



*Stafford Vineyards*

*Sauvignon Blanc  
2021 Estate Reserve  
Fiddletown, California*

# **Top 5 Lessons Learned Growing My Own Grapes**

*FOR PRODUCING QUALITY WINE*

V. 2020 Best of Show Estate Grown – V. 2021 Best of Show White

# AGENDA

- 1 – Background of our vineyard property
- 2 - Lesson #1 – Taking the long term approach
- 3 - Lesson #2 – “Physics” of the vineyard
- 4 - Lesson #3 – Creating a balanced vine
- 5 - Lesson #4 – Controlling Powdery Mildew
- 6 - Lesson #5 – Optimizing fruit quality



# Growing Grapes in Sierra Foothills



The Sierra Foothills wine region in California is one of the largest AVAs in the entire United States. It covers 2.6 million acres (1.05 million hectares) across 5 counties extending 160 miles.

Elevations range from 500 feet (152 m) to 3,500 feet (1,067 m).

# Our Location

In 2015 we bought a home and property in Amador County CA with about 3/4 acre of planted vines.

## Amador County, Fiddletown AVA

- Mostly west and south facing slopes
- Terrain is hilly and slighted more elevated than other parts of the county leading to wines that are brighter and more elegant in style.
- Soils are decomposed granite and volcanic material, shallow and low quality leading to reduced vigor and yields. Zinfandel is the flagship varietal.





# The Vineyard



Elevation: 2200 ft

Surrounding area is moderately to heavily wooded with seasonal pond next to the vineyard.

Planted Varietals

- Zinfandel
- Barbera
- Grenache
- Petite Sirah
- Sauvignon Blanc

# The Vineyard



Barbera - 20 year old vines

Zinfandel - mix of 20 and 5 year old vines

SB, Grenache, PS - 5 year old vines

All blocks 6x10 vine and row spacing

Vineyard is on a South facing slope

All are head trained, with the exception of Sauv Blanc which is on VSP trellis

# Lesson 1 - Think Long Term

**Next year's vintage begins as soon as harvest is over.**

Start next year with a “clean vineyard” that is ready for bud break and optimized for fruit production. Some things we do ....

- Deep irrigation after harvest: enables root development, storing energy.
- Remove remaining crop residue to reduce disease pressure. Drop/disk into mid-row.
- Disking vineyard rows to integrate organic material left in mid-rows.
- Seeding vineyard rows with cover crop.
- Fertilizing – only as needed.
- Pruning – done in late spring after rains to avoid Eutypa Dieback.

**There is no Magic Bullet**

**You get out what you put in**

**Everything is interrelated.**



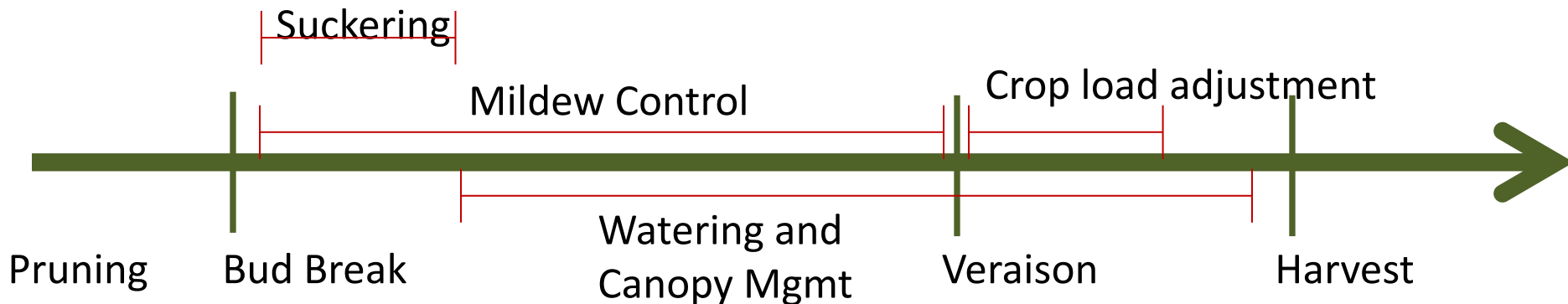
# Lesson 2 – “Physics” of the Vineyard

## ITS ABOUT THE TIMING OF PERFORMING VINEYARD ACTIVITIES

For every **action** there is a + reaction (optimized effort).

For every **inaction** there is a – reaction (more work later, fruit quality).

- Weed control
- Suckering
- Pruning
- Watering
- Spraying for mildew
- Managing crop load and sun exposure



# Take Notes on Vineyard Activity

8:41

April 3 - long-pruned vineyard with help from Carol and Jeannie.

April 19 - start final pruning to spurs. Frosts seem to be over.

April 23 - Grenache, Barbera and Petite Sirah finished pruning. Buds have yet to break.

May 1 - Finished pruning all vines, ending with Zin. Scattered bud break throughout all vines.

