

Machines can help wine grape industry survive labor shortage

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Using mechanical pruning like above can save between 60% to 80% of labor operation costs per acre compared to manual pruning alone. Credit: Hector Amezcua/UC Davis

Wine grape growers in California and elsewhere face increasing labor costs and severe labor shortages, making it difficult to manage and harvest a vineyard while maintaining profitability. Growers are increasingly turning to machines for pruning, canopy management and

harvesting, but how well these practices are executed can substantially affect yield and quality. A new [review](#) by researchers at the University of California, Davis, published in the journal Catalyst, provides guidelines for growers to make the best use of machines.

"Wine grape laborers have been virtually nonexistent. People don't want to work in vineyards anymore because it's remote, tough work," said Kaan Kurtural, professor of viticulture and enology and extension specialist at UC Davis. "There is now machinery available to do everything without touching a [vineyard](#)."

Kurtural has designed a "touchless" experimental vineyard at the UC Davis Oakville Station to help growers understand how machines can help them cope with the [labor shortage](#). While machines reduce the need for seasonal manual [labor](#), they do not eliminate it. The degree of labor reduction depends on growing region, grapevine type and the number of practices growers mechanize.

The review provides guidance on using machines for winter pruning, canopy management and harvesting as well as how to design a grape vineyard for machines before planting. Videos showing the operation of different types of machinery and practices can also be found in the review.

Economic savings, quality grapes

About 90% of the wine grapes crushed in the U.S. are mechanically harvested. Previous studies have found about a 50% savings in labor costs from using machines to harvest instead of hand harvesting.

"Using more mechanization in a vineyard beyond just harvesting can also reduce labor costs without affecting [grape](#) quality." Kurtural said.

Mechanical pruning, for example, can save between 60% to 80% of labor operation costs per acre compared to manual pruning alone. One experiment in the San Joaquin Valley, where more than 50% of California's [wine grapes](#) are grown, also showed using mechanical canopy management machines to manage merlot grapes resulted in twice the amount of color. The more color, or higher anthocyanin concentrations, the better the quality. It can significantly improve returns from vineyards in California's heartland.

Kurtural said there are machines available to manage canopies, including machines for leaf removal, shoot thinning and trunk suckering. Kurtural noted that the [machines](#) are American made, developed by researchers at the University of Arkansas and commercialized by manufacturers in Fresno and Woodland, California.

More information: S. Kaan Kurtural et al, Mechanization of Pruning, Canopy Management, and Harvest in Winegrape Vineyards, *Catalyst: Discovery into Practice* (2021). [DOI: 10.5344/catalyst.2021.20011](https://doi.org/10.5344/catalyst.2021.20011)

Provided by UC Davis

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