Wines. The panel focused on 360° marketing, commonly referred to as omni-channel marketing, which is focused on consistent messaging and ensuring the customer is at the center of every touchpoint.

A Shifting Marketplace

In 2021, wine e-commerce sales were 146 percent higher than pre-COVID figures and since then one thing has become clear to the panelists: wineries must continue to invest in digital marketing strategies. In the past, wine was viewed as a product that would never successfully sell online since the consumer could not smell or taste it before purchasing. Now, pandemic behavior has reinforced the fact that many consumers simply regard wine as another commodity available for online purchase, not just in a tasting room or restaurant. This realization has created an opportunity to reach an infinite list of customers to attract, and begins by mapping a customer's journey to discover, and ultimately acquire, a brand's wine.

In the past, wineries focused heavily on marketing to tasting room visitors and wine club members–in essence, those already aware of the brand and its wine. While successful in grabbing repeat sales, this outreach does not entice an untapped plethora of consumers who may not be familiar with a brand. This presents the perfect opportunity to find digital users and then convert them into purchasers, and the current technologies and data available enable a much higher success rate.

Current digital marketing tools, such as those that enable extreme targeting and automation, allow a brand to introduce a high level of personalization based on the intended digital user's buying and spending habits. Video and virtual tastings/sales can now bring content to life in new ways. For so many brands, virtual outreach was unexplored territory prior to COVID. Now virtual tastings are being referred to as the sixth DTC channel and has been instrumental in keeping existing buyers engaged and extending outreach to new potential purchasers. Each of the panelists agreed that these tactics are not going away and show the importance and effectiveness of introducing a product to an untapped market.

How to Think About Omni-Channel Marketing

Brands cannot wait for consumers to come to them. Wineries must find creative ways to encourage sales and wine club membership and sales beyond traditional pitches to tasting room visitors. In the past, this often meant sending a representative out into the various markets and more recently has shifted to video experiences, given recent travel restrictions. The reverse has also been true: customers have not been able to travel to a tasting room. It is for this reason, the panelists argued, brands need to invest in digital that evokes that same experience and reinforce the feeling that the customer is at the center of the messaging strategy, and not the product. People feel special when they have an in-person encounter, and marketing tactics need to recreate and reinforce that feeling, even across digital platforms.

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Wineries Find Success in Omni-Channel Marketing

Timing

Not every consumer is buying wine for the same reasons or at the same time, and brands must pay attention to online behavior. The timing of digital marketing, whether the wine is a new release, occasion-based (i.e., birthdays, holidays) or is simply a more emotional purchase by the customer, is essential. Brands must understand where each customer is in their purchasing journey and be creative in the related messaging.

Device

Consumers are also spending an increasingly larger proportion of time on their mobile devices over traditional desktops or laptops. Many brands continue to design for desktop and neglect to optimize for mobile. Even though conversion may be lower on mobile devices, it is vital for brands to conceive messaging on mobile first, given the increasing likelihood of engagement with an Instagram post or via clicking on an email from a phone.

Data

After the marketing message has been created, what a brand does with the data received is vital, and, too often, overlooked. It is no longer enough to post a Facebook ad or send a promotional email. Investment must be made in analyzing and understanding the information. It is important to gauge conversion rates, time spent on the website, items left in a cart or pages visited. All this data can be analyzed and used for further conversion or to tailor future messaging: What are consumers interested in learning more about? What kept them engaged? Did the website hinder sales?

Measuring ROI is crucial for successful current and future marketing campaigns, regardless of the size of the winery. Brands must also pay attention to ensure their current staff has been trained to understand the importance of this information and collect it when necessary, or recruit talent to execute successful digital strategies.

Behavior

Omni-channel marketing also focuses on understanding consumer behavior by age cohort, and it is obvious to the panelists that 'boomers' (aged 57 to 75) are not the dominant purchasing group anymore. This group often comprises most wine club members, and as they approach retirement and have lower discretionary income, wine brands need to shift focus to gain market share from consumers aged 30 to 55. The broader Millennial market is changing some of its preferences away from wine because of several factors, including the health consequences of alcohol consumption, earlier adoption of craft beer and spirits over wine and lack of wine knowledge.

Wine brands have to work harder to attract this younger demographic and be able to connect via methods they utilize. For example, boomers frequently rely on wine publications and ratings to buy wines, which younger audiences do not place as much value on. The good news is that this younger age group are active digital users and frequently engage with multiple digital platforms in a day. This is a natural gateway to attract and engage with potential new customers.

E-commerce sales are here to stay and become even a larger percentage of a winery's total revenue. There are thousands of wines available, and if a brand doesn't invest in a comprehensive marketing strategy—one that includes multiple digital platforms—another brand will seize the sales opportunity. **WBM**

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THE ENTRY FROM WineShop at Home in the series category consisted of three sparkling wines (white, rosé and red) sealed with a crown cap without a capsule. Designed by the firm TRYBE Creative, the simplified format is meant to be appear as "young and fun" with bright colors to differentiate the three wines. The judges called the series "to the point and hip" and the lack of cork, foil, and wire hood does convey an approachable and easy-to-enjoy wine while the premium label is in line with the $25 price.

A new brand by the firm WineShop at Home, the wine also represents two ongoing trends in the overall market: the popularity of sparkling wine and the ongoing growth of direct-to-consumer (DTC) sales. Founded in 2005, the company is based in Napa, Calif., and owned by the Fredrick family of Texas. The company's chairman, Stan Fredrick II, has more than 30 years' experience in direct sales including serving as senior vice president and president of international for the clothing company Colesce Couture. President and CEO Jane Creed previously was a senior vice president with The Pampered Chef and is a former member of the Direct Selling Education Foundation's board of directors. Winemaker Alexandre Reble oversees production of more than 50 unique brands.

WineShop at Home is a bonded winery that recruits consultants who arrange in-home wine tastings featuring the company's wines. Following the tasting, the consultants provide order forms and WineShop then fulfills those orders and gives the consultant a commission of the sale. Tastings are also performed online, and consultants are also encouraged to set up their own websites to facilitate tastings and orders.

Sales of sparkling wine have been strong throughout the past two years and that growth has also been seen in winery direct-to-consumer (DTC) shipments, which would include those of WineShop at Home. According to data by Wines Vines Analytics/Sovos ShipCompliant, U.S. wineries shipped more than 333,000 cases of sparkling wine worth nearly $128 million in 2021, which is 13 percent more than in 2020 by volume and 24 percent more by value. The average bottle price of sparkling shipments in 2021 was $31.87, which is 10 percent more than the previous year. Sparkling's DTC growth was even more impressive in 2020, with value up 33 percent and volume up by more than 40 percent. **WBM**

BOTTLE IMAGES: OUTSHINERY

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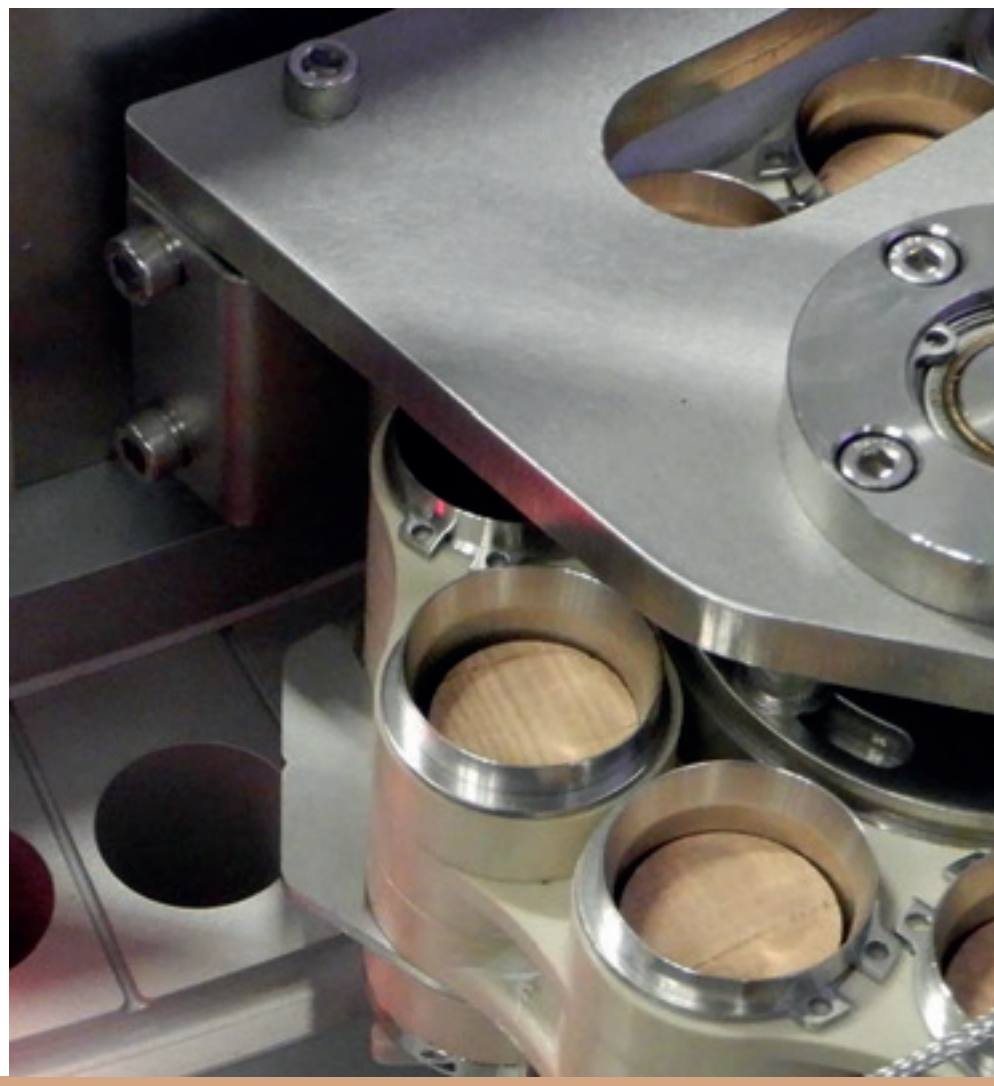

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RETAIL SALES ANALYSIS

Retail Wine Sales Down 7 Percent in January

Wines Vines Analytics

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

Sales Value Down 7 Percent in January

Off-premise table wine sales fell 7 percent versus a year ago in the four weeks ended Jan. 29, NielsenIQ scan data showed, totaling nearly $1.2 billion. Sales for the latest 52 weeks totaled $16.2 billion, down 8 percent from the previous year. The month following the holidays is typically slower for wine sales, and this year a large proportion of consumers reported an intention to observe Dry January. While the decline in 52-week sales was stronger than in recent periods, actual dollar sales remained steady as seasonal spending patterns returned to off-premise sales.

