



## Frog's Leap Winery, Napa Valley

### Dry-Farming Case Study

**May 2009, July 2010**

#### Background

He is farming over 200 acres. They own 3 ranches totaling about 150 acres, lease 2 ranches of about 25 acres, and then there is the Leeds' family ranch. All certified organic.

He farms across all the topography of the valley, Rutherford, St. Helena. Has land down by the river and up on the benches.

Frank has been farming his family's ranch since 1984. It has been in his family since his grandfather purchased it during Prohibition in 1926. He grew up in San Francisco, his father was a doctor. His uncle farmed it before him and taught Frank the methods. It has always been dry farmed, a tradition brought over from Spain and Italy.

#### Dry farming

Napa was all dry farmed, since the 1850s. They dry-farmed tomatoes before grapes were planted. Some Lodi farmers dry farmed but most of the San Joaquin Valley is a desert, not possible. Using irrigation for frost control started in the 1960s, drip irrigation during the growing season started in Napa in 1971.

In Napa you need 16-18" of rainfall to dry farm. He has gotten that every year since 1977. Rain in the winter does not interfere with farming activities.

All of the great wines of the world were dry farmed, including the California wines that won the famous Paris competition.

#### Problems with conventional vineyards

The standard approach to farming vineyards now: mow the centers, spray herbicides around the plants, use drip irrigation for water and fertilizer. Pests, diseases all love the top foot of soil. He attributes a lot of the problems that wine grape growers have with nematodes or diseases, such as phylloxera, to this wet topsoil.

Less moisture in the top layer of soil as in dry farming also reduces weeds and mildew. Irrigation leads to weeds which then require herbicides which cause loss of soil organic matter which then requires fertilizer and more irrigation.

Lack of cultivation in conventional vineyards leads to hard ground, the rainfall just sheets off it taking the chemicals with it and causing water pollution problems.

80% of rootstock in Napa was AXR, a shallow rootstock that comes up to the surface. Lots of vineyards were replanted in the 1980s with this rootstock. The way grapes are grown now is like

hydroponic tomatoes. The average wine grape root system is now only 25% the size of roots in traditional dry farmed grapes.

His vines are often bigger than conventional vines. They are healthy, they don't collapse. The plant shifts naturally to ripening. The grapes show off the *terroir* more, more concentrated, in better balance.

#### Grape varieties and rootstock

You can dry farm all varieties of grapes. He plants different varieties in different types of soils. Down by the river he grows white varieties. On western benches with loamy soil he plants red varieties and in Maxwell clay plants Sauvignon Blanc. That is, he grows Sauvignon Blanc in the best ground and the worst ground and the reds in between. But he uses the same rootstock everywhere.

Most of his vines are on St. George rootstock. He has 4 acres on SO-4 riparian rootstock and it has been excellent dry farmed. And he has one acre on 110-R rootstock, and it has been fine dry farmed, but it matures later. Planted one vineyard on 5-C (or maybe it was SO-4), a riparian rootstock. You have to force the roots down, they don't want to go down. In general, St. George does better. Martinez nursery in Winters has the best rootstock.

#### Yields

He thins the red grapes to 4 tons/acre. That is pretty normal for conventional red wine grapes. Everyone thins it to that. If you have more yield than that the winemakers come down on you. You don't want big yields for high quality wine. With white grapes he gets 6-8 tons/acre.

No compromise in dry farming, no yield loss. The assumption that dry farming means low yields may be because people associate it with the hillside vineyards in Sonoma and Mendocino.

#### Planting and spacing

When planting a vineyard, he likes to have at least one year fallow (two winters) and he would have more if money were not an object

Adds limestone, 4-5 T. compost, etc.

Grows a cover crop, green manure

Brings in a D-8 with a ripper to 3-4'

Plants in April

No water until June 15, then 5 gallons/plant, immediately cover with soil

Then cultivate cross ways, just like the old timers

August—field bud the rootstock

When he plants a vineyard, he waters the baby vines twice the first year and once the second year. He likes to pour water into a basin around the plant and then cover it with dirt.

