

# Coastal grape growers can use less water during drought

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A new study from UC Davis researchers sheds new light on how vineyards can mitigate drought effects at a time when California is experiencing a severe water shortage. Credit: Greg Urquiaga / UC Davis

California grape growers in coastal areas can use less water during times of drought and cut irrigation levels without affecting crop yields or

quality, according to a new study out of the University of California, Davis.

The findings, published today (Sept. 1) in the journal *Frontiers in Plant Science*, show that vineyards can use 50% of the [irrigation water](#) normally used by [grape](#) crops without compromising flavor, color and sugar content.

It sheds new light on how vineyards can mitigate drought effects at a time when California is experiencing a severe water shortage and facing more [extreme weather](#) brought on by [climate change](#), according to lead author Kaan Kurtural, professor of viticulture and enology and an extension specialist at UC Davis.

"It is a significant finding," Kurtural said. "We don't necessarily have to increase the amount of water supplied to grape vines."

Growers will also be able to use this information to plan for the next growing season. "Everybody's worried about what's going to happen next year," he said.

Kurtural and others from his lab studied irrigation and cabernet sauvignon grape quality at a research vineyard in Napa Valley over two growing seasons, a rainy one in 2019 and a hyper-arid one in 2020.

They focused on crop evapotranspiration, which was the amount of water lost to the atmosphere from the vineyard system based on canopy size. The weekly tests used irrigation to replace 25%, 50% and 100% of what had been lost by the crop to evapotranspiration.

Researchers found that replacing 50% of the water was the most beneficial in maintaining the grape's flavor profile and yield. The level of symbiotic arbuscular mycorrhizal fungi, which help grapevines

overcome stresses such as water deficits, was also not compromised. And the water used to dilute nitrogen application was also reduced, making the process more environmentally friendly.

The water footprint for growing grapes also decreased. For both the 25% and 50% replacement levels, water use efficiency increased between 18.6% and 29.2% in the 2019 growing season and by 29.2% and 42.9% in the following dry year.

While focused on cabernet sauvignon, most red grapes will respond similarly, he said.

"In the end, drought is not coming for wine," Kurtural said. "There doesn't need to be a tremendous amount of [water](#) for grapes. If you over irrigate in times like these, you're just going to ruin quality for little gain."

**More information:** The Bipolar Reset Experiment (BIRX) was conducted at Site 300., *Frontiers in Plant Science* (2021). [DOI: 10.3389/fpls.2021.712622](https://doi.org/10.3389/fpls.2021.712622)

Provided by UC Davis

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