

Realizing the Heritage



Grape Growing and Winemaking in the Livermore Valley

Authored by UC Davis Professors James T.
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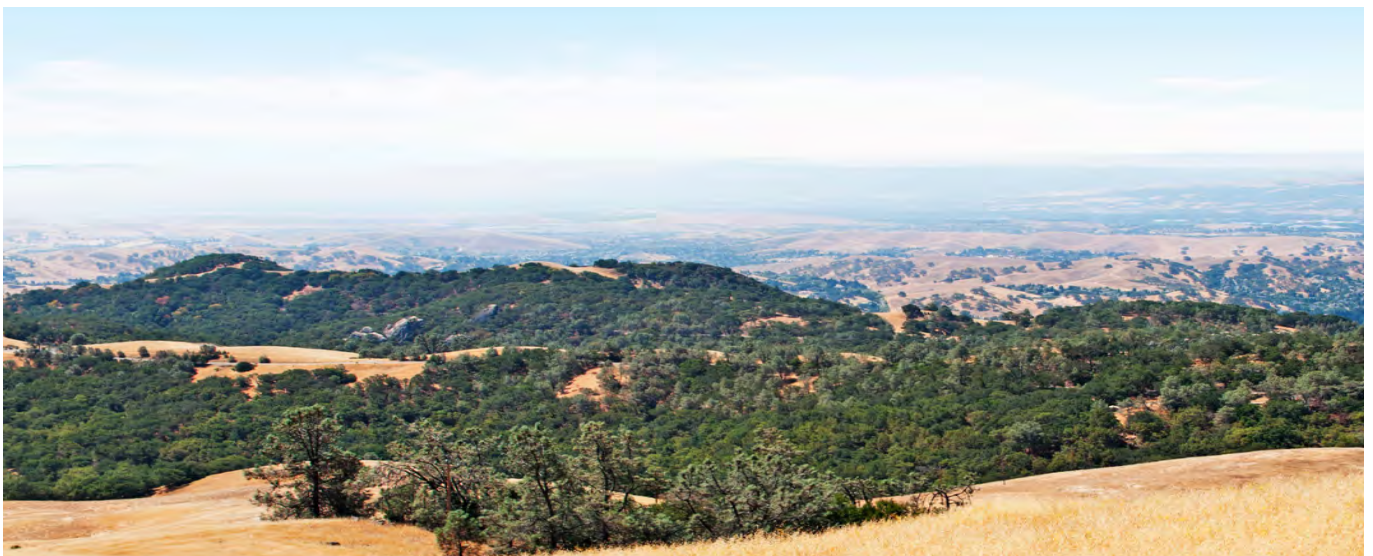
ABOUT THE STUDY

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Research underlying this report was supported by the Tri Valley Conservancy and prepared especially to help provide useful information for public and private decision-making in the region.

The objective and hope of the authors is that this publication will serve its immediate purpose and be of broader interest to other regions and perhaps other commodities facing similar considerations that are ubiquitous in agricultural communities on the urban edge.



Graphic Design for this document was provided by Victoria Josephine.

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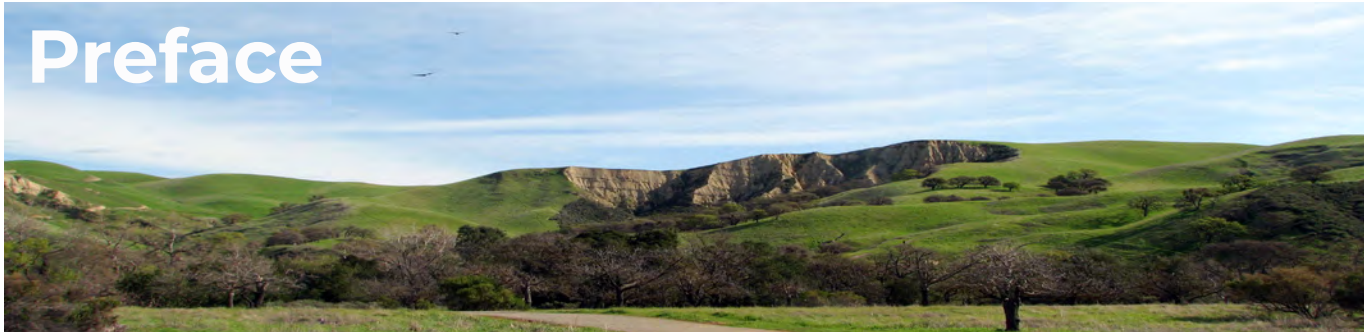
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At the Department of Agricultural of Resource Economics at UC Davis, **Jeremy Murdock** led the Farm Cost and Returns studies underlying our analysis in Section 5. **Carlyn Marsh**, an undergraduate student, reviewed the report for continuity and clarity and **Dr. William Matthews** helped with final manuscript preparation.

We hope we have not omitted anyone and we sincerely thank everyone for their contribution to and support of this report.



Source: Karen Lee Inoyue

Since the 1880s, the Livermore Valley has had a distinguished history as one of California's premium wine grape regions. It has the requisite climate, soils, and water to produce grapes that can be the source of high-quality wines. A century later, visionary leaders sought to preserve this rich agricultural region despite pressures to allow it to be converted to dense housing.

In 1993, the Alameda County Board of Supervisors (BOS) adopted the SLVAP (Area Plan), which calls for increasing cultivated agriculture - particularly viticulture - in the historic South Livermore Valley. When the Board of Supervisors next adopted the original East County Area Plan (ECAP) in 1994, it incorporated the entire SLVAP into ECAP.

The Board of Supervisors established several goals within ECAP for the SLVAP including the establishment of an agricultural land trust, now known as the Tri Valley Conservancy, with \$8.5M from the Ruby Hills settlement to help implement the Area Plan (Policy 346). Other goals included a "critical mass" of cultivated agriculture, particularly viticulture, of 5,000 acres (Policy 339), the attraction of wineries to the Area Plan in a "range of sizes," (Policy 343), and the development of various visitor-attracting uses typical of a "world-class" wine country (Policy 344), such as a resort hotel.

The Tri-Valley Conservancy was founded with the goal of safeguarding the Tri-Valley's urban growth boundaries and achieving a critical mass of cultivated land, in particular vineyards, in the South Livermore Valley. As of 2021, there were 2,800 acres planted as vineyards. The planted acreage needs to be protected and further planting encouraged and supported to ensure the economic viability of our wine region.

When the Tri-Valley Conservancy commissioned this study with the University of California at Davis, the intent was to acquire an impartial assessment of the economic viability of wine production in the Livermore Valley American Viticultural Area. We believe that this report provides the context, background, economic reasoning, and evidence to help address the potential to maintain and perhaps expand profitable commercial wine grape and wine production in the Livermore region.

The Tri-Valley Conservancy is gathering valuable input from key stakeholders in the community and it will be reflected in our strategic goals in achieving the conservation goals called out in the South Livermore Valley Area Plan. We welcome the opportunities the report presents to fully "realize the heritage" of grape growing and winemaking in the Livermore Valley.

Introduction

Realizing the Heritage evaluates the economics of winegrape and wine production in the Livermore Valley, a wine producing region to the east of the southern San Francisco Bay. This study provides information for the Livermore community organizations, the local industry and interested individual and groups that may help guide planning. We believe it also provides a useful framework for many other regions and for other industries considering similar sorts of question in California and beyond.

In the 1880s, the Livermore Valley was California's newest and most dynamic wine region, producing some of California's most sought-after wines and winning two of California's three gold medals awarded at the Paris Exposition of 1889. Today, the valley is a sometimes-overlooked part of California's large coastal winegrape and wine industry. Although geographically distinct from other California wine regions, Livermore is not economically separate. Like other California grape growing areas, Livermore's grape and wine prices are largely determined by the overall supply and demand for California wine and Livermore is a part of the vast global supply and demand for wine. Livermore is an excellent location to grow flavorful grapes than can make premium wines, but so are other coastal regions. While this report focuses on the economics of Livermore's grape and wine production, it also places the Livermore Valley in a state-wide and global context.

Livermore's vineyard acreage will expand if vineyards are the most profitable use of agricultural land and other scarce resources, including the investment capital of those who wish to be in the winegrape business. The results of two surveys we conducted find concerns about the current profitability of many of Livermore's small independent vineyards and wineries. Nonetheless, two recent forward-looking winegrape cost studies show that, under the right conditions, new Livermore Valley vineyards can be profitable and competitive with other coastal California regions in grape quality, price and productivity. Moreover, given Livermore's small share of California coastal winegrape and wine production, even a small increase in demand for Livermore grapes is likely to raise Livermore grape prices and vineyard profitability, allowing the valley to realize its heritage of the 1880s.

Thus, while the following chapters raise many challenges and concerns, we find that with careful farm investments and effort at wine marketing, the prospects for winegrape and wine in the Livermore Valley can be favorable.

Executive Summary

The economic viability and financial feasibility of local agricultural industries have long been of deep and enduring interest and importance for large and small communities, both rural and suburban.

Sometimes the concerns relate primarily to broad economic contributions such as jobs and local tax base, but in other situations local agriculture brings environmental or cultural related community benefits.

Local winegrape and wine industries are of particular interest because they are often tied to community identity and agritourism and on-farm wineries bring visitors and recreation opportunities that many farm-based industries do not.

Here we explore the economic viability of the local winegrape and wine industries in the Livermore Valley in Alameda County, California.

Several important economic questions surround the winegrape and wine industries in the Livermore Valley. These questions center around the potential to maintain and perhaps expand profitable commercial winegrape and wine production in the Livermore region.

This report provides context, background, economic reasoning and evidence to help address these questions.



Source: Milly Seibel

Livermore Valley



Source: Spencer Demera

The Livermore Valley, southeast of Oakland and northeast of San Jose, is on the eastern edge of the San Francisco Bay region. Since the 1880s, it has had a distinguished history as one of California's premium winegrape regions. Beginning in the 1950s, population and suburban pressures have grown and land use for housing and commercial purposes has risen.

The city of Livermore grew from about 4,400 in 1950 to about 16,000 in 1960 and continued to grow steadily to about 90,000 in 2020.

In response, the region developed and extended zoning and other land use policies in attempts to maintain local agricultural and specifically winegrape land use.

These land use policies are designed, in part, to reflect historical traditions and preserve open space.

The Livermore Valley has the requisite climate, soils and water to produce grapes that can be the source of high-quality wines. Of course, like most wine growing regions, Livermore Valley grapes account for a small share of the total acreage of premium California winegrapes.

Livermore's approximately 2,800 acres of bearing vineyards represent about 2.3 percent of the roughly 120,000 acres of California vineyards with similar climatic and other requisite conditions.

The fact that Livermore Valley grapes are a small share of a large market means that grape prices in the region are largely determined by the balance between the supply and demand of winegrapes in the coastal crush districts.

Winegrapes and wineries in the Livermore Valley

Winegrapes are the major agricultural crop in the Livermore Valley, comprising 90 percent of the Valley's irrigated agricultural acreage. Livermore's grape supply comes from 125 vineyards, most of which are small and independent.

Sixty-eight are under ten acres in size and 36 are over ten but less than 20 acres. Collectively these 104 vineyards accounted for 878 acres, or about 32 percent of all vineyard acreage. This means that more than two-thirds of acreage is owned by the 21 vineyards of 20 acres or more. Two companies account for approximately half of Livermore's winegrape acreage.

Most of these small vineyards are farmed by custom-farming companies rather than by the vineyard owner. About 500 acres were leased to third parties in 2020.

Planted in the late 1990s or early 2000s, approximately 2,000 acres of Livermore vineyards are now in or are entering their third decade of production and will either be removed or replaced by 2030 due to declining production as a result of trunk diseases.

As with its vineyards, the vast majority of Livermore's approximately 48 wineries are also very small.

Twenty-two wineries produced fewer than 2,000 cases in 2019 and collectively averaged 800 cases. Nineteen wineries produced more than 2,000 and fewer than 6,000 cases, and, as a group, averaged 3,300 cases. Five wineries produced more than 6,000 cases but fewer than 25,000 cases.

Two wineries, Wente Vineyards and Concannon, produce over half of all Livermore wine. They are also the only Livermore wineries with national distribution, although the Wine Group, which owns Concannon, currently has that winery up for sale.

Concentration of national wine marketing was not always the case. In the 1880s and 1890s, wineries such as Olivina, Mont Rouge, Ruby Hill, Concannon, Bellevue and Cresta Blanca, shipped wine across the country and established Livermore's national reputation.

However, by the 1970s, as the California wine boom began and wine production expanded dramatically in coastal regions throughout California, the number of Livermore wineries operating on a national scale, and thus keeping the Livermore name before a national audience, had fallen to just Concannon and Wente.

Winegrape development in the Livermore Valley at the end of the 20th Century

In the 1980s, as Livermore and Pleasanton increased in population, developers sought to convert rural land to housing. Advocates for open space preservation opposed such conversion. In 1993, the South Livermore Valley Area Plan (SLVAP), allowed the development of 20-acre parcels in the Ruby Hill area.

The SLVAP allowed the creation of relatively dense housing developments within the cities of Livermore and Pleasanton if new “mitigation” vineyards were established at the rate of approximately five acres of mitigation vineyard for each acre of agricultural land converted to housing.

Livermore’s requirement for mitigation vineyards diluted the influence of standard grape supply and demand factors on vineyard development in the Livermore Valley.

Approximately 1,500 acres of mitigation vineyards were planted in the late 1990s and early 2000s.

The 1990s were a boom period for California vineyards, with winegrape acreage doubling statewide in a single decade.

In Livermore, landowners joined developers in establishing vineyards and we estimate that in the 1990s, 400 acres of vineyards were planted in addition to the mitigation vineyards.

One result of the state-wide planting boom and the requirement for mitigation vineyards is that approximately 1,900 of Livermore’s current 2,800 vineyard acres are at least 20 years old and will either be removed or replaced by 2030.

Vineyard and winery economic prospects

Vineyards are expensive thirty-year capital investments. Two recent (2021) U.C. studies of the cost of establishing and operating a vineyard in the Livermore Valley estimate that a vineyard costs approximately \$30,000 per acre for vineyard establishment, with another \$25,000 for vineyard-suitable land.

A well-managed vineyard with better than average yields – due to higher vine density per acre than the mitigation vineyards of the 1990s – and expected prices at or just above those prevailing for high quality Livermore Valley grapes could expect an annual return of about \$2,800 per acre after covering the 5.5% interest on the investment in land and establishment.

The study of a hypothetical new Cabernet Sauvignon vineyard anticipates a yield of seven tons per acre, about two tons per acre above the district average. In recent years, most mitigation vineyards have been unable to obtain such yields and prices despite relatively high costs to farm.

Our survey of Livermore Valley vineyard owners and custom farming companies provided data on acres and yields by variety, costs of production, prices received by variety and general profitability. We received information regarding 71 individual vineyards representing 77 percent of estimated total bearing acreage. As with many surveys, a high share of respondents did not answer all the questions.

Cabernet Sauvignon and Chardonnay accounted for about two-thirds of Livermore Valley acreage. Cash costs for farming an acre of grapes was reported by respondents as between \$4,000 and \$5,000 per acre, broadly consistent with the Cost and Return Studies estimates of \$4,830 per acre for Cabernet and \$4,756 per acre for Chardonnay. Survey respondents reported that red varieties produced seven tons per acre in 2018 and just over five tons per acre in 2019, while white varieties produced just under ten tons per acre in 2018 and six tons per acre in 2019.

Many of Livermore's independent vineyards were not profitable in 2019 and 2020. Income from grape sales was generally sufficient to pay the cash cost of producing and harvesting a crop, but was not enough to repay the initial expenses of establishing a vineyard or the opportunity cost of the land investment.

In 2020, at least 500 acres of vineyards were leased for \$300 per acre, which made little contribution to the approximately \$3,600 amortized annual cost per acre for depreciation of vineyard or other physical capital or a return on the investment. Anecdotal reports indicate that some Livermore vineyards have not been profitable for decades, which is consistent with lack of new plantings in the Livermore Valley since the early 2000's.

Our 2020 survey of Livermore wineries provided data on the winery production, revenue, grape prices paid, origin of grapes crushed, and general profitability. The fifteen winery responses represented about one-third of Livermore's wineries and was representative across winery size, but included both large wineries.

Significant findings included the following: (1) Two-thirds of wineries crushed grapes from outside the Livermore Valley in addition to crushing grapes grown in the valley, (2) most reported paying higher prices for Livermore grapes than the district-average price and (3) all of the wineries producing fewer than 2,000 cases sold 95 percent or more of their wine direct from the winery.

Ten wineries provided detailed financial information and six of these ten wineries had no profits or lost money in 2019. Unprofitable small wineries are unlikely to provide incentives for Livermore's viticulturists to expand their grape acreage or to attract outside investment in Livermore Valley wine.

The total of all small wineries in the Livermore Valley crush a small share of all Livermore Valley grapes. Assuming yields of 5 tons per acre and 50 cases per ton, the 41 Livermore wineries producing fewer than 6,000 cases collectively required production from about 330 acres of Livermore vineyards. The five wineries producing between 10,000 and 25,000 cases used another 375 acres of Livermore grapes.

The largest winery, Wente Vineyards, farms approximately 1,000 acres and is largely self-sufficient in grapes, while Concannon, according to a sales brochure, has 180 acres of producing vineyards. In total, grapes from about 1,900 acres are required by Livermore's current wineries, leaving the production of 900 acres, almost one-third of Livermore's total acres and approximately half of the independent vineyard acreage, to be exported out of the Livermore Valley at prevailing spot-market prices for coastal grapes. This estimate may be low, as Wente Vineyards' grape and wine production is marketed in various ways and some production is not necessarily labeled as from the Livermore Valley.

Livermore winegrape and wine prospects

As with much of California agriculture, water availability may limit vineyard expansion in the Livermore Valley. Current allocations from the State Water Project are not fully used, indicating that water may be available for new vineyards. However, climate change, problems of water movement through the Delta, and increasing regulations, cause concern that irrigation water for new vineyards may be insufficient. Even if water is available, the competitive position of the Livermore Valley relative to other winegrape regions in California may challenge the underlying economic viability of some small vineyards.

In 2019 the Livermore Valley produced 4,385 tons of Cabernet Sauvignon, less than two percent of all coastal Cabernet produced in California. In one sense that means it is easy for the Livermore Valley to be subsumed within the overall coastal flow of reasonably high-quality wine. It also means, however, that a small percentage shift in preferences to favor Livermore, could cause a major increase in the price of the limited quantity of Livermore grapes. Of course, a price reduction would follow from a relative demand shift in the other direction.

The bottom line is that Livermore is part of a broad region that commands the respect of wine consumers, but that Livermore does not have a reputation that sets it apart with exceptional characteristics and prices relative to many other coastal California grapes.

The Livermore Valley winegrape industry will thrive if it can keep costs under control relative to other coastal regions, if it can improve yields in the next generation of vineyards and if it can maintain or improve demand by expanding its reputation in the national market or in the local market for vine tourism.

This report documents that Livermore Valley grape acreage is likely to expand only if expected grape prices are high enough to allow more Livermore vineyards to expect profitability. Given the small share of local grapes that they use, moderately increasing the number of small local wineries in the Livermore Valley can only marginally increase the local demand for Livermore grapes. A doubling or more of wine tourism and purchase of local wine at the winery would be required to have a major impact on aggregate demand for Livermore grapes. Such a significant improvement in the broad demand (willingness to pay) for Livermore labeled wines would increase grape prices and vineyard profitability, because the potential for supply expansion is limited and would take many years. One way to increase demand for wine from Livermore grapes would be to increase the effort to market those Livermore wines to a much broader audience. That would likely require national distribution and marketing.

Section 1. Setting the Stage

Livermore Vineyards and Wineries in 2020

This introductory section describes the number, size and geographic distribution of vineyards and wineries in the Livermore Valley as of 2020. It also compares the Livermore grape and wine industry with other crop industries such as those for olives and tree nuts.

This section sets the stage for the sections that follow, which examine the agronomic conditions for wine grape production in the Livermore Valley, the history of grape and wine production, the impact of land use decisions in the 1990s on the grape and wine industry, the major processes and costs associated with planting and operating a vineyard, and the results of two surveys examining the profitability of Livermore's vineyards and wineries.

Unlike the sections on cost of production and profitability, which are derived from confidential survey responses, this introductory section is based on publicly available data sources.

The Study Area

This study focuses on the level or slightly sloping land south and southeast of the city of Livermore, where almost all Livermore Valley vineyards are located. Vineyards concentrated in this area historically for reasons that are explained in section 3 of the report.



Source: Gene Frieders

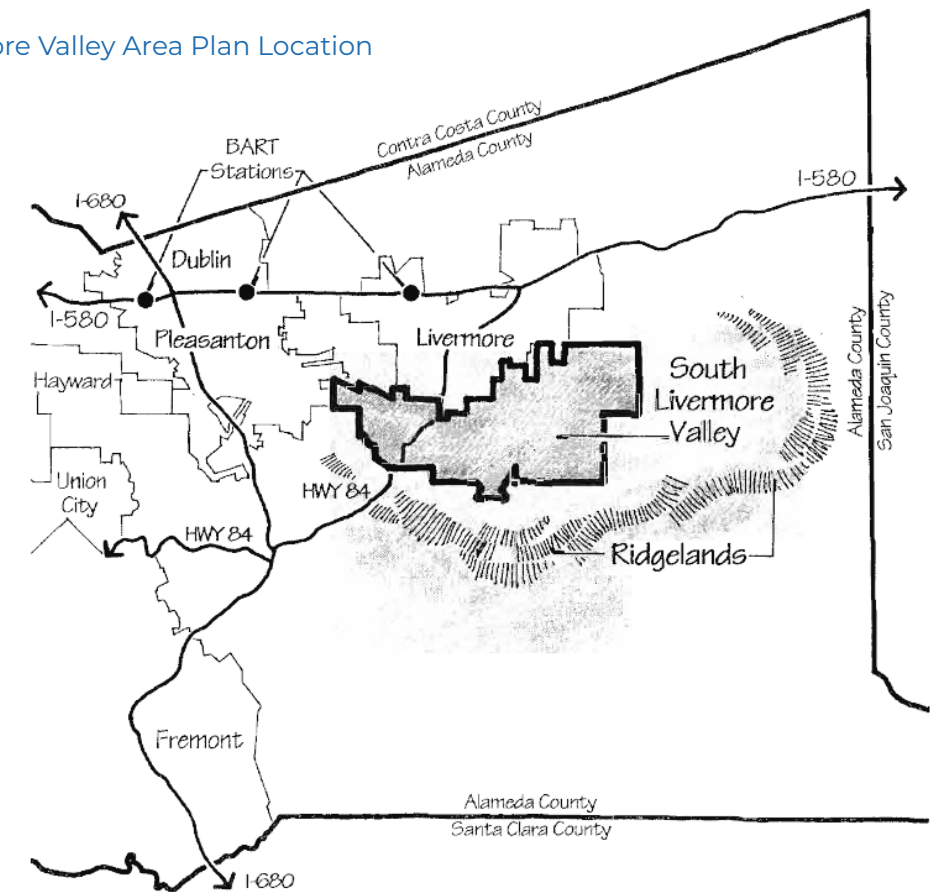
From west to east, Livermore's vineyard land extends perhaps eight miles, beginning at the site of the old Ruby Hill winery, just south of the city of Pleasanton and ending about two miles past Greenville Road, which is the eastern edge of the city of Livermore.

The city of Livermore is effectively the northern boundary of cultivated land, although a few vineyards are found within the city limits of Livermore. Depending upon topography, vineyards extend south from the city of Livermore for one to two miles, until the southern foothills become too steep for cultivation.

This area is described in the 1993 South Livermore Valley Area Plan (SLVAP, 1993). Figure 1.1 which we take from the South Livermore Valley Area Plan, shows the study area in relation to the cities of Livermore and Pleasanton and I-580.

Figure 1.2, from the Tri Valley Conservancy, shows the current plan area, which has been expanded slightly to the east. Expansion boundaries are outlined in orange.

Figure 1.1:
South Livermore Valley Area Plan Location

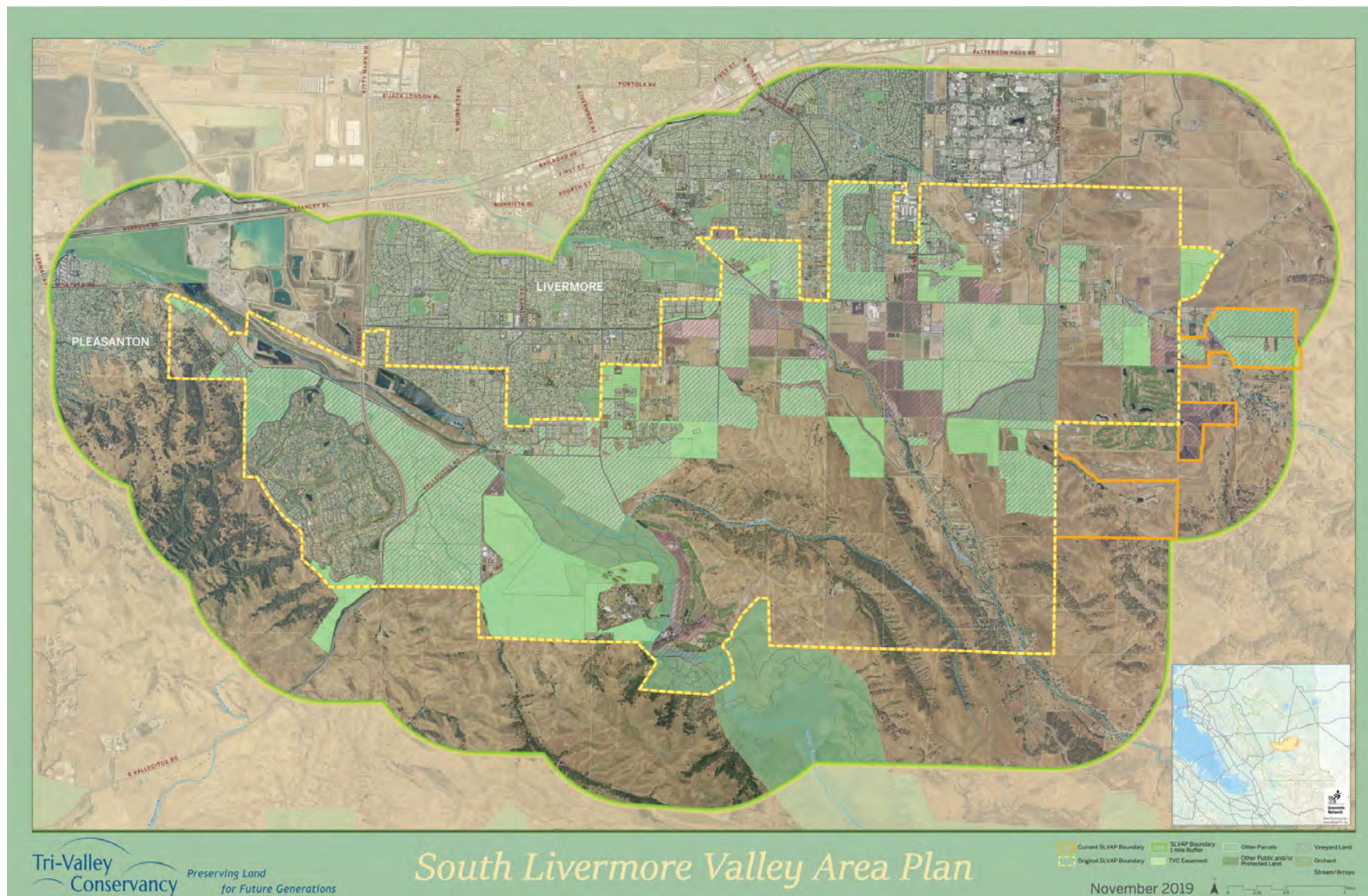


The Plan Area location and boundaries.

Approx. Scale: 1" = 4 miles

Source: South Livermore Valley Area Plan, 1993.

Figure 1.2:
Current Boundaries of the South Livermore Valley Area Plan



Source: Tri-Valley Conservancy. Digital version can be found at <https://trivalleyconservancy.org/south-livermore-valley/>

The total land area in the South Livermore Valley Area Plan is approximately 14,000 acres (SLVAP, 1993), but between 4,000 and 5,000 acres are either too hilly or lack sufficient water to be cultivated for winegrapes. The generally level land south of the city of Livermore runs in a continuous band from the old Ruby Hill winery on the west to the area east of Greenville Road.

Three arroyos, Arroyo Valle, Arroyo Mocho and Arroyo Seco, all of which slant downward north-westerly from the southern hills into the Livermore Valley, form three contiguous farming areas in the level land north of the hills and south of Livermore.

Arroyo Valle

Arroyo Valle, the arroyo furthest to the west, created an alluvial fan of gently sloping land extending from Ruby Hill at the western edge of the mouth of the arroyo to the eastern edge, Holdener Park, at the eastern end of Hansen Road.

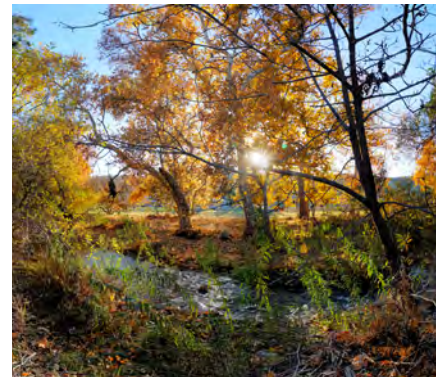
Arroyo Road runs north/south through the center of the arroyo. Arroyo Valle was the location for much of Livermore's 1880's grape and wine boom, which is discussed in detail in Section 3. Cresta Blanca, perhaps Livermore's most famous winery from that era, is located toward the southern end of Arroyo Road.

To the west of Cresta Blanca was the huge Olivina ranch and winery. Slightly further west was Chateau Bellevue and to its west was the historic Ruby Hill winery and vineyard, which is now divided into country club homes and 20-acre vineyard estates. Today we count approximately 1,300 acres of vineyards in this area of the South Livermore Valley Area Plan.



Arroyo Valle

Source: Richard W Finn



Arroyo Mocho

Source: John Toeppen



Arroyo Seco

Source: Barbara Reynolds

Arroyo Valle's alluvial fan contains perhaps 3,000 acres that are within the South Livermore Valley's Area plan. Much of this land is already used for agriculture, for parks and for golf courses.

Approximately 660 acres of vineyards and rural homes are located in the 35 parcels constituting the "vineyard estates", which were created within the Ruby Hills development in the late 1990s. The Arroyo Valle area is also home to the 847-acre Sycamore Grove Park, the 225-acre Ruby Hills Country Club and golf course, and the 105 acre "Course at Wente Vineyards." These golf courses and parks, while adding to open land, reduce cultivatable land in the Arroyo Valle by almost 1,200 acres.

Arroyo Mocho

Arroyo Mocho is Livermore's second arroyo. To the south, it is separated from Arroyo Valle by about six square miles of steep hillsides and canyon lands that extend north approximately two and a half miles from the southern hills into the Livermore Valley. This intrusion accounts for about 4,000 acres of non-cultivable land within the South Livermore Valley Area Plan. The Arroyo Mocho alluvial fan extends north, past Tesla Road and into the city of Livermore. It is bounded on the west at Concannon Road's junction with South Livermore Avenue and extends approximately two miles east along Tesla Road to Greenville Road. Mines Road is the main north/south road through Arroyo Mocho.

Like Arroyo Valle, the Arroyo Mocho area is also an historic area and is home to the Wente and Concannon wineries, both of which were established in the 1880s. Today, the Arroyo Mocho area has numerous wineries and vineyards located on the north and south sides of Tesla Road and within the city of Livermore, primarily on either side of South Vasco Road.

To the north of Tesla Road and especially within the city of Livermore, parcels are generally smaller than 20 acres in size, often five to ten acres, while south of Tesla Road, parcels are generally larger than 20 acres and farming is conducted on a larger scale. Most parcels to the north and south of Tesla Road have access to canal water. The Arroyo Mocho and its alluvial fan account for approximately 4,000 acres of land.

We estimate that at harvest in 2020 there were just under 1,200 acres of vineyards in the Arroyo Mocho area.

