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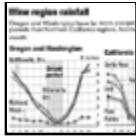
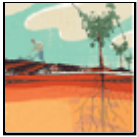
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Turning water into wine

To water grapevines or not -- the roots of the wine industry's next great controversy

Alice Feiring, Special to The Chronicle

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For years, I took the New World's thirst for vineyard irrigation for granted. I believed what I was told: Napa Valley was a desert and needed its 100 to 200 gallons of water per vine per season.

I never realized how complex an issue water was until I visited northern Oregon's Willamette Valley, where I noticed black irrigation pipes snaking through the vineyards. The region gets 40 inches of rain annually, double the oft-quoted number necessary to grow wine grapes without delivering any extra water to the vineyard. I accepted the need for water in California and even more so in desert-like eastern Washington. But the Willamette Valley?

In the best vineyards of Europe, the practice of dry farming -- relying solely on natural precipitation to water grapevines -- is almost universally accepted. Yet in the New World, irrigation is now viewed as essential to the wine industry's survival. And what began as a novel innovation -- drip irrigation -- has become standard practice, such that throwing dry farming into a viticulture conversation is like pitching a lit match into a brittle summer forest. Who knew that something as simple as watering plants could be so, well, hot?

Here's one reason why: California is anticipating drought conditions this year. Most vintners who dry-farm aren't worried; they've seen it before and have gotten through just fine. But some, like Kunde's Steve Thomas, acknowledge that the future of viticulture will have to be sensitive to water shortages. With global warming, drought-tolerant practices are likely to become a way of life.

"We're going to have to start to think of it. It's got to be coming down the road," Thomas says.

Whether adding water or withholding it, water management is a crucial aspect of wine-grape growing, and drip irrigation can be found in about 70 percent of the state's 471,000 acres of wine grapes.

Originally, the preferred watering method was flood irrigation, in which parcels of vineyard were

deluged with water. According to Peter H. Gleick, president of the Pacific Institute in Oakland, which studies global water issues, flooding was quite wasteful, using 20 percent more water than the current technology. It was replaced by drip irrigation, a method that applies water in drops to each individual vine, which was devised more than a century ago but refined by Israeli researchers after World War II. Drip irrigation arrived in California in the 1970s.

And it was firmly in place when the devastating vine louse phylloxera hit the state in the late 1980s. Large swaths of California vineyards were replanted. One key decision during replanting was to ditch the drought-resistant rootstock most of the state was planted on -- phylloxera-resistant St. George as well as the popular hybrid AxR1, which had been thought to fend off phylloxera but turned out to be vulnerable.

They were replaced with riparian rootstock -- water-loving stuff. Roots that previously had to dig deep now hung out close to the ground -- and that's where University of California Davis viticulture and enology professor Larry E. Williams likes them.

"If you're a grape grower, you want to have that vine dependent on what you do so you can manipulate them," says Williams, whose academic work focuses on irrigation management. Williams further explained: "Since the vine is getting most of its water from the drip system, then a grape grower has greater control on how much the vine gets water."

The other objective for replanting was to mirror the density in Bordeaux and Burgundy, up to 2,500 vines per acre instead of the previous status quo of 450. Vines competed for the soil's water and prompted the need for 100 to 200 gallons of water per vine per season -- each vine typically produces two to four bottles of quality wine per year. Though water consumption in California rose as a result, replanting helped revive the state's fine wine industry, and the practices became standard.

But not all vintners are convinced. In Oregon, the Deep Roots Coalition views irrigation as an unnecessary, terroir-occluding manipulation.

"When Oregon's wine pioneers ... planted the first vinifera wine grapes in the north Willamette Valley, they understood that with the abundant rainfall and careful attention to timely cultivation of the soil, irrigation was just not necessary for the vines to thrive," says Doug Tunnell of Brick House Vineyards. "Today, 40 years on, those same first vineyards have yet to see a single drop of water from a drip hose."

