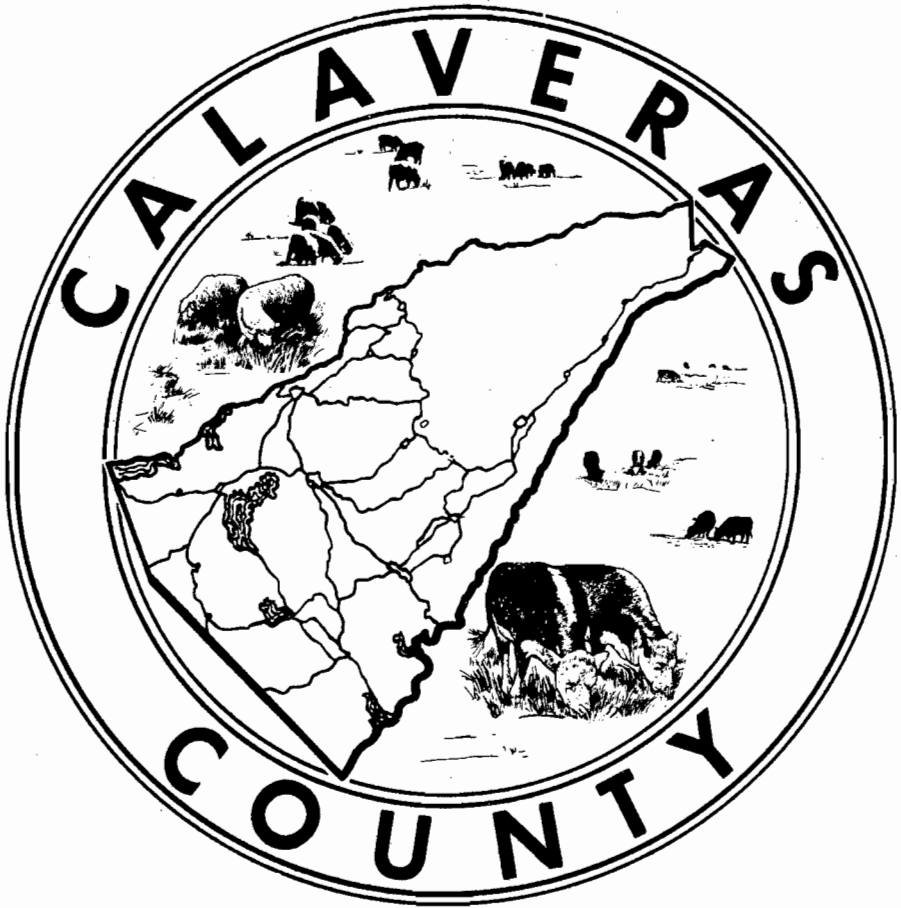


WINE GRAPE

PRODUCTION



1975

Prepared by Calaveras County Farm Advisors Office
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and

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WINE GRAPE PRODUCTION IN CALAVERAS
COUNTY - 1975

History:

In the eighth chapter of Genesis, Noah's Ark came to rest on Mount Ararat, in the Caucasus Mountain of Armenia; "Noah began to be a husbandman, and he planted a vineyard".

First missionaries arrived from Baja California at San Diego in 1769; two years later their vineyards were established with the Criolla type grape that had originated in Mexico. This was the grape that is now called the Mission variety here in Calaveras County.

Less than 100 years later, about 1860, dryland vineyards of Missions and Zinfandel grapes were under cultivation near Murphys, Calaveritas, Chili Gulch, Jesus Maria and West Point. Wine grape growing increased in acreage and became a way of life as the miners came to the Sierra Foothills.

Since then, wine grape production has been squeezed and pressured through violent changes - legal, economic, moral and biological. A few acres of these historical plantings however, still exist as monuments to the reasons and regards of wine grape production in the history of our land and its people.

Production in Brief

Climate:

Probably the most critical resource in quality wine grape production is climate, especially temperatures during the fall ripening period as it effects the sugar and acid content of mature grapes. Temperatures, or more specifically; the summations of daily heat averages above 50 degrees F. from April 1 to October 31. Grape producing areas of the world are zoned into such temperature regions; Region I being the coolest and Region V the warmest.