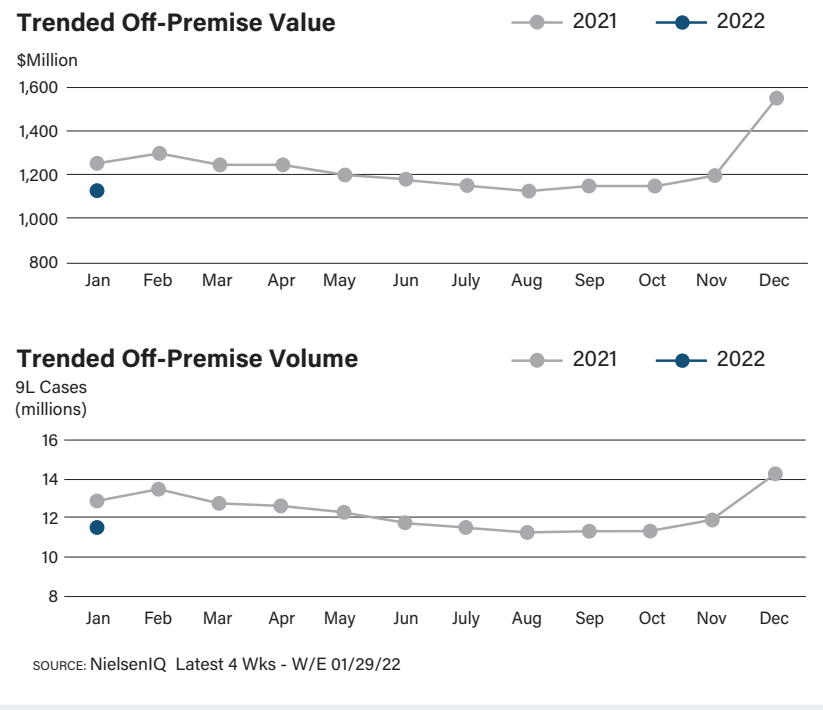
Sales Volume Down 10 Percent in January

Off-premise table wine volumes dropped 10 percent versus a year ago in the four weeks ended Jan. 29 to 11.5 million 9L cases. The decline contributed to a contraction of 12 percent in the latest 52 weeks versus a year earlier to nearly 160 million 9L cases. The sharper drop in sales volume versus value reflected a moderating trend in consumption as the new year began as well as the willingness of consumers to spend more per bottle when they do purchase wine.

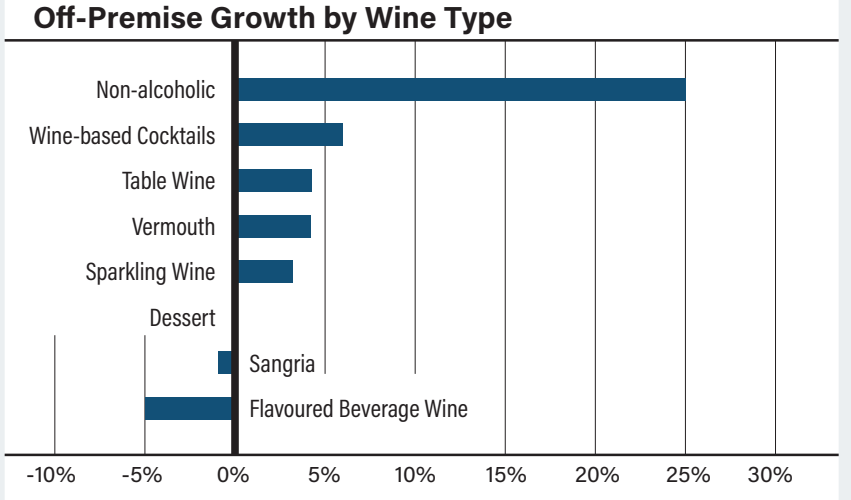
Dry January Boosts Non-Alcoholic Wines

NielsenIQ's latest four weeks began following New Year's and ran through Jan. 29, offering a glimpse of how the trends of premiumization and Dry January play out alongside one another. Drilling into specific wine segments, table wines fetched 4 percent more than a year ago at $8.40 a bottle. Sparkling wines increased 3 percent to $14.12—the most expensive wine type sold through off-premise outlets. Both reflect the well-established premiumization trend. But the strongest growth of any wine type was logged by non-alcoholic wines, which saw their average price rise 25 percent to $7.18 a bottle. This was in addition to more than 24 percent growth in sales during the period compared to a year ago. While wine-based cocktails saw even faster growth in sales, rising 32 percent, and fetched more per bottle at $7.78, but saw relatively lackluster price growth, rising just 6 percent versus a year ago.

The latest period marked an acceleration in the growth of non-alcoholic wines versus the latest 52 weeks. The wine type saw sales value increase 27 percent to $47 million in the 52 weeks ended Jan. 29, and the average bottle price within these transactions was 17 percent higher than a year ago at $6.33. The growth of non-alcoholic wines was many times faster than that of sparkling wines, which gained 2 percent to $2.4 billion in sales. Table wine, the single largest wine type by sales value, saw sales drop 8 percent to $16.1 billion in the latest 52 weeks. **WBM**



SOURCE: NielsenIQ Latest 4 Wks - W/E 01/29/22



SOURCE: NielsenIQ; off-premise sales, 52 weeks ended Jan. 29, 2022

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 January 29, 2022

		Dollar Value		Dollar Value % Chg YA		9L Equivalent Volume		9L Equivalent Volume % Chg YA		Avg Equivalent Price Per 750ML	
		Latest 52 Wks - W/E 01/29/22	Latest 4 Wks - W/E 01/29/22	Latest 52 Wks - W/E 01/29/22	Latest 4 Wks - W/E 01/29/22	Latest 52 Wks - W/E 01/29/22	Latest 4 Wks - W/E 01/29/22	Latest 52 Wks - W/E 01/29/22	Latest 4 Wks - W/E 01/29/22	Latest 52 Wks - W/E 01/29/22	Latest 4 Wks - W/E 01/29/22
	TOTAL TABLE WINE	**16,168,539,100**	**1,160,029,140**	**-8.3**	**-7.0**	**159,996,409**	**11,512,085**	**-12.4**	**-10.3**	**8.42**	**8.40**
PRICE TIERS BY CONTAINERS	BOX	1,578,525,108	120,511,687	-11.1	-5.9	35,715,163	2,704,546	-11.8	-7.4	3.68	3.71
	$0-$3.99	562,835,043	42,201,179	-13.9	-10.5	18,875,757	1,401,646	-13.9	-11.5	2.49	2.51
	$4+	1,015,675,921	78,308,528	-9.4	-3.2	16,839,121	1,302,860	-9.4	-2.6	5.03	5.01
	Total Table Wine Glass	14,251,725,363	1,016,667,131	-8.2	-7.1	120,525,775	8,556,039	-12.8	-11.2	9.85	9.90
	Value Glass $0-$3.99	492,773,470	35,264,046	-19.8	-17.5	12,195,743	865,047	-20.6	-18.4	3.37	3.40
	Popular Glass $4-$7.99	2,757,671,321	199,046,343	-17.0	-13.9	41,017,860	2,941,541	-17.5	-14.7	5.60	5.64
	Premium Glass $8-$10.99	3,264,909,781	232,496,701	-13.6	-11.8	28,408,331	2,005,179	-13.9	-12.6	9.58	9.66
	Super Premium Glass $11-$14.99	3,560,195,758	252,808,353	-5.8	-4.9	23,368,973	1,645,568	-6.1	-5.6	12.70	12.80
	Ultra Premium Glass $15-$19.99	1,948,045,649	140,062,280	0.6	0.7	9,451,703	671,369	-0.1	-0.3	17.18	17.39
	Luxury Glass $20-$24.99	774,270,594	54,560,845	0.0	-0.1	2,999,252	209,209	0.9	0.3	21.51	21.73
	Super Luxury Glass $25+	1,415,672,589	99,463,060	9.9	4.4	2,898,046	203,467	6.9	2.2	40.71	40.74
IMPORTED	IMPORTED	4,436,858,069	306,084,742	-9.9	-7.6	42,461,189	2,971,848	-13.0	-10.4	8.71	8.58
	ITALY	1,465,719,648	100,347,304	-8.6	-8.5	11,678,068	789,836	-11.3	-11.3	10.46	10.59
	AUSTRALIA	676,314,218	49,351,048	-16.0	-15.4	10,827,075	791,298	-15.9	-15.2	5.21	5.20
	FRANCE	629,092,269	37,252,332	-5.6	-4.2	3,423,652	198,419	-9.6	-8.3	15.31	15.65
	CHILE	363,003,734	27,196,235	-15.5	-8.0	6,237,395	472,217	-14.5	-7.2	4.85	4.80
	SPAIN	155,706,849	12,010,045	-9.9	-3.6	1,112,584	83,791	-16.3	-9.0	11.66	11.94
	GERMANY	80,206,067	5,329,118	-12.4	-8.3	685,850	45,083	-14.6	-10.7	9.75	9.85
	NEW ZEALAND	639,238,058	43,486,432	-3.6	2.6	4,405,527	294,758	-5.1	0.3	12.09	12.29
	ARGENTINA	312,627,832	23,636,988	-15.4	-9.6	3,153,023	236,606	-18.2	-11.4	8.26	8.33
	SOUTH AFRICA	26,495,385	1,889,891	-10.2	-6.5	219,189	15,660	-9.8	-6.1	10.07	10.06
	PORTUGAL	49,809,083	3,074,123	-11.4	-9.9	490,632	29,452	-12.4	-11.7	8.46	8.70
DOMESTIC	DOMESTIC	11,731,681,030	853,944,398	-7.7	-6.8	117,535,220	8,540,237	-12.1	-10.2	8.32	8.33
	CALIFORNIA	10,543,500,279	772,268,095	-7.4	-6.1	108,484,573	7,926,417	-12.1	-9.9	8.10	8.12
	WASHINGTON	606,534,873	41,657,829	-14.1	-15.5	4,805,419	325,930	-15.2	-16.7	10.52	10.65
	OREGON	309,528,217	22,137,495	-2.0	-5.6	1,516,340	106,934	-4.1	-8.4	17.01	17.25
	TEXAS	31,834,822	2,245,932	-13.9	-17.4	344,981	23,447	-15.7	-22.4	7.69	7.98
	NEW YORK	42,681,510	2,176,360	-9.9	-1.3	455,231	26,933	-14.7	-7.5	7.81	6.73
	NORTH CAROLINA	45,118,812	3,279,412	-4.5	-6.9	456,409	32,476	-6.1	-11.5	8.24	8.42
	INDIANA	25,443,762	1,749,893	-9.4	-16.2	274,407	18,675	-9.0	-16.9	7.73	7.81
	MICHIGAN	26,427,630	1,626,579	-10.5	-16.9	264,340	16,125	-13.1	-19.0	8.33	8.41
TYPES	RED	8,422,949,178	633,049,170	-8.4	-7.9	73,051,140	5,486,077	-13.4	-11.5	9.61	9.62
	WHITE	6,524,700,084	456,995,922	-7.3	-4.6	71,410,082	5,045,496	-10.6	-7.7	7.61	7.55
	PINK	1,215,398,553	69,725,982	-12.2	-13.0	15,487,844	977,007	-15.5	-16.3	6.54	5.95
VARIETALS	TOTAL CHARDONNAY	2,721,013,548	195,444,794	-7.2	-4.4	29,257,093	2,115,327	-10.4	-7.5	7.75	7.70
	TOTAL CABERNET SAUVIGNON	3,189,264,698	242,669,506	-5.8	-4.5	25,676,804	1,976,302	-11.8	-8.5	10.35	10.23
	TOTAL PINOT GRIGIO/PINOT GRIS	1,468,598,354	103,322,886	-6.8	-3.3	18,118,829	1,287,198	-9.2	-5.6	6.75	6.69
	TOTAL PINOT NOIR	1,337,263,621	103,016,573	-5.5	-3.7	9,130,444	707,552	-10.1	-6.7	12.21	12.13
	TOTAL MERLOT	642,015,552	47,734,003	-14.1	-12.4	8,126,118	602,348	-17.3	-14.3	6.58	6.60
	TOTAL SAUV BLANC/FUME	1,290,093,350	88,342,073	-2.5	0.9	10,731,456	739,328	-4.9	-1.5	10.02	9.96
	TOTAL MUSCAT/MOSCATO	624,905,539	42,288,582	-16.9	-17.1	8,771,027	592,372	-19.1	-18.8	5.94	5.95
	TOTAL WHITE ZINFANDEL	235,145,711	16,047,525	-16.2	-17.8	4,572,079	313,593	-17.4	-18.1	4.29	4.26
	TOTAL MALBEC	245,893,713	18,992,252	-14.8	-8.5	2,178,858	170,452	-17.1	-8.3	9.41	9.29
	TOTAL RIESLING	235,310,304	15,805,000	-14.1	-12.5	2,343,144	156,470	-16.9	-14.6	8.37	8.42
	TOTAL ZINFANDEL	220,564,083	16,156,343	-13.2	-14.2	1,432,011	103,184	-16.8	-18.4	12.84	13.05
	TOTAL SHIRAZ/SYRAH	115,865,640	8,588,309	-16.9	-15.0	1,192,008	88,428	-21.2	-18.4	8.10	8.09
	WHITE BLENDS (ex. 4/5L)	252,367,503	16,765,164	-9.6	-10.6	2,706,440	185,046	-13.5	-13.2	7.77	7.55
	RED BLENDS (ex. 4/5L + CHIANTI)	2,188,006,468	160,012,904	-9.4	-12.4	17,960,715	1,306,987	-13.4	-15.3	10.15	10.20
	ROSE BLEND	703,940,682	34,496,812	-9.1	-8.4	5,450,603	282,378	-12.6	-12.9	10.76	10.18
GLASS SIZES	750ML	12,066,947,365	858,472,407	-6.8	-6.3	84,734,618	5,970,928	-11.1	-10.3	11.87	11.98
	1.5L	1,888,401,880	137,135,212	-16.2	-12.1	31,096,272	2,253,271	-17.0	-13.2	5.06	5.07
	3L	52,007,244	3,714,943	-17.9	-14.5	1,216,055	85,800	-17.7	-14.5	3.56	3.61
	4L	68,032,912	4,846,332	-15.6	-14.2	2,081,693	147,885	-16.5	-15.3	2.72	2.73
	187ML	92,691,780	6,297,760	-11.8	-12.7	1,043,790	72,484	-13.4	-12.8	7.40	7.24
	375ML	59,969,295	4,575,158	25.1	11.4	222,231	17,021	31.1	11.3	22.49	22.40
BOX SIZES	ex. 4/5L	1,107,922,247	85,434,258	-10.1	-3.8	19,299,334	1,491,908	-10.3	-3.7	4.78	4.77
	1L	33,714,908	2,685,134	-5.6	2.8	478,384	37,786	-5.9	1.9	5.87	5.92
	1.5L	19,249,093	1,414,999	-25.0	-21.1	356,757	25,709	-28.5	-26.8	4.50	4.59
	3L	821,602,623	63,720,521	-13.4	-5.7	15,601,755	1,212,519	-12.1	-4.6	4.39	4.38
	5L	470,598,896	35,077,058	-13.3	-10.5	16,415,732	1,212,629	-13.5	-11.6	2.39	2.41
	TETRA	267,684,643	20,348,407	3.4	4.2	3,347,011	254,167	1.8	4.5	6.67	6.67

