SevenFifty Daily

WINE

The Complex Science of Assessing California's Fire-Damaged Vines

Bracing for another fire season, Napa and Sonoma viticulturists decide whether to replant or revitalize many vineyards that burned in 2020

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Soot on the base of a vine post-fire in Cornell Vineyards. Photo by Matt Morris.

"The Gamble fire came from the north, 15-10 from the south, and Hennessey from the west—they all came here and partied," says Craig Becker, the proprietor of Somerston Estate in Napa, Calif. The 1,682-acre property saw approximately 1,400 acres of damage, including the loss of 20,000 vines during the LNU Lightning Complex Fire.

Becker is just one of many growers whose vines were damaged during the 2020 wildfires at the peak of harvest. Now, at the start of the 2021 growing season, California's vintners are once again bracing for another potentially difficult year: Drought emergencies have already been declared in Sonoma and Mendocino counties.

But for many northern California vintners, the exact toll of the 2020 fire events—including the LNU Lightning Complex fires, which began on August 17, and the Glass Fire, which began on September 27—remains uncertain. While many blackened vineyards were immediately written off, many more remain in flux—and could for several years. *SevenFifty Daily* spoke with viticulturists, winemakers, and researchers about how they are approaching the complicated nature of finding salvageable vines in premier vineyard sites.

The Fine Line Between Replanting or Revitalizing

Mark Greenspan, a viticulturist and president of Advanced Viticulture Inc., says the majority of vine damage from fire events is due to excessive heat. The most impacted vines are those within proximity to inflamed forestry and leaf-litter which radiate high levels of heat into neighboring vineyards.

Flames brought in by under-vine cover crop, weeds, or other vegetation scorch vine trunks, affecting the internal vine tissue—namely the cambium, the tissue responsible for replenishing the vascular cells that transport water and nutrients from the root system through the vine. Soot and scorch marks at the base of the trunk are the most telling signs that internal tissue is affected.

> ***"It's a fine line between where you want to revive versus replant. Why would you save just 20 percent of a vineyard instead of bringing evenness to the property?" – Jean-Baptiste Rivail, Newton Vineyard***

That was certainly the case for Newton Vineyard, which was decimated after the Glass Fire ripped through its winery and vineyards. Viticulturist Laura Deyermond conducted a time-consuming manual assessment, cutting into the cambium layer of vines within the 68-acre estate, and used VineView Enhanced Vegetation Index (EVI) aerial mapping. "EVI maps spectrally isolate the grapevine from the surrounding soil and cover crop, so you get just the vine canopy information," explains Deyermond. For Deyermond, the two assessments determined 71 blocks of the 74-block estate should be replanted.

Aerial view of Newton Vineyards following fire damage. Photo courtesy of Newton Vineyard.

"It's a fine line between where you want to revive versus replant," says Jean-Baptiste Rivail, the president and CEO of Newton Vineyard. "Why would you save just 20 percent of a vineyard instead of bringing evenness to the property?"

Adds Greenspan, "You can do a partial replant, but vines of different ages will also add more variability, and it's harder to manage in terms of irrigation and nutrient needs."

The state of a vineyard's infrastructure is also a consideration when deciding whether to salvage grapevines post-fire; melted pipes, hoses, and other irrigation infrastructure would mean that rehabilitated vines would have no access to water. The three blocks that the Newton Vineyard team decided to save are near a functioning water system.

Australia has become well-versed in seasonal bushfire events, and California vintners have looked to the country for lessons in vineyard revitalization. However, much of Australia's vineyard recovery data is specific to the local terroir and methods of viticulture. For example, some Australian producers can cut own-rooted vines off near ground level and retrain a completely new trunk; those with intermittent vine-row damage can utilize layering to propagate fresh vine material.

That's not an option for those planted on rootstocks. "It has been observed that the rootstock *may* remain viable—but that with extensive trunk damage, the scion may require regrafting with healthy material," says Mardi Longbottom, the viticulture and sustainability manager at the Australia Wine Research Institute.

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Vines also have varying degrees of susceptibility to fire and smoke due to pre-existing health issues, such as old age, viruses, and pest infestations, according to Spring Mountain Vineyard vineyard manager Ron Rosenbrand. For example, the trunk disease Eutypa is one of the most common problems for growers in the area.

"My guess is vines affected by Eutypa will have a harder time recovering—if at all," says Rosenbrand, who estimates he lost between 30,000 and 35,000 vines in the Glass Fire (about seven to ten percent of total planted acreage). Young vines

are also unsuitable for revitalization; their thin trunks and weak root systems are too fragile to withstand even minimal heat damage.

Budbreak on fire-surviving vines at Cornell Vineyards. Photo by Matt Morris.

But assessing the damage of otherwise healthy vines can be tricky. Some may show signs of recovery by pushing out new shoots in the canopy within a couple of weeks after a fire, according to Longbottom. "However, they're not always viable long term," she says. "Growers have reported vine decline and death after two to three years."

"Even minimal damage to the internal trunk tissue will cause some kind of damage because the vine can't repair that," adds Greenspan. "Sap can move around [the damage], but even then, there will be noticeable weakness. Two or three years down the road, it will eventually collapse."

Once vascular tissue is damaged, a vine will struggle to fully recover: the damage will always be present and an impediment to the vascular system. "In our experience, assessments of viability become more accurate over time," says Longbottom.

This might lead growers with minor scorch marks to want to wait to decide on replanting, but this uncertainty can affect future vintages. "Every little bit of variability in the vine growing cycle is a potential negative," says Greenspan. This is especially true for high-end wine producers like those impacted during the 2020 fires; questionable grape quality is not an option.

Before-and-after aerial view of Cornell Vineyard. Photo by Matt Morris.

That was a consideration for Elizabeth Tangney, the viticulturist and winemaker for Cornell Vineyard in Sonoma's Fountaingrove District AVA. Ultimately, she decided to uproot 30 percent of the estate's 20 planted acres due to vine damage. Some vines were too young to survive; others were way too scorched.

However, the fate of one block still hangs in the balance. Its irrigation hose is mostly intact, and there are no scorch marks or soot stains on any trunks. "I know from the weather station the area got up to 180°F in air temperature, but I don't know if the fire actually ran through the block," says Tangney. "So, I don't know if the base of the vines were actually damaged or if it just got really hot."

Fully assessing the viability of this vineyard will require close monitoring throughout the growing season as Tangney looks for uniformity between questionable vines and known healthy ones from budbreak to veraison. At harvest, she will assess whether grape structural levels align with what is expected from healthy grapes and potentially vinify the fruit separately if there's any question of quality.

As vintners continue to evaluate the damage from the 2020 fire events, they're also preparing for what a dry 2021 may bring, utilizing the lessons learned from the past year. "Record and take notes," advises Tangney. "Immediately after the fire, be in the vineyard and record everything. The choice to rip out versus to replant is a huge decision—a huge financial decision either way. My notes and observations are what helped me through the whole process and gave me confidence in my choices."

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