The Sierra Foothills from 1000 to 2500 feet vary widely in temperature differences between locations and years. However, based on limited information from recording thermometers and ranchers cooperating with this office, we are learning that our foothill areas appear to be in Zones III and IV.

Field variety test plots were established in 1973 at 1000, 1500 and 2500 feet elevations using six commercial certified varieties for evaluation of both their production ability and wine quality.

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Spring frost damage has long limited grape production in mountainous areas. Overhead sprinkler irrigation now offers a real possibility for frost protection where adequate irrigation water supplies are available.

Soil Requirements:

Grapes grow well in many different soils. The deeper and more fertile soils usually produce the highest yields, but some grape varieties will produce higher quality on soils of limited depth.

Soils less than 18 inches deep above heavy clay or bedrock are to be avoided as a vineyard site; soils should be well drained. Soils of limited depth require irrigation through the summer growing season for commercial production yields. Soils that permit grape root penetration to deeper soil moisture are needed for successful dryland production.

Principal soils used for dryland production in Amador County are listed as Ahwahnee, Sierra, Supan, Sites and Shenandoah series. In Calaveras County, these and other soils are suitable as vineyard sites.

Soil slopes less than 30 percent are most desirable for vineyards. On rolling vineyard land and steeper slopes, soil erosion can become a most serious problem, making the use of cover crops or sod culture between vine rows very important and desirable.

Varieties:

In commercial plantings, growers are advised to check with wineries to learn what varieties are needed that the winery would be willing to purchase. Perhaps there may be some possibility of local wineries being built to exploit the excellent grape quality of this area. With the constant flow of visitors to the Mother Lode, as well as, the local resident demand provides a market potential.

Red wine varieties that show real promise in Calaveras County for commercial production are Zinfandel, Napa Gamay, Cabernet Sauvignon, Ruby Cabernet and Petite Sirah. Missions still produce well but are of limited demand for use as a wine blending variety. As field test plots and commercial plantings make available information more sophisticated, additional varieties will, no doubt, be added to this list of distinctive quality varieties adapted to our area.

Use Only Certified Stock

Planting:

Grape vines can be set anytime during the dormant season before growth starts in the spring. In new areas, resistant rootstock is not necessary and rootings are usually made with the variety plant selected for production.

Customary plantings are 10X10 feet or 8X12 feet (wider distance between rows for equipment use) with 20 foot roadways on each side and at 1/8 to 1/4 mile intervals.

It is most important in planting new vineyards to lay out the grape stakes in straight continuous rows at proper spacings before planting the vines.

Fertilization:

About 40 units (pounds) of nitrogen per acre for dryland production and 50 pounds for irrigated vineyards are recommended. Excess nitrogen may cause plants to produce vegetative growth rather than fruit so individual vineyard experience and testing is necessary.

Other plant nutrient problems such as boron and zinc deficiencies are usually evident from observing growth symptoms in the field. Leaf tissue analysis is a most useful guide in identifying and assessing these deficiencies and other nutrient needs of vines.

Irrigation:

The values of wine grape irrigation have long been discussed and never really settled. Many growers are convinced that only dryland grapes make quality wines. Others, who disagree, claim that vines need a constant supply of soil moisture for growth and production and if irrigation is carefully managed, quality can be maintained year after year - maybe even improved.

As the grape industry moves into Calaveras County, it is evident that we will continue such discussions for a long time to come. Until then, it is a fact that vines must have available soil moisture through the growing season; and there is no differential in price at most wineries for dryland grapes over the price paid for irrigated grapes used for quality and distinctive wines.

Drip irrigation and overhead sprinklers are typical of new developments in vineyard irrigation practices. A full investigation of advantages, problems, costs and maintenance requirements are recommended before final decisions are made.

Three acre feet of water per acre was used in the sample costs for both frost protection and irrigation. Application of six acre inches per acre were estimated per irrigation to supply daily evapo-transpiration water losses of 1/3 acre inch per acre during summer growing season. The irrigation supply and system assumes about 1/2 mile of pipeline from source of supply, a lift of 50 feet to booster pump and permanent distribution lines to overhead sprinklers. An electric motor standby charge is also included in the per acre pumping costs of water.