Less water, more terroir

Pinning their belief on old-world wisdom about grape growing, the Deep Roots Coalition's seven Willamette-based wineries believe dry farming is the way to deliver a specific sense of place to a wine and one that reflects the vintage -- not the viticultural decisions of the winemakers. They

believe that vines get addicted to water, that watering makes vines physiologically lose track of when it is time to shut down and prepare for harvest, all leading to less complex fruit.

One of the primary reasons they believe so fervently in dry farming lies in the nature of grapevines and their miraculous roots, which can Roto-Rooter through just about anything -- including granite and dense clay.

Loire Valley vintner Nicolas Joly, a guru of the biodynamic movement, claims vines can wriggle down 60 feet into the ground. British wine writer (and Chronicle contributor) Jancis Robinson writes in the "Oxford Companion to Wine" that it's more likely 20 feet, and usually that's in more arid areas like Portugal's Douro Valley, where vines must seek precious water to nourish their grapes and stay alive.

Besides water, vines also suck up a diversity of minerals in the soil that leave a mineral stamp on the fruit. In the right deep soils, and if there are 18 to 20 inches of rain in the winter, conventional wisdom dictates that irrigation is not necessary.

Europeans seeking fine wine associate irrigation with overcropping -- when vineyards have large yields of under-ripe grapes -- and generic table wine, which prompted regional laws that outlawed the practice in places like Burgundy and Bordeaux. Though the beastly hot summer of 2003 resulted in some bending of the irrigation rules and further changes were announced recently by French officials, the practice is still frowned upon as a violation of terroir among the Old World's greatest wineries. But things are never that simple.

UC Davis professor Williams acknowledged a few examples of California vineyards that can dry-farm, many even in relatively arid Paso Robles and others in Sonoma's Dry Creek Valley. But he talks about those remaining old vines -- beautiful head-pruned gnarly vines, such as those found in Kunde Estate's Century vineyard -- as oddities.

Growers' insurance

Steve Thomas is the vineyard manager of the 600-acre Kunde Estate in Kenwood, out of which 100 acres are dry-farmed. Thomas said that even if he was able to convert to dry farming he would keep the pipes -- installed to the tune of \$1,600 an acre -- as insurance to deal with the variability of weather and for applying vineyard treatments such as nutrients, fertilizers and pesticides.

Like many others, he underscored that if California returned to dry farming, vintners would have to rip out rootstock, replace with drought-resistant types and replant vines farther apart.

Which is exactly what Tablas Creek Vineyard in Paso Robles did when it put in new plantings. Most of the property gets two deep waterings a season with drip pipes. General manager Jason Haas says his family planted that new plot in 2006 and 2007 -- totally dry farmed -- because they had no

water access on the vineyard.

They planted on 1103-P, a rootstock known for its excellent drought resistance. Haas planted less densely, based on 600 vines per acre, more similar to traditional dry farming in Paso than in Chateauneuf du Pape, where the Perrin family -- a partner in Tablas Creek -- also farms vineyards.

Irrigation is part of the ongoing debate between traditional and modern winemaking, Haas mused. "But it really depends on whether you are trying to make a product that is consistent or a product that represents that place and year in as compelling a way as possible," Haas says. "It's like Fresno State (viticulture and enology) profs rolling their eyes at the use of native yeasts (and saying), 'Well yes, if they want to take that risk.' "

In Napa, soft-spoken winemaker Boris Champy takes such risks -- with both native yeasts and dry farming -- at Dominus, owned by Christian Moueix of Bordeaux's legendary Chateau Petrus.

"When I was in school in Bordeaux my professor told us about the dry farming on the Greek island of Santorini, which illustrated how adaptable the vine could be," Champy says. "Sometimes they only get 4 inches of rain a whole year. But because the soil is made up of crushed pumice and is greatly absorbent, it transfers the tremendous nighttime humidity as moisture to the vine."

Irrigation not only keeps vines well hydrated, it is a significant player in manipulating fruit flavors and quality. Since the early 1990s, the fashion in grape picking has typically been to leave fruit on the vine until late in the season in order to elevate the level of Brix, a measure used for grape sugar.

