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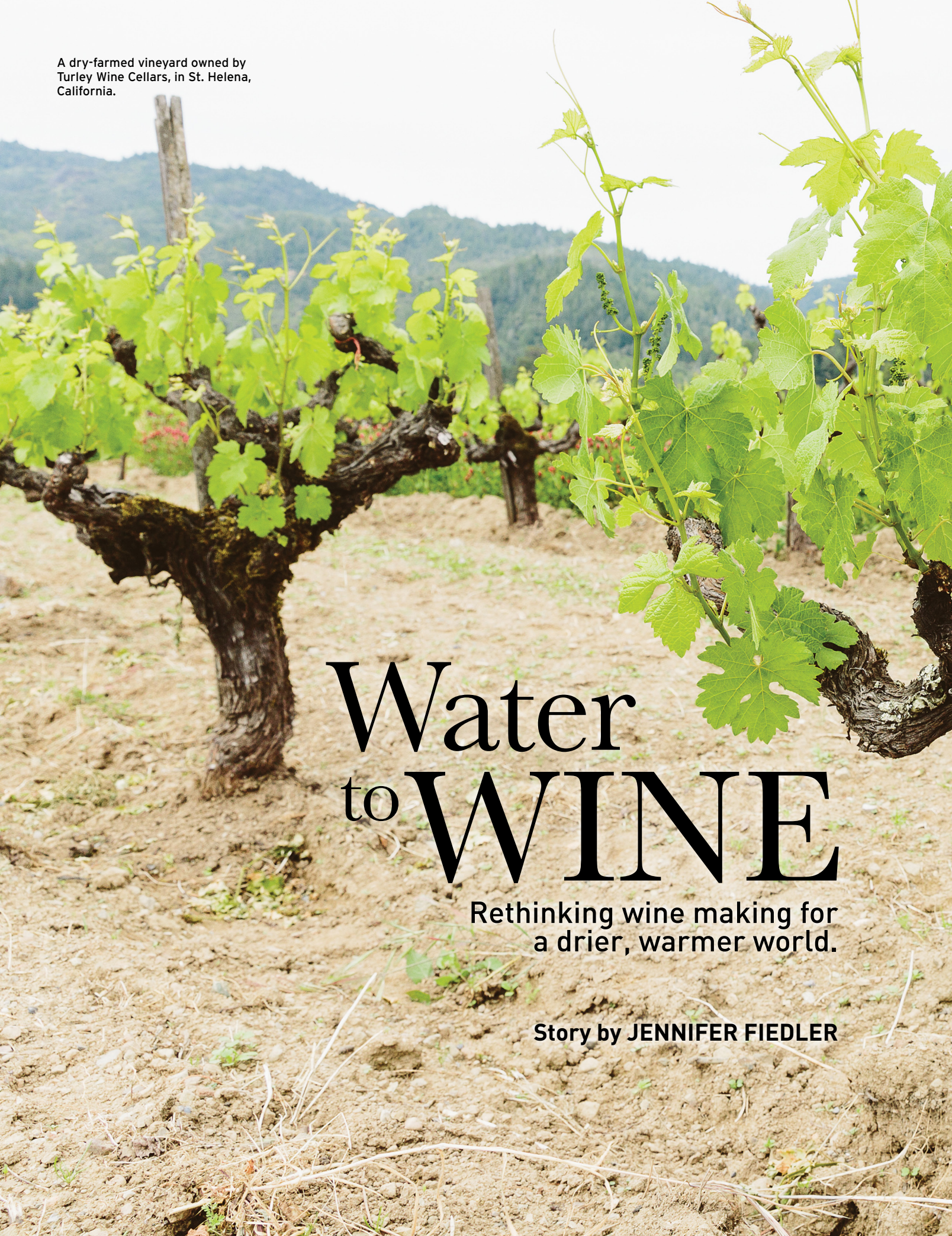

A dry-farmed vineyard owned by Turley Wine Cellars, in St. Helena, California.