Spacing varies across the vineyards: 7x9.5, 6x9.5, 7x10, one is 10x5. 50 square feet is the minimum, but it depends on the soil type.

### Frost control

Some of his ranches have overhead frost control. Doing frost control twice in a year is normal, four times is a bad year. He waits until it is 32 degrees before applying water, regardless of humidity levels. Most people use wind machines, but this year [2009] was the worst frost since the 1940s. He was thankful to have the water. You put on about 1/10" per hour for 2-4 hours each time. So in a good year you would use 4/10"-8/10" of water and in a bad year 8/10"-1.6" So even in a bad year you are putting on very little water, an inch or two. If you can't control for the frost you are done for the year.

### Cultural practices

He gives a long discourse on the importance of cultivating the soil. He reads me something he wrote about it, all the wonderful things that it does. He tells the story from Aesop's Fables about digging for buried treasure in the vineyard and not finding any but getting the best yields ever.

You turn the soil over first thing in the spring after the rains, about mid-March. Cultivating brings up the moisture.

He plants a cover crop every winter: peas, oats, vetch. It opens up the ground. Also get mustard self-seeding, good for nematodes. You can vary the cover crops depending on how much vigor you want.

Mows the cover crop with the prunings.

Disc it in depending on how much vigor you need, or let N blow off.

Plow around the vines with a French plow (hoe plow) to move soil away from the vines. This is because he has the vines (Bordeaux varieties) on trellises, not head pruned, just cane pruned.

Disc again with a drag to get the soil level, usually around the time the fruit sets.

Use a spring tooth harrow with a drag to create the dust mulch, or a spader. The dust mulch is only 3-4" first pass, 6" second pass, 8" third pass. "Dust" is really a misnomer, you don't want dust, just dry soil to seal in the moisture.

He believes that tillage improves the physical condition of the soil. Plant food and organic matter are of no use unless the plant can access them. Cultivating helps that. Continuous cultivation also decreases problems from gophers and other pests.

The logic of dry farming is to save the rainfall by holding it in the soil. If you have hardpan, rip it up. Use cover crops. Cultivate to create a finely divided soil that can act like a sponge.

You can keep moisture in with a mulch you haul in. You can put pieces of wood on the ground and keep moisture in. Or you can cultivate and create a dust mulch.

He cultivates a young vineyard weekly. He cultivates an older one every two weeks, maybe 6-8 passes a season, although some maybe only once a month. The vines grow better with cultivating, end of story, he makes no apologies, see Aesop. "A cultivation is worth two

irrigations.” Cultivating is like pressing down on the gas pedal. I asked him if he had ever tried cultivating less and he said “No, I’m trying to hit the ball, not just stand there.”

#### Water savings

Saves a minimum of 16,000 gallons/acre compared to people who irrigate lightly. Some people use a lot more water. There are 325,851 gallons in an acre-foot of water. So he is saving only 1/20 of an acre-foot. But on his whole 200 acres, that’s 10 acre-feet. On 40,000 acres in Napa that would be 2,000 acre-feet.

#### Costs

The most expensive way to grow grapes is to densely plant them. First you have the installation costs, which are greater the more plants you put in. Then you have to pay more to prune. Plus all the input costs of the conventional system—everybody mows, sprays.

For him, cultivating is the only extra cost, five extra passes on average, all the ranches are different. Everything else costs less. In general, he believes that annual operating costs are about the same for conventional and dry farmed grapes, although a cost study that he participated in showed him having lower than average costs.

#### Conversion

Estimates that 1,000 acres are dry farmed out of 40,000 acres of wine grapes in Napa.

Lots of vineyards could be converted, depends on the spacing. Need a minimum of 50 square feet for each plant. Also the soil type must be able to hold water.

Seventeen years is the average life of a vineyard in Napa. They don’t live very long, usually killed by irrigation-induced disease such as oat root fungus or phylloxera. When you think that there are dry farmed vineyards out there that are 75 years old, it shows the superiority of dry farming.