Arroyo Seco

Further east, the Arroyo Seco is the third arroyo that flows into the Livermore Valley. For descriptive purposes, we consider that Greenville Road serves as its western terminus, where Arroyo Seco's alluvial fan joins with Arroyo Mocho's. Arroyo Seco is smaller than Arroyo Valle or Arroyo Mocho, perhaps accounting for 1,500 acres of level to sloping land, but it contains several sizeable vineyards. It also includes the 160-acre Poppy Ridge golf course to the south.

Both the golf course and the vineyards receive water from the South Bay Aqueduct. The eastern areas of Arroyo Seco were originally not included in the 1982 Livermore Valley American Viticultural Area or in the 1993 South Livermore Valley Area Plan. Eastern areas of Arroyo Seco with vineyards, such as the Ghielmetti vineyard on Reuss Road and the Madden vineyard further south on Tesla Road, were added to the South Livermore Valley Area Plan in about 2001 and included in the Livermore Valley American Viticultural Area when it was amended in 2006 by the Federal government.

We estimate that the Arroyo Seco area of Livermore had approximately 400 acres in bearing vineyards at the time of the 2020 harvest.

Agriculture in the South Livermore Valley

In September of 2020 there were just over 3,100 acres of orchards and vineyards in the subject area of this report. Of these, 160 acres were planted to olives, 135 to Pistachios, and 2,824 to wine grapes (Alameda County Pesticide License applications and the Tri Valley Conservancy's list of easements). Let us briefly review how these numbers reconcile with our estimate that perhaps 9,000 acres of the area within the South Livermore Valley Area Plan was sufficiently level and with access to water to support irrigated crop cultivation.

We claimed that the SLVAP contains approximately 14,000 acres and estimated that at most 5,000 acres were too steep or lacked sufficient water for irrigated crop product. More than 2,000 acres of the remaining 9,000 acres already have non-agricultural uses. Golf courses and parks cover 1,350 acres, while the homes around Ruby Hill cover 400 acres. Urban uses within Livermore accounts for an additional 500 SLVAP acres. Taken together, at least 2,250 acres of land within the South Livermore Valley Area Plan are not available for irrigated crop cultivation, leaving a bit under 7,000 acres that could be used for irrigated crops.

Of course, landowners do not always devote all of their suitable and available land to crop production. The approximately 3,100 acres of vineyards and orchards are planted on 138 separate parcels totaling 5,700 acres. While some owners may plant almost all potentially cultivated land to tree and vine crops, on average about 55 percent of the land is so used. One reason that much of Livermore's cultivatable land is not planted to trees and vines is that many parcels are in the range of five to ten acres, and many of these small parcels have not been planted to permanent crops, perhaps because potential net economic benefits are negative or close to zero and residents prefer other landscaping around their homesites.

The current 3,100 acres of vineyards and orchards represent an increase of almost 50 percent in 30 years. The 1992 Environmental Impact Report for the establishment of the South Livermore Valley Area Plan estimated that the area contained perhaps 2,000 acres of vineyards and 100 acres of orchards, although the EIR noted that "some orchards have been abandoned" (Alameda, 1992, p. A-2). Much of the expansion since 1992 has been the result of newly available canal water and a winegrape boom in the mid and late 1990s to support increased demand for coastal Merlot and Cabernet Sauvignon. The availability of canal water is discussed in Section 2 of this report while Section 4 addresses land used planning and the wine boom of the 1990s.

Although winegrape production dominates Livermore's agriculture, olives and pistachios have found niches in the Livermore Valley. There are three commercial-scale olive orchards in the Livermore valley, totaling 160 acres. Olives are planted in all three of Livermore's arroyos. The Crohares, owners of part of the historic Olivina ranch in the southern portion of Arroyo Valle, have 85 acres of olives and mill and process their oil at that site. A 62-acre olive orchard spread across three parcels is located on the north side of Cross Road in the far northern corner of the South Livermore Valley Area Plan. A third orchard of approximately 13 acres is in the Arroyo Mocho, east of Mines Road and adjacent to the South Bay Aqueduct. Although some olives are grown as boundaries or around wineries, we have not included them in this report and this acreage is not listed in the Livermore Agricultural Commissioner's "Growers List."

Livermore has five pistachio orchards, totaling 135 acres, located in the Arroyo Mocho area of Livermore. The largest is the Ising Ranch, totaling 88 acres of bearing pistachios and located on the east side of Mines Road, south of the aqueduct. The next largest, planted on the Old Regina property, is 15 acres in size and located on the west side of Mines Road. The remaining three orchards are between 10 and 12 acres in size and are planted on the east side of South Vasco Road, between East Avenue and Tesla Road. This area is a mixture of smaller agricultural parcels and urban housing. Pistachios seem particularly suitable for property adjacent to housing because they do not require as many agricultural operations each year as winegrapes.



Source: Eric Ahrendt

Winegrapes in the South Livermore Valley

Vineyards, Vineyard Acres and Data Sources

We determined that there were 2,841 bearing acres and 129 distinct vineyards in Livermore in September 2020.

Of these vineyards, all but one, which had 17 bearing acres, was located within the boundaries of the South Livermore Valley Area plan.

There were thus 2,824 bearing vineyard acres and 128 vineyards in the study area.

Acreage was determined and parcels were identified by using publicly available data, primarily information from the Alameda County Agricultural Commissioner's "Grower List" and the Alameda County's Assessor's parcel maps.

All commercial agricultural operations are required to report pesticide applications and must obtain a permit for each vineyard where pesticides are applied.

Required information includes location, crop type, crop acreage, name of owner, name of applicator and location. Because different individuals submit the information for different parcels, the data submitted are often in different formats. For example, "location" may be listed as a street address or may instead be a specific location, such as "south of the corner of Vasco and Tesla." In some cases, the grape variety is specified, in other cases the crop is listed as "winegrapes."

It is often unclear whether acreage reported represents the entire vineyard or the portion of the vineyard being treated by a particular pesticide application. Assembling an accurate and useful list of vineyards and acreages from these listings required several passes through the Grower List and Assessor parcel maps.

These data were supplemented by mapping technology using Google Earth and by cross-checking with the Tri Valley Conservancy's lists of conservation easement holders. The resulting list was then reviewed for accuracy by TVC Board members familiar with the vineyards in the area.

No such list can be entirely accurate and even a few months later it is out of date. A vineyard may have been missed, or we may have incorrectly estimated the size of a vineyard derived from GPS mapping tools.

Despite these caveats, we are confident that the list captures the vast majority of active commercial vineyards currently in the Livermore Valley.

We defined a vineyard as a single contiguous unit planted to grapevines, whether or not the physical area spread over separate parcels or contained more than one grape variety. For example, the Concannon Vineyard, which is currently for sale, is advertised as a 181-acre vineyard. Although the vineyard covers eight distinct legal parcels and is planted to multiple varieties, we counted it as one vineyard.

Vineyards separated by distance and owned by the same firm were considered to be distinct vineyards. An example here is Wente Vineyards, which owns several distinct and historic vineyards, including two vineyards named for and originating from Louis Mel and Herman Wente. Both vineyards are separated by distance and we counted them as two vineyards.

Two further remarks. We did not include vineyards smaller than one acre in size, because they are unlikely to be parts of commercial operations. And, when we list vineyard acreage, we refer to the area actually planted in vines, not the acreage of the parcel, or parcels, where the vineyard is located.

Size, Management and Location of Livermore Vineyards

Of the 128 vineyard parcels located in the subject area of this study, 68 vineyards, totaling 363 acres, are smaller than 10 acres. Another 36 vineyards are 10 acres or larger but smaller than 20 acres and account for 515 additional acres. Added together, there are 104 vineyards in the study area that are smaller than 20 acres. These 104 vineyards represent 81 percent of the total number of vineyards in the study area and about 31 percent of total acreage.

The large number of vineyards smaller than 20 acres is a legacy of the zoning decisions of the late 1980s and early 1990s, which is discussed in greater detail in Section 4 of this report. For example, the Crane Ridge development created ten parcels of about 20 acres in size, most of which have between ten and 17 acres of vineyards.



Source: Barry zupan

The Ruby Hill development created 35 parcels of approximately 20 acres each, most of which have vineyards, some of them of four to five acres in size, others covering 17 or 18 acres. The Crane Ride and Ruby Hill developments account for almost half of the vineyards smaller than 20 acres. The remaining 59 vineyards are spread throughout the South Livermore Valley. Some are in rural areas, others are adjacent to housing developments, where they seem to function as greenbelts.

At least ten of these small vineyards are located at wineries, where they supply some of the winery's production needs and also serve as pleasant landscaping. Eight vineyards larger than 100 acres total 983 acres and account for 35 percent of the valley's acreage. Given that most of Livermore's vineyards are under 20 planted acres in size, it is not surprising that most of the owners of these small vineyards either hire vineyard managers or lease their vineyard to a vineyard operator. There are four firms that manage vineyards in the Livermore Valley: Diamond West, KM, Tres Valles, and Wente.

As derived from the Alameda Agricultural Commissioner's "Grower Report," these four firms manage or lease approximately 100 of Livermore's 128 vineyards. Vineyard leasing and contracted management is an important part of the Livermore grape economy, but since our data on these practices come from our survey responses, we discuss them in Section 7 of this report. Arroyo Mocho has the most vineyard acres, the largest number of vineyards, and the largest number of vineyards smaller than 10 acres (Table 1). Relative to Arroyo Mocho, Arroyo Valle has fewer vineyards smaller than 10 acres, fewer vineyards with more than 100 acres, but more vineyards between 10 and 100 acres. Arroyo Seco, a newer vineyard area for Livermore, has the fewest acres and the fewest vineyards of any size. Table 1.1 shows total vineyard acreage and number of vineyards sorted by vineyard size and region (Arroyo).

Table 1.1: Number of Livermore Vineyards and Total Vineyard Acres by Arroyo as of September 2020

Size in Acres	Arroyo Valle		Arroyo Mocho		Arroyo Seco		Total Areas	
	# Vyds.	Acres	# Vyds.	Acres	#Vyrds.	Acres	# Vyds.	Acres
<10	24	151	33	169	11	43	68	363
10<20	22	300	11	166	3	49	36	515
20<60	5	169	2	94	1	21	8	284
60<100	2	167	3	222	4	290	9	679
>100	1	147	6	836	0	0	7	983
Total	54	934	55	1487	19	403	128	2824

Source: Alameda County Agricultural Commissioner's "Grower List" 2020.

The Arroyo Mocho area has six of the seven vineyards larger than 100 acres in size. Four of these large vineyards in the Arroyo Mocho area are owned by Wente along Tesla Road, one is owned by Concannon on the north side of South Livermore Avenue, and one is owned by Rick Corbett and is located at the southern end of Greenville Road.

The area along Tesla Road and South Livermore Avenue was the original home for both Wente and Concannon and, as the Wente's business grew, they acquired land close to their original property within the Arroyo Mocho. The Corbett's "Del Arroyo" vineyard was established as a mitigation vineyard for a housing development north of Concannon Boulevard.

The Arroyo Mocho is also home to many small wineries with vineyards surrounding the wineries. At least eight of the 33 vineyards smaller than ten acres are located at wineries. Of the 11 Arroyo Mocho vineyards that are between ten and 20 acres in size, nine are in the Crane Ridge development to the west of Greenville Road south of Tesla Road.

The majority of Arroyo Valle vineyards are associated with the Ruby Hill development of the mid-1990s. Thirty-three of the 46 vineyards in Arroyo Valle smaller than 20 acres in size have addresses on Kalthoff Commons, East Vallecitos, or East Vineyard Avenue. Most of the other small vineyards in the Arroyo Valle area are located along Marina Avenue or Wetmore Road. The Marina Avenue vineyards are just outside the southern edge of the city of Livermore, where a development of five- and ten-acre parcels was created prior to the SLVAP. The Wetmore Road vineyards are located on the north side of Wetmore Road on either side of Arroyo Road, where both the Dante Robere and Las Positas wineries are located.

The Arroyo Seco has four major vineyards totaling 290 acres including the Ghielmetti and Reuss Road vineyards, located on opposite sides of Reuss Road, both of which were established as mitigation vineyards for agricultural land used for housing. All four are commercial vineyards, as opposed to the 11 small vineyards that average four acres in size. Ten of the 11 small vineyards are located on five-acre and ten-acre parcels.

Vineyard Age

Coastal California vineyards generally have an economic lifespan of about 30 years before declining productivity due to trunk diseases causes growers to replant or remove a vineyard. Approximately 1,900 acres of Livermore's vineyards were planted during the 1990's red wine boom when grape prices were high. Section 4 discusses the increase in red winegrape acreage in Livermore and elsewhere. Based on surveys and other information, we discuss later in this report the finding that at least two-thirds of Livermore vineyards are in their last ten years of economically productive life and will either be removed or replanted in the coming decade.



Source: Anna Rouse

Wineries in the South Livermore Valley

We do not know exactly how many wineries were operating in the Livermore Valley in 2020. Wineries are licensed by the Tax and Trade Bureau of the U.S. Department of the Treasury.



Source: Friends of Open Space and Vineyards

In July of 2020, the Tax and Trade Bureau listed 60 winery permits for the Livermore Valley. However at least 14 of the listings were “wineries” with no websites or activity in the marketplace that we could find. A review of a map of Livermore Valley area wineries found at the Friends of Open Space and Vineyards (<http://www.fov.org/livermore-wine-map.html>) showed a few wineries not on the TTB permit list, as well as a few wineries that were no longer in business. The Livermore Valley Winery Association’s website (<https://www.lvwine.org/amass/documents/map/14/2021%20Livermore%20Valley%20Wine%20Country%20Map.pdf>), seems to list only the 30 wineries that were members of the Association. In order to determine which Livermore wineries were actually selling wine, we contacted bw166, a firm that studies the U.S. wine industry and tracks California wineries by sales. Bw166 provided us with a list of Livermore valley wineries with estimated sales volumes and bottle prices in 2019. The list is provided as Table 1.2 below.

Bw166 derives winery sales data from filings of payments by California wineries to the State Excise Tax Board. By knowing the amount paid and the tax rate, the volume of wine sold can be calculated. Average bottle price and percent of sales that are direct to consumers are estimates by bw166 and are derived from analysis of retailer scan data and industry interviews. Sales estimates are for all wine sold by each winery located in the Livermore Valley and not for wine produced from Livermore grapes. As will be discussed in Section 6, many wineries in the Livermore Valley produce wine from grapes grown outside the Livermore Valley in addition to grapes grown in the valley. Wineries come and go, and the bw166 list contains at least one winery (White Crane) that is no longer active and one winery (Bishop’s Vineyard) which we could not locate in Livermore. The bw166 data seem the best source of information on Livermore Valley wineries.

Table 1.2: Livermore Wineries by Case Production, Average Dollar Price per Bottle, and Percent Direct to Consumer Sales Area Plan

Winery	Cases	\$/Bottle	DtC%	Winery	Cases	\$/Bottle	DtC%
Wente	700,000	\$27	20%	Longevity	2,000	\$24	80%
Concannon	100,000	\$10	10%	Aguirre	2,000	\$24	
Ruby Hill	25,000	\$25	85%	El Sol	1,800	\$20	95%
Steven Kent	25,000	\$50	75%	Tesla Vntrs	1,500	\$19	100%
Darcie Kent	20,000	\$30	60%	RMolyneau	1,500	\$34	99%
Tenuta Vrds	14,000	\$25	5%	Occasio	1,500	\$30	80%
Murietta	10,000	\$45	50%	Charles R.	1,200	\$30	100%
Nottingham	6,000	\$49	70%	Wood Fmly	1,200	\$39	95%
McGrail	5,500	\$45	80%	Leisure St.	1,100	\$28	90%
3 Steves	5,300	\$35	99%	Entropy	1,000	\$27	75%
Fenestra	5,000	\$20	75%	Cedar Mtn.	1,000	\$28	20%
Mitchell Katz	4,000	\$40	90%	BishopsVyd	1,000	\$12	
Rios-Lovell	4,000	\$22	80%	Eagle Ridge	850	\$25	95%
Crooked Vine	4,000	\$35	75%	Omega Rd.	800	\$30	95%
Page Mill	3,500	\$27	80%	Caddis	500	\$39	
Bent Creek	3,400	\$29	97%	Ehrenberg	500	\$39	
Dante Robere	3,000	\$30	100%	Iron Palm	500	\$40	
Las Positas	3,000	\$40	80%	Enoteca 5	400	\$42	
White Crane	3,000	\$45	80%	Favalora	400	\$28	
Cuda Ridge	2,500	\$40	90%	Arroyo	200	\$28	
Retzlaff	2,500	\$40	90%	HLW Vyd	200	\$28	
Garre	2,500	\$28		Harris	200	\$34	
White House	2,000	\$33	99%	Beck	100	\$28	
BoaVentura	2,000	\$50	90%	Embodied	100	\$28	

Note: DtC% is the direct-to-consumer sale percentage.

Source: bw166 data, 2019

According to the bw166 list, in 2019 there were 48 wineries in the Livermore Valley with wines for sale. Twenty-two of these wineries produced fewer than 2,000 cases. Collectively these 22 wineries sold approximately 17,550 cases in 2019, for an average of just under 800 cases. There were 19 wineries selling between 2,000 and 6,000 cases.

These 19 wineries sold 65,200 cases in 2019, for an average of 3,432 cases. Five wineries sold between 10,000 and 25,000 cases, totaling 94,000 cases in 2019, for an average of 18,800 cases. The two largest wineries, Wente and Concannon, which is owned by The Wine Group at the time of this report but is currently for sale, are much larger than any of the other wineries in the Livermore Valley.

Livermore wineries are located in all three of the valley's arroyos, but the majority are found in Arroyo Mocho, generally along Tesla Road between the intersections with South Livermore Avenue and Greenville Road. This stretch has included Wente since 1884, as well as more recent wineries such as the Mitchell Katz, Garre, Rios-Lovell, Darcie Kent and Steven Kent wineries.

A secondary concentration of wineries is found on Greenville Road, both north and south of Tesla Road. Eight of the wineries on the bw166 list are in industrial buildings within the city of Livermore along South Vasco Road. Five wineries are in the Arroyo Seco, generally on small roads or drives that branch off of Tesla Road. The Arroyo Valle, which was home to most of Livermore's early wineries in the 1880s, has only a few wineries, most notably Ruby Hill, Tenuta and Fenestra in the old Ruby Hill property, as well as Las Positas and Dante Robere along Wetmore Road.

This brief description of Livermore's wineries and vineyards in 2019 and 2020 is intended as an introduction to the South Livermore Valley to orient the reader for the other sections of this report. Sections 6 and 7 of this report analyze survey responses and examine winery and vineyard size, age, and profitability in detail.

Section 2. Livermore's Agronomic Conditions for Winegrape Production

This section outlines the main agronomic conditions in the Livermore Valley that have led to the production of high-quality wine grapes for many decades.

These are the features of the Livermore Valley that attracted winegrape growers and winemakers to the region in the late 19th century.

These features of the Livermore Valley continue to allow production of winegrapes that lead to wines that command accolades and high prices relative to most (but not all) of the winegrapes of California and the world.

These conditions are climate, soils and irrigation water. Each condition is discussed separately, but of course they interact. Moreover, the impact of these condition on the grapes and wine depends crucially on how winegrape growers and winemakers manage the production process.



Source: Barbara Nichols Reynolds

Section 2A.

Livermore's Climate for Grapes

Introduction to the Role of Climate

Climate is the most important factor affecting both grape quantity and inherent grape qualities and the Livermore Valley possess an excellent climate to perfectly ripen many varieties of grapes. Although each grape variety responds a bit differently to climate, the point made by Albert Winkler in his still famous book, *General Viticulture*, in 1962 remains true today:

“Cool weather fosters a high degree of acidity, a low pH and a good color and in most table wine varieties it brings to the mature fruit optimum development of the aroma and flavoring constituents and the precursors of the bouquet and flavoring substances of wines” (Winkler, 1962. p.55).

Each of the main varieties of *vitis vinifera* grown in California originated in specific areas of Europe where each had been selected and had adapted to the climate of that region over centuries. While a variety may produce larger yields when grown in an area that is warmer than where it originated, the sensory properties of the grape are often less intense and the resulting wine made from such grapes is usually not priced as highly. Relative to Europe, grape growing and winemaking in California is not very old and much of California's history of wine production has been an attempt to find the best climatic area for a specific variety.

Amerine and Winkler (1944) studied the interaction between variety and climate and divided California grape growing areas into five climatic regions based on the temperature of the region between grape bloom and harvest. The warmth of a viticultural area was assessed by determining the “degree-days” of a given area. This was calculated in Fahrenheit by taking the average temperature of each day (high temperature plus low temperature divided by two) and then subtracting 50 degrees (the base temperature for grapevine metabolism). The degree day contribution of each day was then cumulated for the growing season, April through October, resulting in a “Growing Degree Days” (GDD) calculation that was then used to classify a region. This system is still widely used throughout California.

Table 2.1: Amerine and Winkler Degree Day Classification in Fahrenheit and Celsius

Region Classification. (example in parentheses)	Fahrenheit GDD	Celsius GDD
Region I, (Northern Santa Lucia Highlands)	<2500	<1389
Region II, (Carneros, Russian River)	2500-3000	1389-1667
Region III, (Livermore Valley, Napa Valley)	3001-3500	1668-1944
Region IV (Lodi)	3501-4000	1945-2222
Region V (San Joaquin Valley)	4001-4900	2223-2709

Source: Author addition of Celsius to Amerine and Winkler 1944.

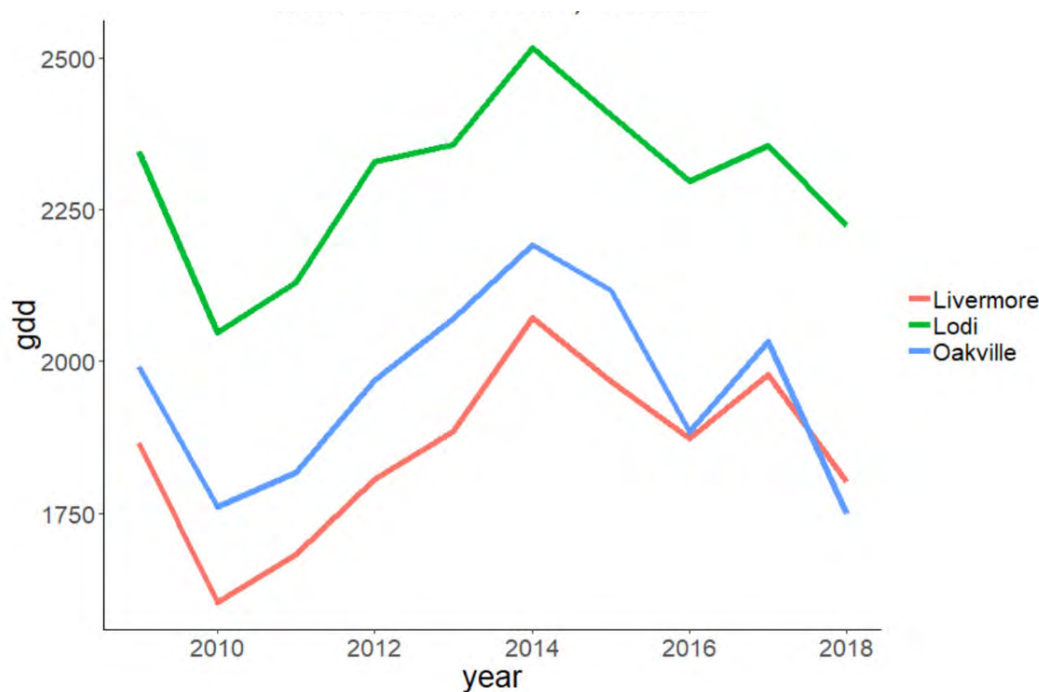
In the Amerine/Winkler classification system, Region I is the coolest region with fewer than 2,500 degree-days. Region I vineyards reliably ripen cool-weather varieties such as Riesling but not late-season varieties such as Cabernet. Region I growing areas are generally very close to the Pacific Coast with a strong maritime influence. The northern part of the Santa Lucia Highlands, an east facing vineyard area in Monterey, is generally considered a Region I, while the southern portion is probably a Region II. This cool area, like other Region II coastal areas, such as the Santa Rita Hills in Santa Barbara, the Carneros in southern Napa and Sonoma counties, or the Anderson Valley in Mendocino, is considered an excellent location for producing full-flavored Pinot noir. Region II has between 2,501 and 3,000 GDDs, while Region III is slightly warmer, averaging between 3,001 and 3,500 GDDs.

Region III growing areas are generally found in California's coastal valleys, with some marine influence from the Pacific Ocean. Livermore, like the heart of the Napa Valley, is considered a Region III (or low Region IV in some years) and is climatically excellent for Cabernet Sauvignon. Region IV, with a GDD of between 3,501 and 4,000, is typical of the Delta, while Region V, with a GDD above 4,000 describes most of California's San Joaquin Valley. Climate change has warmed many California viticultural areas in the past 30 years.

For example, the heart of the Napa Valley, which was considered a low Region III in Amerine and Winkler's original classification, is probably now a high Region III/ low Region IV. Despite warming, the importance of climate in the development of grape characteristics remains as significant today as it was almost 80 years ago when Amerine and Winkler wrote their seminal article.

Temperatures vary from year to year. Figure 2.1 compares the GDDs for three areas, Livermore, Lodi, and Oakville from 2009 to 2018. Livermore is slightly cooler than the heart of the Napa Valley and in most years both may be considered Region IIIs, although in 2014 both Livermore and Napa would have been rated low Region IVs. Lodi, in the heart of California's Northern San Joaquin Valley Delta region east of Livermore, is generally a high Region IV, but in 2014 would have been a low Region V.

Figure 2.1: Growing Degree Days for Livermore, Lodi and Oakville from 2009 to 2018, in Centigrade



Source: Q. Pan. Calculations from PRISM Climate Database

Grape Varieties, Climate and Price



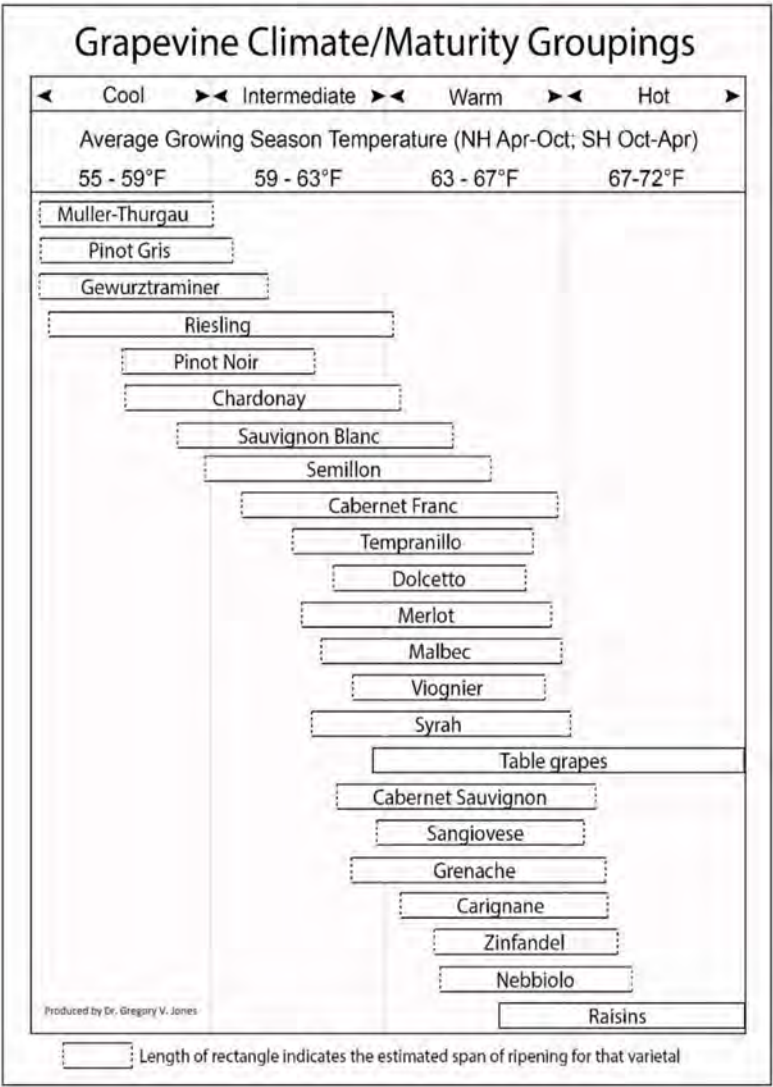
Source: Anna Rouse

Just because a grape variety originated in a specific climatic region—for example Riesling in a Region I—does not mean that the variety cannot be grown in a warmer region. What it does mean is that when the variety is grown in a warmer region, it will generally not possess the same varietal aroma and flavor intensity as when grown in a cooler region and will thus not be as valuable as its cool-weather produced counterpart.

Chardonnay is a good example of this phenomenon. According to the *California Grape Crush Report*, in 2019 the average price of Chardonnay grown in District 7 (Monterey and San Benito Counties), which can be considered a Region II, was \$1,338 per ton. Chardonnay grown in the Lodi-Woodbridge area, a Region IV, fetched \$520 a ton, while the same variety grown near Fresno, a Region V, was worth \$387 per ton (NASS, 2019). Although climate does not explain all of the price disparity, it is clear that Chardonnay grown in cooler coastal areas is more highly valued than Chardonnay from California's Central Valley.

Jones (2006) produced a chart (reproduced below as Figure 2.2) that shows, based on his research, the climatic zones in which grape varieties produce their most intense varietal flavors and aromas. The climate grouping that Jones describes as “warm” represents a climatic area corresponding to the warm end of Region II (2730 GDD F.) and the upper end of region III, /lower end of Region IV (3570 GDD F), an area similar to Livermore.

Figure 2.2: Grapevine Grouping by Climatic Region



Source: G. Jones. "Climate and Terroir", 2006

Figure 2.2 does not mean that an area that Jones would describe as "warm" cannot grow grapes such as Chardonnay and Pinot noir, but rather that, generally speaking, those varieties when grown in a "warm" area will not be as flavorful or as intense as the same variety when grown in what Jones describes as an "intermediate" or "cool" region. Because they will not be as flavorful or intense as when grown in a cooler area, they will generally receive lower prices. For this reason, when analyzing the supply of grapes of a given variety, we must also consider where the grapes are grown. The area of California vineyard land in Region I and II is approximately 48,000 acres while the supply of Region III is about 127,000 acres. We return to this point when we discuss where the Livermore Valley fits within coastal California vineyard areas.

Climate's Limited Role in Grape Prices and the Role of Other Factors

If climate were the only variable in determining grape qualities, areas with similar climates would produce grapes with similar characteristics and prices. However, this is clearly untrue as is seen in the market for wine and grapes. How the grapes are grown, how the resulting grapes are transformed into wine, and the quantity demanded relative to the quantity produced all effect the price of grapes and wine. Demand can sometimes be enhanced through marketing and regional promotion coupled with a well-known and consistent history, and therefore reputation, of producing highly valued wines.

In California, the most extreme example of wine and grape prices based upon region are the wines and grapes from the Napa Valley. Since the 1940s, Napa Valley wine producers have continually promoted the Napa Valley and have invested in improving winemaking and grape growing. They also developed a critical mass of well-funded wineries focused on producing expensive wines (Lapsley, 1996). As will be discussed in section 3, the Napa Valley's concentration of well-funded wineries with a shared goal of producing only very high quality wines is reminiscent of the Livermore Valley in the 1880s.

The results of collective innovation and regional promotion are seen in the price for Napa Valley Cabernet Sauvignon grapes. According to the *California Grape Crush Report*, in 2019 the average price for Napa Cabernet grapes was \$7941 per ton. Many areas of Sonoma County have climates very similar to that of the Napa Valley, but the average price of Cabernet per ton from Sonoma vineyards in 2019 was \$3055, almost \$5,000 less than in Napa.

Even in the Napa Valley, grapes from more famous (or better promoted) vineyards fetch significantly higher prices than grapes grown in neighboring vineyards. For example, Cabernet from the famous To Kalon Vineyard routinely sell for up to \$30,000 per ton, well above the Napa average. Although climate is important in allowing viticulturists to produce grapes with desirable intrinsic attributes, having desirable intrinsic attributes is not sufficient to command a high price in the grape market.

High prices based on enhanced demand due to regional or brand reputation have what might be termed a "virtuous circle" or self-sustaining effect. High prices allow higher producer margins, which in turn allow increased precision vineyard work, such as cluster thinning, which produce a more uniform harvest. This is important because viticultural decisions such as vineyard orientation, trellis systems, irrigation and use of shade cloth can, to a small degree at least, mitigate the increasing temperatures due to climate change. Money spent in viticultural operations cannot transform a high Region III vineyard into a Region II vineyard, but it can help to maintain the vineyard functionally as a high Region III in the face of a changing climate.