Source: NielsenIQ

Is Wellness for Wine Professionals the Industry's Achilles Heel?

Maintaining health and wellbeing, while working in the wine business, can be challenging.

Rebecca Hopkins and Cathy Huyghe

Rebecca Hopkins is a wine marketing communications professional and founder of A Balanced Glass.
Cathy Huyghe is the founder of Enolytics, a columnist for Forbes.com and co-creator of content for A Balanced Glass.

CONVERSATIONS AROUND HEALTH AND wellbeing are deeply personal, and traditionally reserved for private conversations with trusted friends, loved ones and professionals. When a global pandemic cuts off the very threads that have connected a community and supported people through difficult times, the vulnerability of our industry is brought to light.

In some ways, the wine business has always been uncertain and vulnerable. It's an industry soaked in good times, celebration, conviviality and creativity. At the same time, wine professionals also face natural disasters, sudden or unexpected loss, financial insecurity and woefully ill-equipped systems for addressing concerns of physical health and mental wellbeing.

The last two years in particular have taken a brutal toll on our industry, as business travel stopped, countless restaurants shuttered and sales channels vanished. It's heartbreaking.

What are we to do, other than take a deep breath, pour a glass and "figure it out?"

We believe that there has to be a better way.

At its core, the wine industry is sustained on alcohol. It's known to impede normal bodily functions when consumed at certain quantities, and it causes long-term harm when misused—but the industry has not yet found a way to holistically educate and support the professionals who drive the $7.5 billion/457 million case wine economy, much less help them sustain health and wellbeing for the long-term.

While the beverage alcohol industry is leveraging the evermore increasing consumer trends in health and wellness, with messaging and product development for natural, organic, gluten-free and lower calorie products, much of this is being done without taking responsibility for the industry's own health. It can be argued that the industry is exploiting the desire of the consumer but taking no responsibility to support and protect its own workforce.

Since 2018, our online platform, A Balanced Glass (ABG), has been focused on understanding the health challenges that face industry professionals who live day-in and day-out around alcohol. At the time of writing, the ABG community spanned more than 2,200 members across more than 10 countries with 75 percent of the audience based in the United States. Through blog posts, newsletters and ongoing dialogue with community members, we have identified a number of areas where the industry falls behind on sustaining the wellbeing of its own workforce.

Here we consider three main challenges, namely self-moderation, company culture as a part of wellbeing and industry leadership. We offer actions and solutions that can help employees perform at their best and help employers recruit and retain best-in-class talent. Ultimately, the goal is to develop and support a high-performing workforce for the wine industry over the long-term.

ABG Primary Research on the Impact of COVID

The Global Wellness Institute (GWI) indicates that U.S. consumer spending on mental health and wellness goods and services topped $66 billion in 2020[1], up 10.3 percent in 2019 as people looked for ways to self-manage mental health and wellbeing during COVID.

The GWI also estimates that the United States is the largest market for wellness workplace programs, spending more than $15 billion per year[1]. With healthcare costs borne mostly by employers, it's reasonable to conclude that this expenditure is primarily motivated by their desire to manage and reduce medical care costs for employees, to improve recruitment, increase retention and maximize performance and productivity in the workplace.

Closer to home, while consumer consumption of wine may have risen over the last two years, the negative impacts of COVID on the health and well-being of wine professionals were felt in the early months of the pandemic.

In August 2020, 200 members of the ABG community contributed anonymously to a survey on community health and wellness to better understand the effects of COVID-19 on their lives.

When asked how their overall health and wellbeing had changed, 52 percent cited it was "a little worse," and 18 percent stated "much worse" than pre-COVID times. Sixty-six percent of respondents cited financial/employment stability as their top concerns, followed by mental health and wellness (64 percent) and physical health concerns (61 percent). Concerns over social equity and justice ranked fourth at 57 percent of survey respondents.

By the end of 2020, the challenges of living through a pandemic became painfully evident although the survey was surprising in its results. No one was saying that it was easy, but we didn't expect to find people reporting that their well-being had actually improved. In a follow-up survey conducted in November 2021, 47 percent of ABG community respondents stated that their mental and physical health and wellbeing were better than pre-COVID times, and 37 percent said they were around the same level. We can infer that for some in the focus group, adjusting to a life without in-person activities

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and contacts (such as business travel and client hospitality) offered more opportunity for time with family, physical activity or self-care.

The COVID pandemic has also brought to light the pressures on working families as they struggle to manage work and life expectations. For many professionals outside of production, the lines between personal and professional life have blurred as homes became multi-purpose spaces, encompassing schools, workout centers, retreats and dwellings.

In the struggle to "do it all," respondents ranked lower intensity exercise, reading and meditation as the top three activities to help support personal wellbeing.

Models From Industry Leadership

In January 2022, Pernod Ricard's CEO and chairwoman Ann Mukherjee announced a new wellness benefit for U.S. employees, created in partnership with telehealth provider "Better Up."

The program offers employees a dedicated mental fitness coaching tool and support. "The mental wellbeing of our employees is a top priority for me," Mukherjee said. "As we continue to move through and beyond this pandemic, it is not only about keeping our employees physically safe, but keeping them mentally safe as well."

Mukherjee doubled down on her personal position, leading with vulnerability and transparency. She stated on her personal LinkedIn page that "Each employee gets a personalized plan based on their unique goals and needs…. That's why I'm so excited about Better Up Care–it's an invaluable resource for daily life, not just for times of crisis. I, for one, will definitely be taking advantage of it."

Unfortunately for the nature of the wine business, initiatives, such as Pernod Ricard's, land predominantly within the domain of larger employers.

In the wine sector, corporate companies, such as Treasury Wine Estates, E. & J. Gallo Winery and Constellation Brands, offer robust HR and workplace wellness programs as part of their medical plans. For example, Southern Glazer's Wine & Spirits (SGWS) offers its "Better for You" program in partnership with Virgin Pulse.

However, due to the family-owned and boutique nature of the wine industry, workplace wellness is often limited to basic medical care. That leaves the broader focus of mental health and wellbeing up to either the individual, proactive SME business owners and leaders, or like-minded community groups.

Prioritizing wellness for employees can seem like another task on an operator's never-ending "to do" list, but action can be taken in very small yet meaningful ways in the workplace today.

Here are a few suggestions we've found to be effective for ourselves and colleagues:

- One of the simplest ways to show leadership is to offer company activities that are not oriented around drinking. This creates spaces of inclusion and supports all employees equally. This can include outdoor activities, stretching and movement classes, or meditation or mindfulness gatherings.
- Opening team meetings with a few minutes of movement or a guided meditation can help improve employee wellness. Pausing for just 60 seconds of silence at the beginning of a meeting to gather the group's collective calm can have a positive impact. Online resources for free mediation programs are abundant and can be practiced inside or outside of work hours.

