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Dry Farming in California: Saving Water, Making Great Wine

Dry-farming wine grapes refers to crop production that relies on residual soil moisture to meet vine growth requirements. With sufficient winter rainfall, the water retained in soils can support vine growth and berry development during the dry season without supplemental irrigation.

Dry farming has a long history of use in Europe and California. Starting in the 1970s, drip irrigation in vineyards became common and the practice of dry farming in California declined. However, today there are still dry-farmed vineyards throughout the state.

Community Alliance with Family Farmers (CAFF) is actively working to promote dry farming by convening growers to learn best practices, share techniques and visit vineyards practicing dry-farming methods.

Dry farming a vineyard can significantly reduce water usage. Frank Leeds at Frog's Leap in Napa Valley indicates that compared to

other Napa growers, he is saving a minimum of 16,000 gallons of water per acre a year by dry farming his vineyards. Water savings may be even greater in hotter regions.

In many areas of California, water demand across sectors has outpaced water supply. In Napa and Sonoma there are concerns over declining stream flows. In areas such as Paso Robles, groundwater overdraft is leading to declining water availability. Water demand is expected to increase as the state's population grows and the climate changes.

Although the irrigation requirements of winegrapes are less than other crops, the significant acreage of California vineyards means that growers need to be aware of water use. Where possible, dry farming methods can reduce grower dependency on scarce water resources and improve grape quality.

Quality Benefits of Dry Farming

Dry-farming wine grapes can have benefits for grape and wine quality. Many growers who dry farm maintain that the grapes produced have more concentrated flavors, lower sugars, ripen early, and better express the characteristics of the vineyard site (terrior). These quality characteristics can produce wines with lower alcohol, more minerality, and balance. Some of the finest wines California has produced were made from dry-farmed grapes, including the wines that won the 1976 Judgment of Paris.

Dry farming a vineyard is more than simply not irrigating and is part of a larger vineyard management system. There are many different ways to dry farm and techniques will vary based on vineyard site and climate. Here we discuss some of the key aspects of dry farming and present examples from California dry-farmed vineyards.

Planting or Converting a Vineyard

Vineyards may be planted to be dry farmed, or irrigated vineyards can be converted to dry farming methods. If planting a dry-farmed vineyard, it may be necessary to water the vines minimally for the first one to four years of growth to help the vine establish a strong root system.

Converting an irrigated vineyard to be a dry-farmed vineyard can be difficult, and there are many different ways it can be done. Many growers wean vines off of irrigation by slowly reducing the amount of water given each season. Deep ripping the ground



around the base of the vine will pull up the shallow roots and encourage deep root growth. Simply turning off the irrigation on the vines should be done with caution, as it may result in yield loss and vine stress.

Site Selection: Climate & Soil Type

Climate- Dry-farmed vineyards should be located in areas with adequate rain and available moisture. The amount of rain necessary will vary depending on the water holding capacity of the soils, the average temperatures, and other vineyard sites characteristics. Coastal fog can also provide essential moisture. Some growers dry farm with as little as 12" of annual rain, while others need 22".

Soil Type- Throughout California, vines are dry farmed on many different soil types. Vineyard sites with deep soils and high water holding capacity, such as clay or loamy soils, may be easier to dry farm. These soils retain the most moisture into the dry growing season. Shallow soils bedrock underneath, fractured soils, and sandy soils may not be able to hold as much water.



Vineyard Design & Management : Varieties, Rootstock, Spacing, Soils and Cover Crops

Grape Varieties- Grape variety selection depends on climate; depending on where in California the vineyard is located, there are certain grape varieties that are more suited to grow in the specific climatic parameters. Within those climatic constraints, more vigorous varieties are best suited for dry-farmed vineyards. Among others, Zinfandel, Tempranillo, Grenache, Petite Syrah, Mourvedre, and Sauvignon Blanc are commonly dry farmed in California.

Rootstock- Rootstocks that promote deep root growth

to search out nutrients and water are important for a successful dry-farmed vineyard. Many dry-farmed vineyards in California are planted on St. George, the traditional rootstock, but a number of other rootstocks, such as 110R and 1103P have been used successfully.

Vine Spacing- Dry-farmed vines may need more space between vines than irrigated vineyards to minimize competition for resources and promote extensive root growth without crowding. Vine spacing will depend on the water holding capacity of the soils, annual rainfall, and needs of the vines. Common spacing in California varies from anywhere between 50 square feet to 150 square feet.