Where Livermore Fits

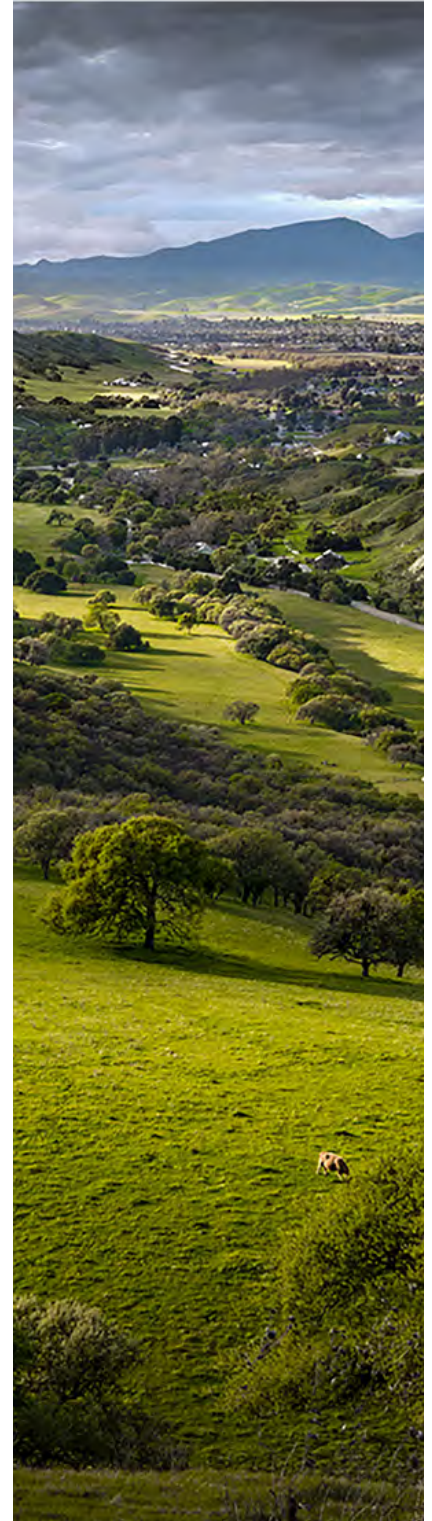
Considered from the perspective of share of either total vineyard acres or total tons produced, Livermore is a very small part of California's total grape and wine production. According to the *2018 Alameda County Agricultural Commissioner's Report*, Alameda County counted 3,482 acres of producing winegrapes, which delivered just over 18,000 tons of grapes.

That same year, the *California Grape Acreage Report* showed a total of 461,096 bearing acres and the *California Grape Crush Report* indicated that California wineries crushed 4.2 million tons of winegrapes. By these measures, Alameda County had less than one percent (0.7 %) of California's winegrape acreage and accounted for less than one-half a percent of production.

Of course, Livermore's main competition is not with grapes made from California's Central Valley, but rather with grapes grown in coastal areas in general and, more specifically, those grapes grown in a similar climate, a high Region III or low Region IV. According to the *California Grape Crush Report* and the *California Grape Acreage Report*, in 2019 coastal California vineyards covered 232,800 bearing acres.

These vineyards produced just over one million tons of grapes, or about one-quarter of California's crop. By these measures Livermore represented about 1.5 percent of all coastal acreage and 1.8 percent of production.

Because the smallest geographic reporting unit in the *Grape Crush Report* and the *Grape Acreage Report* is either the County or the Grape Crush District (county level or, in some cases multi-county), we do not have acreage or production data by Winkler/Amerine climatic regions, nor are recording climate stations available in every region to provide temperature data. Still, it is possible to make some estimates of vineyard acreage and climate in Regions I, II and III.



Source: Barry Zupan

Pan (2019) analyzed a 20-year data set of more than 15,000 coastal California red wines reviewed by the Wine Spectator. She correlated wine price by variety with GDDs for the wines to investigate the role of climate and weather in wine price.

Pan used a climatological program called PRISM to calculate the GDDs for sub regions in California where recorded weather data were not available. PRISM uses temperature data from the nearest two or three recording stations and then extrapolates based on geography to provide temperatures for the desired location. Based on Pan's work and information on bearing vineyard acres provided from various regional promotional websites, we estimate that there are approximately 48,000 acres of bearing vineyards in climatic regions I and II, with about 20,000 acres each in Sonoma County and the Central Coast, and 4,000 each in the Napa Carneros region and Mendocino County (predominantly the Anderson Valley). We subtracted the Region I and II acreage from the total coastal bearing acreage found in the *Grape Acreage Report*, to arrive at approximately 127,000 acres of Region III bearing vineyards. It is these regions with which Livermore should be compared.

The two counties with the most Region III vineyards are Napa and Sonoma. Together, the region III vineyards in these two counties total approximately 77,000 acres. Although Livermore grapes and wine compete with wines produced from these counties, both Napa and Sonoma wineries and vineyards have developed reputations that raise the price of their Region III grapes and wines.

According to Jones, the best Cabernet Sauvignon wine is made from grapes grown in a warm Region II or a Region III, such as Napa, parts of Sonoma, and Livermore. In 2019 the Napa average price for Cabernet was \$7,941 and in neighboring Sonoma it was \$3,005. The weighted average price of Cabernet grown in the remaining Region III areas of California, approximately 50,000 acres, was \$1,700. It is to these areas that Livermore should be compared.

When compared with California's other Region III vineyards, Livermore seems to receive prices similar to other non-Napa or Sonoma Region III vineyards. The 2018 Alameda *Agricultural Commissioner's Report* indicates that the average price of red wine grapes grown in Alameda in 2018 was \$1591. Considering that Cabernet generally receives a price premium over other Region III red varieties, it seems that, in 2018 and 2019, Livermore growers received prices similar to other Region III growers.

From the position of climate, the Livermore Valley is an excellent place to produce full-flavored European grape varieties that originated in areas such as Bordeaux, the Rhone, or northern Italy and Spain. The economics of grape production depend upon factors beyond simply climate and is discussed Section 5.

Section 2B.

Livermore's Soils for Winegrapes

If the climate is temperate and there is access to water, grapes can grow in most soil types. As Winkler wrote in his classic text, *General Viticulture*, "when all soils used for growing the various kinds of grapes in the many different grape-producing regions of the world are compared, one finds that they range from gravelly sands to heavy clays, from shallow to very deep, and from low to high fertility" (Winkler, 1962, p. 63).

Growers operate on individual parcels of land, not general climates. It is thus natural that some growers differentiate their vineyard by endowing special attributes to the soils of their particular vineyard. Vineyard aspect, meaning the direction a vineyard faces, and the slope of the vineyard can also affect a vineyard's microclimate and thus grape composition. But such differences are because of air movement and temperature, not because of soil.

Unless soils contain high concentrations of metallic salts, such as boron, or are situated above an extremely high water table, most soils are suitable for vineyards, although vineyard management practices will differ between vineyards on various soil types.

We do not discuss the soils of the entire Livermore Valley American Viticultural Area, a very large area, most of which is not planted to grapes. Rather, we focus on the South Livermore Valley, where grape growing and winemaking has historically been located and is currently concentrated. As described in Section 1, this viticultural area is located south and southeast of the City of Livermore, extending to and into the southern hills of the Livermore Uplands. It is bounded on the west by the Ruby Hill area of Pleasanton, and extends east into the Arroyo Seco, a bit beyond Greenville Road and the Poppy Ridge Golf course.

Most vineyard area is on alluvial plains, although some vineyards are found in the Livermore Uplands, such as Crane Ridge. Generally all of these soils are suitable for vineyards, although differences in slope, depth of soil and the water holding capacity of the soils cause differences in vineyard management.

According to a 2018 soils report written for the Livermore Valley Winegrowers Association by Coastal Viticultural Consultants, most of the vineyard area in the southern Livermore Valley is either alluvial soil laid down by streams from Arroyo Mocho, Arroyo Valle, and Arroyo Seco, or sandstone. Composed of sandy loam, the soils are not particularly fertile, although easily worked, and tend to have lower water holding capacities than do soils with higher clay content, thus requiring irrigation.

Low fertility is not a problem in vineyards, especially considering that vine vigor can be a problem for viticulturists who are interested in producing a grape crop, rather than foliage. Vineyards in the hills often have a higher percentage of clay than do the sandy loams of the valley and can thus hold more water from winter rains, demanding slightly less irrigation, especially in growing seasons following a wet winter. In conclusion, the soils in the south Livermore Valley are excellent for vineyards as long as irrigation water is available.



Section 2.C.

Agronomic Conditions: Livermore's Water

Plants use water, lots of water. The typical unit of measurement used for irrigation water in the United States is an "acre foot". One acre foot is the amount of water needed to cover an acre of land a foot high with water: 325,851 gallons. The two main drivers of water use in plants are the amount of leaf area and ambient temperature. Mature orchards have more leaf canopy than do grapes, which are pruned each year, and thus tree crops usually use more water per acre than do grapes. A crop grown in a cool coastal valley uses less water than the same crop grown in the hot Central Valley.

As a warm Region III, Livermore's vineyard temperatures are moderate and Livermore crops use less water than if they were grown in the warmer San Joaquin valley. Wine grapes in the Livermore Valley generally require one acre foot of water per acre of vineyard, although vineyards may need more water in drought years and slightly less in a year following heavy winter rains. Olives use about twice that amount to produce an economic crop. Fertile land located in a mild climate will not produce a crop without water. For the Livermore Valley, water availability may prove to be a constraint on vineyard expansion.

Because California generally has very little or no rainfall during the growing season of most commercial crops, the two sources of irrigation water for California agriculture are surface water and ground water (water pumped from the ground). California farms often use a mixture of ground water and surface water, depending upon the availability and cost. Agriculture and golf courses in the Livermore Valley are almost entirely dependent upon surface water derived from snow in the Sierra Nevada. The snow melt is stored in reservoirs and then moved south via the Federal Water Project and the State Water Project (SWP) systems through the Sacramento-San Joaquin Delta and, finally, via the South Bay Aqueduct (SBA).

Zone 7 of the Alameda County Flood Control and Water Conservation District, the wholesale water agency for the Livermore Valley, acquired water allocations for domestic and agricultural use from the State Water Project at the inception of the SWP in the early 1960s.

The water quantity varies with season and hydrologic year. Increased state-wide demand coupled with environmental regulations to protect the ecosystem have constrained volume. In most years Zone 7 receives only a portion of its annual maximum contractual allocation of 80,610 acre-feet. The delivery reliability of this water is also entirely dependent upon the reliability of the State Water Project system, including the South Bay Aqueduct (SBA).

The Livermore groundwater basin, unlike many agricultural areas of California, is not currently in overdraft condition. According to the South Livermore Valley Area Plan EIR (1992), prior to the development of the State Water Project, the Livermore Valley was in serious overdraft condition. Since the 1970s, water from the State Water Project has been used to recharge the groundwater basin and maintain sustainable conditions. However, groundwater in the Livermore Valley basin in some areas contains levels of boron that are detrimental to vines and trees.

Much of the well water in the Livermore Valley tests at 1 ppm of boron and water from others tests at 2-3ppm (Zone 7 Annual Report for the Sustainable Groundwater Management Program, 2019), requiring dilution with surface water before use for irrigation. Grapevines and olives can generally tolerate up to 1 ppm of boron. Although landowners can apply for a permit to drill an agricultural well, few have done so because of the potential for boron, extremely low yields from the wells installed in the Livermore formation, and the general availability of surface water. In its last published Annual Report, Zone 7 reported that in 2018 agriculture in Livermore used 5,500 acre feet of water, of which 5,400 came from the SBA and only 100 acre feet from agricultural wells. With less than one percent of its water coming from wells, Livermore agriculture is largely dependent upon State Water Project surface water.

The current cost for water to an end-user is about \$200 per acre foot. The cost is comprised of Zone 7's SWP cost plus the cost of establishing and maintaining delivery systems to vineyards and orchards, and managing the State Water Project supply. Zone 7's responsibility ends at the SWP turnout meters and Zone 7 is not involved with distribution. The current wholesale price is \$173 per acre foot before administrative costs, which bring the end user's cost up to about \$200 an acre foot.



Source: Brad Rank



Source: Brad Rank

In 1997, 6,600 acre-feet of Zone 7 water was allocated to non-potable use including irrigation. Prior to this, between the 1960s and 1990s, growers and golf course owners had applied for and were granted allocations of water from Zone 7 on an as-needed basis.

Allocation amounts were based on acreage of land irrigated by the applicant, on the applicant's historical rates of irrigation, and on Zone 7's anticipated long-term average State Water Project reliability. During this early period of allocation, growers were not charged a fee for their allocation of SBA (canal) water but were charged only for the water used.

Allocation acquisition changed between 1997 and 2000. Zone 7 administrators sought to increase Zone 7 water volumes from the State Water Project by purchasing permanent allocations from other water districts that were not using their full allocations. Zone 7 allowed agricultural firms to purchase a portion of this increased allocation for \$3,750 an acre foot.

Thus, if a vineyard owner wanted to increase his or her allocation by ten acre feet, he or she would have paid \$37,500 to Zone 7 for the right to purchase an additional ten acre feet (3.3 million gallons) in future years at the future prevailing rate. Between 1997 and 2000, an additional 1,500 acre-feet of allocation was purchased by Zone 7 for Livermore growers, bringing the total untreated water allocation to 8,100 acre feet. All these allocation amounts (pre-1997 and post 1997) were based on the reliability of the SWP in 1997, which was approximately 76%. Since then, the reliability of the SWP has declined and is anticipated to continue declining.

Since Zone 7's untreated water deliveries are entirely dependent on the State Water Project system including the South Bay Aqueduct, and because Zone 7 does not control the State Water Project or the South Bay Aqueduct, Zone 7 does not guarantee a full allotment of water in every year per the Rules and Regulations for Untreated Water Service. In times of water shortages, water can be allocated to agricultural users in proportion to each user's share of total allocations. According to Philip Wente, in times of drought when Zone 7's water allocation has been reduced by the State Water Project, agricultural users have been asked to conserve water, but have always received their requested amounts (Philip Wente, 2020).

Water allocations, which are essentially commitments by Zone 7 to agricultural uses based on availability of SWP water, have value based on the reliability of the SWP system. Allocations are owned by individual growers, not by Zone 7. Zone 7 administers water delivery and contracts with the Department of Water Resources for supply.

As a thing of value, water allocations can be sold or traded between water users, although the transfer of water allocation must be approved by the General Manager of Zone 7. From 2000 and 2020, 1,100 AF of untreated water allocations were transferred between water users.

The value of those transfers is private information except for a 2016 transfer when 25 AF were transferred to Zone 7 at \$5,000/AF. Over time, 2,600 AF of untreated water allocation have been assumed by new owners due to purchase of parcels receiving irrigation water. Such a transfer is not automatic and is a point of negotiation between seller and buyer.

Customers for untreated irrigation water have not requested full delivery of the allocated 8,100 acre feet of irrigation water thus far. According to Zone 7 sources, 5,400 acre feet were used in 2018 followed by another 4,500 acre feet in 2019, while the projection for 2020 use was 5,800 AF. A partial explanation of the difference between the total allocated volume of untreated water and the volume actually applied probably lies with a change in application methods in vineyards and orchards.

Back in the 1960s and 1970s, when Livermore growers first applied for water allocations from Zone 7, overhead sprinklers were used rather than drip irrigation. Overhead sprinklers apply water across the top of a vineyard and lose significant water to evaporation.

In contrast, drip irrigation applies water to the grapevine root zone and much less water is lost through evaporation. Additionally, the original allocation amounts were based on higher anticipated yields from the SWP project, which has declined significantly and is anticipated to continue declining.

Based on allocated volumes of untreated water, there seems to be unused irrigation water from Zone 7 in wet years with high SWP allocation. The difference between full allocation (8,100 AF) and the 2020 projected use (5,800 AF) might suggest that there are 2,300 acre-feet of unused water that could be applied to irrigate new farming ventures or, for example, golf courses, in the Livermore Valley. However, this calculation assumes that irrigation allocation holders are willing to sell or transfer a portion of their untreated water allocation. It also ignores the reality that a vineyard is a 30-year investment, relying on water every year.

Despite the history of Zone 7's reliable delivery of irrigation water, climate change, increasingly stringent regulations in the Delta, and seismic risks in the Delta, have all led to an overall declining reliability of the State Water Project. The Delta Conveyance Project, currently in planning, is designed to address these issues affecting the State Water Project system's reliability, but that project itself has no guarantee of success.

It is likely that irrigation water users will not receive their full allocation every year in the future. Because irrigation water is pro-rated in years of water shortage, holders of water allocations may decide that it is more prudent to keep their "surplus" water allocations rather than to sell a portion of their water allocation to others or to use it to irrigate new plantings.

In 1993, one of the goals of the South Livermore Valley Area Plan was to add an additional 2,900 acres of vineyard, bringing total acreage to at least 5,000 acres. Given the increasing scarcity of surface water in California, Livermore agriculture's dependence upon surface water from the SWP via the South Bay Aqueduct, and the declining reliability of SWP water, it seems water availability may be a major constraint to the expansion of vineyards and orchards in the Livermore Valley. Vineyards and orchards are economic investments with a 30 year horizon.

Few landowners will make major investments in establishing a vineyard or an orchard unless they are confident that the investment will be profitable and that the necessary inputs, especially water, will be available for the life of the vineyard or orchard.

Section 3. Livermore's History as a Grape and Wine Region

History can help differentiate one region or producer from another. Some wine buyers associate a long history of wine production with qualities that warrant higher prices (Beverland, 2006). For that reason, firms and regions promote their history, often using past awards to signal that their firm or region is exceptional.

With its beginnings in the early 1880s, history has an especially important role in Livermore. In the 1980s and early 1990s, Livermore's early history as a wine producing region became a rallying cry for land preservationists who sought to protect the rural landscape from urban growth by promoting Livermore's viticulture.

The author of the 1993 South Livermore Valley Area Plan warned that "What was once California's premier wine region was quickly becoming another suburban 'edge city'" (SLVAP, 1993).

The claim that Livermore had been "California's premier wine region" was an overstatement. But it is true that Livermore was early recognized as a leading white wine producing district and for a century was referred to as California's "Sauterne" district.



Conceptual view of California prior to 1850 and the arrival of large numbers of European settlers, notice the size of the Tulare Lake in the lower San Joaquin Valley nearly 5 times the size of Tahoe.

Source: Courtesy of Wentz Family

This chapter traces the history of the Livermore valley as a viticultural region and compares it with other areas of coastal California. It also shows the importance of a critical mass of well financed and innovative individuals in the development of regional reputation. The goal of this chapter, as with the discussions of climate, soil and water, is to provide crucial background to the current situation and outlook.

Although Livermore has always comprised a small portion of California's coastal wine production, from its beginning it was a leader in fine wine production. Like other regions, Livermore grew dramatically during the wine boom of the 1880s. Several of its wineries survived Prohibition by producing altar wine and, following Repeal, these historic wineries helped pioneer the varietal labeling of wine in California.

During the 1950s and 1960s, the number of acres and wineries declined, as was true for other coastal areas. Unlike some other regions—most notably Napa and Sonoma Counties—Livermore's acreage and wineries did not expand with the wine boom of the 1970s. By 1990, the diversity of wineries that had been key to Livermore's early development had been winnowed down to one remaining historical winery, Wente, which grew or purchased the majority of grapes grown in the Livermore Valley.

Original Winery of C.H. Wente, circa 1900



Source: Courtesy of Wente Family

Building a Regional Reputation: The Early Years

Reputations are established through the actions of individuals and groups. Reliable production of excellent wine requires three, perhaps four, deliberate steps. First, variety and climate must be matched to optimize grape characteristics. Although growers must take climate as a given, they decide what varieties to plant. Second, the vineyards must be managed with the goal of emphasizing the inherent characteristics in the grapes, rather than emphasizing quantity produced per acre. Third, many decisions determine how the grapes are transformed into wine. Some choices, such as barrel aging, add cost but may enhance the wine.

Finally, having chosen to produce fine wine, producers must effectively market the wine at prices that cover the costs. All four of these criteria were met in Livermore in the 1880s. The result was that Livermore wine producers took two of the three gold medals awarded to California producers at the Paris Exposition of 1889. This outcome confirmed Livermore's position as one of the leading producers of fine wine in California.

Livermore's history as a commercial wine producing region began in 1880 with the California wine boom. By the start of the 1870s, phylloxera in France had reduced supply and raised prices of French (and later most European) wine globally. In 1875, foreign wine prices were further increased in the United States when Congress raised the tax on imported wine.

In 1878, as the United States emerged from an eight-year depression, Americans turned to California as the source of their inexpensive wine. Increased demand led to higher prices for California grapes and wines. This in turn unleashed a planting boom throughout California. Between 1880 and 1890 California's vineyard acreage almost quadrupled from 45,000 acres to 170,000 acres (Alston et.al). Livermore's conversion of land from grain to grapes was part of this boom.

Unlike Napa, Sonoma, or Santa Clara Counties, or the Warm Springs area of Alameda County, Livermore had produced little, if any, commercial wine prior to the wine boom of the 1880s. Robert Livermore, for whom the city of Livermore is named, had established a small vineyard of mission grapes in 1844 on his rancho, but that was for personal use. John Kottinger, who had married into the Bernal family and acquired land through their land grants, had planted a four-acre vineyard on his ranch in 1874 near Pleasanton. But prior to the boom of the 1880s, Livermore had little experience with commercial grape and wine production. This changed dramatically during the 1880s as Charles Wetmore and Joseph French Black jointly promoted the Livermore region as a place where premium wines could be produced.

In 1857, Black arrived near Pleasanton and began growing wheat in the valley. His success allowed him to buy 4,000 acres from the Bernal family in 1863. Some, if not all, of this land was in the Arroyo Valle, which accounts for its early development. In 1880 Black contacted Charles A. Wetmore, the Executive Officer of the newly established California Board of Viticultural Commissioners, to assess whether Black's land in Livermore would be appropriate for grapes. Wetmore identified the region as being climatically similar to Bordeaux, enthusiastically endorsed the Livermore area, and acted as a real estate agent for Black. Wetmore ultimately purchased land in 1882 from Black for a vineyard and winery, which he named Cresta Blanca. By early 1882, Black had sold over 3000 acres, mostly to individuals seeking to establish vineyards and wineries (Sullivan, 2014a).

Cresta Blanca circa 1940



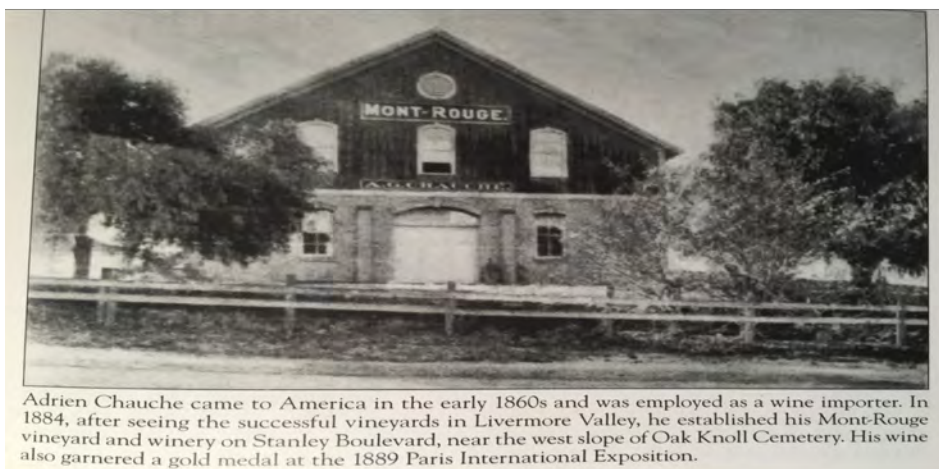
Source: Courtesy of Wente Family

In retrospect, Livermore probably benefited from being able to start fresh as the only new grape growing region close to the San Francisco Bay Area. Unlike regions that had begun 30 years earlier, Livermore was not burdened by large plantings of Mission grapes, which made, at best, indifferent wine or brandy. Nor was it plagued by phylloxera, which was already established in Sonoma by the late 1870s and which rapidly moved into the Napa Valley in the 1880s. Train service, originally from San Jose to Livermore but later from Livermore to Oakland, made the valley easily accessible from the Bay Area and Livermore land was inexpensive relative to more established grape-growing regions.

In the 1880s, under the influence of Wetmore and Black, successful businessmen and merchants from San Francisco and Oakland set out new vineyards of climate-appropriate vinifera varieties and established wineries. Most of these individuals focused on producing fine wine and had sufficient financial resources to commit to long term investments.

Their vineyards were generally in the Arroyo Valle, south of Livermore. Despite low grape and wine prices in the 1890s, and the depression of 1893, these individuals seemingly had sufficient access to capital to continue to produce and distribute fine wines from the Livermore Valley. One of the first to plant was a wealthy German, George True, who had purchased 580 acres from Black in 1876 and who planted 60 acres of vineyard in 1880. At some point in the next decade, True built a winery and California's State Board of Viticultural Commissioner's 1891 *Directory of Grape Growers and Wine Makers of California* lists True as owning 95 acres of vineyards, with almost half of the acreage devoted to the white grapes "Colombar" [Colombard] and Folle Blanche (CBVC, 1891). Black joined True that year, setting out 35 acres of winegrapes. Black continued to expand his "Lomas Vineyard" to 185 acres by 1891, with 40 acres planted to white grapes such as Sauvignon blanc and Semillon, in addition to Muscat de Bordelais and Folle Blanche. Like True, Black also established a winery sometime during the 1880s.

Perhaps the most important entrant in 1880 was Adrian Chauche, a native of Graves, a well-known district in Bordeaux. In 1869, Chauche had established a successful wine import business in San Francisco, growing wealthy enough to build a winery in Livermore, Mont Rouge, in 1880 and to begin setting out a vineyard. While his own vineyard came to bearing, ultimately totaling 63 acres in 1891, Chauche purchased from local growers, paying top price for the best varieties. His 1895 Zinfandel Claret was one of two Livermore wines to earn a gold medal at the 1889 Paris Exposition (Sullivan, 2014b).



Adrien Chauche came to America in the early 1860s and was employed as a wine importer. In 1884, after seeing the successful vineyards in Livermore Valley, he established his Mont-Rouge vineyard and winery on Stanley Boulevard, near the west slope of Oak Knoll Cemetery. His wine also garnered a gold medal at the 1889 Paris International Exposition.

In 1881 Julius Paul Smith entered the valley by purchasing 1,949 acres of land south of Livermore and establishing an estate, Olivina, complete with a winery and, ultimately, 660 acres of grapes. Smith had made a fortune mining borax, a mineral, in Death Valley. By 1885 his winery and distillery were operational. Smith initially focused on grapes for red wine production, such as Zinfandel, Mataro and Cabernet Franc, but about one-third of his vineyard was planted to a wide variety of white grapes including 24 acres of Sauvignon blanc (Sullivan 2014a, CBVC, 1891).

Olivina Winery Circa 1900



Source: Courtesy of Wente Family

Storage Tunnels at the Olivina Winery



Source: Courtesy of Wente Family

In 1882, Charles Wetmore began his own winery, Cresta Blanca, and set out 42 acres of grapes, most of which were Bordeaux red varieties, but which included 12 acres of Semillon and six acres of Sauvignon blanc. He was joined in Livermore by his younger brother, Clarence, who planted the Electra Vineyard, following roughly the same mixture of varieties. Assuming that there were now a sufficient number of vineyards not connected to wineries, Camille Aguillon and Gottardi Bustelli established the Pioneer Winery, which became one of Livermore's largest wineries in the 1890s.



A very early winery in Livermore was owned in 1881 by two Swiss-Italians, Camille Aguillon and Gottardo Bustelli. It was located on the north side of the railroad tracks where Bank of America is currently located. By 1900, the winery, which was acquired by the California Wine Association in 1894, was shipping out 1.6 million gallons of wine annually from Livermore. One of their wine tanks had a 30,000-gallon capacity. It was 20 feet in diameter and rose to a height of 18 feet. The *Height* noted that "two sets of quadrilles could be formed on the bottom of the tank."

Source: Courtesy Livermore Heritage Guild

In 1883, John Crellen, an English immigrant who had become wealthy in San Francisco banking and real estate, purchased 450 acres in Pleasanton, hired the noted architect H. W. McIntyre, and began construction of Ruby Hill. Like his neighbors in Livermore, Crellen planted the majority of his vineyard to red and white Bordeaux varieties. In Livermore that year, two college friends of Clarence Wetmore purchased separate properties near Cresta Blanca. John Wheeler, the son of a Napa vineyard owner, became the first secretary for the State Board of Viticultural Commissioners in 1880 and bought 110 acres, naming it the Cornelia Vineyard, after his daughter (Peninou). Another U.C. graduate, Frank Fowler, purchased 70 acres adjacent to Cresta Blanca and planted grapes, naming it the Dos Mesas Vineyard (Sullivan 2014a). According to wine historian, Charles Sullivan, both Fowler and Wheeler established their own wineries, although the 1891 directory does not mention Fowler having a winery.

Not everyone who established a vineyard was already rich or immediately built a winery. In 1883 Carl Wente, a German immigrant, purchased a half interest in Dr. Bernard's 25-acre vineyard, which was planted on a 50-acre parcel in the Arroyo Mocho. The following year, Wente built a small winery. Bernard's interest went to Herman Otersen and Dr. Louis Busch upon Bernard's death in 1887, and with his partners, Wente expanded the vineyard to 47 acres in 1888. In 1901, Wente bought out his partners, becoming sole owner of the winery (P. Wente, 2021).

Head Pruned Bernard/Home Vineyard - Typical through 1950's



Source: Courtesy of Wente Family

Wente Vineyards Looking West to East



Source: Courtesy of Wente Family

James Concannon another famous name in Livermore history arrived also in 1883. Concannon, a 36-year-old Irish Catholic, had been steered to Livermore by San Francisco's Archbishop Alemany. He purchased 47 acres near Wente in Arroyo Mocho, planted 44 acres, and soon began producing altar wine at another winery. In 1897 Concannon constructed his own winery and expanded his vineyards. The connection with the Catholic Church would prove fortuitous for both Wente and Concannon, as both survived Prohibition by producing sacramental wine (Sullivan 2014 a, Sullivan 2014 b).

The next year in 1884, two other Frenchmen, Alexander Duval and Louis Mel, joined the growing community of Livermore Valley grape growers and winemakers. Mel had established insurance agencies up and down the Pacific coast and settled in Livermore, purchasing 160 acres south of the Wente vineyard in Arroyo Mocho, saying that the area reminded him of France. The story goes that Mel's wife was a childhood friend of the wife of the owner of Chateau d'Yquem. She wrote an introduction for Charles Wetmore, who then imported Sauvignon blanc, Semillon and Muscadelle of Bordeaux cuttings directly from Chateau d'Yquem.

By 1891, Mel had a 25 -acre vineyard planted predominantly to white varieties. His countryman, Duval, a native of Bordeaux, was a civil engineer who had amassed a fortune in South America building railroads. Duval purchased 180 acres in Arroyo Valle, planted 150 of it to grapes and erected the Bellevue winery. Although Duval's focus was red wine production with acreage devoted to Cabernet Sauvignon and Malbec, he still found room for the Bordeaux white varieties of Sauvignon blanc and Semillon.

This listing of individuals who established wineries, generally in the Arroyo Valle, could continue, but this list is sufficient to document that, in a few short years, many wealthy individuals had come to Livermore, each with a goal of producing fine wine made primarily from Bordeaux varieties. At a time when almost all California wineries sold their wine in bulk to San Francisco merchants, many of Livermore's wineries bottled some, if not all, of their production under their own labels. This had the effect of not just promoting their individual brands, but also their region.