May 11 - Thurs ...Sprayed roses with fungicide.

May 15 - bud break about 90 % complete. No spring frost, so all vines are looking good. Do suckering in about a week.

May 20 - finished suckering Barbera. 8 hrs total to do ... 1 hr per row.

May 21 - mowed vineyard. About 5 hrs total run time on mower. Total about 10 hrs on mower at this point of time, 2 years of operation.

May 22 - sprayed Barbera, Grenache, PS, SB with 25 gal JMS. Zin not fully budded out, so was not sprayed.

May 30 - disked vineyard.

June 1 - finished suckering Zin. Started water on the Barbera at 10:00 AM.

June 2- spray JMS + 6 oz Quintec; Zin, Barbera, Grenache 1/2 PS.

## Example of Phone Note APP

Provides history of actions and year to year reference for activity.

8:42

June 24 - water Grenache 30 hrs

June 26 - water PS 30 hrs

June 27 - water SB 30 hrs

June 28 - water Barbera 30 hrs

June 29 - spray Barb, Grenache, PS JMS + Quintec, 35 gal

June 30 - spray SB, Zin 35 gal .... Total 70 gal for coverage

\*\*\* Spraying for botrytis \*\*\*

July 10 - spray Grenache, Barb, 45 gal JMS + Switch using 8 oz - 14 oz/acre.

July 10 - Started water on 1/2 of Zin + Grenache + 1/2 PS. 30 hrs.

July 11 - AM started water on bottom half of PS. PM, started water on remaining Zin and Barbera

July 12 - PM, finished water on PS 30 hrs.

PM, Started water on SB

Spray Zin, SB, 45 gal JMS + Switch using 7 oz - 14 oz/acre.

July 13 - AM, finish water on Zin, Barb, 36 hrs.. PM Finish water on SB 28 hrs.

\*\*\* Spraying for botrytis \*\*\*

July 24 - sprayed Zin and PS with JMS + Elevate 8 oz in 50 gal. High amount of PM damage, suspect Switch has a shorter spray cycle. Lots of interior leaves yellowing and falling off too perhaps indicating lack of water.

# LESSON 3

## **CREATING A BALANCED VINE**

### **MANAGING GROWTH AND FRUIT DEVELOPMENT**



# New Plantings?

Most importantly – match rootstock and scion/variatal choices on growing location and conditions. Make informed/objective choices.

- Rootstock that matched our soil type, water availability and nutrient ability. 3309 was chosen.
- Goal: expand winemaking to a white wine.
  - Several varieties matched our growing conditions (and hot summers). Sauv Blanc was chosen because we like the wine and had access to scions from a local vineyard.
- Goal: plant 2 varieties that we like to drink as a single variety, but also providing good blending components.
  - Petite Sirah – Award winning blend of Zin, Barbera, PS.
  - Grenache – Great for both red and rose’.

# Planting Decisions



To trellis or not > head trained

Grenache and Petite Sirah



# Award Winning Sauv Blanc





# Spur position and pruning

Managing fruit quantity, quality and vine balance starts with spur selection, position and pruning to the desired fruiting load.

# Spur position and pruning

Before

Zinfandel

After





# Spur position and pruning

Before

Petite Sirah

After





# Spur position and pruning

Before

Barbera

After





# Spur position and pruning

Before

Grenache

After





# Spur position and pruning

Before

Sauv Blanc

After





# Water Management

Keep leaves green to harvest.

- A stressed vine does not necessarily produce better fruit/wines.
- Watering excessively promotes too much green growth and herbaceous flavors .
- Regulated Deficit Irrigation optional but needs to be managed carefully.

Know your soil type to understand water requirements. Sandy = more, clay = less

Your vines will “tell you” when they need water.

- Tendrils pointing up (good) vs. droopy (possible deficit) vs dried out completely.
- Leaves turning their backs to the sun.
- Basil leaves drying out and dropping.



# Water Management

Be proactive - Be aware of temperature forecasts and adjust watering schedule and quantity ahead of excessively high temps. Same for rain.

Walk through the vineyard regularly (2-3 x a week) to observe how the vines look.

Water deeply and less often. A single vine may use a gallon or more a day, especially in very hot temperatures.

# Sunlight into Wine

Give clusters filtered exposure to the sun.

- Around the time of veraison, remove interior leaves shielding clusters from direct sunlight.
- Remove interior laterals.
- You should be able to see all the way through the fruiting zone.
- Avoid exposure of clusters to direct sunlight.



LESSON 4

**POWDERY MILDEW**



# Powdery Mildew

**Powdery Mildew is the most serious and widespread disease in CA vineyards in terms of expenses incurred for control and losses in quality and yields.<sup>1</sup>**

Reduced wine quality can occur if as little as 3% of the berries are infected.

All succulent grapevine tissues are susceptible to infection.

- When leaves are young, yellowing, crinkling, distortion and defoliation can occur.
- Shoot infections can stunt vine growth.
- Infection of berries can reduce size, produce scarring and cause berries to split.