- Leaders can model self-care behavior, such as scheduling personal or family time on the calendar just as they would schedule a meeting. This demonstrates a personal commitment at the leadership level to health and wellness. With work and personal time more blended than ever, leading with vulnerability and making time for personal wellbeing with family offers others the opportunity to do the same.

- Conducting check-ins and one-on-ones that are NOT performance-related, but focused on employee mental wellness, offers environments of support that will also enhance wellbeing.

Real leadership goes even further, offering flexibility to meet the needs of a changing workforce. However, the sentiment among the wine community, while hopeful, is dubious on leadership's visible and impactful actions toward improving wellness in the workplace.

"I think the conversations are beginning to happen! You can see [wine businesses] posting about wellness, wages, opportunities, etc. But I don't see a lot of ACTION," said one anonymous respondent from the ABG survey.

Treasury Americas, one of the largest wine-only companies in the United States, is taking significant action for mental health support for employees. Two years ago, marketing employee Tamara Stanfill left full-time employment with the company to pursue a career in wellbeing, with a focus on earning her meditation teacher certification, in addition to her 200-hour Yoga Teacher Training. She then collaborated with Treasury Americas, returning in a part-time role, as public relations manager, while growing her business as a mindfulness teacher. Today, Stanfill leads bi-weekly yoga and meditation sessions for Treasury Americas' employees during the mid-day work schedule that are designed to help with relaxation, stress/anxiety reduction, building resilience and developing a sense of self-compassion. Furthermore, Treasury is reported to be rolling out a robust mental health program called "Lyra" for employees that offers a range of support services, programs and counseling to support mental health and wellness, in addition to existing offerings for financial health and fitness as part of a robust benefits package.

Establish Expectations of Moderation

With a profession grounded in a culture of alcohol consumption, setting workplace expectations around drinking at work is a critical starting point. Establishing codes of conduct and protocols, and reviewing policies on drinking in the workplace can help create feelings of safety and inclusion for employees. Beyond the protocols and codes of conduct, it is necessary to also state explicitly and transparently the recourse or consequences of any breach of expected behavior. "Inspect what you expect," as the saying goes: We do expect a certain outcome, and we need to verify that it actually happened.

Carefully consider and adapt the language used in each business around moderation and responsibility. That helps to open up the conversation with co-workers on healthy boundaries around alcohol and drinking, mental health and wellbeing. "Moderation" does not mean abstinence or lost sales, but it does mean that more responsibility is required from industry leaders to create environments that are safe, inclusive and appealing to potential candidates.

Moderation and mindful consumption apply to alcohol, of course, and these tenets also extend to the consumption of food, social media, screen time and other "inputs" that we absorb into our bodies.

"Wellbeing is more than just limiting consumption," one ABG community member commented in the survey. "When you have limited time for yourself, it's nearly impossible to make mental and physical health a priority, much less limit consumption after a long day or week."

Yet personal clarity about levels of consumption and boundaries around those levels are tools for managing mental health. It is challenging to learn how to handle these tools and it takes practice, but self-discipline is also a cornerstone of a successful, healthy and long career in wine.

Community is Critical

Finding safe environments to explore difficult subjects is one of the most important aspects of finding balance. Networking activities that do not revolve around alcohol (such as running groups, community yoga or hiking groups) are ways to connect with community members without drinking.

Telehealth has transformed the conversation about mental health support, with support available 24/7 around the world. Since providers can be located remotely, those seeking treatment can go outside of peer groups, reducing the fear of workplace or industry stigmas surrounding treatment. Industry support groups, such as Ben's Friends, Restaurant After Hours, Club Soda and Not Nine to Five, all provide industry-tailored community network groups and offer support for mental health, wellbeing and alcohol issues.

Free mental health resources and tools are available, but it helps to have a "heads up" on where to look.

One place to start is in the hospitality and broader beverage alcohol network. Healthy Pour was established in 2020 by Laura Louise Green, MEd LPC, a licensed professional counselor with more than 20 years' experience in the beverage alcohol industry and seeks to improve the mental wellbeing of hospitality and hospitality-adjacent professionals.

The organization offers leadership skills training for hospitality professionals through the Healthy Pour Institute and is expanding the offerings, through their various consulting services, to support hospitality employees and alcohol and hospitality-adjacent industries. Green's 20 years of experience in hospitality and beverage alcohol sales give her a unique ability to address the industry's challenges from an informed and compassionate perspective.

Hospitality media outlet, *Plateonline.com*, recently published a "Mental Health Toolkit" targeted to hospitality professionals. Offered free of charge in a downloadable PDF format, the Toolkit offers mental health support resources, techniques and real-life examples for ways that readers can both address their own mental health and support others in the workplace.

More commercially, "Circle"—from telehealth provider Modern Health—is an online platform that offers free mental health support tools across a broad spectrum of mental health and wellness, including Diversity, Equity, Inclusion and Belonging (DEIB), drinking and moderation, and trauma counseling.

Unfortunately, most resources in mental health and DEIB for the industry remain in the hands of grassroots organizations that have formed under a common vision (for example, the Diversity in Wine Leadership Forum) and rely on contributions through grants, scholarships and industry opportunities, to support their growth. Additional, notable organizations that are advancing DEIB in the wine industry include The Vinguard, Lift Collective, the Two Eighty Project, Industry Sessions, Dream Big Darling, Bâtonnage and The Roots Fund.

Maryam Ahmed, co-founder of the Diversity in Leadership Forum, is leading by example in helping organizations grow. "It starts with the understanding that not everyone is coming at the topic of DEIB from the same level of understanding, but holding people accountable at the organizational level of everyone who is making the commitment is key. If we hold ourselves accountable for professional and personal growth, we are inherently holding each other accountable."

It is imperative that the grassroots organizations are successful to create even more inclusive environments, drive the much-needed evolution of the industry and create safe, and sustainable, working environments.

Wellbeing as a Reflection of Culture

The landscape, demographics and profile of wine employees are actively in flux. From DEIB initiatives to working parents facing increased childcare demands in a pandemic, people who work in wine today are not the same people who worked in wine 20 years ago or even 10 years ago.

The wine industry is in a position to recognize this shift and actively engage the evolving requirements of the current workforce. Broader trends of employee wellness at work point toward, especially during COVID, mental health declines, challenges with meeting basic needs, burnout, increased stress and feelings of loneliness and isolation. Subthemes of increased work demands include unmanageable and increased workload, loss of work-life separation, more hours spent working, too much time at the computer and not enough staff support[10].

Those trends and subthemes offer an outline for company culture in wine that reflects employee wellness needs today. A "checklist" of suggestions include:

- Develop D&I protocols. See the next section for a deeper dive.
- Treat mental health as an organizational priority, with clear ownership and accountability mechanisms. Leaders serve as allies by sharing their own personal experiences, which helps cultivate a stigma-free environment.
- Prioritize employee health and wellbeing beyond HR. Make it visible through activities, such as monthly roundtables and special interest focus groups.
- "Encourage employees to get up and get out of the winery," suggested Amy Gardner, president of WineTalent, an industry executive recruitment agency. "This could be engaging in business conferences, educational seminars, etc., but it can also just be encouraging staff to get up and take a walk. So many wineries have spectacular grounds. A little forest bathing can do us all a lot of good."
- Offer access to mental health services in order to counteract increased levels of stress and anxiety.
- Develop compassionate and safe spaces for honest employee discussions on topics, such as re-entry anxiety.
- Offer career development opportunities to identify meaningful responsibilities and counteract burnout.

- Gut-check company adherence to pay parity and advance women in leadership roles. Financial stability and security are key elements of wellbeing.
- Develop or enlist an experiential incentive program that delivers rewards and recognition that are meaningful to employees.

By surveying the ABG community and assessing their feedback, we see that wine employees are doing the work toward their own wellness. It's also clear that they are looking to expand their individual wellness priorities into the workplace so that working in wine is a continuation of, rather than an exception, to their wellness journey. For employers looking to build a high-performance workforce, that means meeting head-on the wellness expectations and challenges of today, such as workplace flexibility, equity and inclusion and the Great Resignation.

Engaging a Younger Workforce

In a survey conducted by NielsenIQ in January 2022, 65 percent of consumers ranked mental health as their primary concern over the next 12 months[9]; and as younger candidates enter the wine profession, mental health and well-being offerings will become more important.

Employers that offer support for wellness will attract better talent, but it's important for employers to recognize that certain odds are stacked against them. The prevalence in the workplace of mental health challenges increased between 2019 and 2021, and younger, historically underrepresented workers still struggle the most.

A study reported in an October 2021 issue of the *Harvard Business Review* found that "Millennials and Gen Zers, as well as LGBTQ+, Black, and Latinx respondents were all significantly more likely to experience mental health symptoms. Like Millennials and Gen Zers, caregiver respondents and members of historically underrepresented groups—including LGBTQ+, Black, and Latinx respondents—all were more likely to leave roles for their mental health and to believe that a company's culture should support mental health. In fact, 54 percent of all respondents said that mental health is a DEI issue, an increase from 41 percent in 2019."[11]

Those statistics reflect cross-industry research, and the Willamette Valley Wineries Association offers suggestions that are specific to wine and to small wineries, in particular. "Many wineries want to create a more inclusive culture but aren't sure where to start," said Jessica Mozeico, president and winemaker at Et Fille Wines and president of the association's executive board. The group created the Diversity Equity Belonging & Inclusion (DEBI) Toolkit to help wineries organize their efforts and a DEBI Pledge that outlines choices a company can make to further their commitment along the lines of hiring, training, suppliers and marketing.

"Much of [the Toolkit] is self-study designed to educate ourselves about diversity issues, and it is organized to suit your time availability," Mozeico stated. "There are articles if you have a few minutes, trainings and longer form articles, books and podcasts if you want a deeper dive. There is also a list of Black Owned Businesses that we encourage others to add to so wine businesses can consider supporting suppliers of underrepresented communities."

Access to mental health services is both a need and a demand of a younger workforce, and they're willing to commit to companies who provide it. Research conducted by Forrester Consulting on behalf of insurance provider, Modern Health, reported that 86 percent of 18- to 29-year-olds would be more likely to stay at a company that provides high-quality resources for them to care for their mental health[2].

Furthermore, the same research indicates that 87 percent of employees want their employer to care about their mental health but believe that only 66 percent of employers actually do. Moreover, 87 percent of C-Level and HR leaders believe they are supportive of mental health, but only 45 percent of employees and managers have access to health benefits within a healthcare plan[2].

The wine business has traditionally been a place where the shortfalls of a secure financial income or robust health care were supplemented by perks, such as unlimited tastings, the opportunity to work on a vineyard or invites to exclusive industry-only events. However, for professionals growing up digitally native, and with constant access to information, these incentives may hold less appeal to the new generation of legal drinkers whose value systems are increasingly revolving around transparency of business practices, ethics, inclusion and a more moderate approach to drinking, particularly when faced with the ever-present risk of all activities being captured and shared online.