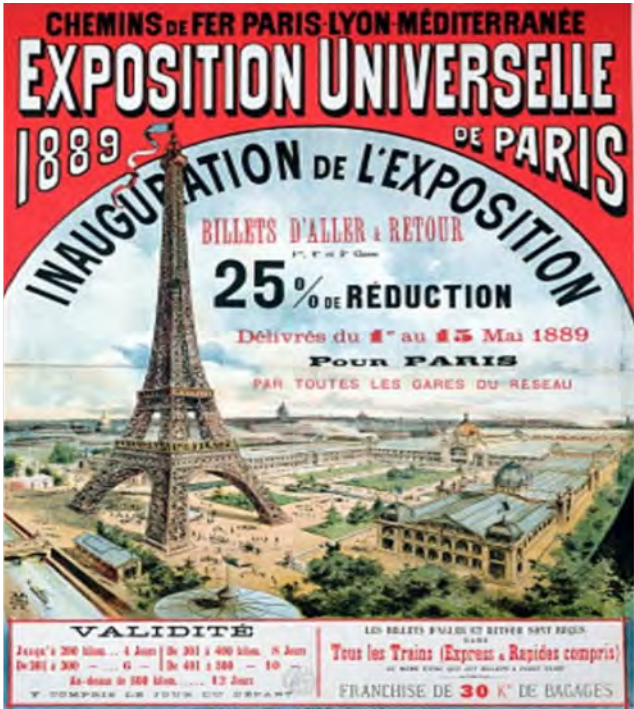
The influence of Charles Wetmore was central. He had recognized Livermore's potential and promoted the region. He had invested in the region and, acting as an agent for Black, had attracted many of the early winery owners to Livermore. He suggested the varieties best suited to the Livermore climate. He helped organize the growers and wineries, including instigating inspection of cuttings for the presence of phylloxera. It is fitting, then, that his was the other Livermore wine to take a gold medal at the 1889 Paris Exposition.

In the words of Charles Sullivan, “Livermore reached the peak in 1889 with two of the three gold medals awarded to American wines at the Paris Exposition.

The wines were Chauche’s Zinfandel Claret and Charles Wetmore’s white blend of classic Sauternes varieties. The third gold was for a Zinfandel by Napa’s Giuseppe Migliavacca” (Sullivan 2014 b). In less than a decade, Livermore had joined the ranks of Napa and Sonoma County both of whom had been producing wine since the 1850s.

In 1891, the California Board of Viticultural Commissioners conducted an in-depth survey of grape growing and winemaking in each California County. The table below is derived from that survey.

Paris 1889 First Major International Awards for California Wine Cresta Blanca-Gold, Grand Prix Mont Rouge-Gold



Source: Courtesy of Wentz Family

Table 3.1: Winegrape Vineyard Acres, Number of Vineyards and Wineries, by Bay Area County, 1891

Location	Acres in Vineyard	Number of Vineyards	Number of Wineries
Alameda County	6,396	128	30
Santa Clara County	10,294	432	127
Napa County	18,177	556	168
Sonoma County	22,351	794	115
Livermore including Pleasanton (within Alameda)	3,770	92	17
Saint Helena (within Napa)	7,294	198	79

Source: California Board of Viticultural Commissioners *Directory of the Grape Growers, Wine Makers and Distillers of California*, 1891

Seen in statistical perspective, in 1891 Livermore was a small part of coastal California's grape and wine production. Together, Livermore and Pleasanton accounted for approximately 6.6 percent of all winegrape vineyard acres in the Bay Area counties, 4.8 percent of the number of winegrape vineyards, and 3.9 percent of the number of wineries. Livermore was a significant, if small, share of the fine wine landscape in California.

The 1890s Through the Repeal of Prohibition

The early 1890s, just before the onset of the Depression of 1893, may have been the high point for the Livermore Valley from the perspective of winegrape acreage and regional reputation. Because most acreage reports are by county, it is difficult to find reports specific to Livermore. Estimates of Livermore grape acreage are generally anecdotal, and it is often unclear if the estimates are for bearing acres of winegrapes or all acres of all grapes and even the definition of "Livermore" is often not well specified. Sullivan states that at the end of the 1880s Livermore had "about 6800 acres. . . yielding about 500,00 gallons of wine from sixteen wineries" (1998, p. 190).

This figure seems unrealistically high and Sullivan seems to have confused the 6,836 acres of all grapes for all of Alameda County, reported in the State Board of Viticultural Commissioner's *Directory* of 1891, with the 3,770 acres of winegrapes listed by the *Directory* for Livermore and Pleasanton growers. Charles Bundschu's 1893 report, *The Vineyards of Alameda County*, lists Livermore's and Pleasanton's winegrape vineyard acreage as 4,095 acres (Bundschu, 1893). The number of acres may have topped 5,000 acres in 1886 at the height of the wine boom, but without actual reports, such numbers are speculation.

The Depression of 1893 lasted for four years and reduced the demand for wine. This decline, coupled with increased supply from the new production from California's massive plantings in the first half of the 1880s, led to ruinous grape and wine prices in the 1890s. Livermore's leading wineries such as Cresta Blanca, Ruby Hill and Olivina, focused on producing and bottling their best varietals, and sold off other wines in bulk. Inspired by Cresta Blanca's gold medal for a Sauterne-like blend at the Paris Exposition and as a way of differentiation from other California wineries, top Livermore producers increased their production of white wines made from Semillon and Sauvignon blanc.

With the winemaking technology then available, white wines were more difficult to produce than red wine due to oxidation. Because of this, well-made white wines were distinctive in what was otherwise a sea of red wine, especially when the white wine was made from the strongly flavored and aromatic Sauvignon blanc.

Growers with Sauvignon blanc or Semillon received good prices for their grapes during the depression of the 1890s, while growers with vineyards of standard red varieties were faced with low prices and by the emergence of phylloxera, which was slowly working its way through the gravelly soils of the Livermore Valley.

The result was that some growers pulled their unprofitable vineyards out of production, some wineries went out of business, and acreage shrank to about 2,500 acres by 1910 (Westover and Van Duyne, 1911). Many of the wealthy founders of Livermore's new wineries in the 1880s were deceased by the 1890s. Adrian Chauche passed on in 1893, followed by George True in 1894, and John Crellin of Ruby Hill in 1895. True's and Chauche's wives continued to operate their wineries, as did Crellin's children, but the founders and their trail-blazing energy were gone.

Perhaps the most important ownership change took place before the onset of the depression when Charles Wetmore sold Cresta Blanca to his brother, Clarence in 1892. Charles Wetmore was described by many people as very intelligent about wine, but a very poor businessman, unlike his brother, Clarence (Sullivan, 2014b, E. Wente, 1971). Clarence Wetmore, in partnership with Charles Bowen, built on his brother's idea and energy, and successfully guided Cresta Blanca until the advent of Prohibition, when the winery was sold.

Some wineries prospered during the 1890s, producing and selling bulk wine rather than bottling their production. Carl Wente's winery initially focused on bulk wine production. Sullivan lists Wente as having produced 450,000 gallons of wine in 1902 (Sullivan, 2014b). Assuming 150 gallons per ton, Wente would have required 3,000 tons of grapes, which, at two tons per acre from unirrigated vineyards meant that Wente was processing about half of the grapes grown in the region.

His son, Ernest, in his oral history, "Wine Making in the Livermore Valley", comments that his father made very little margin on the majority of the wine, which Ernest described as "vin ordinaire" produced primarily from Zinfandel, and that "he probably swapped dollars" (E. Wente, p. 8). But the volume kept workers employed and allowed the elder Wente to produce smaller lots of varietal white wines (E. Wente, 1971).

Wente had a good business selling his white wines to companies in Sonoma and Napa that bottled the wines under their own labels. Indeed, Wente was co-owner of the Napa & Sonoma Wine Company of San Francisco, a blending and bottling business founded in 1883 by a number of leading vintners including Charles Krug and Emil Priber. By 1908 Wente had purchased majority ownership and regularly bottled some of his wines under the Napa & Sonoma Wine company's various labels (P. Wente, 2021).

Ernest remembers his father coming home in 1915 and proudly announcing that he had won four gold medals at the 1915 Panama-Pacific Exposition—all for wines that Wente had produced but had sold in bulk to wineries, which had bottled the wines and then entered them at the Exposition.

James Concannon, too, did well during the 1890s and into the new century. According to Sullivan, by 1897, two years after building his winery, Concannon was producing 100,000 gallons. Some of this was sold to merchants in San Francisco, some to the San Francisco diocese of the Catholic Church. Like Wente, Concannon did not bottle wine under his own label until after Repeal of Prohibition in the 1930s.

Wente Vineyards 1934 Looking Southeast



Source: Courtesy of Wente Family

Both Sullivan and Gibson, describe the first two decades of the Twentieth century as a generally prosperous time for California wine in general and Livermore in particular (Sullivan, 1014b and Gibson, 1969). Immigration from southern Europe had increased the number of wine drinkers in the United States and tariffs kept the price of imported wine higher than the price of California wine. According to Sullivan and Gibson, the Livermore Valley expanded during this period, emphasizing white grapes, particularly Sauvignon blanc and Semillon. Sullivan claims that Livermore had 3,500 acres on winegrapes in 1920.

This is close to the figure of 4,000 acres given by Gibson, who cites a 1936 article by Herman Wente, "Livermore Valley White Wines," which appeared in the trade magazine, *Wines and Vines*. According to Wente, at the advent of Prohibition in 1919, the Livermore Valley had approximately 3,000 acres of "sauternes grape varieties" and 1,000 acres of "other grapes" (Gibson, p. 61).

Both numbers seem at odds with the figure of 2,500 acres in 1910 from the USDA soils report of 1911. Livermore vineyard acreage could certainly have expanded by 1,000 or 1,500 acres in the decade leading up to Prohibition, although the uncertainty surrounding alcohol control and Prohibition must have dampened vineyard investment to some degree.

Livermore's experience with Prohibition differed markedly from that of the rest of California. Prohibition had criminalized the commercial production, transport and sale of alcoholic beverages, but it had also allowed home production of wine for personal use. With this exemption and other forms of alcohol illegal for home production, demand for grapes that could be shipped east for home production increased and grape acreage in California almost doubled in the first four years of prohibition.

This was not the case in Livermore. Most home winemakers desired tannic and deeply colored, thick-skinned, red grapes that could be transported in rail cars and which could be re-fermented with water and sugar to make a second wine. Livermore vineyards were primarily planted to thin-skinned white grapes. Livermore growers could have grafted their vines to red varieties such as Alicante Bouschet or Petite Sirah, but generally did not do so for two reasons.

First, Livermore's red grape variety vineyards could not compete in productivity with California's Central Valley vineyards or even coastal areas such as Napa and Sonoma. This is reflected in grape shipping statistics. In 1929, Livermore growers shipped 75 rail cars of grapes out of the valley, while Sonoma shipped 1336 and Napa shipped 1398 (Gibson).

The second reason that Livermore vineyard owners did not graft their white varieties to red ones is that, unlike most of California, Livermore had two active wineries that purchased grapes and produced wine during Prohibition. Both Wente and Concannon produced sacramental wine for the Catholic Church during Prohibition. Concannon, which had begun as a winery producing altar wines, continued almost normal production volumes throughout Prohibition (Gibson).

Assuming 150,000 gallons annual production, 150 gallons per ton, and two tons per acre, Concannon's production would have accounted for about 500 acres of Livermore grapes. Wente produced about 60,000 gallons of sweet and dry "sauterne" each year (Gibson), which it sold to Beaulieu Vineyard in the Napa Valley.

Beaulieu's owner, George de Latour, supplied red wine to Catholic dioceses across the United States. In order to increase his sales, de Latour approached Wente to produce wine to be sold under the Beaulieu Federal bond. Ernest Wente remembers his father complaining to de Latour that he hadn't been paid for the previous year's wine. Latour replied "My business is with the church. They are very slow paying, but they are good" (E. Wente, p. 22).

Wine sales to Beaulieu became so regular and such an important part of Wente's operation that in 1927, when the Federal government tightened regulations about transfers of wine between wineries, the Wentes turned their Federal bond over to Beaulieu until the end of Prohibition. The 60,000 gallons of wine produced by Wente translated into approximately 200 acres of "sauterne" grapes that were saved during Prohibition.

By the end of Prohibition, Livermore vineyard acreage had shrunk to between 2,500 and 3,000 acres and only a handful of wineries remained (Gibson, 1969 and Sullivan, 1998). According to Sullivan, Ruby Hill produced some sacramental wine, although volumes are not stated. Cresta Blanca did not produce wine during prohibition, but it did maintain its vineyards. Livermore had fallen from its peak in 1889, but it did have a few active wineries and had been able to maintain most of its sauterne varieties ready for repeal.

Repeal to the Wine Revolution

The time between repeal of Prohibition on December 5, 1933, and the beginning of the wine "revolution" of the late 1960s was a period of slow growth for wineries such as Concannon and Wente, as well as for California's table wine producers in general. Herman Wente states there were 12 active wineries following Repeal and that 500 acres were replanted, bringing Livermore's total to about 3,000 acres, with the majority in white grapes (Gibson). Of the 12 wineries, only five bottled any of their own wine.

Cresta Blanca and Ruby Hill, which had bottled prior to Prohibition, and Wente, Concannon and Garrati, although much of the production of these three wineries was sold in bulk to other wineries or out-of-state bottlers. Following Repeal, the demand for commercial wine was primarily for fortified wines, which were not produced in any volume by Livermore producers, while home winemakers continued to produce their own dry table wine at home.

Still, even in the difficult time of the Depression, Livermore wines and grapes fetched a premium. A writer in *Wines and Vines* in 1937 reported that “Livermore white grapes are usually twice as high in price as white grapes from other locations” and that “Livermore wines are higher in price than practically any other white dry wine” (E. M. Sheehan, as quoted in Gibson, p. 68).

In his oral history, Ernest Wente remembers that he and his brother decided to bottle a limited volume of their best wines under their own label, including the first varietally-labeled California Chardonnay in 1936 (E. Wente, 1971). Wente recalls advice from their long-retired neighbor, Clarence Wetmore, that it would take 20 years to develop a strong brand in the market place and that they should go slowly, as it would only take two years of poor wine to ruin the brand. In the late 1930s, Wente gained distribution on the East Coast of the United States when wine writer and importer, Frank Schoonmaker, selected a Wente wine to sell in his “Schoonover Selections”. Wente was in select company, as Schoonmaker had tasted over 500 wines and selected wines from Larkmead and Inglenook of the Napa Valley and Paul Masson of Saratoga (Lapsley).

Schoonmaker was an early advocate of varietal labeling, urging producers to name the variety, the location of where the grapes were grown, and the name of the producer on the front label. As seen in their decision in 1936 to bottle a Chardonnay and label it by the varietal name, the Wentes and Schoonmaker were a good fit. With the U.S. entry into W.W. II, Schoonmaker enlisted. Wente, Martini and Korbel assumed Schoonmaker’s debts and receivables, and then assigned distribution to 21 Brands, an east coast distributor and to Parrott and Company, a West coast distributor (P. Wente, 2021).

With these sales companies, Wente wines went into national distribution (Lapsley, E. Wente, 1971). Many years later, in 1975, the Wentes and the Martinis, purchased Parrott and Company, giving both wineries their own national distributing company. (P. Wente and C. Wente, 1991).

The war years saw an increase in American wine consumption as wine became the only unrationed form of alcohol readily available. The U.S. government had taken over the major distillers to produce industrial alcohol for the war effort, thus ending the production of distilled spirits for the duration of the war. Beer production was reduced as the government directed U.S. grain towards food for U.S. consumers and the Allied forces. Schenley Distillers purchased Cresta Blanca in 1941, expanded production, and began to produce wine that could be sold by its national salesforce (Lapsley). Schenley also purchased both the Roma brand from the Cella family and the Elk Grove winery from Colonial Grape Products, making Schenley the largest producer of California wines by the end of 1942 (Pinney, 2005). Although Schenley purchased grapes from all over California, it emphasized Cresta Blanca and the Livermore location.

Following the end of W. W. II, with whiskey and beer back on the shelves, per capita consumption of table wines dropped and the number of California wineries fell. Livermore followed the state trend. By 1950, only seven wineries remained active in Livermore (Gibson), with Wente, Cresta Blanca and Concannon being the only Livermore wineries with national distribution. In the early 1950s, the Livermore Valley, like the Santa Clara Valley to the south, began to urbanize. Part of the impetus for suburban growth in Livermore came from the establishment of the Lawrence Livermore Laboratory in 1952 and the Sandia National Laboratory in 1956.

Livermore's population almost quadrupled from 4,364 in 1950 to 16,058 in 1960, increasing the demand for land for housing and putting pressure on the vineyards to the south of Livermore and Pleasanton. During this time the Wentes began experimenting with vineyard irrigation, using overhead sprinklers. When an ample source of water became available from the California Water Project in the early 1960s, Livermore vineyard owners found that tons per acre more than doubled, with no detrimental effect on grape qualities. To some extent, then, vineyard acreage could be converted for housing but still allow the Livermore wineries to maintain production levels.

The Wine Boom, Urban Expansion and Land Preservation.

In 1967, for the first time since repeal, more table wine was sold in the United States than fortified wine. The trend toward table wine had begun at the start of the 1960s and accelerated in the 1970s. For the most part, however, Livermore did not join in the trend (Gibson). In 1966, Livermore had 1,689 acres of grapes, of which almost 70 percent were white. Since the main growth in wine consumption in the 1960s was in white and rose wines, Livermore should have been poised to expand production. According to the Grape Acreage Report, California coastal counties counted 54,552 acres of grapes in 1971, which more than doubled to 121,885 acres by 1980. During this decade, Alameda County grape acreage only grew by 11 percent, from 1,786 acres to 2,068. Why didn't Livermore acreage increase?

Part of the answer lies in land valuation and taxes. In the years before Proposition 13 was passed in 1978, county assessors valued land at the highest market value and many of Livermore's vineyards were prime candidates for conversion to housing. In 1965, the California legislature had passed the Williamson Act, which lowered the property tax assessment on agricultural land if a property owner signed a contract not to develop the land for ten years.

Some rural landowners were skeptical of the new act, or didn't want to limit their future actions. By the mid-1960s, the Wente family owned about 800 acres of vineyards (E. Wente, 1971) in the Livermore Valley. With the boom in wine consumption, the family realized that they needed to increase their grape supply to meet increasing demand for wine.

As Philip Wente put it in an interview in 1991, "The tax assessor was having a marvelous time running around assessing things at various whims and notions. My father really believed that there might come a time, given the way things were going at that date that the Livermore Valley would no longer be viable for winegrowing, much as the northern Santa Clara Valley, unfortunately, has seen a demise. So he headed out for Monterey County" (P. Wente, 1991). Concerned about urbanization and property taxes in the Livermore Valley, the Wentes decided to develop a 275-acre vineyard in the Salinas Valley in 1962.

Other grape growers and wineries made similar decisions. Monterey had plenty of water and inexpensive pastureland that could be converted to vineyards. It was a cool region and well suited for Chardonnay, the boom grape of the 1970s. Best of all, there was no urban pressure that might cause land values to be taxed at a higher rate in the future. Although the Salinas Valley was a new and therefore unproven viticultural area, it was close to San Benito County and Almaden's Paicines Vineyard, which was well known for its grape production. Monterey's vineyard acreage increased almost five-fold in ten years, from 6,695 acres in 1971 to 32,237 in 1980.

Investors also looked to proven areas such as Napa and Sonoma, although land in these counties was more expensive there than in Monterey. Napa vineyard acreage grew from 14,834 acres to 26,318, while neighboring Sonoma County saw vineyard acreage expand from 14,918 to 27,822 acres in the same time period. Monterey, Napa and Sonoma were all rural counties, located near to the San Francisco Bay area, but not adjacent to the housing boom. It is not coincidental that the only declines in vineyard acreage occurred in the urban counties of Alameda, Contra Costa and Santa Clara.

The wine boom of the late 1960s and 1970s bypassed Livermore and resulted in consolidation rather than in expansion. By 1967, Livermore and Pleasanton were down to just four operating wineries: Wente, Cresta Blanca, and Concannon in Livermore and the Loretto Winery in Pleasanton, which produced wine from grapes grown in the Central Valley. Ruby Hill was inactive, although its vineyards were farmed. By 1992, following a period of vineyard and winery expansion throughout the rest of California, Wente was the only remaining winery operating under the same ownership as in 1967.

Cresta Blanca was the first of the old guard to falter, when, in 1965, Schenley closed Cresta Blanc, moved all of its operations to Fresno, and allowed the vineyards and winery in Livermore to deteriorate. In 1971, Schenley sold the Cresta Blanca brand to Guild Wineries, but kept the property, with the idea of developing it for housing. In 1981, the 315-acre property was purchased by the Wentes for vineyard development. The Wentes discovered that the storage tunnels and some of the buildings were sound, and converted Cresta Blanca into a sparkling wine production facility (P. Wente 1991). During the 1970s the Wentes also acquired two other potential vineyard properties: The 100-acre Migliore ranch in 1979 and the 600-acre Beyer ranch in 1981. So, with the purchase of the historic Cresta Blanca property, the Wentes had added just over 1000 acres of potential vineyards.

Concannon's turn came next. Joseph Concannon, James Concannon's son, had died in 1978 and not all of the family members wanted to continue operating a winery. In 1980, the family sold the winery to Agustin Huneeus, the former head of international winemaking operations for Seagrams. Huneeus, formed a partnership with International Distillers and Vintners (IDV), which bought Huneeus out in 1983. In 1986 Guinness purchased IDV and acquired IDV's California winery holdings. Guinness sold most of the IDV California winery holdings later that year, and sold Concannon to the German firm, Deinhard. In his 1991 oral history, Philip Wente commented on the situation in the Livermore Valley, saying "here in the Livermore Valley you have two major wineries, Wente and Concannon, carrying 90 to 95 percent of all the acreage, and the whole investment is strictly on their shoulders. Should one of them falter, the whole house of cards is likely to collapse" (P. Wente, 1991, p. 110).

In 1992, Deinhard sold Concannon to Tesla Vintners, an investment group led by the Wentes. Tesla Vintners operated the Concannon winery for a decade, before selling the winery and vineyards to The Wine Group in 2002.



Source: Tri-Valley Conservancy

By 1992, 103 years after Livermore's triumph in France, only one winery from Livermore's glory days of the 1880s remained: Wente. A few new wineries had begun in Livermore in the 1970s and 1980s, but they were all very small, local, operations without national sales. Fenestra and Stony Ridge began in 1976, followed by Retzlaff in 1985, Thomas Coyne in 1989 and Cedar Mountain in 1990. These new operations made very little wine. With its purchase of Concannon in 1992, the Wentes probably processed 95 percent of Livermore's grapes. The consolidation of wineries in Livermore stands in stark contrast with the Napa Valley and California as a whole, where numbers of wineries expanded dramatically from 1970 through 1990.

Table 3.2 shows the number of wineries in California, Napa County, and Livermore at the start of each decade.

Table 3.2: Number of California, Napa County and Livermore Wineries at the Start of Each Decade

Year	California	Napa County	Livermore
1960	256	23	4
1970	240	32	4
1980	508	95	4
1990	807	176	7

Source: Lapsley and Sumner, 2014

Overview

Regional reputations are made in the national and international marketplace and are the result of the cumulative actions of multiple firms representing both their brand and their region. During the 20 years between 1970 and 1990, the number of California wineries competing for consumer attention more than tripled, while the number of Napa brands grew six-fold. Livermore was at a disadvantage relative to other wine regions, having only one company to represent it in the national market, Wente. That a significant portion of Wente's production comes from its vineyard in Monterey has probably caused consumers to focus on Wente as a firm, rather than on Livermore as a place to grow grapes for fine wine. But, even if Wente only used grapes grown in Livermore, it would still be the only brand representing the Livermore Valley in the broad U.S. market, in contrast with the hundreds of brands from other regions that compete for market shelf space and the attention of wine writers.

This brief history is perhaps a cautionary tale of what can happen to regions that do not attract or maintain enough innovative firms to help keep their regional “brand” fresh.

In the 1880s, Livermore was the new region for grape growing. It attracted wealthy individuals who invested in vineyards, wineries, and marketing with the goal of producing the best wines in California. The success of two Livermore firms at the 1889 Paris Exposition confirmed the over-all high quality of Livermore wines and the potential of the area for viticulture. For the next 70 years, Livermore mirrored the larger California industry and maintained its place as an area specializing in white wines. However, the wine boom of the late 1960s bypassed Livermore. Instead of attracting new firms with sufficient capital to compete in the national marketplace, as did other California regions, Livermore instead lost its major firms, one by one, until only Wente remained.

Why investors were not drawn to Livermore is partly due to the reasonable supposition that Livermore's vineyard land would inevitably be lost to urbanization. For several reasons, urban pressure on Livermore was managed to allow maintenance of vineyard acreage. The Livermore Valley's response to the pressures of urbanization and the results of its land-use planning decisions, as seen in the 1993 South Livermore Valley Area Plan, is discussed in the next section of this report.

Section 4. The South Livermore Valley Area Plan and Livermore's Recent History

Channeling growth and maintaining open space were issues throughout the San Francisco Bay Area in the 1970s and 1980s. After contentious debate, in 1968 the Napa Board of Supervisors passed the "Ag Preserve," which aimed at limiting development in the Napa Valley by establishing a minimum parcel size of 20 acres. In Livermore, control of urban growth became focused on "saving the vineyards" and resulted in the 1993 approval of a major piece of area land-use planning, the South Livermore Valley Area Plan. This plan regulated the conversion of agricultural land into housing developments and required the development of "mitigation" vineyards to compensate for "lost" agricultural land.

The cost of these vineyards was borne by housing developers and increased the cost of houses. The decision to plant a mitigation vineyard was thus part of an economic calculation of demand for housing in the Livermore Valley, rather than an estimation of the future demand for Livermore grapes. Approximately 1,500 acres of mitigation vineyards were planted in the late 1990s and early 2000s.



Source: Tri-Valley Conservancy

Livermore's mitigation vineyard plantings occurred during a state-wide expansion in red wine vineyards that lasted from 1992 to about 2001. As U.S. demand for red wine increased, grapes prices rose, sparking plantings of new vineyards throughout California. Wineries scrambled to increase production and offered higher grape prices to obtain supply. Total California red winegrape acreage doubled during the decade and all California wine regions, including Livermore, saw an increase in red wine vineyards.

Although the majority of Livermore's plantings in the late 1990s and early 2000s were the result of mitigation vineyards required by the South Livermore Valley Area Plan, a desire on the part of Livermore landowners to participate in the red wine boom no doubt played some part as well. Between 2000 and 2009, Alameda County's bearing red grape acreage expanded from 592 acres to 2,123 acres, accounting for more than 75 per cent of total winegrape acreage. For more than a century Livermore had been known as a region focused on producing wines from white grapes and had been called "the Sauternes District," specializing in Bordeaux varieties. At the start of the twenty-first century, that heritage was gone and Livermore had become one of many coastal grape growing areas focused on red wine production.



Source: Tri-Valley Conservancy

Crane Ridge, Ruby Hill and the South Livermore Valley Area Plan

Since at least the 1970s, the minimum parcel size in the rural area around Livermore has been 100 acres. In the mid-1980s, the Wentes proposed to divide a 200-acre site, Crane Ridge, into ten 20-acre parcels with vineyards and home sites. As Eric Wente put in his 1991 oral history, “a hundred acres was not large enough to support a grazing cattle ranch, and it was much too large to encourage individual investment for intensive agriculture, either orchards, vineyards, or any other such intensive agriculture.”

Wente went on to describe a study of the Napa Valley that the Wentes had commissioned that showed that “over 40 percent of the parcels in the Napa Valley floor in the prime winegrowing district are twenty acres or less in size. . . . during the late sixties and all the way through the seventies it allowed a vast diversity of investment to come into the Napa Valley and participate in the burden of the wine business” (Eric Wente, 1991).

The Wentes saw Crane Ridge as a model for new vineyard development where housing would pay for new vineyards whose grapes would be used by local wineries. The Crane Ridge division was approved, with Wente establishing the vineyards and placing each parcel in a conservation easement. Crane Ridge became not just a model for new vineyards, but for new housing developments as well.

Save the Vineyards, a civic action group now known as Friends of Open Space and Vineyards, was established in 1981 in response to the urban growth of Livermore and Pleasanton and the perceived decline of viticulture. In 1987, the Board of Supervisors brought together land-use planners and elected officials from the cities of Pleasanton and Livermore, urban and rural property owners, and concerned citizens such as those active in Save the Vineyards, to establish the South Livermore Valley Area Plan (SLVAP). The process took six years and was finally approved by the Alameda County Board of Supervisors in 1993. It was spurred on by both the Crane Ridge and Ruby Hill developments.

The Ruby Hill property was located between and south of the cities of Livermore and Pleasanton. The developer, Signature Homes, proposed to convert about 1,000 acres of the old winery’s vineyards and buildings into a golf course and homes. The project was initially approved by Alameda County in 1991. The County was then sued by the cities of Livermore and Pleasanton, contesting the development. The lawsuit negotiations and the development of the South Livermore Area Plan took place concurrently and both were settled in 1993, with the approval of both a plan for the development of Ruby Hill and the approval of the South Livermore Valley Area Plan.

The South Livermore Valley Area Plan included approximately 14,000 acres of land surrounding the southern and eastern sides of the City of Livermore. It called for an expansion of Livermore's vineyard acreage from the then 2,100 acres to "a minimum acceptable level" of 5,000 acres (SLVAP p. 10), and it proposed that land converted to housing would pay for such an expansion. Two mechanisms facilitated more vineyard acreage: (1) an investment of \$8.5 million in the creation of a land conservancy to be used to purchase development rights, and (2) a requirement that an acre of new vineyards, or some other form of permanent agriculture, be planted for each acre converted to housing. The "Vineyard Estates" at Ruby Hill, which consisted of more than thirty home sites on 20-acre parcels that were planted to vineyards and placed into conservation easements, followed the example set by the Crane Ridge development.

The basic mitigation formula was straight forward: For every acre of land converted to urban use, one acre of agricultural land would be planted to vineyards or orchards and placed into a conservation easement to preclude future development. In addition, each housing unit required that an acre of land be placed into permanent agriculture and conservation easement. By this formula, one acre of agriculture land that was split into five 0.2-acre home sites required that six acres of permanent agriculture be established and placed into a conservation easement as mitigation. Unfortunately, the mitigation vineyard had to be a new vineyard—the replanting of an existing but old vineyard did not qualify.

The South Livermore Valley Area Plan generally required that approximately 90 percent of a parcel be in permanent agriculture, allowing ten percent for a building envelope. Further, it required proof of at least eight years of vineyard maintenance. A contract to purchase grapes for eight years was considered such proof. The South Livermore Valley Area Plan was a compromise between developers and community members. But the establishment of new mitigation vineyards was the result of the economics of housing development, rather than the result of a series of economic decisions by landowners that more grapes would be demanded by Livermore and California wineries and that these new vineyards would be profitable investments.

Once accepted by the Board of Supervisors, the SLVAP had the force of law, but, like Napa's Agricultural Preserve, it could also be undone or modified by the Board of Supervisors. In 2000, modification was made significantly more difficult with the passage of Alameda County's Measure D, which locked in place existing land use policy. Measure D required that changes to established land-use policy, aside from technical points, be approved by popular vote, rather than by a vote of the Board of Supervisors.

1990 to 2020: Livermore Grape Acreage

The developers of the South Livermore Valley Area Plan assumed that the plan would encourage the development of wineries by increasing the supply of Livermore grapes. The plan thus called for an expansion of “cultivated agriculture to the maximum acreage possible with a minimum acceptable level of 5000 acres” and for “the development of additional wineries with a range of sizes” (SLVAP, 1993, p. 10). Livermore’s grape acreage in 2020 was about 2,800 acres far below the 5,000-acre minimum. The number of wineries has grown, but most of the new wineries are quite small and fulfill neither the plan’s stated goal of “a range of sizes” nor the unstated goal of increasing the demand for Livermore Valley grapes.

Table 4.1 shows the estimated number of new wineries established in the Livermore Valley by decade. The figures are derived from the websites of Livermore Valley wineries and slightly underestimate the total number of new wineries as it does not include currently-operating wineries without websites or wineries that began but which are now out of business.