# Water to WINE

## Rethinking wine making for a drier, warmer world.

Story by JENNIFER FIEDLER

Carolyn Fong

In spring of this year, amid news of a healthy snow pack, record rainfall and super blooms of wildflowers, California Governor Jerry Brown lifted the drought emergency for most of the regions in the state that had been in place since 2014. The historic drought, which started in the fall of 2011 (and followed another major drought, from 2007 to 2009), had drained groundwater levels to unseen lows in California and sent the state's agricultural industry scrambling to find ways to conserve water.

The sense of relief among most winemakers about the rain's return was visible: Instagram feeds were filled with photos of ducks floating on vineyard ponds, raindrops on budding vines and lush green cover crops in between rows. "Currently at 17 inches and counting," Santa Barbara County grower Peter Stolpman wrote about Ballard Canyon's deluge of rainfall. "Enough, already," read a caption on Napa winemaker Cathy Corison's photo of a flooded vineyard.

But even as winemakers welcomed the rain, there's a sense that this wet year may be more a respite than the rule. A recent study from Stanford University scientists warned that the state has the potential to see drought conditions almost every year going forward, thanks to the overlap of rising temperatures and lower rainfall.

It's not just California. Chile, Argentina, France, Oregon, Australia and other wine-producing regions have all seen similar historic droughts this decade, with more—including side effects like increased wildfires—expected to come. While vineyards tend to use less water than conventional agriculture does for other crops, it's clear that water—and the lack of it—will be an issue of increasing importance in coming decades. As such, forward-thinking winemakers are reexamining each part of the grape-growing and wine making process to see where water use can be cut back—and, in many cases, this means hybridizing the best practices from the past with futuristic technology.

## Old Habits

One of the buzziest conservation techniques gaining traction among California grape growers is also one of the oldest: dry farming. The practice of growing grapes without irrigation is common—and legally required—in Europe's most prestigious wine regions (with some exceptions), but had been much harder to find stateside. California, like much of the New World, began using drip irrigation in vineyards in the 1970s, borrowing the technique from large-scale agriculture to boost production in a consistent manner.

But a handful of winemakers are starting to reconsider. "We weren't sure we could do it in Paso Robles," says Jason Haas, Tablas Creek partner and general manager. Beginning in 2000, Haas planted the estate's first fully unirrigated vineyard and began running experiments on the land, carving out trenches to monitor root depth and soil moisture. As part of greater efforts to reduce water usage, Haas is on track to add 55 acres of dry-farmed vines to the 30 acres already using the practice, which will eventually make up more than half of his parcel in western Paso Robles. "It doesn't rain here for six months of the year," he says.

Dry farming is more complicated than simply not watering the vineyard; vines must be groomed from an early age to grow a complex root system that can reach water tables. In drier regions, the vines need to be planted farther apart so as not to compete for the available water, and young vines are especially susceptible to failure in early years.

Top: Tablas Creek Vineyard; bottom: Carolyn Fong

Above: Dry-farmed Grenache grapes grown by Tablas Creek, in Paso Robles, California. This photo: Young, dry-farmed Petit Syrah grapes grown by Turley Wine Cellars.

Tegan Passalacqua, director of wine making for Turley Wine Cellars, in one of Turley's dry-farmed vineyards.

The practice of dry farming is resonating with growers around the world. Groups such as the Deep Roots Coalition in the Pacific Northwest advocate for wines made exclusively from nonirrigated grapes, while others, such as the Australian Wine Research Institute, are helping to further our understanding of sustainable practices that will work as our climate changes.

Over the course of the 2000s, Haas' vines gradually achieved resiliency and finally began producing the quality of grape he was looking for: more elegance, more minerality, and expressing more terroir. For the wine, Haas mixes these grapes with those from the other, minimally irrigated half of his vineyard, which is planted more densely but offers a different flavor profile. "You get more power out of those grapes—more tannin, more alcohol, more intensity," he says, noting that a mix between the two types ends up creating the right balance for Tablas Creek.