Insects and Other Pests:

Many different insects and mites attack grapes. Those capable of doing local damage are the grape leafhopper, white fly, Willamette mite, phylloxera, cutworms, bud mite, thrips, grasshoppers and nematodes.

Rodent pests; gophers, ground squirrels, mice may girdle young vines. Jack rabbits and cottontails are often destructive on young vines. About the only effective control for deer damage is fencing; repellants have not proven to be effective, nor have depredation slaughter permits available from California Fish and Game. Birds can play pure havoc in vineyard as grapes mature before harvesting. Neighbors horses and cattle can also cause some serious problems as can beavers.

Diseases attack grapes; perhaps the most common and important is powdery mildew; - control and eradication recommendations are available. Oak-root fungus or armillaria root rot is native to California and common to most oak trees - it also attacks vines. Other diseases appear to be of minor or very limited importance, so far, in Calaveras County.

Weed Control:

Weeds compete with vines for soil moisture, soil nutrients, sunlight, harbor other pests, interfere with cultural operations and harvest. Weed controls may involve winter sheep grazing, herbicide in the vine row, mowing and cultivation. In the other hand, weeds if properly managed, may harbor beneficial insects, help control soil erosion, reduce vineyard dust and lower cultivation costs.

Outlook:

One of the most serious economic problems in the wine industry is over-production of wine grapes that are being grown in regions where distinctive varietal grapes for table wines are not adapted. As wine customers become better acquainted with quality varietal wines, it is expected that, over time, such problems will be corrected.

The Sierra Foothills are capable of producing quality wine grapes comparable to the premium wine producing areas of Napa and Sonoma Counties. With consideration of the present economic market situation for wine grapes, this crop in Calaveras County is one of the most profitable crops per acre that is grown between the elevations of one to three thousand feet. Should grape prices not continue to hold their present levels, wine grapes in this area should still prove to be an economically feasible land use relative to other crops, if local quality wineries and retail markets can be established and maintained.

The development of dependable economically priced irrigation water supply and distribution system will in a large measure, determine the future importance and value of wine grape growing as well as other commercial agricultural crops in Calaveras County.

Agricultural Extension Wine Grape publications at your County Farm Advisors Office:

<u>Name</u>	<u>Publication Number</u>
Before You Go Into Commercial Grape Growing	AXT- 90
Mechanical Harvesting of Grapes for the Winery	AXT-403
Evaluation of Wine Grape Varieties for Lodi Area	B-865
Frost Protection with Overhead Sprinklers	L-201
Frost Protection Costs for Northern Coast Vineyards	AXT-267
Weed Control in Grapes	Lange
Chemical Weed Control in Vineyards	Lange
Grape Pests in California	C-445
Insect Grape Pests of Northern California	C-566
Pruning the Home Vineyard	AXT- 31
Powdery Mildew of Grapevines	Hewitt
Rots and Bunch Rot of Grapes	B-868
Field Budding	Lider
Vineyard Irrigation	AXT-199
How to Green Graft Grapes	AXT-115
California Wine Grapes	B-794
Grape Varieties for Wine	Amerine
Systematic Appraisal of Coastal Soils for Grapes	Neja
Grape Leafhopper	Jensen
Spider Mites	Lynn
Wine Grapes in Amador County	Plaister
Sample Costs to Produce Wine Grapes	L-2260

Other Important Publications:

California Grape Acreage	Annual
Calif. Crop & Livestock Reporting Service P.O. Box 1258 Sacramento, Ca. 95806	
General Viticulture	Winkler

The University of California Agricultural Extension programs and information are available to all without regard to race, color or national origin.

SAMPLE COSTS TO PRODUCE WINE GRAPES IN
CALAVERAS COUNTY - 1975

Yield: 6 tons Zinfandel Labor: skilled, \$3.00; other \$2.50/hr.
Acreage: 80 acres, overhead sprinklers for frost control.