1. Quoted from "Grape Pest Management"

# Powdery Mildew Control

Season-long control depends on reducing early-season inoculum and subsequent infection. **Start treatments soon after bud break.**

Control should be an integration of cultural practices (canopy management) along with the use of fungicides.

Disease development and spread is based upon climate conditions; i.e. rain and temperatures.

- Spores released at temps from 50° to 85°F, optimum temps 68° to 75°F.
- Temps above 86°F growth/infections delayed or do not occur.
- Temps above 90°F kills spores if the duration is 12 hours.

Timing and rate of spraying are influenced by the daily accumulation of moisture and temperatures. **Refer to PM Risk Index Model.**

# PM Risk Index Model

**Use the index to determine disease pressure and how often you need to spray to protect the vines. Spray intervals can be shortened or lengthened depending on disease pressure.**

- If spores are present, an epidemic will begin when there are 3 consecutive days with 6 or more continuous hours of canopy temperatures between 70° and 85°F.
- Add 20 points for each day with 6 or more continuous hours of temps between 70° and 85°F.
- Until the index reaches 60, if a day has fewer than 6 continuous hours of temperatures between 70° and 85°F, reset the index to 0 and continue. Above 60, subtract 10 points.
- If temperatures reached 95°F for more than 15 minutes, subtract 10 points.
- If there are 6 or more continuous hours with temperatures between 70° and 85°F AND the temperature rises to or above 95°F for at least 15 minutes, add 10 points.



# Risk Assessment Index Example

UC Davis Website

<https://ipm.ucanr.edu/weather/grape-powdery-mildew-risk-assessment-index>

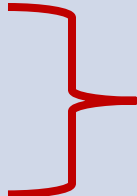
Rombauer Sierra Foothills Station

Date	RAI	Disease pressure	Pathogen status	Hours 70° ≤ Temp ≤ 85°	Hours Temp > 95°	Notes
09/14/2023	0	low	present	3.1	0.00	
09/15/2023	0	low	present	3.5	0.00	
09/16/2023	20	low	present	6.6	0.00	
09/17/2023	40	moderate	reproduces every 15 days	8.2	0.00	
09/18/2023	60	high	reproduces every 5 days	8.5	0.00	
09/19/2023	80	high	reproduces every 5 days	8.9	0.00	
09/20/2023	100	high	reproduces every 5 days	10.4	0.00	

# FRAC - Fungicide Resistance Action Committee

FRAC codes assigned according to a fungicide's mode of action.

Alternating fungicides with different modes of action is essential to prevent pathogens from developing resistance.

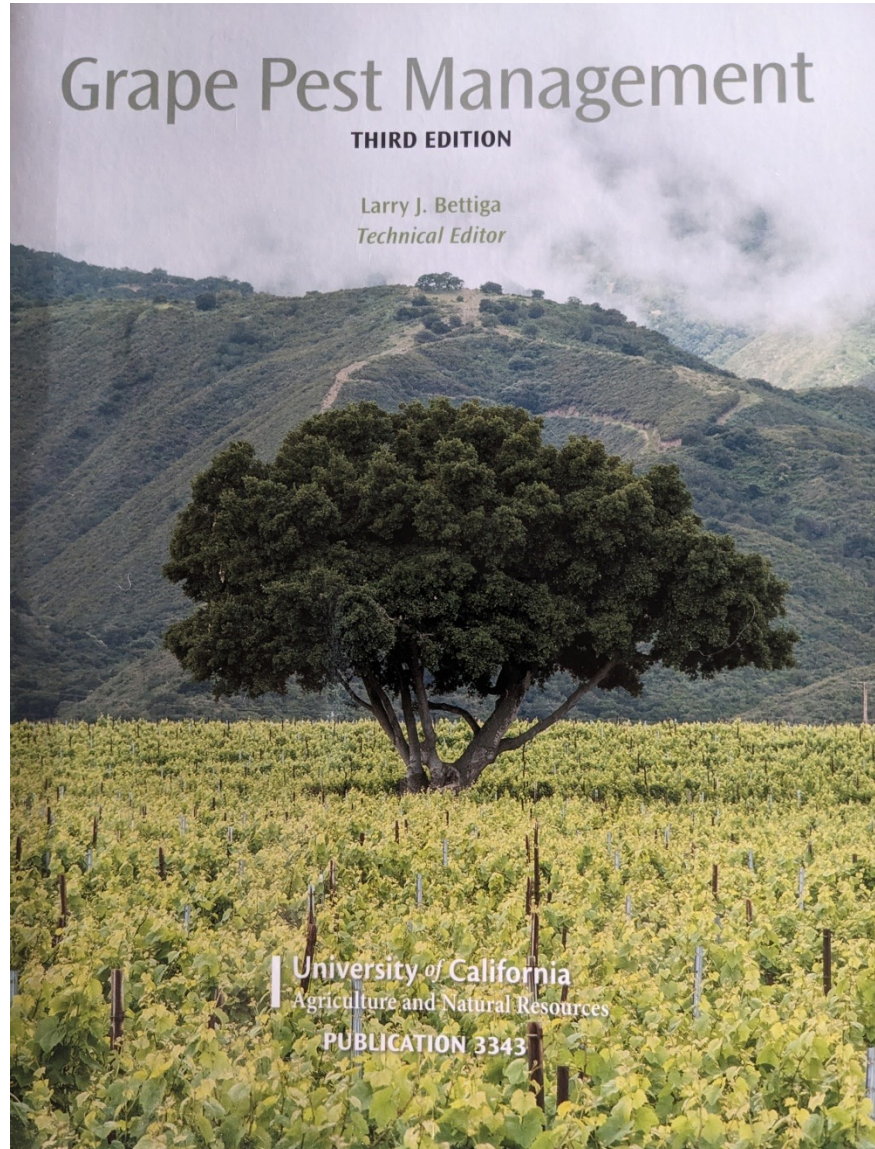
Fungicide Type	Details
Synthetic  <b>MY STRATEGY</b>	Code 3: Demethylation inhibitors Code 11: Strobilurins Code 13: Quinolines Code 8: Benzophenone  <b>Rotate</b>
Natural compounds, oils and inorganic salts	Stylet Oil: <b>Tank mix – 100% for initial sprays</b> <ul style="list-style-type: none"><li>• Short residual activity and need for direct contact</li><li>• Must be applied frequently during high disease pressure</li><li>• Good tank mix with synthetics</li><li>• Be wary of phytotoxicity with certain synthetics</li></ul>
Biologicals	Use only when disease pressure is low
Sulfur	<ul style="list-style-type: none"><li>• An effective and economical material</li><li>• Must be present before fungus develops</li><li>• Phytotoxicity with high temps and alternating with oil</li></ul>