Table 4.1: Estimated Number of New Livermore Wineries by Decade

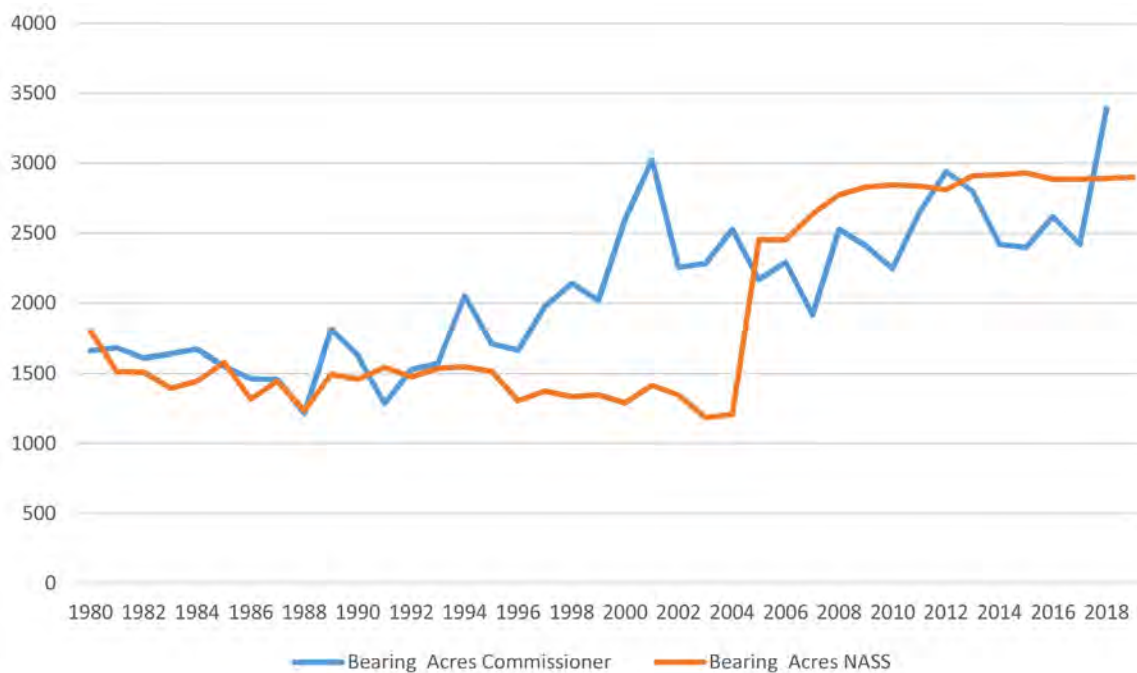
Decade	Number of New Wineries
1990-1999	7
2000-2009	11
2010-2019	9

Source: Author data acquired from winery websites

The vast majority of these wineries produce very little wine. According to the bw 166 data presented in Section 1, only two wineries, Wente and Concannon, produce over 100,000 cases (240,000 gallons) of wine in the Livermore Valley, while 22 wineries produce fewer than 2,000 cases (12,000 gallons). In aggregate, these 22 wineries use grapes from approximately 66 acres. They contribute only a rounding error to the demand for Livermore grapes. Most of these wineries seem to have been started by individuals who have aspired to transition from home to commercial winemaking or to build event centers, which wineries could operate in areas not zoned for banquet halls. These wineries have remained quite small, focused on direct from the winery sales rather than sales through distributors.

Determining Livermore's vineyard acreage precisely over time is difficult as acreage is only reported at the county level and the two sources, the Alameda County Agricultural Commissioner's *Annual Report*, and the USDA's National Agricultural Statistical Service's *California Grape Acreage Report* often report very different numbers for the same year. Figure 4.1 shows the reported bearing winegrape acreage for the entire County of Alameda from 1980 to 2018 as reported by the two sources.

Figure 4.1: Alameda County Winegrape Bearing Acres 1980-2018



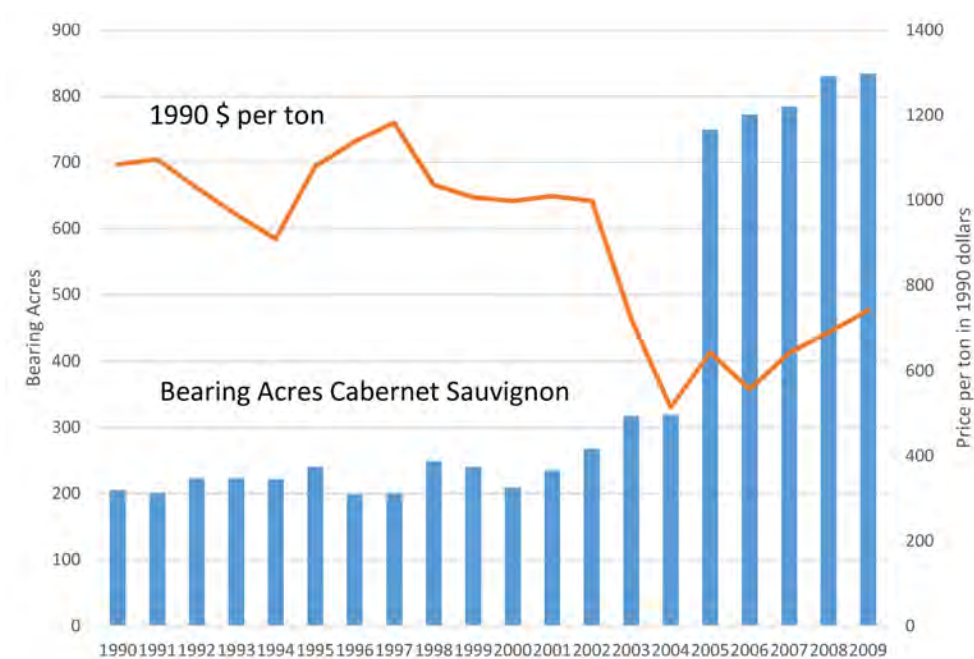
Sources: Alameda County Agricultural Commissioner's Reports and National Agricultural Statistics Service
California Wine Grape Acreage Report

The two sources differ in almost every year and, for the period between 1996 and 2004, they differ dramatically. In 2001, the Alameda Agricultural Commissioner reported 3,023 bearing acres of winegrapes, while the NASS report showed just 1,417. We don't know which is the most accurate. The NASS report showed a huge jump of bearing acres in the single year of 2004, which may indicate that NASS under-reported acreage from about 1996 to 2004. However, as discussed below, during the late 1990s and early 2000s, at least 1,500 acres of mitigation vineyards were planted in the Livermore Valley, and so the major increase in bearing acres reported by NASS in 2004 may be correct and it is possible that the Alameda County Agricultural Commissioner's reports overstated earlier plantings. The other problem with both sources is that the data are for all of Alameda County, rather than the Livermore Valley. Although some winegrapes are grown in Sunol and Castro Valley, it is probably safe to assume that at least 95 per cent of Alameda County's grapes are located in the Livermore Valley.

Assuming that Livermore accounts for 95 percent of Alameda County's vineyards, the NASS data or the data from the Alameda County Agricultural Commissioner show that Livermore's bearing acreage was a bit under 1,500 acres in 1993 when the SLVAP was approved. The SLVAP claimed 2,100 acres of grapes in 1993 but does not state whether these included non-bearing and fallow acres. It is possible that Livermore had 600 non-bearing acres in 1993. The Crane Ridge project had 150 acres that were not yet bearing in 1993 and the 1990s were period of strong profits for California wine in general, so other new vineyards may had been planted in 1991 and 1992 and were not yet bearing.

Figure 4.2 plots the price of Crush District 6 prices for Cabernet Sauvignon grapes in 1990 dollars (the solid line) with the NASS data on acres of Cabernet Sauvignon vineyards in Alameda County for 1990 through 2009. The 2002-2004 price drop for Cabernet Sauvignon grapes from Crush District 6 is seen clearly in Figure 4.2, as is the more than 400-acre jump in bearing acreage that corresponds to new plantings just as the high price period was ending. (Note, we use County and Crush District data because we do not have price and acreage data for Livermore specifically.) Livermore accounts for approximately half of the Cabernet Sauvignon production in Crush District 6, which also includes Santa Cruz, Santa Clara, Contra Costa, San Mateo and San Francisco Counties. There is no reason to think the movement of prices over time would be much different within the crush district.

Figure 4.2: Bearing Acres of Alameda County Cabernet Sauvignon and Inflation Adjusted (1990 Dollars) District 6 Price per Ton for Cabernet Sauvignon, 1990-2009



Source: NASS California Wine Grape Acreage Report and NASS California Grape Crush Report, 1990-2009.

The acres of vineyard planted in the later 1990s and early 2000s, both statewide and in Livermore, caused red grape prices to fall throughout the state and in Livermore once these new vineyards came into production. The fall in prices that occurred between 2002 and 2004 preceded the increase in Alameda County Cabernet bearing vineyard acreage. This indicates that the demand for Cabernet Sauvignon from Livermore was not separate from the general demand for coastal Cabernet Sauvignon.

By our calculations, Livermore's mitigation vineyards totaled 1,500 acres in the late 1990s and early 2000s. This mitigation acreage added to existing vineyards that were periodically replanted by established wineries to replace declining vineyards and to respond to the consumer demand for red wine. Additionally, there were also new (non-mitigation) plantings by others who responded to the projected winegrape profitability and improved water availability from Zone 7. We estimate that, in total, between 1,900 and 2,100 total acres of vineyards—either new or replants of existing vineyards—were established in Livermore in the late 1990s and early 2000s. Of these, at least 1,500 were mitigation vineyards. Table 4.2 lists the mitigation vineyards known to us by date and vineyard acreage. This list may be incomplete.

Although Livermore is a distinct wine district, it is also a part of the California supply of winegrapes. As discussed in Section 2A, grapes grown in similar climatic areas generally have similar characteristics and generally can substitute for each other.

Table 4.2: Livermore Mitigation Vineyards by Year and Vineyard Acres

Vineyard Name	Vineyard Acres	Year Planted
Crane Ridge	150	1992-1993
Hayes	125	1995
Callahan	130	1998
Smith	147	1998
Reuss Rd./Silva	100	1999
Ghielmetti	65	1999
Eric	100	1997-2000
Sachau	83	1999
Vineyard Estates	460	1999-2002
Del Arroyo	134	1999-2002
Total	1,494	

Source: TVC and public records, conversations with industry members.

Substitution is limited to some degree by Federal labeling laws that require that 85 percent of the grapes used to produce wine come from the named American Viticultural Area (AVA) if the AVA is named on the label, and that 75 percent of the grapes used to produce wine be from the county named, if a county appellation appears on the label. If a Livermore winery labels its wine as from the Livermore Valley AVA, that winery has a very narrow range of substitutes for Livermore-grown grapes, as only 15 percent of the wine could come from grapes grown outside the Livermore Valley AVA. Conversely, if a winery produces wine labeled as “California,” it can draw from grapes grown anywhere in California. Such a winery may use Livermore Valley grapes, but will not pay a premium for those grapes relative to other grapes of similar characteristics, and will quickly shift to other coastal regions if the grapes grown in those regions are similar to and less expensive than Livermore grapes. There is only a very small group of California wineries willing to pay a premium for Livermore grapes and once Livermore growers produce more grapes than are likely to be used by Livermore wineries, all Livermore grapes not under contract come into price competition with grapes from other regions. This occurred during the 1990s and is still taking place today.

Conclusion

The 1993 South Livermore Valley Area Plan sought to protect agricultural land by requiring that developers plant approximately six acres of new vineyards and place them in conservation easements for each acre of land converted to housing (actual number of acres depended upon housing density) and pay into a fund to finance conservation easements. The South Livermore Valley Area Plan and Measure D have effectively ended the conversion of agricultural land to housing and the funds provided by the Ruby Hill developers have been used to purchase conservation easements on existing rural properties, although not necessarily to develop vineyards or orchards on those properties.

The expectation that the South Livermore Valley Area Plan would somehow create a dynamic wine and grape industry in Livermore that would place Livermore on equal footing -- at least in reputation if not in size -- with Napa and Sonoma has not occurred. Livermore's flowering in the 1880s was due to the individual and collective efforts of wealthy individuals who aspired to compete with the world's best wine producers. The SLVAP called for an increase in the number of wineries in the valley. That has occurred, but the majority of these new wineries produce fewer than 2,000 cases of wine and require only small quantities of Livermore grapes. In 2021, only one large winemaking company with national and international reach and a focus on producing wine from Livermore Valley grapes is active. Together, the 1993 SLVAP and the 2000 Measure D have effectively ended conversion of vineyard land to housing by increasing the cost to developers. However, the resulting conditions have failed to attract the level of investment necessary to make Livermore competitive in the national and world markets for luxury wine.

Section 5.

The Cost of Growing Grapes in the Livermore Valley

For more than 80 years, the University of California has produced “Cost and Return” studies that describe typical costs to produce certain crops in various California regions. The studies gather narratives and information from meetings with farm cooperators, UC Cooperative Extension advisors and other industry members to identify the usual operations and production practices required to establish and produce a crop. This information is combined with information about input and output prices to determine costs and returns for a hypothetical, representative, well-managed, farming operation for a particular crop, region and year.

Vineyard studies use the hypothetical farm approach and make assumptions as to size, cost of land, availability of water, parcel characteristics and details such as whether the vineyard is part of a larger farming operation, and whether, for example, the vineyard applies organic (or biodynamic) restrictions and markets the grapes as organic (or biodynamic), all of which will affect investment and farming costs. An individual farm’s costs may and will vary from those described in the cost study for a given procedure, but the actual operations required to produce a crop represent those that are typical for a given region.



Source: TVC and public records, conversations with industry members

Cost studies are reviewed by local farm cooperators and UC staff prior to publication. Cost studies are used by investors, lenders, farmers, government regulators, input suppliers, researchers and many others who wish to understand agricultural costs and returns. Cost studies are used by just about everyone who wants to learn about typical farming operations for a crop in California. To better understand vineyard establishment and production costs in the Livermore Valley, we conducted two cost and return studies for the Livermore Valley, one for Cabernet Sauvignon and one for Chardonnay. The studies are available at <https://coststudies.ucdavis.edu/en/current/>.

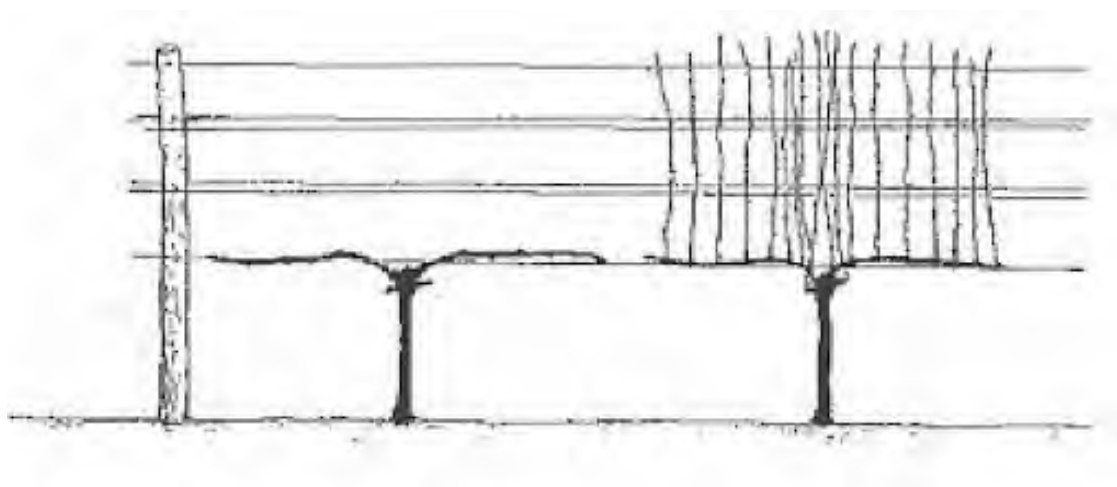
How Grape Vines Grow

To understand how vineyards are established and managed, let us review briefly how grapevines grow. Unlike trees, which develop permanent trunks, limbs and branches in order that their leaves can reach sunlight for photosynthesis, vines produce shoots with tendrils that use other structures as a scaffold. The vines climb the scaffold to light, where they flower and produce fruit. For grapes, which only produce flowers and fruit on new wood each year, vines must be pruned annually during winter dormancy if next year's fruit is to be located in a desired area of the vine. California viticulturists have developed trellis and pruning systems for California's sunny growing conditions. The most popular system is called the "VSP bilateral cordon."

A "bilateral cordon" means a grape vine with two arms at the same level on opposite sides of the grapevine. In establishing a vineyard on a trellis system, a grapevine is planted and a shoot is allowed to grow up a stake up to and past the cordon wire. The following winter, this shoot, which will become the grapevine's trunk, is pruned just below the cordon wire. The next spring when the vine emerges from dormancy and begins to grow, two new shoots are allowed to grow from the trunk along the cordon wire. These shoots harden into canes and become the "cordons" that extend on either side of the main trunk. Like the trunk, the cordons are permanent parts of the grapevine and are not pruned once established.

In the third year, shoots grow from buds on the cordons. Over the growing season these shoots harden into canes, flower and bear the grapevine's fruit. The next winter when the vine is dormant, these canes will be cut almost back to the cordon, leaving one or two buds where new canes will extend from the cordon the next year. The pruning process is repeated each year and "spurs" develop along the cordons. These spurs become the location for one or two new shoots at each spur position along the cane. The bilateral cordon system is easier to view than to describe and can be seen in Figure 5.1 below, a diagram of a bilateral cordon, spur-pruned, vine after and before pruning. By pruning in the same location each year, the vine's fruit is in the same area above the cordon each year.

Figure 5.1: A bilateral cordon trained vine after pruning



Source: Ferrandino and Bravo, 2016

The term “VSP” stands for “vertical shoot positioning” and refers to a management technique that forces the shoots to grow upward. The shoots are held upright by sets of wires on either side of the shoot that run laterally above the cordon. These guide wires force the shoots upward. One of the main advantages of the VSP system is that it allows the vine’s leaves equal access to sunlight and results in the fruit clusters being located in a zone about a foot above the cordons. The main disadvantage to the VSP system is that it is labor intensive, as it requires workers to either raise the existing guidewires or install new guidewires two or three times during the growing season as the shoots grow upward. Despite this labor cost, most coastal vineyards use the bilateral cordon, VSP trained, system. For that reason, it is used in the Livermore and many other winegrape cost and return studies.

Cost and Return Study Assumptions and Cost Categories

Assumptions

As noted, two winegrape cost and return studies in the Livermore Valley were produced: one for production of Chardonnay grapes and one for production of Cabernet Sauvignon grapes. In both studies we assumed a 40-acre existing farm with less than a three percent slope in the fields and with water rights from Zone 7. Ten percent of the 40 acres is used for roads, irrigation systems and buildings. Thirty-six acres are in an existing vineyard, 18 of which will be removed and replanted either to Chardonnay or Cabernet Sauvignon.

As with all cost studies, the parcel is valued at its agricultural use, which in this case is \$25,000 per acre, which includes water rights to 40-acre feet of water from Zone 7. Funds invested in land have an opportunity cost, since the money could have been used for other investments. Cost studies attribute an annual non-cash overhead expense for the cost of the owned land used for farming. In this study, we apply a 5.5% cost each year, which comes to \$1,375 per acre, similar to the cost of land rent, except that the cost of the owned land is considered to be part of the capital recovery. The study incorporates depreciation on vineyard infrastructure and equipment. For example, the cost of a 2,400 square foot shop building with appropriate tools and equipment are included in the overhead costs.

In these studies a hired vineyard management company establishes and manages the vineyard. Most owners of vineyards of 40 acres or less in the Livermore Valley use vineyard management companies. The vineyard management company charges \$771 per acre as its management fee, in addition to specific operational costs that are recharged to the property owner.

Cash Operating Costs, Cash Overhead, and Non-Cash Overhead

Cost and return studies group costs into three categories. Costs associated with a particular operation, such as spraying a vineyard for mildew control or raising trellis wires for vertical shoot positioning, are considered “cash operating costs” and are accounted for in the year they occur. “Cash overhead costs” are costs associated with maintaining the vineyard each year but which are not directly associated with a particular operation. Property taxes, equipment repairs, liability insurance, and sanitation costs are examples of “cash overhead” expenses.

“Non-Cash overhead” expenses are capital expenses not paid annually in cash that last the life of the vineyard. These expenses including depreciation as an annual expense and an interest cost (the opportunity cost of invested capital) is charged annually, although the actual investment was made earlier. Examples of non-cash overhead expenses include interest and depreciation on expenses of establishing trellis and irrigation systems, general depreciation on buildings and equipment, and an interest cost on the land.

Vineyard Establishment Procedures and Costs

Costs of vineyard establishment are the same for both varieties. However, the net cost of establishment subtracts the value of three tons per acre of grapes harvested and sold in year three. Since the assumed price of Cabernet Sauvignon is \$1,600 per ton and the price of Chardonnay is \$1,400 per ton, the net cost is \$600 higher for the Chardonnay grapes to reflect the lower third year revenue by \$200 per ton for three tons.

Land Preparation

In our cost studies, the new vineyard is being planted on land that was previously a vineyard. The old grapevines are removed in the fall following harvest, and are pulled, piled, and burned. Soil amendments including compost and gypsum are spread and disced into the soil. The land is then ripped in opposite directions to a depth of six feet to breakup hardpan, improve root penetration and water infiltration, and to pull up any remaining roots from the previous vineyard. The ground is then disced again, rolled three times and leveled with a landplane. These operations are all performed in the fall after harvest, but are considered part of the first-year planting costs. These costs are estimated to be \$6,690 per acre.

Irrigation System

The main parts of an irrigation system include buried lateral lines, pumps, filters, drip lines and emitters. These are generally installed during the first year. Lateral lines, a pump to pressurize the system and a filter to keep the system clean are usually put in place after deep ripping and before the trellis system is installed, with the drip lines and emitters laid out after the trellis is in place with a low wire for support of the drip line and to keep it off the ground. This irrigation system, which delivers water to the plant, costs about \$1,650 per acre. The irrigation system delivers Zone 7 water from the South Bay Aqueduct and the amortized cost of the irrigation system does not include the approximate \$200 per acre foot of water required for each acre of vineyard.

Trellis System

Vines require support and vineyard trellis systems are a major investment, estimated to cost \$6,948 per acre, depending upon the cost of steel. Vines are generally planted every five feet within rows, with a metal stake at the start and end of each vineyard row and every third vine within the row. These stakes carry six wires on each row: A wire to carry the drip irrigation hose, a wire at 32 inches to support the cordons, and two sets of paired moveable wires to support the vertically positioned fruit-bearing shoots. All these wires are secured at the end of each row to steel tubes, driven into the ground.



Source: Monica Graham



Source: Tri-Valley Conservancy



Source: Tri-Valley Conservancy

Vines and Planting

Vineyard rows are typically eight feet apart and vines are five foot apart within rows. Such an 8 x 5 spacing requires 1,089 grafted vines per acre and each grafted vine costs \$3.50. Vines are planted by hand in the spring and are generally either wrapped, placed in protective cartons, or put in grow tubes to protect the young vines from animals and herbicide spray. The total cost to plant an acre of vines is estimated at \$6,262. Approximately five percent of the vines will not grow well and will need to be replaced the second year, and two percent will need replacing in the third year. This brings total planting costs for an acre of vines to \$6,734 per acre.

Cultural Operations and Costs

During the first three years, general agronomic work such as weeding in vine rows, mowing the native cover crop between the vine rows, fertilizing and irrigating the vines, and spraying for mildew will be performed, with the amount and costs of operations increasing each year as the vines mature. This is in addition to the specific work of training and suckering the vines in the second year and then shoot positioning the new shoots and moving the trellis wires for vertical shoot positioning in the third year. All of these cultural costs total \$7,795 for the first three years of vineyard establishment.

Harvest, Assessments, and Interest Costs

We assume a yield of three tons per acre in the third year. Harvest costs and grape hauling is estimated at \$304 an acre. Assessments for the American Vineyard Foundation, Pierce's Disease, State inspection and the Grape Acreage and Grape Crush Reports total \$12 per acre in the first year of production. Interest on operating capital totals \$996 for the three years of vineyard establishment. Interest, harvest and assessments total \$1,312 for the three years of establishment

Total Operating Costs

The total operating cost per acre for vineyard establishment, which is derived by adding pre-planting costs, planting costs, cultural costs, harvesting, assessments and interest on operating capital, comes to \$31,130.

Vineyard Establishment Cash Overhead Expenses

Cash overhead expenses associated with establishing a vineyard also add costs. These costs include office expenses, liability insurance, sanitation for workers, property taxes and insurance, repairs and required safety training. In total, our cost studies estimate that these cash overhead expenses average a bit under \$575 a year and total \$1,733 for the three years of vineyard establishment.

Vineyard Establishment Non-Cash Overhead Expenses

Non-cash overhead expenses include the depreciation on buildings, tools, equipment such as ATVs and spray rigs, and the irrigation delivery and trellis systems. Non-cash overhead also includes a 5.5 percent interest charge on the cost of the land, which, at a valuation of \$25,000 an acre is \$1,375 a year.

The total non-cash overhead for the three-year pre-productive period of vineyard establishment totals \$4,710, of which \$4,125 is the “opportunity cost” of holding land as an investment.

Total Cost to Establish the Vineyard

In our cost studies, which attribute an interest cost to the land, total cost to develop a vineyard and to bring it into production is \$25,473 per acre of vineyard. This cost will be amortized over the 27-year predicted economic life of the vineyard. The total cost per acre is summarized below for Cabernet Sauvignon.

Land Preparation	\$ 6,690
Irrigation System	\$ 1,650
Trellis System	\$ 6,948
Vines and Planting	\$ 6,734
Cultural Costs (3 years)	\$ 7,795
Harvest, Interest, Assessments	\$ 1,312
Cash Overhead	\$ 1,733
Less Grape Income 3rd Year	<u>\$(4,800) for Cab and (\$4,200) for Chardonnay</u>
Non-cash overhead	\$ 4,710

The total net establishment cost is \$32,772 as of year 3 for Cabernet Sauvignon.

Cost to Produce Winegrapes

The Annual Cycle

Once a vineyard is established, cultural operations follow an annual cycle. Pruning the vines generally occurs in February, followed by tying the cordon arms to the cordon wire and suckering shoots from the trunk base in February and March. Fertilization is done via the irrigation lines in March and vines will then be irrigated as needed from March through August, generally requiring an acre foot of total water per acre of vineyard.

Bud break and shoot growth generally begins in late March, requiring shoot thinning and shoot positioning in March or early April. Shoot positioning also entails moving the shoot wires upward by hand several times as the shoots grow in April and May. From April through mid-July, sulfur will be applied to control mildew. The number of applications varies, depending upon the growing season and level of humidity, but average six sulfur applications supplemented by one or two applications of other materials. If the leaf canopy becomes too dense to allow air and light penetration to the clusters of grapes, leaves will be removed mechanically, requiring a pass through the vineyard with a specialized machine.

Weed and pest control are on-going operations during the growing season. Weeds within rows are controlled via strip spraying, requiring at least one spray pass through the vineyard in April and again in June. The middles between the rows are mowed to control weeds in May and July. Pest monitoring is continual and generally will require some application of materials to control mealybug and leafhoppers in June and mites in July.

Harvest generally occurs in September and the vineyard will receive a postharvest fertilization via the irrigation system in late September or early October, before the vines go dormant in November. In February, the process begins anew.

In total, our cost studies estimate that cultural costs during a typical production year come to \$3,482 per acre for Cabernet Sauvignon and \$3,382 per acre for Chardonnay, which, unlike Cabernet, does not require mechanical leaf removal.

Harvest, Assessments and Interest

Harvest is done using a contacted custom harvester and generally costs \$250 per acre to harvest and \$18 per ton for transporting grapes to a winery within the Livermore Valley. At seven tons per acre for Cabernet, hauling comes to \$126 per acre. Because we assume eight tons per acre for Chardonnay, the cost of hauling an acre of Chardonnay grapes is \$144 per acre. Hand harvesting is more expensive than mechanical harvesting and labor may not be available. When grapes are at optimum maturity, they need to be harvested. A delay in harvest may often result in a decline in grape quality and price. Mechanical harvesters cost between \$300,000 and \$400,000. Five per cent interest on a \$400,000 machine is \$20,000, while the harvesting cost of a 36-acre vineyard at \$250 an acre is \$9,000. No wonder, then, that owners of small vineyards will choose a mechanical harvesting service if one is available.

Two other expenses, assessments of \$29 and interest on operating capital of \$74, complete the list of cash operating costs for Cabernet. Since assessment costs are based on tons produced, the Chardonnay assessment is a bit higher than the Cabernet vineyard at \$33 per acre. The interest on operating capital for Chardonnay production is \$72 an acre, which is \$2 less than for Cabernet. Total operating costs thus come to \$3,961 per acre for Cabernet and \$3,881 per acre for Chardonnay.

Cash Overhead

These costs, which include liability and property insurance, taxes, office expenses, required worker trainings, and general repairs, have been discussed earlier in the section on vineyard establishment. The costs are a bit higher than during the pre-production years because more workers and more operations in the vineyard require more insurance, office expenses, and repairs. Our cost study estimates cash overhead expenses at \$869 per acre for Cabernet and \$875 per acre for Chardonnay. Total cash costs to farm an acre of vineyard in our Livermore studies come to \$4,830 for Cabernet and \$4,756 per acre for Chardonnay.

Non-Cash Overhead

The two largest non-cash overhead expenses are the attribution of a cost to land (\$1,375 per acre) and the annual interest and depreciation of the vineyard establishment costs, which comes to \$2,019 per acre for Cabernet and \$2,062 per acre for Chardonnay. For both expenses, the studies use an interest rate of 5.5 per cent, which reflects either the costs for farm borrowers charged by farm lenders for business investments or the opportunity cost of capital for considering investment of equally long and illiquid investments. A vineyard is a 30-year investment and a loan to a farming operation is likely riskier than is a 30-year home mortgage secured by an adequately appraised value of the home. This rate is probably below the 'hurdle rate' that most investment firms would use for similar, undiversified and illiquid, investments and is clearly below the average long-term return to investments in a portfolio consisting of the S&P 500 stocks. In the case of the Livermore vineyard in our study, which is valued at \$25,000 per acre, a 5.5 percent interest rate yields an annual non-cash overhead charge of \$1,375 per acre.

Attributing a cost to the investment made in establishing a vineyard must consider vineyard depreciation. The vineyard is expected to produce for 27 years and thus the investment is depreciated over that time period. In addition, an interest charge is made against the declining balance, as this money could have been invested elsewhere. Over the vineyard's productive life span, vineyard depreciation and interest create an annual non-cash overhead charge of \$2,019 for Cabernet for 27 years.

In addition to these two major non-cash overhead charges, there is a \$194 annual charge for depreciation and interest on the shop building, fuel tanks, tools and equipment. These costs would be somewhat higher if the property owner performed all vineyard operations rather than using a vineyard management company. Unlike the vineyard itself, these items all have some salvage value, while it is assumed that the vineyard establishment costs have no value at the end of 27 years of production.

Indeed, there will be some cost to remove the vines and the trellis and irrigation systems before the land can be farmed to another crop or replanted as a vineyard. This brings the total non-cash overhead expense to \$3,587 per acre for the Cabernet Sauvignon vineyard and \$3,630 for the Chardonnay vineyard. Total annual cost per acre is \$8,417 per acre for the Cabernet Sauvignon vineyard and \$8,387 per acre for the Chardonnay vineyard.

Vineyard Income and Profitability: Production, Price and Profit

Vineyard gross revenue per acre is a function of tons of grapes produced per acre and the price paid per ton of grapes. This cost study uses projected yields for the new vineyard planted to the specifications listed and managed following practices indicated. These practices indicate yield per acre above the average for the region based on typical “mitigation” vineyards having approximately 40% fewer vines per acre (660 versus 1,089), which has depressed yields in the region. For prices, the cost study uses a projected price based on having a prearranged “home” for the grapes with a planting contract and market prices consistent with high quality grapes for the region. However, recently, planting contracts for readily available grapes, such as Cabernet Sauvignon and Chardonnay, seem to be rare in the region. The full range of prices for Crush District 6, for which annual data are available, indicates a sizable share of listed prices (about one-third for Chardonnay) that are very low, much lower than the prices used in the cost study. Those prices likely reflect either distressed spot market transactions or non-market transactions within linked grape growing and wine making enterprises.

For Cabernet Sauvignon, the cost and return study uses a yield of seven tons per acre and a price of \$1,600 dollars per ton (2020 dollars). With revenue of \$11,200 per acre the vineyard is highly profitable. The Cabernet Sauvignon cost and return study projects expenses of \$8,417 per acre, resulting in an annual profit per acre of \$2,783. The Chardonnay cost and return study assumes a yield of eight tons per acre and a price of \$1,400 per ton, which would produce a gross revenue of \$11,200 per acre for an annual profit of \$2,813 per acre.