Finally, as new and younger professionals enter the wine profession, mental health offerings will become an important point of differentiation for employers that are looking to attract top talent. The wine industry needs to offer more inclusive, flexible and equitable working environments to retain top talent and attract a younger workforce, or else risk losing this potential pool of employees to other higher paying, more equitable and inclusive industries.

What's Next?

There is hope, and we can start here. With more attention paid to diversity, equity inclusion and belonging, investing in financial security, workplace flexibility and opportunities for development, the industry can remain an attractive place to be. **WBM**

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For These Wineries, Digital Marketing is Serious Business

Digital is the foundation of modern marketing for wineries

Ben Salisbury

IN THE FALL OF 2021, our consulting firm surveyed 500 wine company websites, along with their corresponding social pages, to better understand the current state of readiness to optimize online wine sales. The findings were then published on our website.

As a follow-up to that original post, we then reached out directly to several of the standout wineries to obtain more in-depth insights and learn more about their best practices. The winery executives we interviewed are setting the standard for the industry when it comes to flexing digitial marketing muscles. What we learned during those conversations is shared below.

Digital is the Foundation of Modern Marketing for Wineries

The ongoing pandemic has caused wineries everywhere to bring their digital marketing efforts to the forefront as more traditional sales methods have gone out the window.

But there is a vast chasm between the wineries that exist on the leading edge of digital and those that are falling further and further behind.

"In the current environment, digital is a great way to get your message and your story out to a vast majority of people," observed Cushing Donelan, director of marketing for Sonoma's Donelan Family Wines. "It is one of our top expenditures now."

For Jana Harvey of Scott Harvey Wines in Amador County, "Digital marketing has gained more importance in our marketing strategies every year."

Mobile Reaching Far Beyond the Tasting Room

To compete in an increasingly competitive landscape, wineries can no longer rely solely on their tasting room, wine club and newsletters to sell all the wine they make. They need to reach far beyond their own walls.

Wineries must be able to take their messaging and experiences to the wine enthusiasts wherever they may be, which is typically on their mobile device.

"For us, it's not only about having a mobile-friendly website but a mobile FIRST strategy," according to Jana Harvey of Scott Harvey Wines.

"More customers are reaching us through their phones than ever before," added Harvey. "During the pandemic, we invested in our digital consumer experiences. We have two apps: one mobile-based through Touchpoint Studio and one web-based, which is dedicated to wine and food pairing—called Pair Anything. We do flash sales for our app users and send push notifications on a weekly basis. It's another way to keep in touch with our customers."

Digital Provides the Highest ROI

Perhaps the most significant distinction between wineries that "get it" and those that don't is recognizing that the ROI of more traditional methods of marketing, i.e., those that require someone's physical presence, pales in comparison to the infinitely scalable reach of digital.

"If we compare the amount of money we could spend on a tasting event, we get a much higher return using digital with a lot less physical time required," claimed Eight at the Gate winery owner Jane Richards. "Australia is a big place, and we have not been able to travel within Australia for two years. Add the whole world to that and you have to take digital seriously."

All Roads Lead to Digital

For a shining example of digital done right, look no further than Markham Vineyards. According to Kim Moore, Markham's marketing director, "Digital Marketing is foundational to our marketing mix. The entire world is now digital, so pretty much everything we do is optimized for digital execution. Even more traditional elements, like tasting room menus or our in-store point of sale, will now incorporate QR codes to bring consumers from the brick and mortar world to our digital world–where we can educate, entice and capture contact info for remarketing."

Leading with digital need not be complicated. Donelan summarized his strategy neatly, "Drive people to our website, get them to sign up to our email list, let them know about our wines and build a dialogue with them."

High Tech Means High Touch

Jane Richards and her team are leaning heavily on tech investments to tell their story and create a human connection globally. "We have gone to considerable expense and effort to add NFC chips to our wine bottles to help us tell our story directly to the consumer," Richards said.

"Near Field Communication technology acts as a 'digital wine label' to connect information from each label directly to a smartphone when tapped. We want to leverage this technology to help distributors disseminate information and experiences to create a human connection and leave the consumer feeling as though they have just shared a glass in their vineyard."

For Markham, digital marketing is core to building solid consumer awareness and engagement. "This means content is really important to get the right mix of selling versus branding versus engagement," said Moore.

According to these thought leaders in wine marketing, digital execution brings your brand closer to the consumer. High tech and high touch are not, as it turns out, mutually exclusive.

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To Tell Your Story, Nothing Beats Digital

Every winery has a story, but some are better than others at sharing it. It is not just about reaching as many people as possible. It's about doing it in an authentic way that resonates with wine lovers.

Donelan captured this mindset perfectly. "Wine, for us, is the ability to slow down time, create memories, lasting moments and celebratory events that you have with your friends and family. Wine, for our family, is the catalyst for all of this. So, we write about the things we know."

Forget Everything You Think You Know About Email Marketing

The days of sending out a monthly newsletter and expecting sales results are so yesterday's news it hurts. Digital-savvy wine marketers know that fully leveraging email requires a far more personalized approach.

"The key to personalizing each customer's wine experience is to know your customers," said Jana Harvey. "We send out promotional emails each month; but since they are highly segmented, not everyone receives all the emails all the time."

For Moore, record-high open rates demonstrate they are on the right path when it comes to the use of email. "Our philosophy with email marketing is to put our customers first and make everything feel completely personalized to their liking and interest, with vibrant images and content that offer value," explained Moore.

"We are not just sending emails as a sales tool and pushing them out without a focused message or offer. Each email is outlined in advance with a specific message in mind that also drives our social media efforts."

Not having an e-commerce storefront on their website means Donelan Family Wines must rely solely on their email list. "We try not to bombard our subscribers with emails," said Donelan. "If we don't have anything to say or contribute any added value to our customers, then we don't send the email."

Automation Accelerates Sales

The "welcome email" is the most basic email automation for wineries but is also the most powerful because, according to Moore at Markham, "It offers a seamless way for this potential new customer to learn a little bit more about us and stay in the know with upcoming events and releases."

Without a doubt, one of the most ambitious and inspiring strategies for extending a warm welcome to new customers is Jane Richards' approach. "Every person who places an order on our USA or Australia websites receives a personal video message from us, thanking them for their business." Richards said. "The feedback and open rates on these are huge." Bonjoro is the software Eight at the Gate uses to execute this winning strategy.

Even some of the most basic automations are worth their weight in gold. "We have automations in place for birthdays, anniversaries, first-time purchasers and repeat customers," said Harvey. Embedding a special offer into these automations adds extra topspin to sales as well.

There is More to Facebook Ads than Boosting Posts

"We use Facebook and Instagram ads with the purpose of telling the Markham story," noted Moore. "These ads, or storyboards, are focused on brand awareness and reach, which we have found to be very effective in driving traffic to our website."

For Donelan, "Targeting the right person is the biggest challenge. Otherwise, you pick up a lot of junk with these ads." Like many wineries, Donelan brings in outside help to dial in their advertising spend.

Many wineries are beginning to experiment with "lead ads," which are a special type of ad objective in Facebook's suite of advertising tools that helps wineries grow their list of email subscribers while at the same time strengthen brand awareness. Both Scott Harvey Wines and Eight at the Gate are planning new lead ad campaigns for 2022.

Not All Customers Have the Same Value, and Your Data Hold the Key

Most of the wineries surveyed use Mailchimp as their primary email marketing software and for good reason. Mailchimp helps wineries keep track of their highly engaged contacts, which are rated based on their open and click-through rates.

Kim Moore explained how they leverage this at Markham. "These 4- and 5-star rated contacts, which have demonstrated their interest in our brand, often get exclusive offers in advance of the other subscribers." Markham recently utilized this sophisticated segmentation to debut a new "Merlot mystery pack" last October. By providing their most engaged fans with an early and exclusive offer, Markham was able to reward their most in-tune audience.

For most wineries, their wine club members represent their richest and most valuable customer segment. However, even within this cohort, not all members are equal.

"We work with the analytics company, Enolytics. They give us the algorithms to evaluate our wine club members, so we'll know if any are at risk of leaving us," explained Harvey.

SEO: The Bird's Nest on the Ground for Wineries Everywhere

Search engine optimization may be the most overlooked and underutilized aspect of digital marketing by most wineries. After all, what winery in existence does not desire more well-qualified website visitors?

Proper SEO practices are designed to not only generate more Web visitors but improve the appearance and positioning of the pages on your winery's website so you can convert more visitors to paying customers.

Given the game-changing potential of SEO, it is quite astounding how few wineries are leveraging it. But for those who have committed to these disciplines, the rewards are indisputable.

"Our SEO strategy took form towards the end of 2020 when tasting rooms were closed and our traditional sales methods went out the window," observed Markham's Moore. "We saw this time as an opportunity to pivot focus to e-commerce, and SEO was an important element of that objective to drive consumers to our site (as our high Domain Authority score proves)."

There are many things about the wine business that are beyond our control. But taking the time to learn, practice and improve digital marketing strategies is well within the grasp of even the tiniest winery operation.

A winery's blog can serve to not only delight website visitors with interesting content, but it can also tap into organic search engine results through the practice of targeting specific keywords.

At Markham, "Our blogs serve the dual purpose of engaging and informing customers, as well as increasing our organic traffic to the site which in November and December increased by 33.3 percent, along with the number of sessions by 35 percent and the number of pageviews by nearly 20 percent," said Moore.

Strengthening Digital Marketing Capabilities is Always a Work in Progress

"There is no magic formula you can put on autopilot," noted Donelan. "But there are only so many hours in a day, and rather than me personally reaching out to customers and responding to them, we seek to enable systems that can do that."

"We continue to experiment with our strategy, so it is constantly evolving," said Moore. "We believe in the test and learn approach."

For Richards, it is all about continuous self-education. "I spend a LOT of time listening to podcasts and watching educational content from digital marketing experts in order to understand it all and stay on top of it."

For Harvey at Scott Harvey Wines, "When our in-house people who are dedicated to digital marketing move on, we must continually retrain." She added, "We have found it easier to keep consistency through the use of an outside agency."

The Cost of Inaction Will Continue to Escalate

There are many things about the wine business that are beyond our control. But taking the time to learn, practice and improve digital marketing strategies is well within the grasp of even the tiniest winery operation.

Videos, articles, webinars and conferences abound on these topics. Thanks to many world-class wine marketing agencies, help is just an email away. **WBM**

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Central Coast Remains Key and Diverse Corner of the Wine Industry

Andrew Adams

Andrew Adams is the editor of the Wine Analytics Report and was a writer and editor at *Wines & Vines* magazine for nearly a decade. Adams grew up in the city of Sonoma, Calif., and graduated from the University of Oregon with a degree in journalism. In addition to working at daily newspapers for more than a decade, Adams worked in the cellar and lab at the former Starmont winery in Napa Valley.