# Spray Timing

			Suggested spray schedule			
Index	Disease pressure	Pathogen status	Biologicals <sup>1</sup> and SARs <sup>2</sup>	Sulfur	Demethylation-inhibitors (DMI) <sup>3</sup>	Strobilurins and Quinolines <sup>4</sup>
0-30	low	present	7- to 14-day interval	14- to 21-day interval	21-day interval or label interval	21-day interval or label interval
40-50	moderate	reproduces every 15 days	7-day interval	10- to 17-day interval	21-day interval	21-day interval
60 or above	high	reproduces every 5 days	use not recommended	7-day interval	10- to 14-day interval	14-day interval

# Disease and Pest Resources



Larry Bettiga – University of CA, Davis

Or online resource at

<https://ipm.ucanr.edu/agriculture/grape/>



LESSON 5

**OPTIMIZING FRUIT QUALITY**

# This Is Not What We Want





# “Bringing It Home” – Veraison

Veraison brings activities to make “final” preparations for harvest which optimize fruit quality.

- Interior laterals and leaves pulled to expose fruit to filtered sun.
- Damaged fruit removed.
- Excessive clusters removed.
- Bunched clusters in a single mass thinned.
- “Seconds” from laterals removed.

Its also time to apply netting.





# Bird Damage - Vineyard Netting

Surrounding area created heavy bird pressure.

## Key takeaways

- **Invest in quality (heavy duty) netting.**  
Tried: avian spray, seed trays, falcon kite, streamers but still had 60-70% crop reduction
- **Find an efficient and effective way to apply (and remove) netting.**
- **Balance effort with results – we do not wrap vines.**  
Originally avoided netting due to effort and cost.

Netting made dramatic improvement to yield and quality.



# Final Considerations For Harvest

Pray it does not rain – Botrytis control – some varieties more affected.

- Botrytis control takes place BEFORE bunch closure.

Managing water – less may be better, but do not stress.

Once veraison is 90% complete remove remaining unripe clusters.

Monitor brix along with pH and TA

- Look for visual signs of cluster ripening.
- Use refractometer for berry samples to monitor incremental changes.
- As harvest date nears, take extended sample across entire vineyard/block.

# Brix Testing – Harvest Tracking

Vintage	Date	Zinfandel				
	Sample Date	Brix	Delta/Day	Brix Target	Ripe Factor	Calc Harvest Date
2023	2-Sep					
	9-Sep	17				
	16-Sep	18	0.14	24.5	0.34	5-Oct
				26	0.32	11-Oct
	20-Sep	18.5	0.13	24.5	0.25	14-Oct
				26	0.25	20-Oct
	26-Sep	20.4	0.32	24.5	0.25	12-Oct
				26	0.25	18-Oct
	7-Oct	22.3	0.17	24.5	0.25	15-Oct
				26	0.25	21-Oct
	8-Oct					
	9-Oct	23	0.35	24.5	0.25	15-Oct
				26	0.25	21-Oct
	21-Oct	25.5	0.21	26	0.25	23-Oct

