

# Rural Migration News

## Blog 283

JUNE 2022

### Alternatives to Hand Labor in Wine Grapes

Grapes are a fruit that produces clusters of dozens of individual berries. Most grapes are from the varieties of *Vitis vinifera* native to the Mediterranean region. The FAO estimates that over 70 percent of the world's grapes are used to make wine, a quarter eaten as fresh fruit, and the rest dried into raisins.

There are three major types of grapes: raisin, table, and wine. The 1.1 million tons of CA raisin grapes had an average grower value of \$276 per green ton or \$0.14 a pound in 2020 for a total of \$304 million, the 1.1 million tons of table

grapes had an average value of \$1,320 or \$0.66 a pound for a total of \$1.4 billion, and the 3.4 million tons of wine grapes had an average value of \$795 a ton or \$0.40 a pound for a total of \$2.7 billion. California had 142,000 acres of raisin grapes in 2018, 122,000 acres of table grapes, and 580,000 acres of wine grapes.

#### Production

Producing wine grapes requires pruning grape vines in winter, removing leaves and thinning bunches of grapes in spring, and

harvesting grapes in fall. Pruning and thinning are largely mechanized, and 90 percent of California's wine grapes are harvested by machine.

Grape vines are trained to grow on wires that are parallel to the plant or on wires that form a Y above the plant. The vines are pruned and tied so that the foliage is contained within six to eight inches of wires, allowing bunches of grapes to grow at the bottom of the plant's canopy and making them more accessible to the rods and fingers of harvesting machines that knock berries from the bunches and convey them to gondolas traveling alongside the harvester. Since the grapes are crushed soon after harvest for their juice, there is less concern about damage to the berries from the machine.

California's vineyards are divided into 17 districts, and they produced 3.9 million tons of wine grapes that were crushed in 2021, including two million tons of red and 1.6 million tons of white varieties (the others were raisin and table grape varieties).

The grower price of wine grapes averaged \$860 a ton in 2021, but the price varies by variety, region where the grapes were grown, and other factors. District four Napa growers received an average

The Acreage and Value of Wine Grapes is Rising, but Grower Prices are Declining

Crop	Crop Year	Bearing Acres	Non-Bearing <sup>1</sup> Acres	Yield Per Acre Tons	Production Tons	Utilized Production Tons	Value Per Unit <sup>2</sup> \$/Ton	Total Value \$1,000
Grapes, Wine	2011	540,000	37,000	6.20	3,347,000	3,347,000	637.00	2,132,039
	2012	550,000	38,000	7.31	4,018,000	4,018,000	773.00	3,105,914
	2013	565,000	45,000	7.51	4,245,000	4,245,000	753.00	3,196,485
	2014	565,000	50,000	6.89	3,895,000	3,895,000	759.00	2,956,305
	2015	560,000	48,000	6.62	3,705,000	3,705,000	781.00	2,893,605
	2016	560,000	42,000	7.20	4,032,000	4,032,000	905.00	3,648,960
	2017	560,000	39,000	7.17	4,016,000	4,016,000	927.00	3,722,832
	2018	590,000	47,000	7.26	4,285,000	4,285,000	1,010.00	4,327,850
	2019	590,000	45,000	6.78	4,000,000	3,920,000	972.00	3,810,240
	2020	580,000	40,000	5.89	3,415,000	3,415,000	795.00	2,714,925

\$8,100 a ton for their 65,000 tons of Cabernet Sauvignon grapes in 2021, while District 13 growers around Fresno received an average \$455 a ton for their 83,000 tons of Chardonnay grapes.

A 2019 study of the costs of producing Cabernet Sauvignon grapes in the southern San Joaquin Valley assumed 566 vines per acre with a single high wire cordon that allows vines to be pruned mechanically in a box shape. Labor costs were estimated to be less than \$500 per acre, or less than 20 percent of variable costs of \$2,500 an acre, including \$325 per acre to machine harvest the grapes. With yields of 12 tons an acre and a grower price of \$325 a ton, gross revenue is \$3,900 an acre and machine harvesting costs are \$27 a ton or \$325 an acre.

A 2020 UCCE cost study estimated that an acre of Napa Cabernet Sauvignon grapes yielded four tons worth \$8,200 a ton, generating gross revenue of \$32,800. UCCE assumed that hand labor costs were \$31 an hour, including \$21 an hour in wages and \$10 an hour in payroll taxes and benefits. Hand workers are assumed to pick a ton of grapes in an eight-hour day, making the cost of picking one ton of grapes \$248 and the cost of harvesting an acre about \$1,000.

A 2016 cost of production study for Chardonnay grapes in Sonoma county assumed that a vineyard manager received \$400 an acre to manage a vineyard with 806 vines an acre. Hand harvesting costs \$250 a ton and, with yields of seven tons of grapes an acre, harvesting costs total \$1,750 an acre. Hand workers were paid \$18 an hour, making labor costs with payroll taxes \$25 an hour. Pre-harvest labor costs are \$2,500 an acre for pruning, suckering, and thinning, all tasks done by hand. With

### Napa Valley Attracts 4 Million Visitors a Year



### Hand Harvesting Wine Grapes in Napa



Source: Philip L. Martin.

yields of seven tons an acre and a grower price of \$2,000 a ton, gross revenues are \$14,000 an acre and harvesting costs are \$1,750 an acre.