These prices and yields are based on current information about the future of a newly planted, well managed, vineyard. The cost study uses price and yield assumptions from historical records and assessments of the future situation may either be overly optimistic or may miss positive trends that raise profits.

The costs studies always include a ranging analysis that examines net return over operating costs, cash costs and total costs under alternative estimates, up and down, of quantity of output per acre and market price. For winegrapes, the key numbers reflect the range in revenue minus *total costs* because so much of the overall cost of production is the annual value of the initial capital invested in land at the time the vineyard was established rather than annual operating costs.

For the Cabernet Sauvignon vineyard, the yield range is from 4 tons per acre and 10 tons per acre and the price range is from \$1,150 per ton and \$2,050 per ton. For the Chardonnay vineyard, the yield range is from 5 tons per acre and 11 tons per acre and the price range is from \$950 per ton to \$1,850 per ton. These ranges are considered to cover the likely prices and yields given year to year fluctuations. The cost study computed profits associated with each price yield combination. The ranging analysis for Cabernet Sauvignon appears below in Table 5.1.

Table 5.1: Net Return per Acre above Total Costs for Cabernet Sauvignon

PRICE (\$/ton)		YIELD (ton/acre)					
Wine Grape	4.00	5.00	6.00	7.00	8.00	9.00	10.00
1150.00	-3,804	-2,659	-1,513	-367	779	1,925	3,071
1300.00	-3,204	-1,909	-613	683	1,979	3,275	4,571
1450.00	-2,604	-1,159	287	1,733	3,179	4,625	6,071
1600.00	-2,004	-409	1,187	2,783	4,379	5,975	7,571
1750.00	-1,404	341	2,087	3,833	5,579	7,325	9,071
1900.00	-804	1,091	2,987	4,883	6,779	8,675	10,571
2050.00	-204	1,841	3,887	5,933	7,979	10,025	12,071

Source: "2021 Sample Costs to Establish a Vineyard and Produce Winegrapes, Cabernet Sauvignon Variety, Livermore Valley Alameda County, Crush District 6"

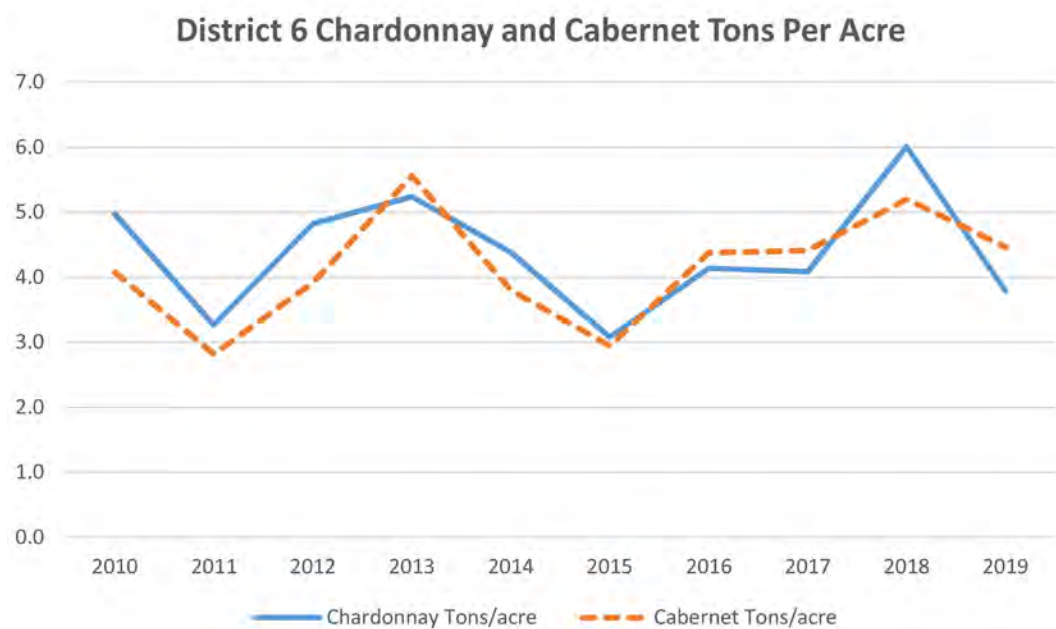
Historical Yields and Prices for the Region.

As context for understanding that the cost study reflects revenues above historical trends for the broader region, we examine historical yield per acre and grape prices for Crush District 6, of which the Livermore Valley is a part. For this analysis we use two sources, the National Agricultural Statistical Service's *California Grape Crush Report*, which reports price and tonnage of grapes crushed by variety and region, and the *California Grape Acreage Report*, which reports bearing grape acreage by variety and region. Crush District 6 includes the counties of Alameda, Contra Costa, Santa Clara, Santa Cruz, San Mateo and San Francisco. Livermore comprises approximately 95 per cent of Alameda County's winegrape production and, depending upon grape variety and year, the Livermore Valley, accounts for roughly half of all District 6 grape acreage and production.

Production

For the decade from 2010 through 2019, yields averaged 4.4 tons per acre for Chardonnay and 4.2 tons per acre for Cabernet Sauvignon. Figure 5.2 shows the tons per acre for each variety for the decade.

Figure 5.2: Tons per Acre for Cabernet and Chardonnay Vineyards in District 6 from 2010 through 2019.



Source: NASS California Grape Acreage Report and California Grape Crush Report, 2010-2019.

Computations by Authors

Clearly, the yields applied for the newly planted, well managed, Livermore vineyards with proper clone and rootstock selection are well above those for the historical average of the whole district, which continues to suffer from low vine density in mitigation vineyards.

Price

In 2019 (before the pandemic affected 2020 season), the average prices (from Table 10 in the Crush Report, which lists weighted average prices for grape purchases between non-related growers and wineries) in Crush District 6 were \$997 per ton for Chardonnay and \$1,258 for Cabernet Sauvignon.

Both of these average prices, and especially the Chardonnay price are below those assumed in the cost and returns study. Moreover, winegrape prices were lower in 2020 due to smoke concerns and other factors.

Table 8 in the crush report provides the full list of reported prices. For Chardonnay, if we ignore the prices from two listing of \$100 per ton and \$225 per ton and the few tons at prices above \$3,000 per ton, the “trimmed” average is about \$1,430 per ton, just above that assumed in the cost study. For Cabernet Sauvignon the effect of trimming the high and low prices is less dramatic but still significant. If we remove the listings with prices at \$660 per ton or less and the high prices with listing from \$3,500 to \$6,200, the weighted average of the remaining prices is \$1,697 per ton, which is above the price assumed in the cost study.

Based on these calculations we can think of the cost study price range as reflecting the most likely prices for higher yielding vineyards, leaving out those that are either very low or very high, which reflect special circumstances of certain low yielding vineyards.

Conclusion

The Cost and Return studies for Chardonnay and Cabernet Sauvignon establishment and production in the Livermore Valley show that the net establishment cost for a new Cabernet Sauvignon vineyard of 18 acres is \$32,773 per acre in year three, totaling just under \$590,000 while the establishment cost of a Chardonnay vineyard is \$33,373, totaling just under \$601,000 for an 18-acre vineyard. Annual operating costs per acre for these new vineyards are projected to be just over \$8,400 (2020 dollars) a year for the next 27 years—the productive life of the vineyard. We assume higher than historical grape yields because of improved plant materials, vine density and vineyard practices.

We assume prices that reflect high anticipated grape quality and management and marketing success. Under these conditions the new vineyards are profitable. Of course, Livermore winegrapes are a very small part of the total Region III grape supply. That means much of the conditions that affect the grape price may occur outside Livermore.

Moreover, much will happen to alter supply and demand for California coastal grapes and wine over the next three decades, and these changes will affect the prices for Livermore grapes and the profitability of Livermore vineyards. Thus, as with other farm investments, planting a Livermore vineyard remains a risky undertaking.

Section 6.

Analysis of the 2020 Livermore Winery Survey and Implications for Winery Profitability

Survey Overview

The previous sections of this report have been based on publicly available information, generally from government agencies. While the information is quite useful, it often is not specific to Livermore wineries and vineyards. In order to better understand the conditions in the Livermore Valley, we created two surveys, one for vineyard owners and one for winery owners. These surveys were mailed by the Tri Valley Conservancy.

Respondents were promised confidentiality and that their responses would remain with U.C. Davis and would be aggregated in such a way that individuals and firms could not be identified in the report.

Respondents could return their surveys three ways. First, they could log on to a confidential survey site and upload their answers there. Second, they could scan or take a photo of their responses and send it via email to the lead researcher, James Lapsley. Third, they could mail their responses to Lapsley in a stamped and addressed envelope. As promised, we have respected respondent anonymity. If specific firm names are mentioned in this section, it was with the firm's or individual's permission.



Source: Ruby Hill Winery

The winery survey requested information on total tons crushed in 2019 by variety, tons crushed by variety grown in the Livermore American Viticultural Area (AVA), and prices paid for those grapes. These are questions that are also asked in the California Grape Crush Report, which allows comparisons of Livermore with other crush districts. The winery survey also asked the number of cases bottled in 2019, the number of cases sold in 2019, distribution channels, gross revenue, gross margin and net profit. While we would have liked to have asked for more information, we feared that more questions would reduce the number of responses. A copy of the winery survey can be found in the appendix to this report.

The mailing list of winery owners was created by reviewing a list of Federal permit holders obtained from the Tax and Trade Bureau's website and comparing that list with lists held by the Livermore Valley Winegrowers Association. Over 50 winery surveys were mailed. We received 16 winery survey responses from the approximately 48 wineries operating in the Livermore Valley. This represents a 31 percent response rate, which is considered a good response for such surveys. More importantly, the responses were from wineries of all sizes and roughly mirror the size distribution of Livermore wineries discussed below. As with most surveys, not every respondent answered every survey question and some responses to the financial questions indicate that some respondents did not fully understand terms such as "gross margin." In some places in this section we mention specific wineries. This is done with their permission and is not a violation of our promise of confidentiality.

Just under one-third of Livermore Valley wineries submitted survey responses. Sixteen wineries of all sizes participated. Six wineries sold fewer than 1,000 cases; six sold between 1,000 and 6,000 cases, two sold between 10,000 and 25,000 cases and two sold over 100,000 cases. One of the 16 wineries did not crush grapes in 2019. All respondents reported data on total grapes crushed, grapes crushed from the Livermore Valley AVA, and information on tons and prices paid by variety for Livermore Valley grapes. Ten wineries provided financial information on gross sales, gross margin and net profit, and an eleventh provided information on profitability but not on sales or margin.

Grapes Crushed and Purchased from Livermore Valley AVA by Variety

Although Livermore vineyards produce all the major grape varieties grown in California, 10 of the 15 wineries that crushed grapes in 2019 purchased grapes from outside the Livermore Valley for their firm's use. These wineries may not be typical—we have no way of knowing—but the finding that most of the wineries in our sample imported grapes from outside Livermore was unexpected. The largest winery in the Livermore Valley, Wente Vineyards, was also the largest importer of grapes. This is not new.

As discussed in Section 3 of this report, Wente Vineyards has had major vineyard holdings in Monterey County since the 1960s and has crushed its Monterey grapes at its Livermore winery since the 1960s. About a third of the grapes used by Wente Vineyard at its Livermore winery were from outside the region. The remaining 14 wineries that crushed grapes in 2019 processed 1,238 tons of grapes, of which 1,067, or 86 percent, were from the Livermore Valley.

Winery size did not seem to be a factor in whether Livermore wineries crushed grapes from outside their region. Although three of the four wineries that only crushed grapes from the Livermore Valley AVA sold fewer than 1,000 cases, the other two wineries that crushed grapes in 2019 and sold fewer than 1,000 cases did import grapes from outside the Livermore Valley AVA. Given the sample size, it is impossible to determine a trend between winery size and use of Livermore Valley AVA grapes. Fourteen of the 15 survey respondents that made wine in 2019 purchased some grapes from the Livermore Valley AVA, and ten of the wineries also grew grapes. Tables 6.1 and 6.2 summarize by variety the tons of Livermore Valley AVA grapes, the number of individual transactions and the weighted price per ton purchased by responding wineries.

Table 6.1: Livermore AVA Red Varieties Purchased by Livermore Wineries by Variety, Number of Transactions, Total Tons and Weighted Price per Ton in 2019

Variety	#	Tons	Price		Variety	#	Tons	Price
Barbera	1	2.5	\$2,960		Mourvèdre	1	1	\$1,600
Carmenere	1	1.4	\$875		Petite Syrah	7	90	\$1,261
Cab. Franc	9	42	\$2,630		Petite Verdot	8	64	\$2,559
Cab. Sauv.	19	746	\$1,383		Sangiovese	2	2.2	\$1,881
Grenache	1	2	\$1,600		Syrah	6	24	\$1,768
Malbec	7	68	\$2,118		Tempranillo	2	4	\$1,375
Merlot	6	386	\$1,467		Zinfandel	3	5.6	\$1,512

Source: Winery Survey, Calculations by Authors

Table 6.2: Livermore AVA White Varieties Purchased by Livermore Wineries by Variety, Number of Transactions, Total Tons and Weighted Price per Ton in 2019

Variety	#	Tons	Price		Variety	#	Tons	Price
Chardonnay	9	235	\$1,135		Semillon	2	1.8	\$1,800
Pinot Blanc	1	3.6	\$1,300		Viognier	1	2	\$2,000
Sauv. Blanc	7	45	\$1,381					

Source: Winery Survey, Calculations by Authors

In total, 1,729 tons of grapes grown in the Livermore Valley were purchased by 14 wineries that submitted responses. This tonnage, at a hypothetical 5 tons per acre, represents the product of perhaps 346 acres, or about 12 percent of Livermore's vineyard acreage. A couple of points stand out. First, red grapes are generally valued more highly than white grapes. White grapes, which are usually picked at lower levels of sugar concentration than are red varieties, can be cropped at higher levels than red varieties. For the vineyard owner, eight tons of Chardonnay per acre at \$1,135 a ton is roughly comparable to five and a half tons per acre of Zinfandel at \$1,512 per ton.

Second, those varieties with higher total tons purchased, such as Cabernet Sauvignon, Merlot, and Chardonnay, are generally valued less than are varieties with fewer total tons. Growers of varieties such as Cabernet Franc or Petite Verdot that are desired by wineries but which are not yet widely planted may receive higher prices for those particular varieties than for other red varieties due to scarcity. However, grape varieties have a way of coming into and falling out of favor, and higher prices generally spark new plantings or grafting, which, in a few years, increase supply and lower prices. Put differently, it seems unlikely that the current high price per ton for Petite Verdot or Cabernet Franc will be maintained if both varieties become widely planted in the Livermore Valley unless Livermore develops a reputation outside the Livermore Valley for growing these varieties.

We also compared prices paid by Livermore wineries for Livermore AVA grapes in 2019 by variety with the weighted average price for the same varieties from Crush Districts 6, 7, and 11 in 2019.

Crush District 6 comprises the counties of Alameda, Contra Costa, San Mateo, San Francisco, Santa Clara and Santa Cruz. Crush District 7 is composed of San Benito and Monterey Counties. Crush District 11 is mainly the northern portion of San Joaquin County with a portion of the southern part of Sacramento County. In all but a very few instances, the prices paid by the reporting Livermore wineries for Livermore Valley grapes are higher, often significantly so, than the average weighed price for the same variety grown in District 6. Table 6.3 compares the weighted average prices paid by variety by the 14 Livermore wineries that reported purchasing Livermore grapes with the weighted average price for the same variety grown in Crush Districts 6, 7 and 11 as reported in the 2019 *Grape Crush Report*.

Table 6.3: 2019 Average Weighted Prices for Major Livermore Grape Varieties Purchased by Responding Livermore Wineries Relative to District Weighted Average Prices

Variety	Livermore	District 6	District 7	District 11
Cab Franc	\$2,630	\$2,546	\$1,567	\$571
Cab Sauv.	\$1,383	\$1,257	\$1,300	\$655
Malbec	\$2,118	\$1,670	\$1,320	\$637
Merlot	\$1,467	\$942	\$956	\$597
Chardonnay	\$1,135	\$997	\$1,338	\$520
Sauv. Blanc	\$1,381	\$802	\$1,196	\$560

Source: Table 10 of 2019 California *Grape Crush Report* and Winery Survey Responses

Depending upon variety, the 14 Livermore wineries paid as little as a 3.2 per cent premium for Livermore Valley grown Cabernet Franc grapes and up to a 72 percent premium for Livermore grown Sauvignon Blanc when compared with the weighted average of each variety grown in Crush District 6. The 14 Livermore wineries also paid a premium for Livermore Valley grapes relative to the same variety grown in Crush District 7, with the exception of Chardonnay, which, as discussed in Section 2A, is better adapted to the cooler climate of District 7. As discussed in Section 5, a wide range of prices is reported for each variety in every crush district and Crush District 6 is no exception. In Section 5, we noted that about one third of all purchases of Chardonnay in 2019 were for either \$100 or \$225 per ton, not a price that would be planned when a vineyard was planted and clearly a signal of a severe issue.

As we will see in Section 7, which analyzes vineyard survey responses, the prices paid by the 14 reporting wineries were significantly higher than the Livermore Valley average. Three possible explanations are relevant. First, if a winery specializes in making wines from the Livermore Valley AVA, at least 85% of the grapes used for the wine must come from the Livermore Valley AVA. It may be that Livermore wineries will pay more for Livermore grapes than will wineries outside the Livermore valley because using the Livermore Valley AVA on their bottled wine is a way for Livermore wineries to differentiate themselves from other California wineries outside the region.

A second reason may be that wineries consider the specific grapes they purchased to be of higher quality than other Livermore Valley grapes. These wineries are, after all, local, and may be presumed to know the local vineyards and growers. Finally, the data responsible for the Livermore weighted average may include some distressed sales of grapes that lost their contract or simply did not have a "home." All three reasons probably apply to some extent.

Winery Profitability and Distribution

The survey found that the majority of responding wineries reported that they were unprofitable in 2019. Most respondents sold more than 90 percent of their wine direct from the winery and did not engage in inter-state commerce. We discuss both findings and provide some industry context below. We note that the number of financial responses represent only slightly more than 20 percent of Livermore's wineries as counted by the bw166 list presented in Section 1. However, we have no reason to believe that the responses are unrepresentative of most wineries in the Livermore Valley.

Ten of the 16 winery respondents shared financial and distribution data, while an eleventh winery answered some, but not all, of the questions. The wineries responding ranged in size. The two largest wineries sold between 10,000 and 20,000 cases, four sold between 1,000 and 10,000 cases and the remaining five sold fewer than 1,000 cases. We do not provide more specific numbers of cases sold in 2019 in order to protect winery confidentiality.

Three wineries reported losses, four reported no profit, and four reported profits from just above zero to over a half million dollars. The answers, as seen in Table 6.4, show a wide range of cost of goods between wineries and cause us to speculate that some wineries did not fully account for all of their costs. We discuss this concern in detail below, but first turn to a brief discussion of wineries as businesses, general levels of profitability in the California wine industry, and the pre-Covid economic environment for California wineries.

Wineries are capital intensive businesses. They must provide for an adequate physical plant, fermentation tanks and equipment that is used for four to six weeks during the harvest to process grapes and which is otherwise idle the rest of the year. In addition, they must provide a temperature-controlled environment for bulk and bottled wines as well as tanks and barrels for wine storage and aging. Inventories are often carried for several years prior to sale, which adds further costs and reduces cash-flow.

This is especially true for red wines that are generally aged for two years prior to release. A typical winery producing red wine in 2019 will crush 2019 grapes during the harvest, will have a cellar of 2018 wine in barrels (and perhaps 2017 wine as well), and will have cases of recently bottled 2017 wine that are being offered for sale (if the 2016 vintage has sold through). The typical winery is thus carrying three years of inventory, which include the cost of grapes, barrels, crush and cellar labor, power for refrigeration and equipment, chemicals and supplies, as well as the depreciation on the physical plant and the interest on any money borrowed for the physical plant.

We purposely limited the number of questions in both surveys to balance ease of completion with completeness of information. For this reason, in the winery survey we only requested information for 2019, although we would have liked to have had data from earlier years. 2018, the previous year, was a pivotal year for California wine: It was the largest harvest on record and, for the first time since the early 1980s, the total volume of California wine sales in the United States did not grow.

We will not spend time speculating as to why consumption of California wine seems to have stalled—report readers interested in the subject are directed to the Silicon Valley Bank’s “State of the Wine Industry Report 2020”, which is available on the internet—but it is important to realize that most California wineries entered 2019 with full cellars of bulk wine from the record 2018 harvest and with larger than expected inventories of bottled wine due to the downturn in domestic consumption of California wine.

The impact of the downturn is reflected in the Silicon Valley Bank’s estimate of pretax profit of the hundreds of wineries to which it loans money. From 2015 through 2018, the pre-tax profits had averaged ten percent, but fell by almost half to 5.3 percent in 2019. Silicon Valley Bank is a major lender to the U.S. wine industry and generally only lends to profitable companies with established histories. Given that Silicon Valley Bank’s winery clients experienced reduced profitability in 2019, it is not surprising that six of the ten Livermore wineries that completed the survey showed no profits or losses. Reported profitability is summarized in table 6.4.

Table 6.4: 2019 Profitability of Ten Livermore Wineries by Cases Sold, \$/Case, \$COG/Case and % Direct

Winery	Profit	Cases Sold	\$/case	\$COG/Case	% Direct
1	-44K	<1,000	413	45	100
2	-65K	1,000-10,000	370	175	95
3	-137K	>10,000	137	68	60
4	0	<1,000	247	128	100
5	0	<1,000	344	65	97
6	0	1,000-10,000	200	67	47
7	23K	<1,000	168	34	100
8	30K	<1,000	270	160	100
9	100K	1,000-10,000	305	58	90
10	560K	>10,000	236	101	85

Source: Winery survey and calculations by the authors.

Two points stand out. First, several of the wineries, most notably numbers 1 and 7, but perhaps winery numbers 3, 5, 6, and 9 as well, seem not to be giving a full accounting of their cost of goods sold (COG in the table). This is important because a higher cost of goods would reduce gross margin and overall profitability even further, turning the three wineries that reported no profits negative.

Grapes are the single largest component in cost of goods. Cabernet Sauvignon grapes purchased for \$1,383 a ton and yielding 60 cases a ton of finished wine (a high yield for red wine stored in barrels for two years) would have \$23 a case cost of goods just in grape costs. Wine bottles, closures, capsules and labels will cost a small winery at least \$15 a case, bringing the minimum cost of goods for a small winery to around \$38 per case. The actual bottling cost will be at least \$4 a case if a mobile bottling line is used, which requires six to eight workers, and if the wine is sterile bottled.

Barrels, which can hold about 25 cases of wine, will add a minimum of \$5 a case and a new French oak barrel purchased for \$1,000 and sold after two years for \$200 would add \$32 a case if the resulting wine was 100% aged in new French oak barrels. The best French barrels cost 50% more. In addition, winemaking and aging expenses, which include personnel, energy and supplies also add to the cost of goods. Depending upon a winery's choice of oak, we estimate that a full accounting for the cost of goods of a typical Livermore Cabernet Sauvignon should range from between \$55 to \$60 a case at the low end, to \$80 to \$90 a case at the high end. We present Table 6.4's figures as they were reported to us, but suspect that a scrupulous accounting of cost of goods would lower the profitability for most of these wineries.

The second point that stands out is the importance of direct sales to gross revenue. We calculated the gross revenue per case (\$/case) by dividing 2019 reported gross revenue by the reported number of cases sold in 2019. Revenue from wine sales was separated from income derived from other activities such as rental of space for events or sale of food. For those wineries with only direct to consumer sales, the average bottle price seems to be between \$20 and \$30 a bottle. Two wineries, numbers 3 and 6, have both lower-than-average gross revenues per case due to lower percentages of direct sales than the other eight wineries.

In California, wineries may legally sell direct to consumers, to retailers and to wholesalers, who then sell to retailers. The advantage of direct sales to consumers is that wineries often receive their full asking price, although they also incur the cost of operating a tasting room and discount their wine from the list price for club members. Most off-premise retailers in California such as liquor and grocery stores operate on a 33 percent margin when selling wine. East Coast liquor stores operate at 50 percent margin or more. A winery that sells a \$30 bottle of wine at the winery must thus sell that same bottle to a California retailer for \$20 a bottle if the retailer is to maintain the \$30 shelf price. Wine sold to a wholesaler is generally sold at half price, in this instance, \$15 a bottle, so that the distributor can sell the wine to a retailer at \$20 and recover sales and distribution costs. The advantages of sales to retailers and distributors are presentation to a much wider audience of potential consumers and larger volumes of wine sold. The disadvantage is, of course, a lower price for the wine sold.

Wineries with a small quantity of production may be better off financially selling as much of their wine as possible direct to consumers and local retailers and restaurants. One caveat is that such wineries may have high explicit or implicit costs of retailing, including the value of the time of retail sales personnel and the operator (who may be the same busy person for small wineries). Direct sales to local retailers and restaurants take time, and if the experience is enjoyable, it may be time well spent, whereas if direct sales are a bother, then direct sales may be expensive. Such costs are obvious and explicit when a winery hires an outside salesperson.

Wineries 3 and 6 seemingly have chosen a different strategy than the others in the group: Both wineries sell a portion of their wine to out-of-state distributors as well as direct to retailers in California. Such distribution sells a higher volume of wine to better spread fixed overhead costs, but at a lower price per bottle. From the perspective of the Livermore grape growers, this strategy may bring the Livermore Valley AVA to the attention of a wider group of wine consumers than do direct sales from the winery. Our 2019 data were derived before the period of COVID-19. In 2020, wine consumers switched channels, increasing their purchases from grocery stores and online, and drastically reducing purchases at restaurant, bars and tasting rooms, most of which were closed for some portion of 2020 due to state regulations. During 2020, wineries 3 and 6 may have benefitted from their strategy of diversifying beyond direct-from-the-winery sales by increasing their volume of wine sold due to channel shifting of consumers.

Conclusions from the Winery Survey

If the winery survey responses are representative of most Livermore wineries—and we have no reason to think that the responses are not representative—most of Livermore’s wineries are quite small businesses operating on the edge of profitability. The smallest 40 wineries on the bw166 list, many of which augment their production with grapes purchased from outside the Livermore Valley AVA, collectively require the output of about 250 acres of Livermore’s vineyards—less than a tenth of the current acreage. The focus on cellar-door sales makes sense for the individual wineries, as most do not seem to have the resources or desire to compete with other wineries for sales to retailers or wholesalers, but direct-to-consumer sales do little to build Livermore’s reputation in the broader marketplace.

As one winery owner put it in a phone interview, “We have generally just broken even. We have professional jobs outside the winery and don’t need to turn this into a profitable business. The winery allows us to make more wine each year than we did as home winemakers. We get to experiment with different varieties, and interact with interested consumers. We do it for the fun, not the money.” It is doubtful that more wineries such as these will either strengthen the AVA’s regional or national reputation or raise the price of Livermore grapes, thus encouraging Livermore’s viticulturists to expand and/or re-plant their acres.

Section 7.

Analysis of the 2020 Livermore Vineyard Survey and Implications for Vineyard Profitability

Vineyard Survey

As was the case for winery production and profitability described in Section 6, publicly available information on vineyards did not allow analysis of Livermore's vineyard acreage by variety, costs of production, or general vineyard profitability. For that reason, we conducted a survey of Livermore Valley vineyard owners. As was the case with the winery survey, we promised respondents complete anonymity and that responses would be grouped in such a way that no individual vineyard could be identified. We report our finding in this section. The vineyard list for this survey, presented in Section 1, was derived primarily from the Alameda County Agricultural Commissioner's "Growers List" for 2020.

The Commissioner's list gives very useful information on the number and sizes of Livermore vineyards. It does not describe grape varieties grown, typical yields, how yields vary by variety, how much water is used, the price of grapes by variety, and, most importantly, the cost of grape production, all of which are necessary to determine the general profitability of grape growing in the Livermore Valley. A copy of the vineyard survey is Appendix 3 to this report.



Source: Lee Anna Koitmaa

To acquire more detailed information, we sent out over 130 surveys drawing from the Commissioner’s list and augmented by the Tri Valley Conservancy’s list of easement holders. We received 29 responses from vineyard owners and independent operators. We then contacted the four custom farming firms that provide farming services to the vast majority of Livermore’s small vineyards. We requested, that these firms supply information about the vineyards that they custom farmed or leased. From these respondents we received information on varieties and yields for an additional 42 Livermore vineyards. Thus, in total, we acquired information on 71 Livermore vineyards, which is 56 percent of Livermore’s vineyards. These 71 vineyards accounted for 2,166 of Livermore’s vineyard acreage, or just over 77 percent of estimated total bearing acreage.

While most respondents supplied acreage by variety, responses were less complete for yields for 2018 and 2019 and responses on costs of production, grape prices and income were often missing. Still, enough financial responses were received that we can make some tentative comments on the general profitability of Livermore vineyards.

Livermore Varieties and Acreage According to Survey Responses

Livermore’s red grape acreage, as reported in the survey responses (which represent just under 80 percent of our estimated 2800 acres), account for 1,393 acres, or 62.9 percent of the survey responses’ acreage. According to the 2019 *California Grape Acreage Report*, 63.4 percent of California’s grape acreage was planted to red varieties in 2019. Livermore’s most planted grape variety is Cabernet Sauvignon at 832 acres. This is also true for California as a whole, although Cabernet accounts for 37.5 percent of Livermore’s survey reported acreage, and only 19.6 percent for the state. Table 7.1 compares Livermore’s four most planted varieties as a percentage share of Livermore’s reported planted acreage with the statewide share of the same varieties.

Table 7.1. Livermore’s Four Most Planted Varieties as a Percentage of Total Bearing Acres in Livermore and California.

Variety	Percent Livermore Acreage	Percent State Acreage
Cabernet Sauvignon	37.5	19.6
Chardonnay	27.8	19.4
Petite Sirah	8.3	2.5
Sauvignon Blanc	6.4	3.1

Source: Livermore Vineyard Survey (2020) and *California Grape Acreage Report* (2019) Computations by authors.

For most of the 20th century, Livermore was known as a region producing white wines with a particular focus on Bordeaux white varieties such as Sauvignon blanc and Semillon. Clearly, that has changed with increased consumer demand for red wines, which grew in the 1990s when many of Livermore's current vineyards were established. Chardonnay became the most popular white variety in the 1980s and remains the dominant white variety as is reflected in the California grape acreage statistics, where it accounts for over half (53 percent) of California's acreage planted to white varieties. In the Livermore Valley, Chardonnay acreage represents 75 percent of all white acreage.

Livermore's plantings of Petite Sirah and Sauvignon Blanc are partly explained by its history. Livermore has focused on Sauvignon Blanc since its beginnings in the 1880s and, starting in the 1960s, the Concannons were leaders in the promotion of Petite Sirah as a varietal wine. With almost two-thirds (65.3 percent) of its survey-reported bearing acreage devoted to Cabernet Sauvignon and Chardonnay, Livermore is heavily reliant on two varieties that are widely planted throughout California and for which Livermore growers do not receive a price premium relative to cooler coastal areas producing Chardonnay, or the Napa and Sonoma Counties producing Cabernet. Livermore growers who responded to the survey have planted 14 other red varieties in addition to Cabernet Sauvignon and Petite Sirah, but these seem to be relatively recent plantings.

Livermore Vineyard Age

Most California coastal vineyards have an economic life of about 30 years. Three years are pre-productive as the vineyard is established, and then, for the next 27 years, the vineyard is considered economically productive. Vineyards older than 30 years of age can certainly continue to produce grapes, but the yield per acre declines, primarily due to trunk diseases, making them uneconomic to farm unless the vineyard owner receives a premium price for grapes from an older vineyard. Although we do not have complete statistics, we estimate that about 1,900 acres of Livermore's 2,800 acres were established in the late 1990s and early 2000s and will be due to be replaced in the coming decade. This amounts to approximately 68 percent of Livermore's current acreage.

Vineyard survey responses reported 1,002 acres of vineyard planted between 1995 and 2002. These responses do not include the Crane Ridge (estimated 150 vineyard acres) or the Vineyard Estates at Ruby Hill (estimated 460 vineyard acres) projects, nor do they include the two mitigation vineyards established by Corbett at Del Arroyo (134 vineyard acres) and Ghielmetti (65 vineyard acres), or the Wente mitigation vineyard at Reuss Road (100 vineyard acres). These three vineyards total 299 acres of vineyard.