> "We need a **reminder** to humanity that **nothing** is forever, and there are **precious resources** you need to **protect.**"
>
> **—TEGAN PASSALACQUA**

Beyond taste, some winemakers also ascribe a moral or ethical component to minimal irrigation. "The most fascinating thing to me is when you hear professionals in the wine industry say, 'You can't dry-farm here,' " says Tegan Passalacqua, director of wine making for California's Turley Wine Cellars. He notes that California vintners essentially dry-farmed for more than 100 years before irrigation became widespread, and he likens the vogue for densely planted, heavily irrigated vines to football players who get injured after short careers. "In the early years you can manipulate the vines more and come into a false balance," he says. "It's the whole instant-gratification thing—'I want my 100-point wine *now*.' "

Passalacqua, whom the *San Francisco Chronicle* described as "an evangelist for dry farming," is also a founder and board member of the Historic Vineyard Society, which works to save old California vineyards, many of which were planted before irrigation. For Sandlands, his own highly acclaimed and hard-to-come-by label, Passalacqua makes wine mostly from gnarled old dry-farmed vines from overlooked vineyards. He says that the drought was, in some ways, a humbling experience. In 2013, the crop was outstanding, but in 2014 and 2015, yields dropped sharply to a scant 0.7 tons an acre in some places (well-irrigated plots in good years can rake in 10 tons to the acre). And he says that he would have considered irrigating a little if the system had been in place, but that it would have been for the health of the plant, not for the yields.

"I do feel like there's an ethical connection to dry farming," he says. "We need a reminder to humanity that nothing is forever, and there are precious resources that you need to protect." Passalacqua notes that irrigation is, in some ways, a way of temporarily inoculating oneself from the greater picture; but he says he wants to build vineyards for his grandchildren, and that requires thinking about the long-term.

"The tight spacing [for vines] that's been going on in Napa and Sonoma is going to be the death of us," Passalacqua says. He does the calculations quickly in his head for how much water the vines need to produce high volumes of grapes. "The problem with all this mentality—the 'I'm so small, I'm one person'—if everyone starts thinking that way, that's a lot of water."

Even so, Passalacqua says there is a lot to learn from farming more responsibly in tight-spaced, irrigated vineyards. In his role for Turley, he oversees a mix of more than two dozen dry-farmed and irrigated old-vine vineyards, and he has found new technology to be a boon in terms of reducing water use overall. In 2006, Turley began using pressure chambers, also known as pressure bombs, which monitor the stress levels of grapevines, and cut water usage by 75 percent.

And we should expect more of this type of technology that allows vintners to extensively monitor their vines, even drilling down into the metrics for individual vines with sap monitors—something that Passalacqua thinks is ultimately good. "High-end farmers in Napa have realized that using water in a more judicious way helps them get better grapes," he says. And even though he might not fully endorse their reasons, it produces a good outcome: less water use.

## On the Ground

Aside from training vines to use less water, another tactic grape growers are exploring is trying to keep more moisture in the ground. In Australia, Yalumba, which farms grapes in Eden Valley and the Barossa Valley, has found success using mulch. For the last 10 years, the winery has used either straw or an organic forest mulch to cover soil around the vines. Viticulturist Brooke Howell says the mulch helps shield the sun, helps modulate the soil temperature and keeps the soil moist for longer—a boon in drought conditions. And the drawbacks are few: it might cost more to truck in the compost (although Yalumba sources it locally, keeping costs down), but the flavor of the grapes is not negatively affected and bounty goes up. "Our research shows using mulch can increase yield," says Howell.

Carolyn Fong

# WINES TO TRY

## Tablas Creek, California

This organic estate in Paso Robles, a partnership between the Perrin family of France's Château de Beaucastel and importer Robert Haas, was founded in the late-1980s as a showcase for Rhône grape varieties.