<u>OPERATION</u>	<u>Hrs./ Acre</u>	<u>Labor</u>	<u>Fuel/Rprs.</u>	<u>Materials</u>	<u>Cost</u>	<u>Total</u>
<u>Cultural Costs</u>						
Prune	16.0	40.00				40.00
Brush Dis- posal	0.7	2.10	0.90			3.00
Fertilize, contract			40 lbs. N. applied		20.80	20.80
Sod Culture (3X)	2.0	5.00	2.80			7.80
Row Weed Control	0.6	1.50	1.66	Herbicide	8.00	11.16
Pest & Disease Control	1.5	3.75	2.70	Insecticide & Fungicide=	18.00	24.45
Irrigate	3.6	9.00		Power to boost, 5.36+standby \$5.10	21.18	30.18
		3 Ac. Ft.	Water cost @\$15	Ac.Ft.	45.00	45.00
Misc. Pest control, etc.	2.0	6.00	3.00	Materials	5.00	14.00
Total Cultural Costs		67.35	11.06		117.98	196.39

Harvest Costs

Pick			80¢ box - 45 boxes/ton			216.00
Load, haul & weigh	5.0	12.50	15.00			27.50
Supervision	2.0	6.00	3.00	Pickup		9.00
Total Harvest Costs						252.50

Overhead Costs

Misc. expense; office, telephone, etc. 6% of above costs (448.89)						26.93
Taxes; land, vines & equip, \$2950X0.25X\$8						59.00
Total Cash Overhead Costs						85.93

Total Cash Costs **534.82**

Investment Costs:

	<u>Per Acre</u>	<u>Exp. Life Years</u>	<u>Annual Cpst Depreciation</u>	<u>7% Interest</u>
Land	500			35.00
Vines	900	30	30.00	31.50
Equip. & Bldgs.	300	10	30.00	10.50
Total Investment Costs	1700		60.00	77.00
Total Annual Investment Costs				137.00
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Total Cost per acre				416.51
Total Cost per ton @ 3 ton yield				138.84

SAMPLE COST TO PRODUCE DRYLAND WINE GRAPES IN
CALAVERAS COUNTY-1975.

Yield - 3 tons per acre. Labor, skilled \$3.00, other \$2.50/hr.
Acreage: 80 acres, planting distance 8X12 feet.

Operation	Hrs./ Acre	Cash & Labor Costs Per Acre				Total
		Labor	Fuel & Rprs.	Materials	Cost	
<u>Cultural Costs</u>						
Prune	16.0	40.00				40.00
Brush Disp.	0.7	2.10	0.90			3.00
Fertilize, contract				30#N.applied	14.10	14.10
Sod Culture	1.0	2.50	1.40			3.90
Row Weed control	0.6	1.50	1.66	Herbicide	8.00	11.16
Pest & Disease control	1.5	3.75	2.70	Insecticide & Fungicide	18.00	24.45
Misc. Pest, etc.	1.0	3.00	1.50	Materials	2.50	7.00
Total Cultural Costs		52.85	8.16		42.60	103.61
<u>Harvest Costs:</u>						
Pick		80¢/box - 45 boxes/ton				108.00
Load, haul & weigh	2.0	5.00	6.00			11.00
Supervision	2.0	6.00	3.00	Pickup		9.00
Total Harvest Cost						128.00
<u>Overhead Costs:</u>						
Misc. expenses, office, telephone etc., 6% above costs(231.61)						13.90
Taxes; land, vines & equipment (\$1700X0.25X\$8)						34.00
Total Cash Overhead						47.90
Total Cash Costs						279.51

Investment Costs:

	<u>Per Acre</u>	<u>Exp. Life Years</u>	<u>Annual Costs 7%</u>	
			<u>Depreciation</u>	<u>Interest</u>
Land	800			56.00
Vines	900	30	30.00	31.50
Irrigation System	800	15	53.34	28.00
Irrigation Supply line	150	30	5.00	5.25
Buildings & Equip.	300	10	30.00	10.50
Total Investment Costs	2950		118.34	131.25
Total Annual Investment Costs				249.59
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Total Costs per acre				784.41
Total Costs per ton @ 6 ton yield				130.74