The actual number may be somewhat larger or smaller because not all vineyard owners responded to the survey and because some vineyards may already have been removed or re-planted.

These older vineyards will not be replaced unless owners believe that the investment of approximately \$33,000 per acre in development costs will be repaid over the life of the new vineyard. To date, few owners seem to have been willing to make such an investment, although some Crane Ridge vineyards are being redeveloped, possibly because continued agricultural activity is required as part of the Crane Ridge conservation easements. According to our survey responses, which admittedly represent only a portion of Livermore's vineyards, only 240 acres of new vineyards have been established from 2013 through 2017. An additional 109 acres have been grafted to different varieties, although grafting new varieties to old vines does not appreciably increase the life of the vineyard.

Livermore Vineyard Yields 2018 and 2019

The general range of vineyard yield is controlled broadly by water availability, climate and by weather, which varies each year. Assuming adequate irrigation, vineyards in warm Region III or cool Region IV areas, such as Livermore, should be able to produce between four and seven tons per acre for red varieties and between five and perhaps up to ten tons per acre for white grapes. Some winemakers believe that lower yields produce grapes with more intense flavors and are thus willing to pay higher prices for grapes from vineyards with lower yields. Decisions on yields per acre are generally made by the vineyard operator in the context of the price expected for the grapes and market preferences expressed in price or willingness to offer a contract for the grapes.

Not all survey respondents provided complete information for their vineyards—some provided information on acreage but not on yield. All of Livermore's larger vineyards are divided into separate blocks. Thus, in compiling the data, we have used vineyard blocks as the basic unit. We requested information on two vintages because vineyards do vary in production from year-to-year. We would have liked to have had more years of Livermore specific data, but that would have increased respondent burden. Year to year variation in tons per acre is reflected in Table 7.2 below, which shows that average yields for all red and white varieties were higher in 2018 than 2019, as reported by survey respondents.

Table 7.2: Livermore Average Yield from Reported Red and White Grapes Acres and Tons

Year and Type	Weighted Average Yield	Total Acres	Number of Observations
2018 All Red	7.0 tons/acre	629	60
2019 All Red	5.3 tons/acre	1243	117
2018 All White	9.7 tons/acre	509	44
2019 All White	5.9 tons/acre	649	62

Source: Vineyard Survey. Computations by authors

Three points stand out. First, 2018 produced an unusually high yield in Livermore as it did throughout California. Yields for Livermore red grapes in 2018 were, on average, 32 percent greater than in 2019. White varieties bore even heavier in 2018 than did red varieties, as 2018 yields were 64 percent higher than in 2019. Using data from the *California Grape Acreage Report* and the *California Grape Crush Report*, we compared District 6 yields for the years 2015, 2016, 2017, 2018 and 2019 and determined that 2018 was approximately 23 percent higher than the average of the other four years.

Based upon that, we use 5.3 tons per acre for red varieties and 7 tons per acre for white varieties as typical yields for Livermore vineyards in our calculations in this report. However, these yields are averages derived primarily from vineyards that are in their last decade of economic production. The higher yields assumed in the cost and return studies discussed in Section 5 represent what Livermore viticulturists believe to be obtainable from a modern vineyard using high quality planting stock and higher vine density.

A second point is that the reported acres used for both the 2018 and 2019 yield calculations represent a significant proportion of the estimated total Livermore vineyard acreage. The 2018 yield data are calculated on tonnage from 1,138 acres, a bit over 40 percent of Livermore's estimated bearing acres in 2020. The 2019 yield data are calculated from 1,992 acres, which represent approximately 71 percent of Livermore's acreage. A third point is that yield does vary depending upon variety, at least for the two years for which we have Livermore survey data. In both 2018 and 2019, Cabernet Sauvignon (436.5 acres in 2018, 773.5 acres in 2019) averaged 5.4 tons per acre. Chardonnay's weighted average yield in 2018, based upon 453 acres, was 9.8 tons per acre and fell to 5.7 tons in 2019 from 554.5 acres.

The reported yields in 2018 and 2019 are significantly higher than the District 6 average yields for the decade from 2010 through 2019 that were discussed in Section 5. This seems odd, as Livermore's acreage represents approximately 50 per cent of total District 6 acreage. If the survey reported data are correct, then the non-reported yields from Livermore and the other areas of District 6 must have been lower than those reported by Livermore survey respondents.

Grape Prices and Demand for Livermore Grapes

Grape prices reported by respondents to the vineyard survey for 2019 ranged from a low of \$400 a ton for a shipment of 250 tons of Cabernet Sauvignon to a high of \$2,400 for a seven-ton lot of Cabernet Sauvignon. Prices for small lots of grapes were generally reported as between \$1,500 and \$1,800 a ton. Except for the \$400 price, these reported prices were generally in line with prices for Livermore grapes reported by wineries in Section 6 and the Crush District 6 prices as discussed in Section 5. However, the grower-reported prices represent a small portion of all Livermore grapes. The prices reported by respondents were for grapes from just nine of Livermore's 125 vineyards, totaling only 109 acres of vineyard, less than four percent of Livermore's total acreage. We report these prices but note that they are not a broad sample and may or may not be representative. As discussed below, the fact that 19 vineyard owners chose to lease their vineyards for \$500 per acre rather than to farm their vineyards and sell their grapes is probably more indicative of the state of the current grape market in Livermore than are reported grape sales from nine vineyard owners.

As discussed briefly in Section 6, some Livermore wineries may be willing to pay a premium for Livermore Valley grapes, either because they differentiate their wines from those of non-local producers by using the Livermore AVA on their labels, or because they believe that Livermore Valley grapes are superior to those grown in other similarly priced areas in California. The fact that that winery respondents reported paying higher than the average District 6 price for Livermore Valley grapes might support this view. Conversely, ten of 15 wineries in the winery survey reported purchasing at least some of their grapes from outside the Livermore Valley. It is probably best to view Livermore grapes as a small part of California's coastal supply and that Livermore wineries prefer to purchase local grapes when convenient. In such a case, how many tons of Livermore grapes are required by Livermore wineries?

In Section 1, Table 1.2, we presented bw166's list of Livermore wineries, which included estimated total sales of wine from all sources by winery. In Table 7.3 below, we use winery survey information to estimate the volume of wine produced by Livermore's wineries from Livermore grapes. We then use these volumes and a yield assumption to determine the approximate vineyard acreage.

We assume an average yield of 5.9 tons per acre based on a Livermore vineyard mix of 62 percent red varieties with a yield of 5.3 tons per acre and 38 percent white varieties with a yield of 7 tons per acre. We further assume 55 cases of wine per ton of grape and calculate that the “typical” acre of vineyard produces 324.5 cases of finished wine. With these revisions, we calculate that Livermore wineries use grapes from just over 2,000 acres of Livermore Valley grapes.

This calculation assumes that wines labeled as from the Livermore AVA are produced using only Livermore grapes. Legally, Livermore wineries could use up to 15 percent wine produced from other California areas, such as Monterey. In such a case, the Livermore acreage required would be approximately 1,700 acres.

Table 7.3. Estimated Use of Livermore Vineyard Acreage by Winery Size

Case Size	# of Wineries	Total Cases Using 100% Livermore Grapes	Acres Using Livermore Grapes	Share of acres	Acres/ Winery
>100,000	2	500,000	1,541	76.1%	770
10,000-25,000	5	80,000	246	12.1%	49
2,000-6,000	19	60,000	185	9.3%	9.7
<2,000	22	17,000	52	2.5%	2.4
Total	48	657,000	2,024		

Source: bw166 sales data adjusted by survey responses. Assumes 55 cases/ton and 5.9 tons per acre. Calculations by authors

If our estimation from Table 7.3 is generally correct, then between 800 and 1,100 acres of Livermore grapes are sold for wine made outside the Livermore Valley. Winery survey responses showed that, with the exception of Chardonnay, respondent wineries paid a premium for Livermore grapes compared with the same varieties grown in other areas of Crush District 6 or in District 7. How do producers in other areas value Livermore grapes?

The short answer is not as highly as do Livermore wineries. One of the custom farming companies in the valley leases Livermore vineyards at about \$500 per bearing vineyard acre (and the owner must provide water, which is currently about \$200 per acre).

This farming company performs all cultivation, harvesting and marketing of the crop. The lessee prefers to sell the crop but, if the lessee cannot find a buyer, the lessee has the grapes custom crushed outside the Livermore Valley with the intention of selling the wine on the bulk market. Custom crushing is a last choice for most vineyard operations because it adds processing and storage expenses to the cost of the grapes and raises uncertainty and increases the time before the winegrape operation receives payment for the grapes.

In 2019, this custom farming firm leased 19 Livermore vineyards totaling about 560 acres and producing approximately 2,500 tons of grapes. The average yield was just 4.5 tons per acre, perhaps indicating that these were mostly older vineyards with declining yields. These leased vineyards represent 20 percent of Livermore's vineyard acreage. The lessee successfully sold 30 tons of mixed variety red grapes to wineries within the Livermore Valley for an average price of \$1,800 a ton. Another 120 tons of white grapes were sold to wineries outside the Livermore Valley for a weighted average price of \$1,146 per ton. A total of 330 tons of red grapes were sold to firms outside the valley at a weighted average price of just under \$500 per ton. The remaining 2,120 tons were custom crushed, with the resulting wine to be sold on the bulk market. The failure to sell a larger share of grapes for a price high enough to negate the option to crush for the bulk market is a bad signal for the demand for Livermore grapes outside the local area.

Costs to Grow Grapes

Although many vineyard owners responded about their cost per acre to grow grapes, it is clear from the range of reported costs that some responses were for direct cash costs for operating a vineyard only, while other responses included cash and non-cash overhead in their costs. The most common range was \$4,000 to \$5,000 per acre. This range fits closely with the Cost and Return Study reported cash operating cost of \$4,830 per acre for an 18-acre block of Cabernet Sauvignon. Over 80 percent of Livermore's vineyards are under 20 acres in size, and over 50 percent are under 10 acres in size. It is certainly reasonable that smaller vineyards would have higher per acre operating costs than the hypothetical 18-acre vineyard in the Cost and Return study. Several respondents cited expenses of between \$7,000 and \$10,000 per acre.

These respondents were associated with wineries and apparently used accountants who included non-cash overhead costs as part of the total cost of growing grapes. The cost and return studies estimated a full cost of \$8,417 per acre for a Cabernet Sauvignon vineyard developed in 2020. Considering that some of the vineyards had lower cost bases and that the costs were generally for vineyards half the size of those in the Cost and Return studies, the reported costs to grow grapes in the Livermore Valley largely agree with the costs from the two Livermore Cost and Return studies.

Profitability

We begin this section with the words of a Livermore grape grower who sent us an unsolicited cover letter with the completed survey. The letter describes one family's experience growing grapes in Livermore, but we expect it encapsulates the experience of many other Livermore grape growers.

"We planted our vineyard in the 1998-2000 period despite advice from several owners that we would not make money. That turns out to be the case: In the twelve years we managed the vineyard, we made a profit only one year, losing thousands of dollars in other years." They then leased the vineyard to a third party. "This allowed us to cover all our operating expenses except the original mortgage taken out to cover the initial planting and purchasing water rights from Zone 7." The lease ended last year, and the author continues "We now anticipate removing the vineyard as there is no interest from others to take on a lease and managing it ourselves is clearly not profitable." The owner concludes "All in all, our advice for future vineyard owners is to be prepared for the ups and down of the industry and have a stable market for your grapes before starting."

Are Livermore vineyards profitable? Some may be, but not the 19 vineyards that were leased for \$500 per acre and, after supplying water for irrigation at \$200 per acre, received \$300 per acre. Considering that the Cost and Return studies suggest a non-cash overhead cost of \$3,621 per acre to recover vineyard establishment costs, those owners clearly had very little return on their initial investment by leasing their vineyards at a low price. However, a return of \$300 per acre is better than nothing, and vineyard owners may use depreciation deductions to offset non-farm income the context of income taxes.

The Cost and Return studies estimate an operating cash cost of \$4,830 per acre to farm an 18-acre Livermore Cabernet Sauvignon vineyard and \$8,417 per acre when all costs are considered. Assuming a typical yield of 5.3 tons per acre for red grapes, a Livermore vineyard owner would need to receive \$1,588 per ton for red grapes to cover the full costs of establishing and managing a Livermore vineyard according to the 2020 Cost and Return studies. What is a vineyard owner to do if the expected \$1,588 a ton drops to \$1,000? With normal yields, the \$1,000 per ton price would cover operating cash costs, but clearly the owner would not recover all the initial investment made in establishing a vineyard.

However, the initial investment made in establishing a vineyard cannot be recouped by pulling the vineyard and ending production. Generally, as long as revenue from grape sales is above the actual annual operating cash cost of farming, an owner will continue farming the vineyard. This seems to be the situation that some, perhaps many, Livermore vineyard owners have been and are currently facing.

For many years some, perhaps the majority, of Livermore vineyards have not been profitable in the sense that they have not repaid their initial investment with an adequate rate of return. They have remained in operation because grape revenue was sufficient to fund vineyard operations and continuing the operation was the best option financially and perhaps for other reasons such as landscaping and tax benefits.

During the coming decade, at least 1,900 acres of Livermore vineyards will come to the end of their economic lifespan and will be removed. Given the recent history of grape production and prices in the Livermore Valley, it seems doubtful that most of this acreage will be replanted.

However, if The Costs and Returns study projections for prices and yields can be met, and if vineyard farming costs are not much higher than estimated, profitable production may be feasible. The challenge is to keep costs moderate while achieving strong yields and quality that allows acceptable prices.

Section 8. Summary and Concluding Comments

This concluding section revisits key findings and draws implications about the potential for expanding the total vineyard area in the Livermore Valley.

Vineyard Profitability

Probably the most important finding of this study is that many of Livermore's independent vineyards have not been profitable. While revenue may be sufficient to cover annual operating expenses, in many cases the amount of annual revenue above annual operating expenses is not sufficient to cover the amortized expenses of establishing a vineyard or to generate a return on the investment in vineyard.

Our vineyard survey gathered prices and expenses for 2018 and 2019. In addition, we have reports of the failure to generate a competitive rate of return on the investment from some vineyards over the past two decades.

It seems likely that low revenue relative to full costs, including land and vineyard establishment, is not a new phenomenon. The first decade of the 21st century was financially difficult for vineyard owners throughout California when prices fell upon the increase in grape supply due to the massive plantings of the 1990s.



Source: Earle Ipsen

In our survey, the fact that 29 Livermore vineyard owners lease their vineyards for net \$300 per acre is evidence of a low return on investment given that land and vineyard establishment was about \$33,000 per acre.

The low revenue relative to cost of many existing vineyards stands in sharp contrast with the finding of the 2021 Cost and Returns studies for Cabernet Sauvignon and Chardonnay described in Section 5. Both those studies present favorable economic outcomes for establishment and operation of vineyards that achieve the yields, prices and costs that are considered feasible for a new vineyard.

We note three major differences between the prospective cost and returns study and the recent experience of existing vineyards. First, many of the operating vineyards have yields that are more than 25% lower than expected for new vineyards. Second, the grape prices of the cost-study vineyards are above those of the average existing vineyard and more importantly are assumed to have a long-term contract that sets the price in a profitable range. Third, the cost-study vineyard is operated by a management company that, while not having especially low operating costs, assures relatively high yields, quality and prices, for a set management fee.

Most independent Livermore vineyards are small— half of all Livermore vineyards are under ten acres in size and 80 percent are 20 acres or smaller. These vineyards have higher operating costs per acre than larger vineyards and lower market prices than vineyards with contracts that are more suited to current market demands. Many of these vineyards are also relatively old and face a decision about replanting soon. Almost 2,000 of Livermore's 2,800 acres were planted between 1995 and 2003 and are now in or entering their third decade of production. Nut crops or olives might be an alternative to winegrapes, but most orchard crops demand more irrigation water than do winegrapes and, given a limited quantity of water available per acre to the region, a switch to orchard crops may reduce the potential for cultivated acreage in the Livermore Valley. Given the decades long experience of low returns on investment in vineyards, and especially the difficulty in finding a profitable market for grapes, it is likely that many vineyard owners will not invest in replanting unless they have a winery contract for their production.

Winery Profitability, Size and Modes of Sales

Wente crushes a large share of winegrape demand in the Livermore Valley. Only Wente distributes nationally wine with a Livermore appellation. Concannon and two smaller wineries distribute some of their Livermore wines to select out-of-state markets. The remaining wineries sell almost exclusively direct from the winery. Broadly speaking the Livermore Valley has been forgotten and mostly overlooked by national wine media and consumers.

Re-establishing a national market for Livermore wines is important, and any growth or increased recognition of quality would be helpful for the local market as well.

Most Livermore wineries are quite small. Forty-one wineries produce less than 6,000 cases, and 22 of those produce fewer than 2,000 cases. Using round figures of 55 cases per ton and five tons per acre, a 2,000-case winery requires the production from about seven acres of vineyard and a 6,000 case winery uses about 20 acres of grapes. We estimate that, in total, the 41 wineries under 6,000 cases in size use the production from only 250 acres of Livermore vineyards, less than ten percent of the current vineyard acreage. No realistic plan for a significant expansion of grape acreage can be based on those small wineries unless there were a transformation in the local market for wine tourism or a large increase in demand for Livermore wine among Bay Area wine retailers.

Currently, most Livermore wineries are marginally profitable at best. Most of the smaller wineries are part-time businesses operated by individuals with limited technical training and capital. Unlike Livermore's original wineries, the current group of smaller wineries seems to lack the financial means and perhaps the expertise to increase national or local reputation, price and profit potential of Livermore Valley wines.

A Look to the Future of Vineyards and Wine in the Livermore Valley Area

The 1993 South Livermore Valley Area Plan called for the development of at least 5,000 acres of vineyard in the Livermore Valley. The plan was approved at the start of an eight-year red wine boom that resulted in a doubling of California's vineyard acreage. Given the boom in red wine consumption, the 1993 goal of at least 5,000 acres of vineyards in Livermore probably seemed reasonable to the planners, developers and open-space advocates who had crafted the plan. Livermore plantings in the 1990s were spurred by the requirement for mitigation vineyards, which allowed aging vineyards near the city of Livermore to be converted to housing and created incentives for new vineyards to be planted to the south in the Arroyo Mocho or east in the Arroyo Seco.

The increase in Livermore vineyard acreage stalled at about 2,800 acres in the first two decades of the twenty-first century as the statewide planting boom of the 1990s reduced grape prices across California, including Livermore. Livermore's vineyards are separated from other California growing regions by the urbanized Bay Area. That helps provide a significant local wine tourism market, but does not insulate Livermore from supply and demand forces that affect the rest of the California grape industry. In fact, Livermore, is one among many coastal AVAs essentially growing the same grapes.

Every AVA, just as many individual wineries, has some measure of specialized local demand and may be able to influence the local price to some degree. But prevailing market conditions affect individual wineries and regions whether selling in the national market or direct-to-the-consumer from a winery in Livermore.

Some Livermore wineries pay a premium for Livermore Valley grapes to emphasize their home region on the wine label. As with other AVAs, 85 percent of a wine labeled as “Livermore Valley” must come from Livermore grapes. But, any price premium for the Livermore Valley AVA must reflect the degree to which customers prefer Livermore wine to the competition. Wineries using Livermore Valley grapes in wines with broader appellations such as Central Coast generally pay the same as for any comparable coastal grapes.

The Tri-Valley Conservancy was chartered and funded by the South Livermore Valley Area Plan. The plan’s goal of at least 5,000 acres is part of the Tri-Valley Conservancy’s mission. One clear finding from this report is that attempting to encourage more Livermore grape supply without stimulating additional demand for those grapes is unlikely to be successful. Insufficient grower returns are not a recipe to stimulate investment. We have found that there can be profitable vineyard and winery investment at suitable market prices, but any increase in acreage must be supported by increased demand for Livermore grapes and wine.

This report was intended to describe and analyze the economic situation and outlook for grapes and wine in the Livermore Valley, not to critique possible ways to encourage new vineyard plantings, or replantings, in the Livermore Valley. Nonetheless, two observations follow from our analysis. First, a specific acreage objective is no longer helpful for the economic health of the Livermore Valley grape and wine industry or the region as a whole. The goal to preserve agricultural open space in the South Livermore Valley has been successfully met without a specific winegrape acreage objective. Second, grape growing and winemaking are vibrant and linked industries driven by basic supply and demand principles. Where agricultural open space has local value to the community, public policies can usefully reduce regulatory burdens on those businesses to keep them economically sustainable. But even more important, an increased demand for Livermore wines would result in increased demand for Livermore grapes and encourage more acreage under vine. Thus, industry collective action to make Livermore grapes more attractive to a broader audience, and therefore more profitable, could be an effective tool to increase or at least maintain acreage.

Appendix 1: Benchmark Studies:

Santa Lucia Highlands

The Santa Lucia Highlands (SLH) is a grape growing region located in the foothills of the Santa Lucia mountain range on the west side of Monterey County's Salinas Valley. Encompassing 22,000 total acres of which perhaps 8,000 could be developed for crops, the east-facing benchland extends roughly 18 miles north to south, starting south of the city of Salinas to the north, and extending a bit south of the town of Soledad. The eastern edge of the Highlands begins just west of the Salinas and Arroyo Seco rivers. The "highlands" range in elevation, starting at approximately at 140 feet above sea level, which is about 20 feet above the Salinas Valley floor. The Highlands gradually increase in elevation as the benchland rises to the west into the Santa Lucia range, with the highest vineyards planted at 2,000 feet in elevation. Soils tend to be sandy loam with low water-holding capacity, generally requiring irrigation. The Santa Lucia Highlands became an AVA in 1991 and now has over 6,400 acres planted primarily to Pinot noir and Chardonnay, varieties that are well suited to the climate in what is mostly a Region I in the Amerine/Winkler classification.

The Livermore Valley and the SLH are both sub-AVAs of the Central Coast AVA and have similar acres of land suitable for viticulture. SLH grapes command a price premium to grapes grown elsewhere in the Central Coast.

There are salient differences. Livermore is essentially a winegrape island adjacent to a major metropolitan area. The SLH is part of a large and diversified agricultural area that grows winegrapes and much more and is not directly influence by suburban housing development. Agricultural water is tightly limited in Livermore but is more available and cheaper in the SLH, as ground water and the Salinas Valley basin are not (yet) in overdraft. SLH is part of a diversified farming region known for high-revenue farming companies. Viticulture seems to have developed in the SLH as a series of joint ventures between farm operations within or drawn to the region. The median size in the SHL region is approximately 50 acres and only ten of the approximately 50 vineyards are 20 acres or smaller. In contrast, 80 percent of Livermore's vineyards are smaller than 20 acres, based on the subdivision of larger parcels for 20-acre estate vineyard homes in the 1990s.

When the vinicultural potential of the SLH began to be widely recognized, major wineries either bought existing vineyards, started joint ventures with SLH farming families, or acquired land through purchase or long-term leases to establish vineyards. Today, those active in the region include several companies and winery-owning investors that have national distribution for their wines, are major vineyard owners, and operate about 40% of the SLH vineyard acreage.

These differences between the Santa Lucia Highlands and Livermore will be explored below, but one important vinicultural difference between the two regions is climatic, and deserves special attention.

Wine Market Importance of Climate for the Santa Lucia Highlands

Climate affects what varieties can best be grown in a given region. The extent of a climate zone affects the quantity of grapes of high quality (high willingness-to-pay by some buyers) varieties. So long as demand is sufficient, constrained supply results in higher grape prices.

Where Livermore is a warm region III and well adapted to the production of Bordeaux varieties such as Cabernet Sauvignon or Sauvignon blanc, the Santa Lucia Highlands is much cooler and excels in the production of Pinot noir and Chardonnay.

Following the early 2000s surge in popularity, Pinot noir is now the dominant variety, accounting for 3,500 of the SLH's 6,400 acres, followed by Chardonnay, with 2,200 acres. According to two Monterey viticultural consultants, who collectively manage 15,000 acres of Monterey County vineyards and who both own vineyards in the SLH, over the past five years Pinot noir prices have ranged between \$2,000 and \$3,500 per ton depending upon vineyard and farming practices. Yields generally are between four to five and one half tons per acre, depending upon the year and viticultural practices. Gross receipts are between \$10,000 and \$12,500 per acre for Pinot noir. (Note that, while not a rule, prices tend to be inversely related to yield narrowing the revenue range.) Chardonnay prices per ton are usually lower, ranging from \$1,500 to \$2,000 per ton, but SLH Chardonnay vineyards have higher yields than Pinot noir—generally producing five to seven tons per acre and thus produce a similar gross revenue per acre as Pinot noir.

Although market demand for a region, variety or brand may sometimes be increased through marketing, or by unexpected influencers such as the 2004 movie, "Sideways," the higher prices achieved by SLH growers primarily reflect the limited availability of cool coastal vineyard land. While Pinot noir is now widely planted in California (48,000 acres in 2019 according to the *California Grape Acreage Report*), there are six or seven fairly well-known and relatively small Pinot noir producing regions in California that command premium prices: the Carneros region in Sonoma and Napa Counties above San Pablo Bay with about 8,000 acres of total vineyard; the Russian River Valley, which ranges from Region I near the Pacific and warms to Region II west of Healdsburg and which contains 15,000 total acres of vineyard; Sonoma County's Petaluma Gap at 4,000 acres; the Anderson Valley in Mendocino county with about 600 acres; the Fort Ross area, a newer region with perhaps 500 acres; the Santa Rita Hills in Santa Barbara with approximately 2,700 acres; and the Santa Lucia Highlands with 6,400 acres.

The total acreage of cool weather Region I and II growing areas is thus about 38,000 acres. The Santa Lucia Highlands represents about 17 percent of California's cool weather growing areas. It and the Santa Rita Hills are probably the currently highest-priced areas for Pinot noir. In contrast, there are probably between 120,000 and 130,000 acres of Region III/low Region IV vineyards, of which Livermore's 2,800 acres, primarily planted to Cabernet Sauvignon, represent approximately two percent. The success of Cabernet Sauvignon in significantly larger AVAs, such as Napa Valley and Paso Robles, where Cabernet Sauvignon is the predominately planted variety, makes it unlikely that Livermore Cabernet Sauvignon will gain much special attention outside of its local area.

There are several other less popular Bordeaux-style grapes that fit in the same climatic zone as Cabernet Sauvignon. With small supplies of such grapes in the market now, if their demand were to jump soon, those growers with available supplies when the price rose would gain. Of course, if those grapes never take off, planting more of them would likely not pay off. Some suggest that the next grape varieties to gain popularity may be Cabernet Franc and the highly aromatic "Musque" clone of Sauvignon blanc, and that could be right. If growers in Livermore planted those varieties as they replant their older vineyards, they might gain attention as the SLH did for Pinot noir two decades ago.

First Phase of SLH Growth: 1960 - 1980

Monterey became a winegrowing region in the early 1960s, when wineries such as Mirassou and Wente, concerned about urban encroachment on their vineyards, began planting in the Arroyo Seco area of Monterey, to the south of the SLH. Following Mirassou and Wente, in 1963, the Paul Masson winery set out 1,000 acres of vineyard on the east side of the Salinas Valley at the Pinnacles. These early plantings were made by established wineries from outside the region that were looking for secure sources of coastal California grapes. In 2019 about 42% of the grapes crushed from District 7 (Monterey and San Benito counties) were owned by the wineries crushing the grapes. This rate is a bit higher than the 40% for District 4 (Napa County), and 37% for District 3 (Sonoma and Marin Counties).

Monterey vineyard acreage expanded dramatically during the wine boom of the 1970s. Bearing vineyard acreage rose from only 1,420 acres in 1971 to 25,102 acres just five years later.

The plantings in the Santa Lucia Highlands were led by Gerald McFarland, a U. C. Davis agronomy graduate, who had previously grown cotton and wine and table grapes in California's San Joaquin Valley.

Understanding agribusiness and tax law, McFarland brought together a group of investors and ultimately planted 11,000 acres of grapes near Gonzales, established a winery, the Monterey Vineyard, in 1974 (later sold to Coca Cola in 1979), and began the first winery brand in the Santa Lucia vineyards, Smith and Hook (1974). Like many of the new vineyard developers, McFarland initially misjudged the actual warmth of the northern Salinas Valley and planted Cabernet and Chardonnay, which were in vogue. The Chardonnay did well, but the wine produced from the Cabernet Sauvignon grapes grown in the northern end of the Salinas Valley was often vegetal, leading some consumers to discount the region's potential. Robert Talbott, the owner of a luxury tie manufacturing company, purchased the Sleepy Hollow vineyard from McFarland in 1982 (and later sold to Gallo in 2015). Nicky Hahn, a Swiss born, French educated, international businessman, entered the Salinas Valley and purchased the Smith and Hook winery and vineyard in 1979.

Expansion of the winegrape industry in the SLH required technical expertise, risk takers and capital. Recent graduates Rich Smith (Agribusiness major with a minor in viticulture from UC Davis) and Steve McIntyre (B.S. in Enology and M.S. in Viticulture from CSU Fresno) originally came to the Salinas Valley in the early 1970s to work for others, saw opportunities, partnered with nearby farm businesses, acquired land in what would become the Santa Lucia Highlands AVA and established farm management companies, ultimately farming thousands of acres of owned, leased and managed vineyards. In 1973, Smith formed a partnership of investors and set out a 320-acre vineyard, Paraiso, planted mostly to Chardonnay, Pinot noir and Riesling.

The 1970s in Monterey County was a time of optimism and experimentation as growers tried various varieties to see what would perform best in the new region. In some ways it is reminiscent of the 1880s in Livermore, when growers planted many varieties to learn through trial and error what varieties would produce the best wine in Livermore's climate. A look at the list of varieties with more than 1,000 acres planted in Monterey in 1976 shows the diversity. Cabernet Sauvignon, which was ultimately found to need the warmer climate found at the southern end of the Salinas Valley, led the list with 4,802 acres. Second was Zinfandel with 2,295 acres. Zinfandel was perhaps not a good choice for Monterey County, and 43 years later in 2019, only 885 acres are bearing.

Third was White Riesling with 2,098 acres, followed by Chardonnay, with 1,975 bearing acres. Chardonnay was to become the dominant variety in Monterey, although not in the SLH. Close behind Chardonnay was Chenin blanc, with 1,787 acres. In sixth place, with 1,646 acres was Petite Sirah, ahead of Pinot noir at 1,556 bearing acres. Pinot noir was to become the most planted red variety in Monterey County as a whole, and to dominate the Santa Lucia Highlands, but it took several decades for this to occur. The final two varieties with more than 1,000 acres planted were Merlot, with 1,221 acres, and Gamay, at 1,118.

During the 1970s and into the 1980s, the Santa Lucia Highlands was simply another growing region in Monterey, its grapes generally blended with those from other areas of the County. Nicky Hahn, Rich Smith and Philip Johnson, who had established the “La Reina” vineyard, recognized that the Santa Lucia Highlands was cooler than the rest of Monterey and that cool weather varieties such as Pinot noir and Chardonnay excelled in the region, especially with its eastern facing vineyard aspect that protected these thin-skinned grapes from the hot afternoon sun. In an attempt to capitalize on the SLH climate and to differentiate the area from the rest of Monterey, in the late 1980s they began the process of creating the Santa Lucia Highlands AVA.

The AVA was approved in 1991 and, for the first time, the appellation “Santa Lucia Highlands” could appear on a wine label. At the time there were only a few wineries located in the appellation, most notably Morgan, Talbott, Smith and Hook and Paraiso, and many buyers of SLH grapes were wineries from Napa and Sonoma. These wineries had established brands and national distribution and were seeking cool weather Pinot noir and Chardonnay to expand their product line. They began bottling SLH wines with the AVA on the label, often with a named vineyard, and the region began to attract notice.

The Maturing of the SLH: 1980 - 2000

Per capita wine consumption in the United States had leveled off during the 1980s, but during the 1990s, red wine per capita consumption tripled, leading to a new planting boom throughout California. During the late 1980s and through the 1990s, the increased demand for SLH grapes sparked vineyard development by both established growers and firms from outside Monterey. In 1986, Agustin Hunneus purchased the 84-acre Estancia Stonewall Vineyard (now owned by Constellation). In 1990 and 1991 the Hahns set out two new vineyards, the 134 acre “Doctor’s Vineyard” and the 146 acre “Lone Oak.”