**Harvest date and  
expected brix**



# “Ripe and Ready”



Undamaged  
Cluster

Brown Stem  
(lignification)



# Vineyard Testing Informs Harvest Date

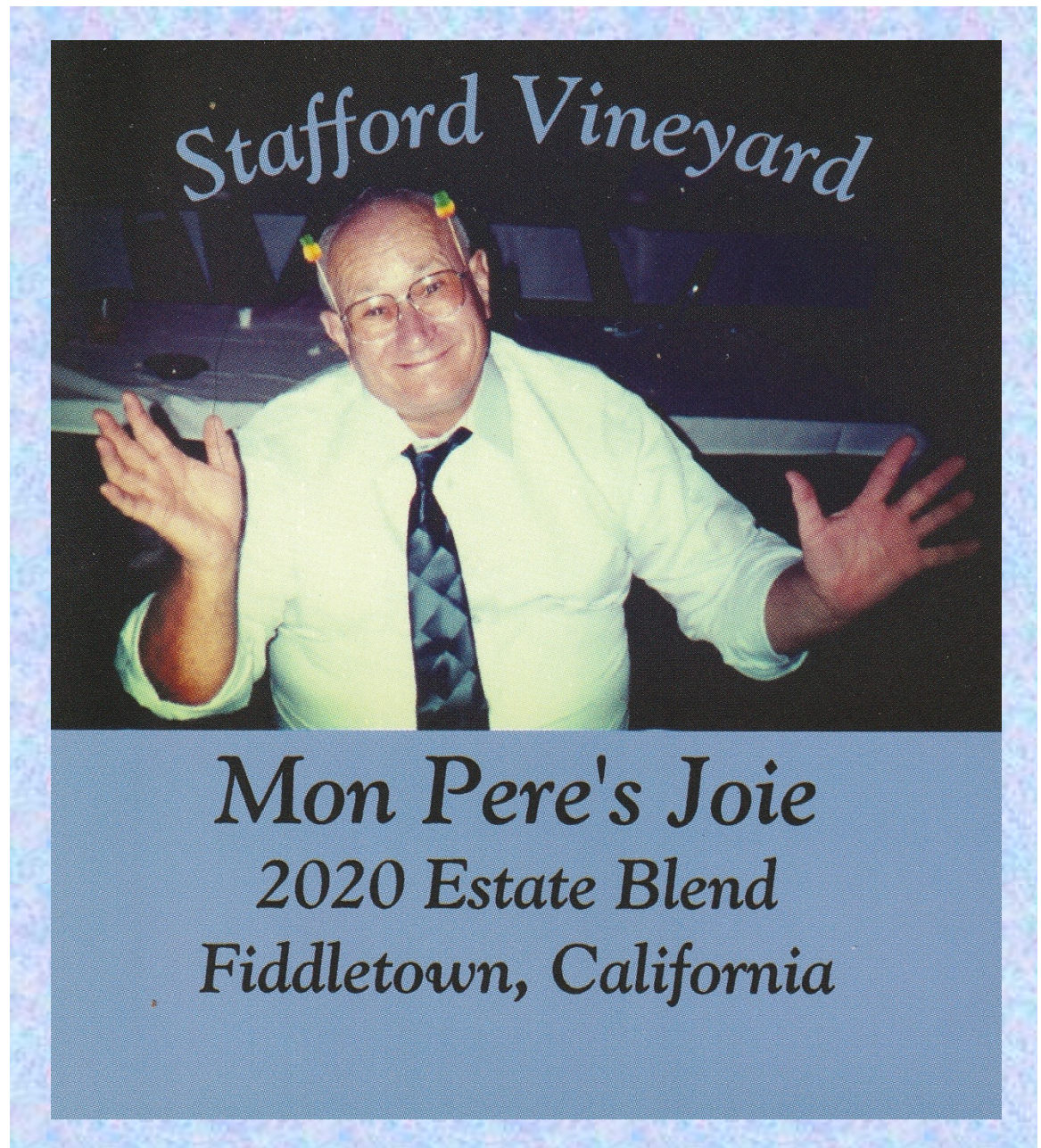




**IN THE END ....**

**HAVE FUN**

*In honor of Norman Morrison, our father, father-in-law, and constant support in our lifelong passion of wine.*