## Turley Wine Cellars, California

This Zinfandel specialist (with tasting rooms in Paso Robles and Amador County) sources grapes from more than two-dozen vineyards in California, with an emphasis on old vines.

## Sandlands, California

Turley winemaker Tegan Passalacqua hunts down some of California's best forgotten dry-farmed vineyards for his own label, which has quickly become a cult favorite.

## Montes, Chile

This Chilean powerhouse began to dry-farm in 2009 under the guidance of founder Aurelio Montes Sr., who was concerned about the effects of climate change.

## VIA, Chile

This label sources grapes for its Carignan and Cinsault from dry-farmed old-vine plots in the Maule and Itate valleys.

In Chile, Montes has been planning for the effects of climate change and water shortage for more than 10 years. Using a combination of techniques, including covering the vineyard in plastic and tree bark and lowering the canopy height of the vines, the team reduced water use by 65 percent. In a recent trial, they are trying to go even further, by covering 1.5 hectares of a vineyard with a special netting that protects the vines from the sun and wind, reducing evaporation of water. "We began our experiment in November 2015 and expect to have concrete results in another three years," Aurelio Montes Jr. says.

Some winemakers are also experimenting with different grape varieties, in the hope that the right grape in the right site will thrive. In the central part of Chile, where most of the vineyards are, rainfall has become scarce. Carlos Andres Gatica Llop, winemaker for VIA, says the average annual rainfall over the last 20 years was between 400 millimeters and 700 mm (about 16 to 28 inches), but that has fallen to around 400 mm in the Maule Valley and 250 mm (less than 10 inches) in Santiago in the last five years. "Those numbers are still mostly alright for quality vineyards," he says. But for high-production vineyards that depend on irrigation, he notes, "this is an opportunity to change." VIA sources from a number of vineyards, including old bush vines grown in the Maule Valley. Llop says that Pais, a native grape, seems to do especially well with less rainfall, as the roots tend to grow deeper.

Randall Grahm, winemaker for Bonny Doon Vineyard in Santa Cruz, says that grapes that are suited for drought conditions, such as Grenache, already exist—it's a matter of planting them in the right site. For his latest project, the Popelouchum Estate in San Juan Bautista, Grahm partially raised funds on Kickstarter to experiment with grape breeding and growing techniques to hone in on grapes that would work well in a drier future—in terms of both taste and utility. "Tannat is extremely drought-tolerant, as well as Furmint," he says. He's also experimenting with drought-resistant rootstock, and his new vineyards are planted with wide spacing for dry farming, and planted strategically to prevent rainwater from sheering away. "You want to treat them thriftily," he says of the more drought-tolerant vines. "They tend to be vigorous."

Going forward, the biggest challenge for wines made with less water may not necessarily be how to make them, but how to communicate the value of dry farming to customers. Because dry farming can be more expensive—at least in the short term, thanks to lower yields and the need for more labor—the bottles tend to cost more than their conventionally made counterparts, and that can be a tough sell. "How do we translate that into terms where customers value that in a wine?" asks Grahm.

The French, Grahm says, have bundled the concept of dry farming into the notion of an appellation. Restricted yields, no-irrigation-allowed and rules on vine spacing may seem overly fussy to New World wine regions, but Grahm says they ensure an expressive terroir, the concept of site-specific taste. "Our country is the wild west," he says. "Nobody knows what our standards are, or should be."

Above a certain point, irrigation dilutes the character of the place, producing wines "that tend to be more generic," Grahm says. And that, ultimately, could possibly be the key to helping Americans understand the premium that comes with making wine responsibly. "In the same way for produce that 'organic' or 'biodynamic' work, 'dry farming' is truly a signifier of quality for wine," says Grahm. ■

Top row: courtesy of Montes Winery; bottom: courtesy of Yalumba

Top left: Overhead netting helps reduce evaporation at a Montes vineyard in Chile. Top right: Aurelio Montes, Jr. This photo: Mulching with straw helps keep more water in the ground at a Yalumba vineyard in Australia.