Soil Health- Healthy soils increase nutrient and water availability to support vine growth and development. Management of the soils will depend on the specifics of the vineyard site, but many dry-farmed growers apply compost to the soils in the

fall and use winter cover crops. Starting in the spring, growers may cultivate the rows. Cultivation techniques vary considerably between growers. Many mow down the winter cover crops and disk the soils repeatedly and create a surface dust mulch that holds the moisture in the soil. Other growers minimally cultivate or prefer only to mow the cover crop throughout the season without disking.

Cover Crops- Many dry-farm growers experiment with cover crops to find the best blend of vegetation and management system for their vineyard site. Winter cover crops help rain infiltrate into the soils and reduce runoff. If the vineyard soils have too much water for the vines, then permanent cover crops can help reduce soil water content. Cover crops can also provide an important source of nitrogen and organic matter increasing soil health and habitat for beneficial pollinators and insects.



Tablas Creek Vineyard in Paso Robles dry farms many sections of their vineyard including this area, Scruffy Hill. They are known for producing Rhône single varietal wines and blends.

Final Considerations for Dry Farming

- Depending on farming methods and production goals, dry-farmed vineyards may yield less than irrigated vineyards. This is due to the wide spacing and sometimes smaller crop load per vine. However, a higher price received for quality grapes and/or wine, as well as the potential for long term contracts for growers due to grape quality, may offset the potential yield loss. The decision to dry farm must be made with this in mind.
- Dry-farmed vineyards may take longer to come into production than irrigated vineyards. In some instances, growers have waited up to four or five years after planting before using the fruit to produce wine. However, this decision will depend on many factors, including grower preference and variety.
- Winter rainfall and soil water holding capacity are two of the most important factors to dry farming. There are some areas of California that simply do not receive enough rain or the soils do not hold enough water to successfully dry farm. These parameters should be taken into consideration before planting a dry-farmed vineyard.



Bucklin Old Hill Ranch is the oldest vineyard in Sonoma Valley and was established in 1885. From this dry-farmed vineyard, Will Bucklin produces a field-blend red wine of Zinfandel, Grenache, Cabernet Sauvignon, Syrah, Tempranillo, and other varieties.

Visit our webpages for more information

www.caff.org/programs/dryfarm/

agwaterstewards.org/index.php/practices/dry_farming/

Dry Farm Vineyard Comparison Chart

Vineyard	Location	Acres	Soil	Varieties	Rootstocks	Spacing (Feet)	Yield/Acre
AmByth Estate	Templeton, Paso Robles	20	Calcareous Clay	Rhone Varieties, Sangiovese, Tempranillo	110R or Own rootstock	12x12 10x10	Around 2 tons
Bernier Vineyard	Dry Creek, Sonoma	40	Eroded hillside	Zinfandel, Petite Syrah, Carignane	St. George	8x8	2-5 tons
Bucklin Old Hill Ranch	Glen Ellen, Sonoma	24	Deep red clay loam	Field blend (2/3 Zin, 14 others)	St. George	10x5	2 to 2.5 tons
Dusi Vineyard	Paso Robles	40	Gravel and chalk	Zinfandel	St. George	10x10 12x12	2.5 tons
Frog's Leap	Rutherford, St. Helena, Napa	>200	Loam, Maxwell clay, etc.	Cabernet, Merlot, Zinfandel, Sauvignon Blanc, etc.	St. George, 110R, SO-4	7x9.5, 6x9.5, 7x10, one is 10x5	Reds—4 tons, Whites—6 to 8 tons
Harrison Vineyards	Healdsburg, Sonoma	7	Deep clay loam	Sauvignon Blanc	AxR1	8x12	4.5 tons
Loma del Sol	Mayacamas Mountains, Sonoma and Napa	100	Red Hill/ Gouling/ Laniger Loams, clay loams	Cabernet, Zinfandel, Petite Syrah, Malbec, Chardonnay, Merlot, Syrah	St. George, 110R, 1103P, 3309, AxR1	4x8 to 8x12	
Poor Ranch	Above Hopland, Mendocino	90		Zinfandel, Petite Syrah, Carignane, Grenache	St. George	9x9 or 9x11	2 to 5 tons
Wolff Vineyard	Edna Valley	55	Sandy loam and clay loam	Chardonnay	Own rootstock	12x8	2.5 to 3.5 tons

This table provides a comparison of several dry-farmed vineyards in California. Data compiled by CAFF from 2009- 2012.