**V. 2020 Best of Show Red**



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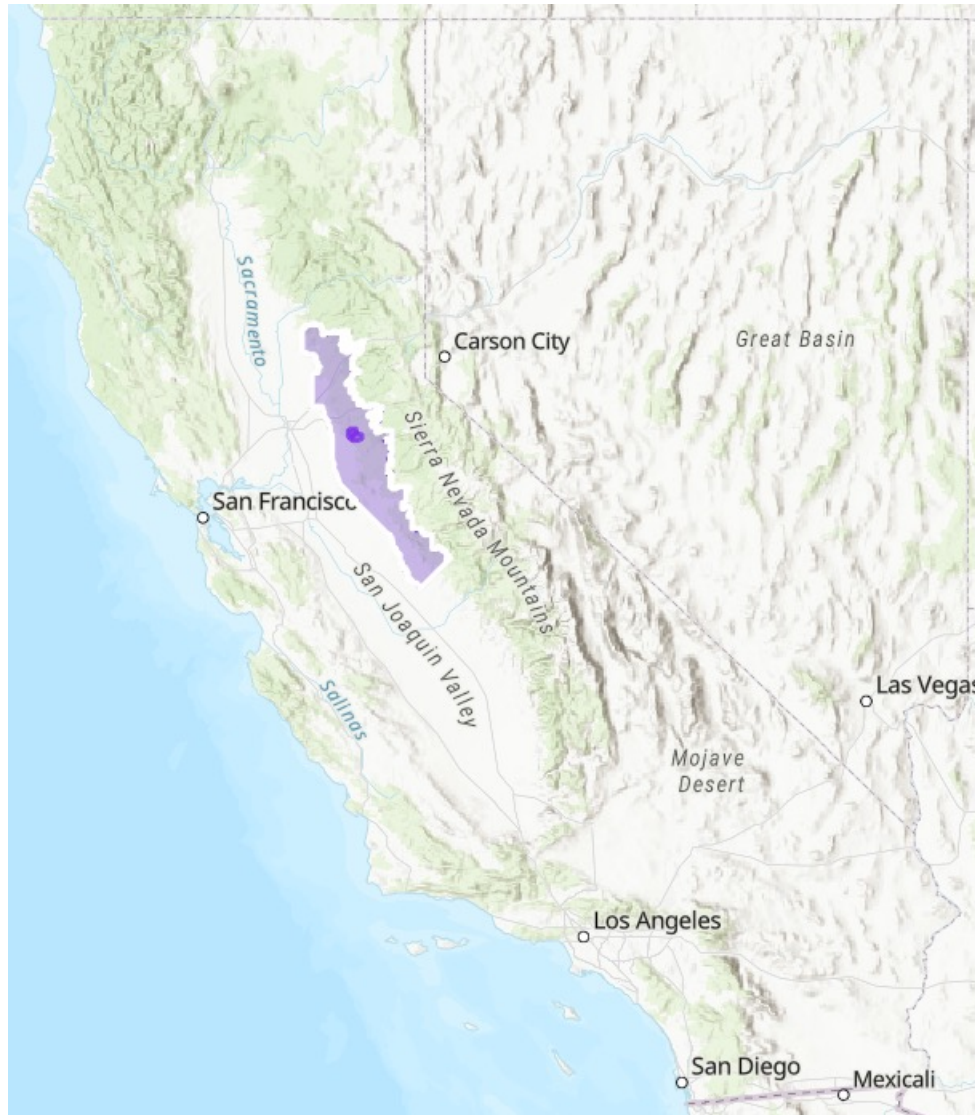
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EXTRA

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# Background



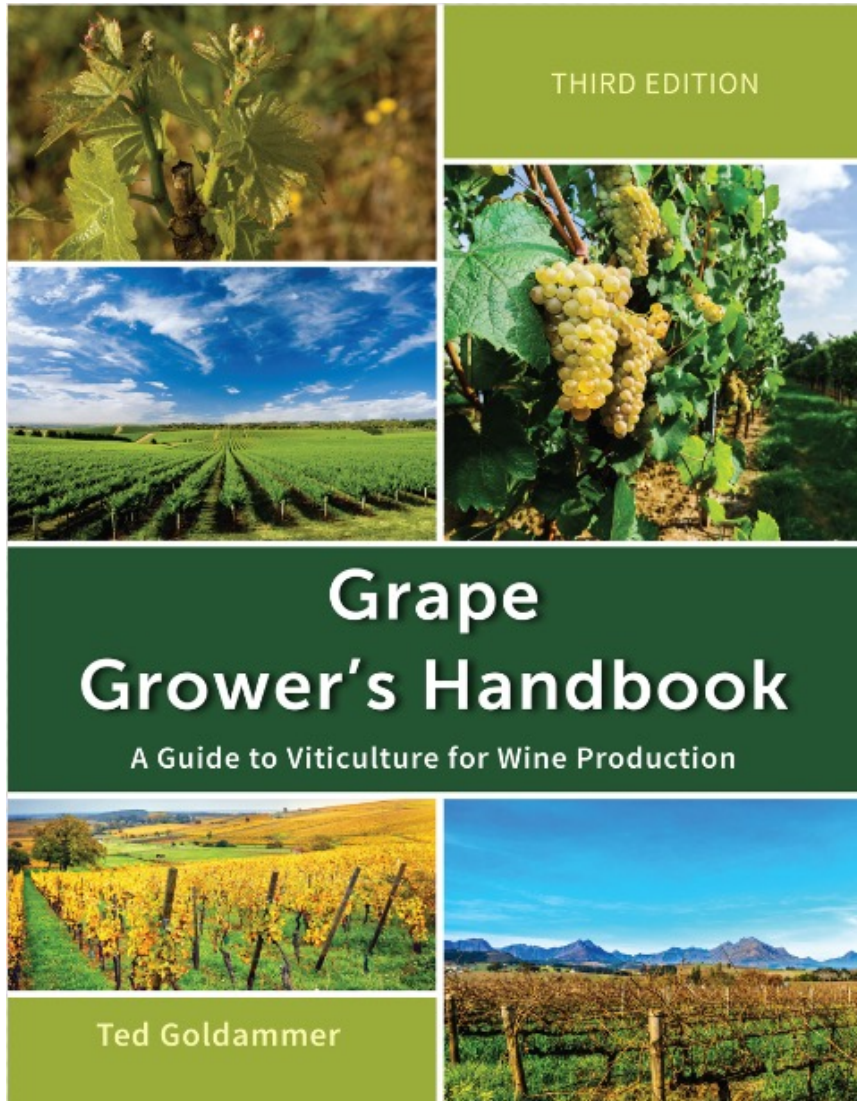
In 2011 we decided to start making wine and traded labor in the commercial vineyard Leah's boss owned for Zinfandel grapes which was enough to make about 6 gallons of wine.