In 1995, the sons of two local Salinas Valley farm families, Gary Pisoni and Gary Franscioni, joined forces to plant “Garys’ Vineyard” a 52-acre vineyard. Pisoni, whose family had owned cattle-land in the Highlands, had planted his first vineyard there in 1982. Franscioni, whose family owned a large row crop operation on the valley floor, expanded into wine grapes, ultimately planting several vineyards in the SLH and in other Monterey regions. Some of the grapes from the Pisoni and Franscioni vineyards are vinified by the Pisonis and Franscionis, but most of the production is sold to wineries.

About the same time that Gary’s Vineyard was planted, the Wagner family of Caymus Vineyards in the Napa Valley purchased two large parcels in the Highlands, the 663 acre “Mer Solier” and the 172-acre “Las Alturas”, and began planting.

The Chardonnay and Pinot noir from these vineyards later fueled the growth of several Wagner family brands. In 1996, the Gallos became SLH vineyard owners when they purchased the 617-acre Olson Ranch at the south end of the AVA, primarily to plant cool climate Syrah, which was in vogue at the time. The following year, the Smiths entered into a long-term lease with the Lindley family, planting out 509 acres of Chardonnay and Pinot noir. In 1998, the Mondavis came to the Highlands, entering into a long-term lease with the Bianchi family and establishing over 800 acres of vineyard. Clearly the Santa Lucia Highlands had come of age in the decade of the 1990s, with over 2,500 acres of new Pinot noir and Chardonnay vineyards planted both by established vineyard owners and by major California wineries with national and international reach.

Challenges of a Maturing Market and Limited Growth: the 21st Century

As production from California's vineyard plantings of the 1990s came to market in the first decade of the 21st century, grape prices generally declined throughout the state, lowering vineyard and winery profitability and reducing the number of new plantings. The growers of the Santa Lucia Highlands were somewhat insulated from this general price decline in grapes for two reasons. First, the market for higher-priced Pinot noir is a small part of the general U.S. market and there are few substitutes available. Second, according to Steve McIntyre, demand for higher-priced Pinot noir actually increased following the debut of the movie "Sideways" and the Syrah vineyards were rapidly grafted over to Pinot. Since the beginning of the 21st century, new plantings in the SLH have been limited not by lack of demand but by the fact that the most attractive sites in the Highlands have already been developed, leaving only marginal sites with higher development costs. In the past twenty years, growers have increased the value of their vineyards by introducing new clones and adopting farming techniques that increase the intensity of the Chardonnay and Pinot noir grown in the appellation.

Any Lessons from SLH for Livermore?

It is tempting to ascribe the success of growers in the Santa Lucia Highlands to their marketing efforts, but the main financial drivers are most likely the constrained supply of Region I and II grapes relative to demand and that there are few direct substitutes for these grapes. Other cool weather regions, such as the Santa Rita Hills and the Carneros, have also seen price increases for their grapes in the past twenty years, so marketing of the SLH is less of a reason for high grape prices than the reputation of the brands that use SLH on their labels. The SLH has achieved national recognition because wineries that purchase SLH grapes label those wines as from the SLH appellation, and place those wines into national distribution, just as they do with the grapes grown in the Carneros or the Santa Rita Hills. Without national distribution, it is almost impossible to develop a national reputation.

Another reason for the region's success is that these vineyards are run as businesses, not hobbies, by experienced agribusiness people. Whether the owners are from general farming enterprises, as was Jerry McFarland, or, more currently, the Pisonis and Franscionis, or from the investment world, such as the Scheids and the Hahns, or from wine production, such as the Gallos, Wagners, or the Mondavis, attention to profitability is paramount to these enterprises. Today, most vineyard operations are managed by a second generation of owners that has grown up in the business, studied agribusiness or business at a university, and is personally involved in their vineyard operations. Over the past two decades, as SLH vineyards have been replanted, attention has been on maximizing the qualities of the grapes grown in the Highlands. Growers and their consultants have increasingly focused on vineyard layout relative to site, clonal selection, and precision farming, so that the growers can deliver the grapes with desired qualities at a particular price to their winery clients.

The Santa Lucia Highlands AVA and the Livermore AVA are quite different in climate, but similar in the payoff from differentiating the grapes grown in their AVAs from the higher-yield, lower-cost-per-ton vineyards of the Central Coast or Central Valley. The SLH is a very cool region that specializes in the production of intensely flavored Pinot noir and Chardonnay that command a price premium. The Livermore Valley is a warm region III/cool region IV that can grow flavorful Bordeaux varieties, but which is in competition with the production from over 120,000 acres of similar vineyards, some of which have relatively low-cost-per ton. To gain maintain or increase profitability Livermore Valley grapes must be differentiated from lower-cost competitors. With small, barely profitable or unprofitable, vineyards and very small wineries that are focused on local, direct-to-consumer, sales the pressure to command a higher market price is even more intense. Grapes in Santa Lucia Highlands are generally grown in larger vineyards with some scale economies. Because it does not have a significant local tourist demand, unlike Livermore, for success the SLH must have a broad reputation among wineries and final consumers for the grapes it grows.

This short study of the Santa Lucia Highlands by Livermore winegrowers and wineries reinforces the importance of running an agricultural operation as a business that is focused on customer desires and driven by a quest for profitability, and which is based on an understanding of the dynamics of supply and demand. Further, the need to differentiate Livermore grapes from larger regions with similar climates, to attract outside investment in vineyard development, and to build a national reputation for at least one varietal that is well suited to the Livermore climate should be closely examined.

Benchmark Study 2: The Temecula Valley

The Temecula Valley is a part of a broad plateau at between 1,200 and 1,400 feet in elevation on the eastern side of the coast range, about 20 miles inland from the Pacific Ocean, and roughly 60 miles north of San Diego and 90 miles southeast of Los Angeles. The Temecula Valley AVA is located to the east of the city of Temecula, in the southwestern corner of Riverside County. The winegrowing area is similar to Livermore in several key ways. First, with approximately 2,500 acres of vineyards and about 50 small wineries, the Temecula Valley is similar in acreage and winery numbers to the Livermore Valley. Second, like Livermore, Temecula is a viticultural island, separated from other grape growing regions, although this geographic separation is more extreme for Temecula than for Livermore. Third, Temecula wineries, even more than Livermore wineries, are focused on direct sales to tourists, rather than national or regional distribution.

Fourth, both Livermore and Temecula rely on surface water deliveries from their local districts rather than pumping ground water. Fifth, Temecula grows the same French, Spanish and Italian varieties as does Livermore to provide variety to their cellar door visitors. A final similarity with Livermore is that most Temecula's wineries are less than twenty years old.

Of course, there are dissimilarities between the regions, too. First planted in the late 1960s, Temecula had no history of grape growing and winemaking and no historic vineyards that it wanted to save from urban development. This leads to a second key difference. The zoning in the Temecula Valley is amenable to small vineyards and wineries and seems designed to promote tourism in the Temecula Valley itself. Land is available without the local government requirement to purchase 100 acres or enter into a conservation easement for smaller parcels, as is the case in many parts of the Livermore Valley.

The result of these land use policies is that many Temecula Valley wineries have event-centers, restaurants, Bed and Breakfast businesses, and, in some cases, full service hotels, in the rural area east of the city of Temecula. The main difference between the regions, which may explain the policy differences listed above, is that Temecula was a planned development in the late 1960s. To understand Temecula's wine and grape industry, we must go back to the history of the development of the area.

Temecula Agriculture Before Grapes

“Temecula,” supposedly derives from the native people’s words for “sunny place,” which seems appropriate. It is a naturally dry area with what was a seasonal creek flowing through the Valley. The valley’s elevation combines with marine air from the Pacific Ocean that enters the valley through the Rainbow Gap to keep the valley cooler than other inland areas in Riverside or San Diego Counties. From the incursion of Spanish settlers in the early 1800s until the early 1960s, the valley was sparsely settled cattle country. Since then, it has been transformed into a city of 120,000 residents, with rural ranchettes, small housing developments, vineyards and wineries to east of the city and avocado orchards to the west.

In 1904, Walter Vail, a wealthy rancher, began purchasing land in the Temecula Valley, ultimately buying three ranches and assembling them into the 87,500-acre Vail Ranch. The ranch extended east into the mountains beyond the valley and west of what is now the city of Temecula into the coastal foothills. In 1906 Vail died and the property came under the management of his son, Mahlon Vail, who lived in Los Angeles, but who oversaw the ranch for the next six decades. In 1948, in a major piece of private construction, Vail damned Temecula Creek, creating Vail Lake, which created a reliable water supply for his land. When full, Lake Vail holds 45,000 acre-feet of water.

By 1960 Mahlon Vail was in his 70’s with declining health and no heirs. He began to look for a buyer for the ranch. One prospective buyer hired a farm manager and appraiser, Richard Break, to evaluate the property for citrus. After examining temperature records, water availability (grapes use less water than citrus) and soil, Break recommended wine grapes. In 1964, a year before his death, Vail sold the cattle ranch for \$21 million to a partnership of Kaiser Aluminum, Kaiser Industries and Macco Construction, a southern California home developer. They each paid \$7 million and named the new company Rancho California Development Corporation (RCDC). The partners changed several times over the next 20 years as did the name of the operating partnership, but for this report we will refer to the managing company as the Rancho California Development Corporation.

The following year, the RCDC, which held all the water rights in the Temecula Valley, created the Rancho California Water District (RCWD). Although Vail Lake and the aquifer beneath the valley were more than adequate for the then-current uses, the RCDC planned major agricultural and urban developments for the property and knew that dependable water would be key to development. For that reason, it annexed the RCWD to the Metropolitan Water District of Southern California so that the Temecula Valley could receive water from the State Water Project and the Colorado River. One result of this decision is that individual property owners have no individual water rights to drill wells and all property owners must rely on the RCWD for water. Another result is that, today, approximately 60 percent of Temecula’s water comes from state water projects.

Grapes Come to the Valley: 1966-1990

Agriculture, light industry, ranches and homes were all part of the RCDC's plan for the valley, but the corporation needed to determine what crops would grow best. In 1966, Richard Break was hired to oversee the planting of five test vineyards at various spots in the valley. Ultimately he and his local manager, Leon Borel, would try 56 varieties. Two commercial vineyards were planted in 1968. The first was by Vincenzo and Audrey Cilurzo, who had purchased 40 acres from the RCDC a year earlier, met Richard Break, and with his encouragement decided to plant a 30-acre vineyard. In 1986 they started a winery, which still continues as the Maurice Car'rie Winery. The Cilurzos are generally credited with establishing the first commercial vineyard in the Temecula Valley, but the first large vineyard was established by a winery from Cucamonga in the same year.

The Brookside Vineyard Company had been started in the 1950s by Philo Biane and was located at the historic Guasti winery in Rancho Cucamonga in San Bernardino County. Brookside rode the wine boom of the 1960s, establishing retail outlet tasting rooms throughout California that were supplied by wine made from the surviving vineyards near the Guasti winery. Those vineyards were aged and low-yielding and were being replaced by houses as population increased. Like the Wentes and Mirassous to the north, Biane began looking for vineyard land that would not be lost to housing developments. In 1968 Brookside purchased 460 acres of land in Temecula from the RCDC and hired John Moramarco as vineyard manager.

Moramarco was familiar with the area and wine. He had been raised in Los Angeles and his father had owned a small winery. He was ultimately to become the head of vineyard operations for Callaway Vineyards for the next thirty years. During his time in Temecula, Moramarco became the unofficial "godfather" of most viticultural operations in the valley and led the development of the creation of the Citrus/Vineyard Zone in the 1990s. The first commercial wine made from Temecula Valley grapes was produced in 1971 by Brookside Vineyards from the vines planted by Moramarco. But by then, he had switched jobs, and was working for the first winery in Temecula: Callaway. Ely Callaway was an entrepreneur and marketer who founded the largest and most influential winery in Temecula. In 1969 Callaway, then President of the textile manufacturer, Burlington Industries, purchased 160 acres of land in Temecula and hired John Moramarco as his head of grape growing. In 1973, when Callaway was passed over for the position of Board Chairman at Burlington, Callaway retired, moved to California and began plans for a winery at his vineyard in Temecula. Jon Moramarco, John Moramarco's son, remembers that grapes from the first harvest in 1973 were shipped north in refrigerated trucks to the Robert Mondavi winery, where Callaway's first wines were produced. Grapes from the 1974 and subsequent harvests were produced at the Callaway winery, Temecula's first winery. John Moramarco became General Manager of Callaway Vineyards and Winery.

Callaway was a marketer who focused on niches. His winery primarily produced white wines, which had the advantage of not requiring extended aging, and which were the wines in demand during America's first wine boom. Callaway recognized that over half of California's then almost 20 million people lived within a 90-minute drive of Temecula, while California's higher-priced wine production was concentrated north of San Francisco. Rather than compete nationally with other producers, Callaway focused on selling direct to Southern California wine consumers, ultimately building sales to about 60,000 cases a year. Callaway capitalized on the fact that his was the only new winery in Southern California and that Southern Californians could take a weekend day, head to the mountains, and visit his winery, hopefully purchasing wine and taking it home with them. Although current Temecula producers have added events, restaurants and lodging, they are essentially following the winery-direct model that Ely Callaway laid out in the mid-1970s.

Assuming Callaway was producing and selling 60,000 cases and that one ton of grapes produced 70 cases of white wine from vineyards averaging 4 tons per acre, Callaway would have required production from about 210 acres, which was more than he had planted. According to Jon Moramarco, Callaway bought grapes from growers such as the Cilurzos and encouraged new vineyards in the Temecula Valley.

In 1981, Temecula was shocked when Callaway sold his winery to Hiram Walker, a distiller that was venturing into wine. By then, Callaway was no longer the only Temecula winery. Mount Palomar winery, which had begun planting vineyards in 1969, opened its doors in 1975 and was followed by Hart winery, which had planted vineyards in 1974 and had become a bonded winery in 1980. Ely Callaway retired for the second time and, with a purported profit of nine million dollars, purchased a small golf club manufacturer, and began his third business, Callaway Golf Clubs. Hiram Walker, which had national distribution for its sprits, took Callaway into national distribution for the first time, which increased sales and required more grapes. In 1987, Hiram Walker was itself acquired by Allied Lyons, an international drinks conglomerate.

Jon Moramarco, who had worked for Callaway in sales and who had then risen through the business structure with the mergers, recalls that Callaway peaked at about 200,000 cases in the 1990s, which would have required somewhere between 700 and 800 acres of grapes. In 1984, Temecula Valley became an official AVA, allowing producers to display the name on the label as long as 85 percent of the grapes came from the valley. During the 1980s, three more small wineries began operation in the valley: Baily and Cilurzo in 1986 and Thornton in 1988. By the beginning of the 1990s, Temecula had a total of five small wineries and one large one. Like Wente Vineyards in Livermore, Callaway was by far the dominant winery in the Temecula valley.

The Citrus/Vineyard Zone and Pierce's Disease: 1989 to 2000

By 1990 there were perhaps 1800 acres of bearing winegrapes in the Temecula Valley. It is hard to know exactly, as the two official sources, the National Agricultural Statistical Service's *California Grape Acreage Report* and the Riverside Agricultural Commissioner's *Annual Report* differ and both report for the County as a whole, not for the Temecula Valley (although the Agricultural Commissioner began reporting separately for Temecula in 2002).

According to the Riverside County Agricultural Commissioner, in 1990 there were 2,221 bearing acres of winegrape vineyards for all of Riverside County, while NASS reported 2,252. Those numbers are quite close, but just two years earlier, Riverside County's Agricultural Commissioner had listed Riverside County's bearing winegrape acreage as an oddly large 3,508 acres, while NASS reported 2,145 bearing acres that same year—quite a discrepancy. According to a 2002 U.C. cost study on establishing and growing grapes in Temecula (Takele, 2002), approximately 80 percent of Riverside County's winegrapes were located in Temecula.

In 1989, as part of a general plan for the south-west portion of Riverside County, the County created a new zoning, the "Citrus/Vineyard Zone," for the Temecula Valley. The planning process had begun in the late 1980s when the County Supervisor for south-western Riverside County had invited John Moramarco to participate in the plan's formation. Concerned generally about the loss of agricultural land to housing that had occurred and was occurring in other parts of southern California, and specifically about the influx of new housing in the Temecula Valley that had been spurred by the completion of I-15, the inland freeway that connected Los Angeles and San Diego, Moramarco brought together a subcommittee of vineyard and winery owners to propose zoning that would limit housing and encourage agriculture in the Temecula Valley. The Citrus/Vineyard Zone, better known as the "C/V" zone was the result. The zone began at the eastern edge of the city limits of Temecula and extended east along both sides of Rancho California Road, the valley's main artery, with the majority of the zone's acreage to the north of the road.

The "C/V" zone regulations allowed the creation of a winery on as little as ten acres of land, but required that 75 percent of the acreage be planted to grapes or citrus. It increased wineries' rights for use of their land by allowing food service and lodging, with up to two lodging rooms per acre of land, and it discouraged urbanization by requiring a five-acre minimum for single family homes. Over the next two decades, the zone was redefined several times, with each iteration generally expanding the rights of producers, but always with the requirement that 75 percent of the land be planted.

In 1999, the minimum parcel size for a winery was reduced to five acres. Five years later in 2004, the Board of Supervisors found the need to allow other “small-scale, commercial uses” not attached to a vineyard or winery within the zone. This included bakeries, gift shops, coffee shops, restaurants, museums and real estate offices. Also that year, the Board required that at least 75 percent of any wine sold from a tasting room must have been produced from grapes grown in Riverside County. In 2009, apparently in response to an increasing number of “special occasions” at wineries, the acreage requirement for wineries wishing to hold events was increased from five to ten acres. In 2014, the “C/V” zone designation was replaced by a broader zoning ordinance, “Wine Country Zones,” which included zones for wineries, equestrian businesses and housing developments. The 2014 zoning also created a series of “classes” of wineries, graduated by increasing parcel size with rights generally increasing with the size of the acreage.

Although zoning requirements had eased, the decade of the 1990s saw little growth in vineyard acreage or number of wineries. In 1996, Wilson Creek, now the largest winery in Temecula, began operations and in 1998 Bel Vino and Palombo both established wineries. By 1999, there were thus eight small wineries in the valley and Callaway. Vineyard acreage remained roughly constant. The Riverside County Agricultural Commissioner reported 2,319 acres of bearing winegrapes for Riverside County in 1999 and our best estimate is that about 80 percent were in Temecula.

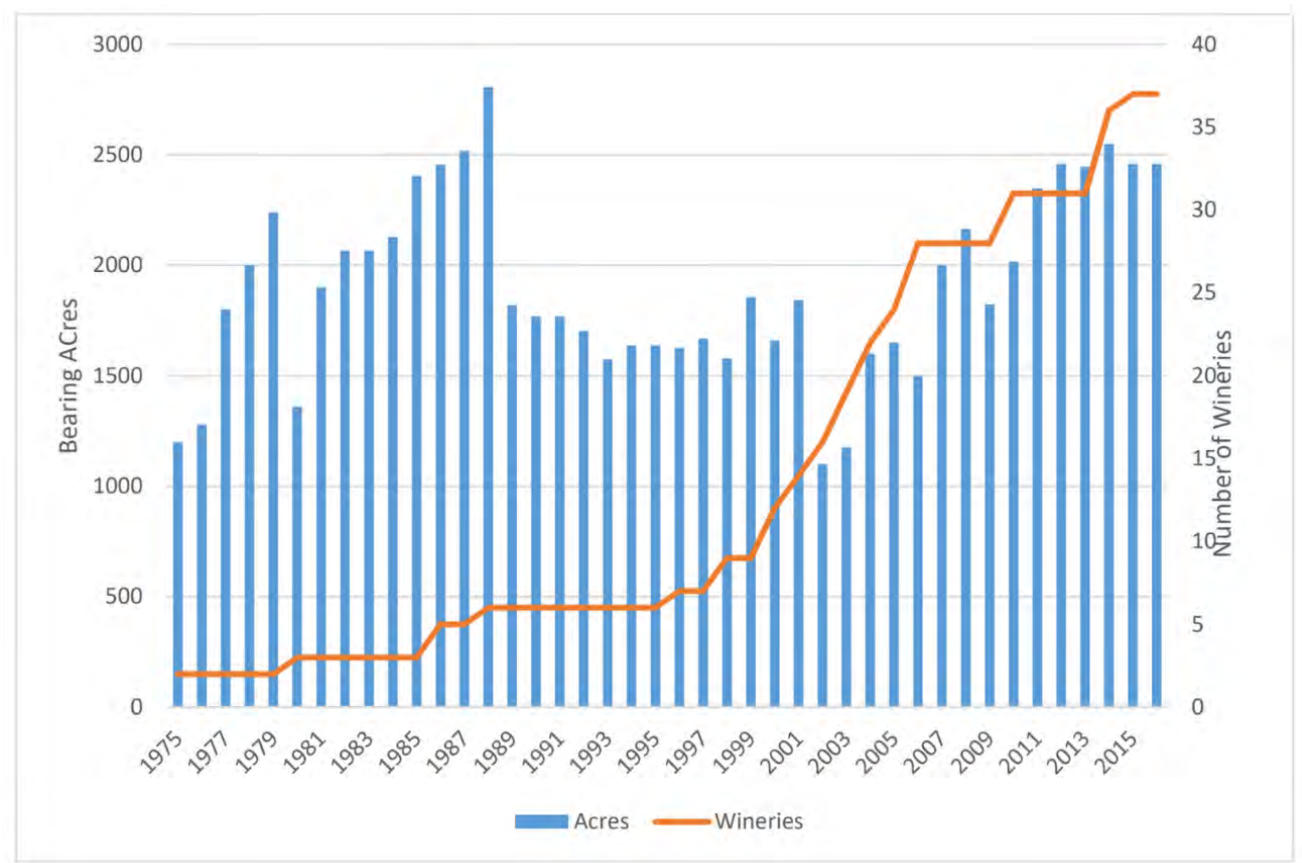
Over the next two years the Temecula Valley lost about 40 percent of its vineyards due to the glassy wing sharpshooter and Pierce’s disease. Pierce’s disease is caused by a bacterium that clogs a plant’s xylem. The disease has always been a minor problem in California, but the introduction of the glass wing sharpshooter, a non-native pest that arrived from Florida in a shipment of citrus trees and which acted as a new vector, spread the bacterium further than normal. By 2002, Temecula hit its lowest point, falling to 1,100 acres of bearing vineyard.

Temecula Comes of Age: 2000 to 2020

Despite the problems of combatting Pierce’s Disease, the number of wineries in Temecula has boomed and acreage has rebounded strongly over the past two decades. Between 2000 and 2009, 19 new wineries were established and bearing acreage almost doubled to 2,000 acres. In the following decade, from 2010 to 2019, nine more wineries entered the valley and acreage expanded to 2,460 bearing acres in 2016, the most recent year for which Temecula acreage figures are available.

Figure 1 shows Temecula’s bearing winegrape acreage and number of wineries over time.

Figure A2.1: Temecula Bearing Winegrape Acreage and Number of Wineries. 1975-2016



Sources: Acreage: Riverside County Agricultural Commissioner's Annual Report. Wineries: Authors' data collected from winery websites.

The one major loss for the Valley occurred in 2005, when Callaway changed hands and was downsized when Allied Domecq, which had been formed when Allied Lyons purchased Pedro Domecq, sold the Callaway winery and 35 acres of vineyards to the Lin Family, while selling the Callaway brand to Shaw Ross a wine and spirits importer and marketing company owned by Southern Glazer Wine and Spirits. Although the Callaway brand still remains in national distribution, it is produced outside Temecula and no longer uses Temecula Valley grapes. The Lin Family has rights to produce and sell their own "Callaway" wine directly from the winery in Temecula but not to distribute.

Both new and old wineries seem focused on tourism and direct sales. Most make full use of the zoning provisions. Of the 28 new wineries established from 2000 to 2019, 20 provide meals of some kind. Thirteen have full restaurants, five have delis, and two provide catering for special events at the winery. Of the nine wineries established before 2000, six have restaurants and one has a deli. Clearly visitors to Temecula wineries won't go hungry.

The majority of Temecula's wineries offer special event space for rent as well. Nineteen wineries specifically mention on their websites that space is available for weddings. According to Greg Pennyroyal, Wilson Creek Winery's Director of Viticultural Operations, the Wilson Creek winery is large enough that it can host three weddings on the same day. Only seven of Temecula's wineries offer lodging, but those that do, do so in a grand manner. The South Coast Winery and Spa, for example, offers rooms in a hotel and 76 villas. Most of the wineries offering lodging are located on Rancho California Road, which received sewer services in 2015, partially paid for by the County of Riverside's transient room tax.

It is not surprising that Riverside County supervisors used hotel taxes to support winery expansion. Over the past twenty years, Temecula has become a major tourist attraction and Temecula wineries have been part of the draw. In 1995, the Pechanga band of Luseno Indians opened a small casino, which expanded in 2002 to include a 522-room hotel, a spa, restaurants, and what is claimed to be the largest gambling casino in California. Located on the southern border of the City of Temecula, it has become a major tourist attraction. In 2004, the City of Temecula's Chamber of Commerce began a campaign, "Visit Temecula", and hired a staff member to encourage visits to "old town." Over the past 16 years Visit Temecula has expanded and now includes a "reputation engineer", a former sommelier, who works full time promoting the Temecula wineries to the southern California region. According to Phil Baily, the founder of Baily Winery, the local wineries are now moving forward on creating a business improvement district just for wineries which would raise about \$1.5 million annually for the purpose of promoting Temecula wines in southern California.

Not competing in the national market, Temecula wineries have diversified beyond the usual Cabernet and Chardonnay by making wines from Mediterranean grape varieties. There is no listing of grape varieties by acreage and websites may be misleading, but it seems that most Temecula wineries have adopted Rhone, Spanish and Italian varieties, not just in an attempt to find varieties that do well in its climate, but also to provide new experiences for their guests.

Greg Pennyroyal who, aside from directing viticulture operations for Wilson Creek and teaching Viticulture at San Jacinto College, also leads the Temecula Small Winegrower Association, estimates that approximately 40 percent of Temecula's grape acreage is owned by wineries. The remaining 60 percent of Temecula's approximately 2,600 acres of winegrapes range in size from hobby vineyards of one or two acres up to 30 acres. These independent vineyards may be managed by the owners, by a farm management company, or by a winery operating under a lease.

According to Pennroyal, grape prices currently range between \$1,750 and \$2,000 per ton with yields generally between three and four tons per acre. The independent growers are important to Temecula wineries.

Pennyroyal cites Wilson Creek as an example. Wilson Creek farms about 160 acres in total, of which 60 are owned by the winery. Water costs are particularly high at \$700 per acre foot and most vineyards use between 1.3 and 1.4 acre feet each season. Land costs vary between \$50,000 and \$100,000 per acre depending upon parcel size and development. Overall, Pennyroyal is optimistic about the prospects for Temecula's wine and grape industry and expects continued expansion. Tourism has increased over the past 20 years, and prior to Covid, most wineries seemed to be profitable. Given the Riverside County requirement that 75% of the grapes used to produce wine sold in Temecula tasting rooms must come from Riverside County, and given the increase in tourism over the past twenty years, Pennyroyal's optimism seems reasonable.

Conclusion and Potential Lessons

Temecula seems similar to Livermore in several ways. First, it is similar in terms of total vineyard acreage and vineyard size as well as in the number and scale of wineries. Like Livermore's smaller wineries, all Temecula wineries are focused on direct sales. However, the majority of Temecula wineries rent event space for weddings or groups and over two-thirds of Temecula's wineries offer some sort of food for sale. Unlike Livermore, Temecula no longer has a winery with national distribution and few if any grapes are shipped for winemaking outside the Temecula Valley. Temecula wineries seem focused on strengthening relations with the more than 20 million residents from San Diego to Los Angeles. Although water is expensive, perhaps as high as \$1,000 per acre, vineyard acreage has expanded over the past decade, and less than half of the vineyard acreage is owned by wineries.

Despite similarities in size and a focus on direct sales, it is unclear how much of Temecula's experience is useful to guide Livermore. First, Temecula is the only significant wine region within an easy day-trip of millions of people. In contrast, Livermore is one of several well-known wine regions within a two-hour drive of the San Francisco Bay Area. Second, Temecula has a more accommodating regulatory environment with regards to tourism. Minimum parcel sizes for wineries are as low as 5 acres and there may be no effective minimum for vineyards, depending upon specific location within the Temecula Valley. Wineries are generally allowed to provide lodging and food service, which have encouraged wineries to offer weddings and event venues and services. Temecula may document what could be possible as a tourist-based industry, with more accommodating zoning and other public infrastructure to support agritourism.

5. Address of this parcel:
6. Assessor's parcel number if known:
7. Total parcel acreage:
8. Who owns this parcel?
9. Does the owner live on the parcel?
10. Do you lease the parcel to a third party? If "No" please skip to question 13
11. If "yes" to question 9, to what firm do you lease your property?
12. If "yes" to question 9, what is your annual lease revenue per acre?
13. Please list the approximate **bearing acreage** by variety and year planted on this parcel:

Variety	Acres	Year Planted
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14. Please list the approximate **non-bearing acreage** by variety and year planted on this parcel:

Variety	Acres	Year Planted
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15. What is the primary source of irrigation water for this parcel? Agricultural Well? Surface Water? Both?

16. For bearing vineyards, approximately how many acre feet of water is applied per acre of vineyard
17. Do you use a vineyard management service for this parcel? If no please skip to question 18
18. What is your average cost per acre of bearing vineyard for the management service?
19. Are any of the grapes on this parcel under contract? If "no" please skip to question 22.
20. If Yes, please describe the type of contract (Evergreen? Term in years, Other?)
21. If yes, please give the approximate percentage of the total tonnage from this parcel that is under contract.
22. Is this vineyard integrated with a winery owned by your firm?

Production Information 2018 and 2019

23. By variety, how many tons of grapes were produced from this parcel in 2018?

Variety	Tons
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24. By variety, how many tons of grapes were produced from this parcel in 2019?

Variety	Tons
---------	------
25. By variety, what was the average price per ton you received for these grapes in 2018?

Variety	Tons
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26. By Variety, what was the average price per ton you received for these grapes in 2019?

Variety	Tons
---------	------
27. By variety, what was the average cost to produce these grapes in 2018?

Variety	Tons
---------	------
28. By variety, what was the average cost to produce these grapes in 2019?

Variety	Tons
---------	------
29. By variety, approximately how many tons of grapes from this parcel were sold to wineries outside the Livermore AVA in 2018?

Variety	Tons
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30. By variety, approximately how many tons of grapes from this parcel were sold to wineries outside the Livermore AVA in 2019?

Variety	Tons
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Winery Survey Questionnaire

1. Demographics: Date, Name of person completing the survey, phone number and email
 2. Winery information: Name of winery, street address, date of first establishment at this address
 3. Winery organization: Sole proprietorship, Partnership, Limited Liability Corp., Other
 4. Wine Production in 2019: Total tons crushed at this location, Total tons crushed from Livermore AVA at this location, Total tons purchased by your firm and crushed at this location (fill in blanks)
 5. Grapes purchased: For each variety of grapes listed below from the Livermore AVA purchased by your firm, please provide the tons and price by variety. (Choose from list of grapes. If your variety or varieties are not included, choose "other" and write name)
 6. Grapes Grown: For each variety of grapes listed below from the Livermore AVA grown by your firm, please provide the number of tons crushed at your facility. (Choose from list of grapes. If your variety or varieties are not included, choose "other" and write name)
 7. Custom Crush: Does your winery custom crush grapes for other firms?
 8. Custom Crush: If yes to #7, how many tons of grapes did you custom crush in 2019?
 9. Wine Bottling: How many cases of wine did you bottle in 2019?
 10. Wine Sales and Income: (fill in blanks)
 - How many cases did your firm sell in 2019?
 - What was your gross revenue from wine sales in 2019?
 - What was your gross margin (gross revenue minus cost of goods) from wine sales in 2019?
 - What was your net profit (Gross margin less cost of sales, administration, depreciation and interest) in 2019 from wine sales?
 11. Wine Sales and Distribution: What percentage by of your bottled wine by volume was sold to Out-of-State Wholesalers, In-State Wholesalers, In-State Retailers, Consumers (direct sales from winery)?
 12. Does your firm conduct other business at the winery site? (Yes/No)
 13. What was/were these other businesses? (Fill in blank)
 14. Approximately what were the total gross revenues from these non-wine or grape related activities?
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