CALIFORNIA'S CENTRAL COAST IS home to 20 percent of the state's wineries. While the majority of those produce fewer than 5,000 cases a year, the region also includes several large wineries making more than 500,000 cases.

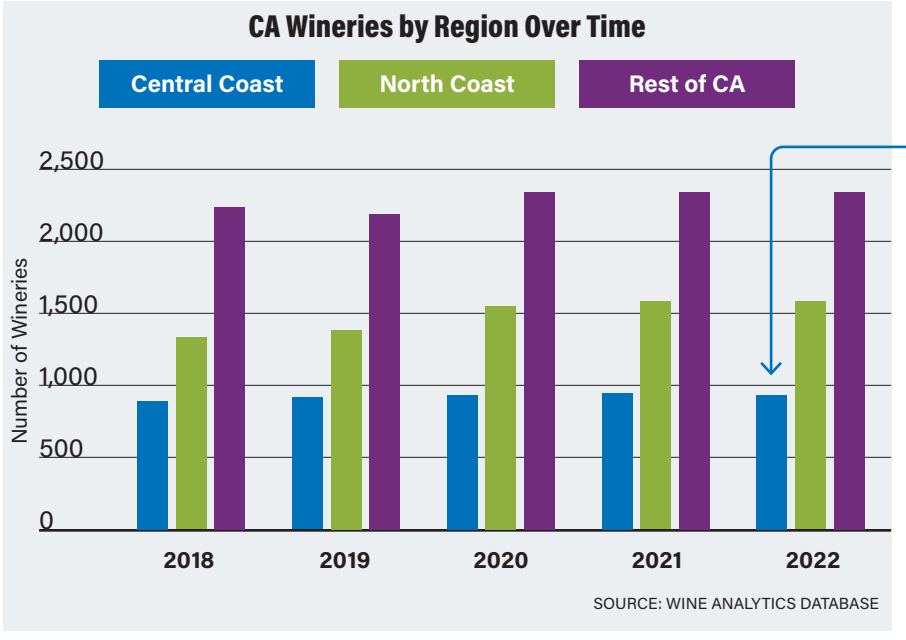
That range in annual production is similar to the rest of California and as the Central Coast offers a wide range of terroir and winemaking styles it's often considered almost another West Coast wine state in of itself. There are currently 945 wineries in the Central Coast, compared to 2,313 in the North Coast, 876 in Oregon and 873 in Washington, according to the Wine Analytics Database.

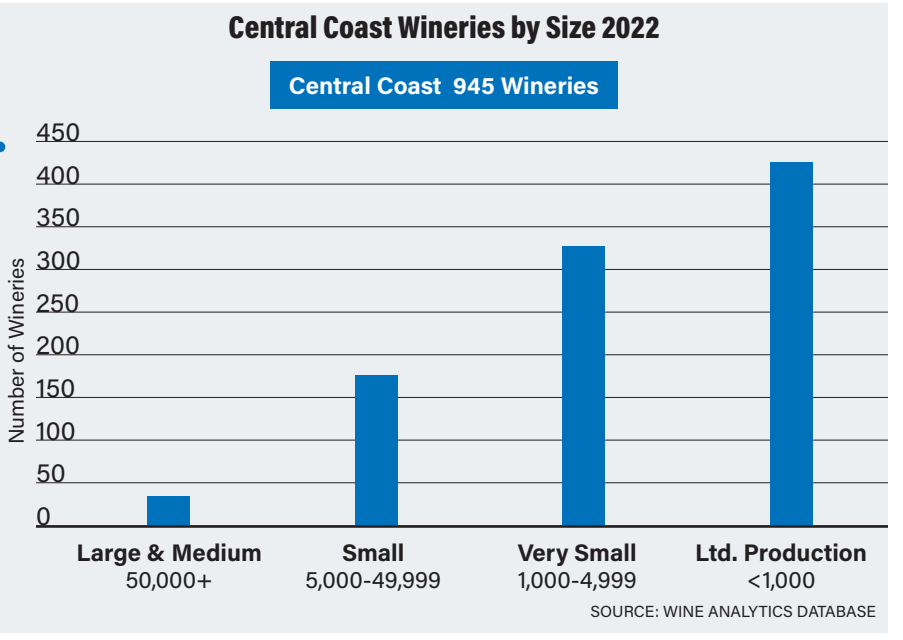
Most of the data for this report comes from the Wine Analytics Database that defines the region as five counties: San Luis Obispo, Santa Barbara, Santa Cruz, Monterey and San Benito. The analytics database can segment the comprehensive Wines Vines Analytics winery database by time series, annual production, average bottle price and other criteria.

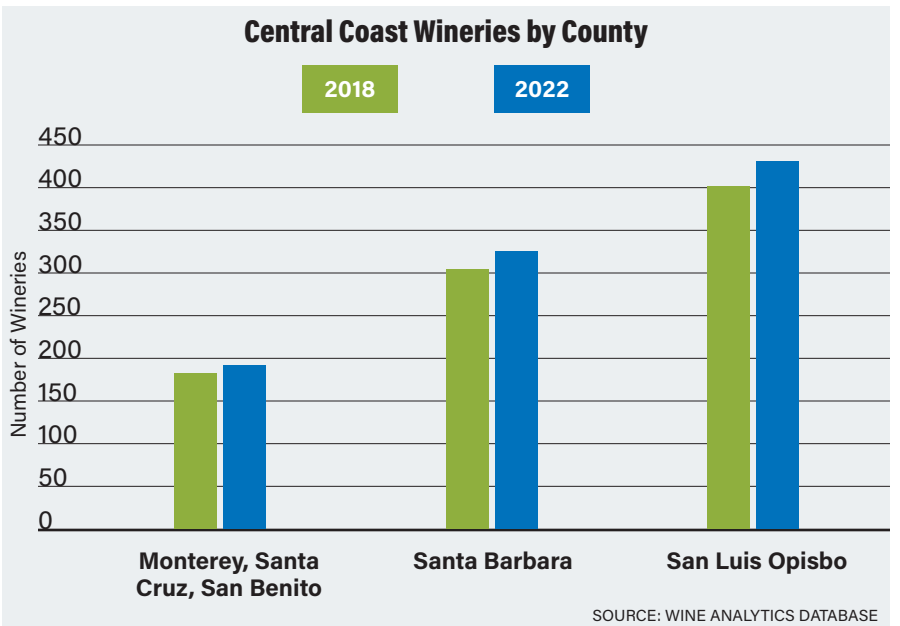
Since 2018, the number of wineries in the Central Coast has grown 7 percent from 886, and while that growth has lagged other areas of California it has ensured the region maintained its share of the state's total number of wineries. Up until 2021, winery growth in California had been led by Southern California where the number of wineries grew by 24 percent since 2018 to 473 or 10 percent of all the wineries in the state.

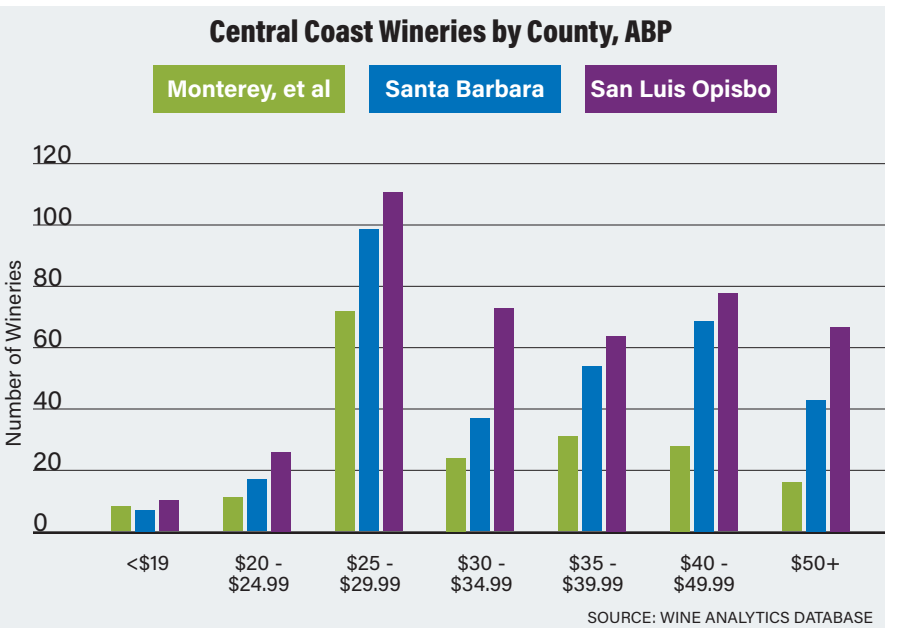
Following the start of the COVID-19 pandemic in 2020, the year-to-year growth of California wineries slowed to around 1 percent in 2021 and since then the number of wineries has leveled off.

While the Central Coast is home to nearly a quarter of California's wineries, most of the state's wine is still produced in the Central Valley and









North Coast, which are the source for nearly 80 percent of the more than 312 million 9L cases of wine California produces each year. According to the analytics database, Central Coast wineries are the source of more than 11 million cases or about 3.6 percent of the state's total production.

In terms of total grape tonnage, however, the Central Coast remains a significant source of supply and much of that wine produced by large wineries in the Central Valley or Sonoma and Napa counties is made with Central Coast grapes. In 2021, the Central Coast (defined by grape pricing districts seven and eight) produced nearly 523,000 tons of winegrapes or more than 14 percent of the state's entire crop of 3.6 million tons, according to the preliminary crush report.

That was a significant rebound from 2020, when the region only yielded around 377,000 tons, similar to what was harvested in the North Coast that year in a harvest curtailed by wildfires and other factors. In the past year, however, the Central Coast's harvest was 24 percent larger than what was picked in the North Coast. In District 8, home to the Paso Robles AVA, the leading grape is Cabernet Sauvignon, which accounted for 45 percent of the district's tons followed by 36,165 tons of Chardonnay and nearly 29,000 tons of Pinot Noir. In District 7, which includes Monterey and Santa Barbara counties, the top grapes are Chardonnay (101,771 tons or 39 percent of the total crop) and Pinot Noir (73,111 tons). Average prices remain lower than in the North Coast, with the per-ton average for District 8 Cabernet at $1,608 compared to $2,749 for District 3 (Sonoma County). And the average for District 8 Pinot at $1,608 compared to $3,484 in District 3.

The grape harvest data aligns with the key varietals produced in each county as well. In San Luis Obispo County—home to the Paso Robles AVA—52 percent of all wineries produce a Cabernet Sauvignon while just 25 percent of the wineries in Santa Barbara County do. Of the 190 wineries in Monterey, Santa Cruz and San Benito counties, 134 or 71 percent produce a Pinot Noir. Across all five Central Coast counties, roughly 40 percent of all wineries produce one of the top three varietals.