GRAPES FOR CRUSHING: Tons of Grapes Crushed in California Wineries During 1974, By Type, Variety and Area Where Grown, With Comparisons 1/

Type & Variety	North Coastal Region	Central Coastal Region	Lodi Modesto Region	Other San Joaquin Valley	Southern California	1974 State Total	1973 State Total
<u>WINE GRAPES (BLACK)</u>							
Alicante Bouschet	660	20	850	3,400	1,010	5,940	13,390
Barbera	150	60	19,160	42,850	430	62,650	33,430
Cabernet Sauvignon	17,020	5,790	1,060	690	240	24,800	16,850
Carignane	19,750	1,250	83,450	92,730	590	197,770	198,240
Early Burgundy	1,970	40	10	---	---	2,020	2,310
Gamay (Napa)	5,820	930	380	1,560	---	8,690	7,770
Gamay Beaujolais	1,700	2,720	---	690	---	5,110	3,680
Grenache	950	1,190	56,860	70,080	4,730	133,810	124,340
Merlot	970	410	80	---	---	1,460	770
Mission	40	60	19,340	18,380	12,750	50,570	41,720
Petite Sirah	8,360	3,540	4,350	6,310	200	22,760	15,410
Pinot Noir	7,950	2,420	130	30	40	10,570	9,910
Ruby Cabernet	400	510	17,750	29,040	360	48,060	25,610
Salvador	10	30	1,840	12,380	380	14,640	12,730
Zinfandel	18,000	5,400	58,930	2,570	4,400	89,300	82,060
Other Black	3,330	1,940	4,780	23,550	2,550	36,150	30,690
All Black	87,280	27,260	292,900	353,530	29,970	791,300	685,180
All Wine	135,840	51,600	395,650	557,230	40,420	1,180,740	995,000
All Varieties	135,840	51,600	639,720	1,427,270	42,570	2,297,000	2,481,000

1/ Reported figures reflect the quantity crushed by variety and region where the grapes were grown.

Source: California Crop and Livestock Reporting Service, "Production & Marketing California Grapes, 1974."

GRAPES FOR CRUSHING: Average Grower Returns Per Ton In California, Delivered Basis, 1974 Crop, By Type, Variety and Area Where Grown With Comparisons 2/

Type & Variety	North Coastal Region	Central Coastal Region	Lodi Modesto Region	Other San Joaquin Valley	Southern California	1974 State Total	1973 State Total
<u>WINE GRAPES (BLACK)</u>							
Alicante Bouschet	188.60	-	2/	2/	2/	77.20	129.80
Barbera	322.80	-	148.10	124.80	2/	132.50	182.10
Cabernet Sauvignon	459.50	2/	2/	2/	2/	435.20	849.30
Carignane	216.60	181.00	124.20	97.80	55.20	114.00	168.50
Early Burgundy	239.60	-	-	-	-	239.60	469.70
Gamay (Napa)	397.50	2/	2/	2/	-	333.40	536.30
Gamay Beaujolais	417.20	2/	-	2/	-	355.90	846.40
Grenache	241.50	2/	112.70	97.40	56.90	101.00	146.90
Merlot	485.40	-	2/	-	-	446.30	799.20
Mission	2/	124.50	91.70	87.50	50.70	78.50	104.10
Petite Sirah	292.40	2/	176.70	125.60	2/	208.00	394.50
Pinot Noir	475.70	2/	-	-	2/	464.20	857.60
Ruby Cabernet	257.30	-	2/	124.60	2/	134.00	180.80
Zinfandel	299.90	279.10	165.70	127.80	58.70	185.30	309.00
Other Black	275.60	2/	117.70	85.40	56.70	101.30	143.70
All Black	353.70	288.20	134.70	104.60	57.70	135.60	214.50
All Wine	328.50	277.20	132.10	103.80	57.70	131.40	205.30
All Varieties	328.50	277.20	111.00	86.40	58.60	105.10	130.20

2/ Prices reflect actual purchases and do not include grower returns for tonnage pooled by cooperations nor returns for grapes grown by wineries and used for their own production