"Remember eucalyptus and green bean flavors?" asks Philip Coturri, who runs a vineyard management company Enterprise Vineyards that specializes in organic farming. "Those were due to unripe grapes. To get today's super-ripe flavors the vines need hydration. Irrigations produce a very different type of wine. Irrigation is a tool for extended ripening."

But isn't there a taste in between green beans and jam? What happens if wine drinkers start wanting a less opulent style? Fashion changes, after all.

Some wine writers and consumers have complained about high alcohol levels and smack-you-over-the-head fruit coming from a long hang time and the often-needed dealcoholizations and acidulations to correct them. Coturri, who besides his family's eponymous farm in Glen Ellen works vineyards for Hanzell Vineyards in Sonoma (which farms with little or no irrigation) and Oakville Ranch Vineyards in Napa, doesn't see that happening. People like the ultra-fruity flavors, he insists.

And then there's the money.

Unlike Europe, California's vineyards tend to be large, making it more difficult to work the land

manually and much more difficult to control without irrigation. "As an organic farmer," said Coturri, "I'm in demand. I pay my workers between \$10 to \$12 an hour. To do that I must produce a consistent 2.5 to 3 tons an acre. On so many of these properties if I dry-farmed them, I'd get 1.5 to 2 tons. It's a matter of sustainability."

But in addition to Dominus, such long-standing Napa properties as Grgich Hills and Frog's Leap dry-farm. John Williams, founder of Frog's Leap Winery in Rutherford, recalls buying his vineyards in 1987. "The vineyards were dry-farmed but then I started to irrigate, because I came from UC Davis. By God, we know how to take care of a vineyard!" he says.

"Under irrigation, I soon realized the vineyards were not thriving. Phylloxera attacked. Fortunately Frank Leeds, our neighbor then -- now vineyard manager -- was driving by the vineyard and said to me, 'I don't want to interject here, but you're killing that vineyard.' And that's when he taught me dry farming. What are the great wines that built the reputation of this valley -- the old Inglenooks and BVs? Not a single one of those wines were irrigated."

Despite using AxR1, Williams' vines fought off the louse in the '80s. He suspects that when he irrigated, the roots shrank up to the danger zone that phylloxera inhabited in the soil. By reverting to dry farming, the roots ran down to water and safety.

One essential requirement of dry farming in arid regions like California is the need to plow the land. This keeps the soil sponge-like, ready to absorb every bit of water that comes its way. If the land is hard or has cover crops during the growing season, dry-farming can't be effective.

Ivo Jeramaz, Grgich Hills' vice president of vineyards and production, agrees: "There's an old saying that one cultivation is worth two irrigations." Jeramaz comes from Croatia, where soils are rocky and the water is scarce. He also says that his vineyards resisted the louse at Grgich's Carneros vineyard site, despite use of the vulnerable AxR1 rootstock. He believes his roots went deep enough to a sandy spot beneath dense clay where they stayed safe. That said, there are no clear scientific conclusions about any link between irrigation and phylloxera.

Art of dry farming

"Where irrigation is a science, dry farming is more an art. It's not always possible, but when it is, it's the best option," conceded Coturri, who oversees both farming options in his vineyard management business. "You see, it's not what you do, it's how you do it. As far as usage? Am I aware of the water I use? You bet I am. And the pavement we put up depletes the aquifer more than vineyard irrigation. Growing high-quality plants is a balancing act. I will use every tool at my disposal to produce something that I love."

Those who endorse dry farming see things in a starker light. "The mind-set of irrigation needs to be challenged. It is just like the great gas-guzzling cars that we have decided are our God-given right

to drive," says John Paul Cameron, an Oregon winemaker who's a founding member of the Deep Roots Coalition. "Since water, like oil, is becoming an increasingly scarce commodity, I believe that our position is the wave of the future."

When pressed, others will often agree. The Pacific Institute's Gleick first said dry farming was impossible. Later he reflected: "As water gets more scarce, we might see a revival of dry farming. Water is still pretty cheap, but when the cost goes up people will look to alternatives and look at lessons from the past."

Alice Feiring is a wine journalist and blogger. Harcourt will be publishing her book, "The Battle for Wine & Love," in spring 2008. E-mail her at wine@sfchronicle.com.

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