In terms of price, 30 percent of all Central Coast wineries have an average price of between $25 and $29.99, but 78 percent of all Central Coast wineries have an average price between $25 and $49.99 with only 13 percent having an average bottle price of more than $50. Among the individual counties, Santa Barbara and San Luis Obispo have similar distribution in terms of winery average bottle price with most wineries falling between $25 and less than $50. In Monterey, San Benito and Santa Cruz, 38 percent or 72 wineries have an average bottle price between $25 and $29.99.

Nearly half of the region's 31 largest wineries—those producing more than 50,000 cases a year—are located in San Luis Obispo County while 18 percent of the region's total wineries produce between 5,000 and 49,999 cases. San Luis Obispo County is home to the most wineries of any county in the region and these are mostly "very small" or those making between 1,000 and 4,999 cases a year while nearly half, 48 percent, of the wineries in Santa Barbara County are defined as "limited production" making fewer than 1,000 cases a year.

In 2021, the total value of Central Coast winery direct-to-consumer (DTC) shipments came to nearly $440 million and that is on top of significant growth in 2020. In 2019, the region's total shipment value was $326 million but that jumped 17.3 percent to nearly $383 million in 2020. Shipment volume in 2020 came to 935,763 cases, which was 15.4 percent more than in the previous year. Shipment volume declined in 2021, just as in most other wine regions, to 868,416 cases or 7 percent less than the record high in 2020.

As total shipment value rose, so too has the average bottle price of the region's DTC shipments. In 2019, the average bottle price was $33.52 and that has since risen by $8.62 to $42.14. The region's total shipment value put it at No. 3 behind only Napa and Sonoma counties of the major regions tracked by Wines Vines Analytics/Sovos ShipCompliant. WBM

Correction

Data on winery direct-to-consumer shipments to Eastern U.S. states was accompanied by incorrect analysis and chart captions in an article in the March 2022 issue of *Wine Business Monthly*. The data on shipment volume, value and average bottle price reflects shipments to those states rather than shipments by wineries in those states.

Wineries & Winemaking

Michael Sommer

Michael Sommer, a winery executive with extensive experience in sales, management and hospitality, joined Benovia Winery as its new general manager. Sommer has a 22-year career in the food and beverage industry. Most recently, he was the general manager of Trois Noix Wines, Jaime Araujo's winery in St. Helena. Prior to that, Sommer held key regional sales positions at Vintage Wine Estates, Southern Glazer's Wine & Spirits, and Treasury Wine Estates, where he successfully improved sales across multiple brands year after year. His food and beverage career began at McCormick & Schmick's in Chicago where he was responsible for 120 employees and purchased wine for six of the brand's restaurants.

Don Sebastiani & Sons, producer of a portfolio of wines and wine-based cocktails, promoted Kim Cotter to the position of chief financial officer. Reporting to CEO Omar Percich, Cotter will oversee all strategic financial operations for the company, as well as play an integral role in shaping the long-term future of Don Sebastiani & Sons. The first female CFO since the founding of Don Sebastiani & Sons in 2001, Cotter steps into this new leadership role with more than 20 years of finance experience in the wine industry, including previous roles with Foley Family Wines, Ledson Winery & Vineyards, and Kendall-Jackson Wine Estates. Most recently, Cotter has served as controller for Don Sebastiani & Sons since 2018, overseeing the company's daily accounting operations, including the accounting, payroll, accounts payable and accounts receivable departments.

Paul Ahvenainen

Gary B. Heck, president and owner of Korbel Champagne Cellars, announced that winery veteran Paul Ahvenainen has been named vice president – operations and winemaking, joining Korbel's executive team. In this new role, he will oversee all wine and brandy production, winemaking, grower relations, maintenance and quality control. Ahvenainen has been with Korbel for 37 years, most recently directing winemaking and grower relations. He has been essential in the growth, production and consistent quality that has earned Korbel numerous gold medals throughout the years. Born in Helsinki, Finland, he emigrated to the United States as a youngster with his family in 1968. He holds a degree in Enology from the University of California at Davis.

Jason Moore from Modus Operandi Cellars was named the new winemaker at Los Pinos Ranch Vineyards. In 2004 at the age of 26, Moore officially started his professional winemaking career by launching Modus Operandi Cellars & Vicarious Wines with 200 cases of Napa Cabernet. Since then, Moore has grown the winery to more than 3,000 cases sold 90+ percent direct-to-consumer with little to no advertising. His wines have been poured at a historic White House State Dinner, they've been written into a Michael Connelly novel The Black Box and have consistently scored in the mid to high 90's by Parker, Dunnuck, Galloni, Suckling, and other major critics.

Sequoia Grove Winery named Jesse Fox its new winemaker. Fox, 43, began his winemaking career in the cellars of Harlan Estates' The Napa Valley Reserve and Promontory; he also served as the assistant winemaker at Ram's Gate in Sonoma-Carneros. Before starting his wine career, which has taken him to the Loire Valley, Argentina and New Zealand, Fox studied at Le Cordon Bleu and Cornell University, and worked as a chef for Thomas Keller at The French Laundry. Together with Bonitati and the talented team, Fox's vision for the future of Sequoia Grove is to herald its place in Napa's history, while producing wines that are balanced both in the glass and with the environment, and presented in a setting that demonstrates its commitment to nature, while reminding guests that wine, food, and friends are the perfect blend.

Lisa Baxter-Burke

Blasted Church Vineyards appointed Lisa Baxter-Burke as experience manager. Baxter-Burke has been in the hospitality industry for more than 20 years. Her experience garnered in wine sales, as a sales and marketing director for a prestigious Naramata winery, and most recently as co-owner in the front of house at Front Street Brasserie in Penticton, prepare her well for her new role.

Castle Rock Winery hired David McCormack to the position of vice president, sales, Central region. He will be based in Chicago and will replace Tom Dempsey, who has elected to retire. McCormack was formerly a vice president and key account manager at Heritage Wine Cellars, a leading distributor of fine wines and spirits in the State of Illinois. In his 22-year career with Heritage, he has held a series of positions of increasing responsibility and importance.

Oscar Riveiro Woolsey

Chappellet Vineyard announced that Oscar Riveiro Woolsey has been named the winery's new director of client services. In this role, Riveiro Woolsey will manage Chappellet's 15-person hospitality team and will report directly to Managing Director David Francke. As director of client services, Riveiro Woolsey will oversee all client-facing services at Chappellet, including its wine club, events program, concierge services, and the winery's acclaimed tasting room on Pritchard Hill. Riveiro Woolsey, who was born in Spain, holds a degree in modern languages from the University of Roehampton, London, and is fluent in English, Spanish and Portuguese, with conversational skills in French and Italian. He also holds an associate degree in wine marketing and sales from Napa Valley College.

Distributors, Importers & Wholesalers

Republic National Distributing Company appointed Sanjay Shringarpure as RNDC's new chief information officer, based in Atlanta, Ga. and reporting to CEO Nick Mehall. As CIO, Shringarpure is charged with helping RNDC accelerate its digital footprint, deliver on ERP modernization, standardize data models and identify new technologies to position RNDC into the future. With more than eight years of experience at E. & J. Gallo Winery, Shringarpure led the Global Information Services organization to provide IT delivery and support. He was head of a corporate Business Process Excellence organization focused on architecting IT strategy to deliver competitive business advantage. He also guided enterprise-wide IT Project Management and Quality Assurance for the company, as well as served as a key member of the M&A opportunity and integration team.

Republic National Distributing Company also appointed Jenn Engel to chief commercial sales officer, the first female CCSO in beverage alcohol wholesale distribution. Engel joins the executive leadership team and reports to chief operating officer Bob Hendrickson. In this new role, Engel will be responsible for the commercial sales strategy, which supports critical business operations. She will provide overall direction of the commercial sales teams. Her team will include commercial finance, trade marketing, SBD wine, SBD spirits, category management and the two NASA teams. Engel joined RNDC in 2020 and most recently served as senior vice president, national & strategic accounts-on premise where she rebuilt the NASA on-premise team and established a geocentric model to bring the team closer to customers. She also implemented supplier target tracking system to promote transparency with suppliers and accountability for NASA team.

Taylor Case has been promoted to the position of director of national accounts off-premise for Folio Fine Wine Partners. Case joined Folio in 2021 as national accounts manager off-premise Southeast, and has a strong history in national accounts including prior director and vice president roles at Wilson Daniels and Vineyard Brands. Based in Miami, Fla and reporting to the vice president of sales, Case will lead the team of four national accounts team members in continuing to accelerate relationships and growth with key national account customers.

Pacific Highway Wines welcomed Allison Lee as director of sales, Pacific Southwest. Lee lives in Santa Barbara, CA and will be responsible for California, Nevada, Arizona and Hawaii. Previously Lee was the Western U.S. sales manager for Napa's Blackbird Vineyards, managing the wholesale business for their two brands, Blackbird and ÆRENA wines, for more than five years. Born and raised in Santa Barbara CA, then earning her undergraduate degree from the University of California at Davis, she began her wine career in the early 2000s working for one of California's top fine wine distributors, Henry Wine Group, as a sales representative, quickly rising to running the company's hotel and national account divisions.

Industry Services & Suppliers

Innerstave appointed Jason Dodge as managing director, winemaking. In his role, Dodge will offer his career of winemaking expertise to Innerstave customers by advising best practices and recommendations on oak and micro-oxygenation use. Dodge brings more than 20 years of experience in the wine Industry, starting his career as an assistant brandy maker for E. & J. Gallo Winery. He then went on to assume senior winemaker roles at Gallo and Diageo, as well as director of winemaking and general manager roles for both Constellation, and Oak Ridge Winery. He has worked with more than 30 different grape varietals. **WBM**

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Amorim Cork America	*amorimcorkamerica.com*	9,67
APCOR - Portuguese Cork Association	*realcork.org*	37
Bank of Marin	*bankofmarin.com/wine*	74
Bergin Screen Printing and Etching	*berginglass.com*	7
Berlin Packaging	*berlinpackaging.com*	79
BevZero Equipment (PolarClad)	*www.bevzero.com*	31
Bin to Bottle Winery	*bintobottle.com*	14
Bouchard Cooperages	*bouchardcooperages.com*	30
BSG Wine	*bsgwine.com*	31
Carlsen & Associates	*carlsenassociates.com*	24
Central Coast Insights (CCI)	*centralcoastinsights.com*	82
Coastal Viticultural Consultants	*coastalvit.com*	55
Cork Supply USA	*corksupply.com*	13,41
Della Toffola USA	*dellatoffola.us*	25
Diam Closures USA	*g3enterprises.com/closures*	23
Duarte Nursery	*duartenursery.com*	51
Eastern Winery Exposition	*easternwineryexposition.com*	59
ETS Laboratories	*etslabs.com*	OBC
Euro-Machines	*euromachinesusa.com*	39
Free Flow Wines	*freeflowwines.com*	30
G3 Enterprises	*g3enterprises.com*	IBC
Global Package	*globalpackage.net*	45
GOfermentor	*gofermentor.com*	29
Guala Closures North America	*gualaclosures.com*	11
Gusmer Enterprises	*gusmerwine.com*	28,38
Hall & Bartley, Architecture-Planning	*hallandbartley.com*	36
Herti US	*hertius.com*	27
Hinman & Carmichael, LLP	*beveragelaw.com*	87
Lafitte Cork & Capsule, Inc.	*lafitte-usa.com*	43