Another vintage occurred in 2014 where we again purchased grapes, expanding our wine production to both red and white varietals.

In 2015 we bought a home and property in Amador County CA with about 3/4 acre of planted vines to support our hobby and interests.



# Grape Grower's Handbook



<https://www.wine-grape-growing.com/>

Alternate: Dick Cooper's  
Book (Mr. Barbera):

**Vineyard Development  
and Maintenance in  
Amador County**

<https://cooperwines.com/>

# Fungicide Compound Research

<b>Powdery Mildew</b>					
<b>Fungicide</b>	<b>Cost</b>	<b>Quantity</b>	<b>FRAC Group</b>	<b>Resistance Potential</b>	<b>Activity</b>
Abound (Quadris)	\$ 209.00	1 gal	11	high	contact, systemic
Armicarb				low	
Coppercount-N					
<b>Elevate</b>	\$ 96.00	2 lbs	17	high	contact
Flint	\$ 293.00	1 qt	11	high	contact, systemic
Kaligreen	\$ 55.00	5 lb		low	contact
Kocide	\$ 48.00	4 lb			contact
Pristine	\$ 400.00	7.5 lbs	11, 7	high	contact, systemic
<b>Procure</b>	\$ 134.00	1 qt	3	high	systemic
<b>Quintec</b>	\$ 123.00	30 oz	13	medium	contact
Rally	\$ 77.00	20 oz	3	high	systemic
Sovran	\$ 100.00	1.25 lbs	11	high	contact, systemic



# Soil Analysis



## Report of Soil Analysis

Ken Stafford - Stafford Vineyards  
 PO Box 725  
 Plymouth CA 95669  
 00-0026368

Lab No.: 23L1023  
 Sampled By: Self  
 Requested By: Ken Stafford  
 Sampled Date: 12/11/23  
 Submitted Date: 12/18/23  
 Reported Date: 12/26/23  
 Location/Project: Stafford Vineyards - Fiddletown CA  
 Crop ID: Wine Grape 5-20 Years mixed

E-mail: kenleah@staffordsmountainhome.com

Copy To:

Soil Acidity Low

No. Description	Depth	SP %	pH units	EC dS/m	Ca meq/l	Mg meq/l	Na meq/l	Cl meq/l	ESP %	Gypsum Req. T/ac-6"	Lime Pres.	Lime Req. lbs/ac-6"	B mg/l	NO <sub>3</sub> -N mg/kg	PO <sub>4</sub> -P mg/kg	PO <sub>4</sub> -P mg/kg	K mg/kg	Zn mg/kg	Mn mg/kg	Fe mg/kg	Cu mg/kg	OM %									
																							S1.00	S1.10	S1.20	S1.60	S1.60	S1.60	S1.40	Calc.	S2.50
		NAPT Methods--->		Handbook 60--->		60-22d		60-23a																							
		Sat. Paste		Sat. Paste		Sat. Paste		Sat. Paste		Sat. Paste		Sat. Paste		Sat. Ext.		AA Ext.		Olsen Ext.		Bray Ext.		AA Ext.		DTPA Ext.		DTPA Ext.		DTPA Ext.		DTPA Ext.	
1	Extracted from approx 7 vineyard rows @ 2' depth	36	4.6	0.56	2.8	0.9	0.2		ND		ND	2100	ND	21	5	9	167	2.2	21	41	2.5	1.8									
<b>Wine Grape Soil</b>		"Texture"	Acidity	total Sal	Calcium	agnesiur	Sodium	Chloride	"Alkali"	Gyp Req	Lime Pres	Lime Req.	Boron	Nitrate-N	hosphate	hosphate	Potassium	Zinc	Mang.	Iron	Copper	OM									
<b>Low</b>		Sand <20	<6.3	<0.5	<4	-	-	-	-		ND		<0.2	<5	<4	<4	<90	<0.5	<1.0	<4.0	<0.2	<0.2									
<b>Normal</b>		Loam 25-45	6.7-7.8	0.7-2.0	5-25	<Ca	<5	<5	<4		2		0.3-0.6	8-20	7-25	7-25	100-250	1.0-4.0	1.0+	4.0+	0.2+	0.6-1.5									
<b>High</b>		Clay >55	8.2+	2.5+	35+	-	8+	10+	6+		4		0.9+	30+	50+	50+	350+	6.0+													

