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Weather & Science

California's \$45 Billion Wine Industry Faces Climate Peril

Vineyards producing California's premier red and white wines are being hit with everything from excessive heat to drought to deep freezes as climate change bears down.



Vineyards in Napa, California, in 2020. *Photographer: David Paul Morris/Bloomberg*

By Kim Chipman

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California's wine country, including the famed Napa and Sonoma valleys, faces a climate crisis so dire that it's posing an existential threat to the future of the state's industry.

Grapes have been hit with one extreme after another. This year's season started out with a deep frost that iced over verdant green buds, nipping them right off the vine. For the crops that survived, the freeze quickly gave way to drought and heat. Just in the past week, record-breaking temperatures baked parched vineyards. Then there's the ever-present threat of wildfires and smoke damage.

The state's wine-grape production is expected to drop almost 4% this year to 3.5 million tons, according to US Department of Agriculture estimates. What's more striking: It will be the second-smallest crop of the decade, trailing only the fire-ravaged harvest from 2020.

For Craig Ledbetter, who owns and helps manage more than 15,000 acres of wine grapes throughout California, extreme frost in the Central Valley's Lodi and Clarksburg wine areas wiped out about a third of the crop on his family vineyards in the region during this year's late freeze.

"There was absolutely nothing that could be done about it: Mother Nature just says 'You're done,'" said Ledbetter of Lodi, California-based Vino Farms. He's now focused on how grapes are faring under this week's blistering heat that can shrivel the fruit. While thin-skinned varieties like chardonnay, zinfandel and pinot noir are especially vulnerable, all types are at risk.

"I don't think anything will come through unscathed," he said.

Shrinking Crops

California's wine-grape harvest is predicted to be the second-smallest of the decade.

Source: USDA
2022 is a forecast

There's been plenty of hand-wringing through the years over what climate change will mean for California's \$45 billion wine industry. But now experts are starting to say the vineyards are already

near the tipping point. It's not about what will happen in the future – the vicious cycle of more intense, more frequent, crop-killing disasters has already begun.

“A significant freeze used to be something we'd talk about every four years,” said Karissa Kruse, president of the Sonoma County Winegrowers in Santa Rosa, California. “Now, we are dealing with frost, flood and heat events in the span of every two months.”

[Read more: A California Winery Is Cheating Climate Change](#)

It's not just one bad season. In the past several years, the trend has been down for the California harvest. If this year's USDA forecast of 3.5 million tons is realized, that would be a drop of 18% from a peak of 4.29 million in 2018. Output hasn't reached 4 million since 2019.

“Can wine-grape growers who've already been hit with low yields over the last couple years afford another short crop? Not really,” said Steve Fredricks, president and partner of Novato, California-based Turrentine Brokerage, a broker of grapes and bulk wine.

Of course, the problems extend beyond California. Climate pressures are weighing on vineyards worldwide. The changing conditions are making some historical wine areas in the Mediterranean and Australia inhospitable, while new players are popping up in other regions, like the UK.

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Oregon, for example, only became well suited for growing wine grapes over the last several decades. Now, planting is also happening in Washington's Puget Sound, where it was always thought to be “way too cold and way too wet,” said Greg Jones, a wine climatologist who's the chief executive officer of Abacela Vineyards and Winery in Oregon. Traditional wine regions like Napa Valley will also need to be more flexible in the types of grape varieties they grow, Jones said.

Will Drayton of Australia-based Treasury Wine Estates, one of the world's largest wine companies with vineyards in Napa Valley, France's Bordeaux and around the globe, said there's no question that the industry is in the midst of a broad shift.

One potential change, according to Drayton, is rethinking the pinot noir that's grown in California's Los Carneros region, which sits in both Sonoma and Napa counties and is known for the red-grape

varietal. With climate shifts in the area, it may make more sense to instead plant merlot, syrah or even cabernet, he said.

“Harvest patterns have been moving around a lot,” said Drayton, Treasury’s director of technical viticulture, sustainability and research. “That requires a lot of quick pivoting on how to react.”



Grapes struck by severe frost in April at Sierra Starr Vineyard & Winery in California's Sierra Foothills. *Source: Jack Starr*

Take the case of Jack Starr, who oversees his family’s vineyard and winery in California’s Sierra Foothills. He’s in a region with ties to the Gold Rush era that’s historically known for warm days and cool nights, perfect conditions for turning out juicy, plump wine grapes. But now, of course, the weather has become unpredictable. A bout of late spring freezes – lasting well into May – made for huge crop losses. He estimates he’ll collect 85% fewer sauvignon blanc grapes than last year.

The recent heat wave also means Starr has been working hard to water crops and ensure grapes don’t get dehydrated, which would throw off the delicate balance of sugars and acids.

“We are focused on trying to keep the water on and keeping these vines as healthy and lively as we can,” Starr said. “They are already tired.”

– *With assistance by Michael Hirtzer*

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