## Labor

Hand harvesting wine grapes is 10 to 20 times more expensive than machine harvesting. Workers cut bunches of grapes into tubs that hold 40 to 50 pounds of grapes and dump the tubs into 1,000-pound bins that are conveyed to the winery for destemming and crushing. A crew of workers pick into shared bins and divide the per-ton piece rate, and most earn \$20 an hour or more in Napa and Sonoma counties, which have the highest shares of hand-harvested wine grapes.

The availability of labor is not a major challenge for most California wine grape producers, especially in the San Joaquin Valley where the harvest is mechanized. Labor is more of an issue in the Napa and Sonoma valleys, where more vineyard work is done by hand and high housing costs reduce the availability of local workers.

The 40th percentile fair market rent for a two-bedroom apartment in Napa county was \$2,165 in 2022, so that a worker employed full time at \$20 an hour would earn \$3,200 a month. If a family had only one earner, two thirds of gross earnings would be devoted to rent. Many low-wage workers who are employed seasonally in Napa live in often-crowded housing or endure lengthy commutes from lower cost housing an hour or more away.

A survey of over 600 vineyard workers and 50 supervisors in Napa county found that two-thirds of the year-round workers in 2018, and 85 percent of seasonal workers, lived outside Napa county, including some who commuted from 100

## Grape Harvesters Dislodge Grapes from Bunches at the Bottom of the Canopy



Source: <https://www.goodfruit.com/new-grape-harvester-leaves-mog-in-the-field/>

miles away. Most earned \$15 to \$20 an hour while working in Napa, well above the state's minimum wage of \$11 an hour in 2018. The major concern of Napa vineyard workers was long-distances commutes.

The vineyard management companies that employ most of the farm workers in Napa and Sonoma report increasing difficulty hiring their desired number of workers. The key figure in the premium wine industry is the winemaker, and many winemakers whose wines sell for at least \$50 a bottle insist that vineyard work be done by hand. UCD's Oakville Experiment Station in Napa planted a "no touch" vineyard designed for mechanization that produces high yields of high quality fruit with machines. When asked why more Napa vineyards are not fully mechanized, UCD's Kaan Kurtural said: "It [machine] doesn't look romantic? I don't see any other reason."

Some vineyard management companies are hiring H-2A workers if they can provide the housing that is required for guest workers. A few vineyards in Sonoma county built housing for H-2A workers, but more are planting and replanting vineyards so that vineyard tasks can be mechanized.

## Mechanization

As labor costs rise, there is likely to be more mechanization in wine grape vineyards. Harvesting California's wine grapes is mostly mechanized, as are pruning, leafing, thinning and other pre-harvest tasks in most wine grape areas. Vineyards planted on steep hills, and those not designed for mechanization, continue to rely on hand workers, but such vineyards are a relatively small share of California's wine grape acreage.

Harvest machine manufacturer Pellenc estimates that handpicking and hauling wine grapes costs \$2,000 an acre, or \$400 a ton for a five-ton yield. Machine picking and hauling with a \$400,000 self-propelled harvester costs growers \$250 to \$500 an acre. The cost of machine picking does not increase as yields rise, while the cost of hand picking rises with yields. Machines can operate efficiently at night, and they remove stems and leaves in the field, which reduces labor needs in the winery.

Grape harvesters have hydraulic systems that allow the machine to be raised and lowered to accommodate different trellising systems. The \$400,000 New Holland Brand

### Shaking Rods Dislodge the Grapes from the Bunches



Source: <https://www.goodfruit.com/new-grape-harvester-leaves-mog-in-the-field/>

### Grape Harvesting Machines can Harvest 2 Acres an Hour



Source: [https://www.lancasterfarming.com/news/main\\_edition/picking-new-holland-pays-off/article\\_31f9f21a-c19f-5fbd-874b-e6a370d3fc2a.html](https://www.lancasterfarming.com/news/main_edition/picking-new-holland-pays-off/article_31f9f21a-c19f-5fbd-874b-e6a370d3fc2a.html)

9090X machine can harvest two acres an hour.

### Outlook

Vineyard mechanization is linked to the economic competitiveness of the California's wine industry, which is grappling with overproduction. A record harvest of 4.5 million tons in 2018 was followed by four-million ton harvests and wildfires in 2020 that left even some Napa Cabernet grapes unsold.

California wineries shipped 276 million nine-liter cases of wine in 2019, including 87 percent to US consumers and 13 percent abroad. In 2019, Chardonnay was 20 percent of US wine sold, Cabernet Sauvignon 15 percent, and red blends and Pinot Grigio 10 percent each. The US has been the world's largest wine market since 2010, with total sales of \$75 billion, including \$44 billion worth of California wine in 2019. A third of US wine is imported. The future of the California wine industry is uncertain. Baby boomers in their 60s and 70s are the major buyers of premium wines, and many are buying less wine, putting downward pressure on prices. Younger consumers are purchasing substitutes for wine such as craft beer, hard seltzer, spirits, and cannabis. Price is also a factor, since a serving of wine is often more expensive than a serving of beer or spirits.

To subscribe to RMN blogs, send email to [ruralmigrationnews-subscribe@primal.ucdavis.edu](mailto:ruralmigrationnews-subscribe@primal.ucdavis.edu)

More at: <https://migration.ucdavis.edu/rmn/>