mg/kg & mg/l are equivalent to ppm

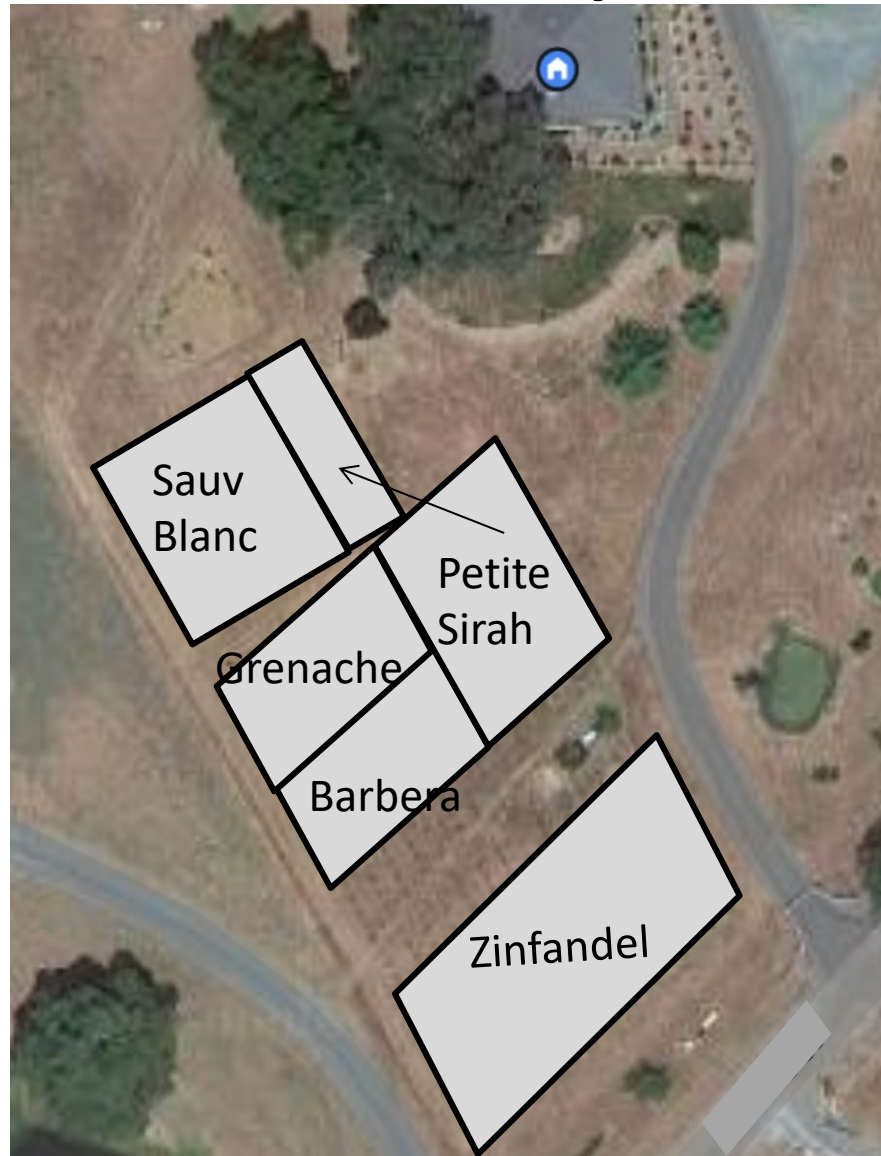
ND = None Detected

Black = Normal

Red = High Green = Sl. Lo

purple = Sl. High Blue = Low

# The Vineyard





# Our Red Blotch Story



**Indicated by pink  
veins and  
confirmed through  
lab testing.**



# Vineyard Sprayer

Match sprayer and tank size to vineyard





# Netting





# Netting





# Vineyard Mowing – Flail Mower



First 7 years - pruned canes were collected by hand out of the vineyard and transported to a burn pile on the property.

As the vineyard grew in size and we began planting a cover crop, dealing with pruned canes and mowing cover crop became too significant of an effort.

Purchase of a flail mower allowed us to leave pruned canes in mid-row and chop up with the mower and disk into the soil later.