Company	web address	page
MA Silva USA	*masilva.com*	35
MBF North America	*mbfnorthamerica.com*	16
MUST Machining & Fabrication	*mustfabricate.com*	26
Oak Solutions Group	*oaksolutionsgroup.com*	75
Olavin Tank	*olavin.com*	28
Portocork America	*portocork.com*	2
Prospero Equipment	*prosperoequipment.com*	46
Rutherford Equipment Rental	*rutherfordrental.com*	38
Sanitary Stainless Welding	*sanitarystainless.com*	49
Saverglass, Inc.	*saverglass.com*	1
Scott Laboratories	*scottlab.com*	21
Seguin Moreau Napa Cooperage	*seguinmoreaunapa.com*	36,33
Sentia Universal Biosensors	*mysentia.com*	32
Shelco Filters	*shelco.com*	26
Spec Trellising	*spectrellising.com*	55
Speidel Tank- und Behälterbau GmbH	*speidel-behaelter.de*	17
StaVin	*www.stavin.com*	15
TOFWERK	*www.tofwerk.com*	69
Tonnellerie de Mercurey USA	*tonnellerie-de-mercurey.com*	61
Tonnellerie Radoux USA	*radouxcooperage.com*	27
UC Davis Continuing and Professional Education	*cpe.ucdavis.edu*	57
Verallia USA	*us.verallia.com*	5
Waterloo Container Co.	*waterloocontainer.com*	66
WineDirect	*winedirect.com*	80
Winejobs.com	*winejobs.com*	86
Wines Vines Analytics	*winesvinesanalytics.com*	56
Wine-Searcher, Ltd.	*wine-searcher.com*	57
Wineshipping, LLC	*wineshipping.com*	65
WiVi Central Coast Conference & Tradeshow	*wivicentralcoast.com*	82,83
Wonderful Nurseries	*wonderfulnurseries.com*	53
World Cooperage	*worldcooperage.com*	47
Zenport Industries	*zenportindustries.com*	52

Dinners

ILLUSTRATION BY BOB JOHNSON

LAST WEEK JAKE LORENZO was reading about a multiple Michelin-starred restaurant in Healdsburg that was bringing in chefs from another multiple Michelin-starred restaurant in New York. All the chefs were going to work together to produce a spectacular, multi-course dinner, one that would showcase their talents, influences, and wild creativity. The more I read, the more exciting this dinner became. By the time I got to the end of the story and read the pricing for this dinner, I confirmed what this detective had suspected. This delicious repast was far beyond my financial comfort zone. I couldn't afford the food, let alone include the wine pairings, and what's the point of incredible food if you can't drink wine with it?

Jake Lorenzo is not complaining about the price. The people involved seem inspired, talented and good-hearted. Active in the community and supportive of their staff, they even started a program to help feed people in need after the Kincade fire. I assume they have high costs, pay their staff well and use the very best ingredients, no matter the expense, so the prices they charge are as fair as they can make them. Unfortunately, it still remains beyond this detective's financial ability. Not to worry, Jake Lorenzo has lived a life encountering hundreds of things I can't afford, and my life has been none the worse for it.

The concept of this dinner got me thinking, though. Years ago, when wine was just taking hold in fine dining restaurants, winemaker dinners were the rage. Great chefs would prepare multi-course dinners that would be paired with various wines from a particular winery. Guests would eat marvelous food, learn about a particular winery and taste for themselves how certain wines matched up with specific foods. Given the amount and quality of food and wine served, winemaker dinners were always a bargain. I wondered if winemaker dinners were still a big deal, or if they had become extinct, like dial phones and delicious $10 bottles of wine.

This detective never figured out why winemaker dinners didn't catch on here in Wine Country. Whatever the reason, Jakelyn's mother and I rarely went to winemaker dinners around town.

On the road, it was another story. Rusty Staub would host a couple winemaker dinners each week in his New York restaurants. Rusty's on Fifth became a mandatory stop for almost every California winemaker who worked the New York market. We had delightful dinners in Kansas City, Seattle, Chicago and Dallas. These dinners weren't just popular in big cities—winemaker dinners made their way into the boonies. Places like Durango, Colorado; Houma, Louisiana and Jensen Beach, Florida were sites of memorable feasts for Jakelyn's mother and me.

Most chefs would crank out elevated food for these meals because the bulk of people attending were their regular customers. They also kept prices in check, by using the dinners as a promotion for their customers. Dinners could range from a greatest hits menu of their most popular dishes to experimental platters where chefs tested new creations on an enthusiastic crowd. The featured winemaker would usually make remarks before the dinner began, speak in between courses and try to sum up after the dessert amidst the cacophony of sweetly juiced revelers.

Winemaker dinners were popular all over the country, but nowhere was the concept taken to heart or better executed than in New Orleans. Jakelyn spent three years at Loyola, finishing up her degree, so Jake Lorenzo became a winery representative for a small California winery in New Orleans to see her more often. Over the years, I performed at hundreds of winemaker dinners. Jerry Henry would help set them up and he, Catherine and Jakelyn's mom would attend to help schmooze the crowd. That was the impetus that made New Orleans our second home.

No matter the chef, food was reliably excellent at these dinners. With Jerry's help, my job was to select the wines, teach the people about the winery and keep them entertained, especially in the lulls between courses or if something went wrong in the kitchen. This detective learned early on that I needed to be funny if I were to captivate the crowd, especially as they drank more and more wine.

I developed a group of jokes that I could interweave into my stories about the winery and winemaking process that kept people entertained. Then I recognized the same people, turning up at multiple winemaker dinners. This detective felt bad about telling the same jokes, so I created fictional personal introductions to the jokes to trick them into believing the stories were true. When I got to the punchlines and they realized they'd heard the jokes before, they laughed even harder.

After all, nothing kills a glorious meal than some expert droning on about wine if he can't make us laugh.

For more than 10 years I hosted an average of 30 winemaker dinners each year in New Orleans. I worked with legendary chefs, like Emeril Lagasse, Paul Prudhomme, John Besh, Susan Spicer and Frank Brightsen. I performed at legendary temples, including Galatoire's and Commander's Palace, as well as unique venues, like the Crescent Bar and Robin's Restaurant out in Henderson. As time went on, my winemaker dinner regulars kept turning up, dragging friends along. They'd even request certain stories. Jake Lorenzo couldn't handle using recycled stories at these dinners, so I started writing my own jokes. By the time I finished my speaking career, I had a 40-minute act of original comedy material, and the winery I represented was embraced by the city.

Jakelyn's mom, Jerry, Catherine and I had hundreds of meals prepared by brilliant chefs. It was fun and a great education. Dozens of those chefs made their way to Jake Lorenzo's table when they visited Wine Country. This experience made for long-lasting relationships, and to this day, it can get embarrassing at all the food chefs send out when we visit their restaurants.

Hopefully, COVID will wind down soon or at least become containable enough so we can safely go back to indoor dining. When we do, this detective hopes they bring back winemaker dinners, especially if they do so at affordable prices. If these dinners return, I expect winemakers to flood Jake Lorenzo with calls for comedy material. After all, nothing kills a glorious meal than some expert droning on about wine if he can't make us laugh. **WBM**

Stephens Moody, winemaker, Mathew Bruno Wines, Rutherford, Calif.

"The simple fact of the matter is over the last 20 years of professional employment in the California wine industry, no publication has maintained such a superior level of relevance, fact based, practical subject matter. Year in and year out it remains second to none. It's true. I read and trust *WBM* articles, research and data published as the single most important production media source for the wine and grape industry.

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BOB MCCLENAHAN

NAME & TITLE: Stephens Moody, winemaker, Mathew Bruno Wines, Rutherford, CA

WINERY NAME AND LOCATION: Mathew Bruno produces single-vineyard, small-lot wines from highly recognized, award winning ultra-premium vineyards. The winery's commitment to outstanding quality extends to every decision, from the label design which was created by famed label designer Chuck House and inspired by antique type face and the shade of the rock in the Cabernet Sauvignon vineyard, to a focus on utilizing the premier fermentation practices and sound execution while constantly remaining in the forefront of new experimental products, yeast strains and barrel toasting regimes.

Each aspect of Mathew Bruno is created with thoughtful care. Focused on venerated sites, the Mathew Bruno philosophy is simple—exceptional fruit from exceptional vineyards, crafted by exceptional winemaking. Mathew Bruno Napa Valley, the winery's first-ever hospitality destination, will open in Rutherford in Summer 2022.

ANNUAL CASE PRODUCTION: 2,500 cases

CAREER BACKGROUND: Raised as a young boy on the grounds of Italian Swiss Colony's historic Petri facility in Escalon, I graduated from Santa Clara University but set off to the Midwest to work for bourbon and wine barrel manufacturer Cooperage 1912. In August 2000, I returned to California to cut my teeth on my childhood pursuit of becoming a winemaker at Bronco Wine Company. I spent the next six years absorbing every lesson. By winter 2006, I was ready to discover what new world winemaking in Argentina had to offer, with a one way ticket in hand. Residing in Mendoza, I was soon working at Vinas de Medrano outside of San Martin as the only on-site English speaker. That summer I returned to the Golden State to take a position at Sonoma-Cutrer Vineyards as a winemaker in the Pinot Noir program. This harvest opened the door to small-lot, premium wine fermentation from coveted vineyards in the Russian River Valley. Post-harvest my duties were to assist in production of Chardonnay, Sonoma-Cutrer's flagship wine.

Challenged to secure a desirable position in the North Coast as a winemaker, I leaned on my contract wine training and became a successful bulk wine and grape broker for years to come, which continues to do to this day. In early 2009, a hometown middle school friend contacted me searching for Napa Valley grapes for the creation of a new wine brand. Mathew Bruno had a vision to create a successful premium wine producing company and was building his team. I soon realized this was my dream opportunity—to share a passion for wine, drive to succeed and enjoy the fruits of our efforts. I signed on as winemaker immediately upon offering and have produced every vintage of Mathew Bruno Wines.

WHAT HAS BEEN YOUR BIGGEST PROFESSIONAL CHALLENGE? When creating a brand from scratch, one of the challenges is developing a vision for a wine program into a reliable style and quality that's palpable by the consumer in each wine produced. Over time, there are many crossroads or opportunities to divert course or chase third party endorsement and critical peer review—it takes trust in one's ability to remain steadfast on the horizon while executing the long-term goals. We are creating a wine brand where consumers have confidence Mathew Bruno to only produces quality wines.

VARIETALS THAT YOUR WINERY IS KNOWN FOR: Cabernet Sauvignon, Chardonnay and Sauvignon Blanc

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