



Shiloh Estate LLC

SHILOH VINES & WINES KNOWLEDGE BASE SERIES

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Growing a Quality Wine

by

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Coordination Draft
Comments Welcome

A vineyard to grow grapes for an ultra-premium priced Bordeaux blend wine is described using *Vineyard Planner*ⁱ, a new decisionmaking tool from Shiloh Estate LLC

Growing a Bordeaux Blend

Hypothetical Exampleⁱⁱ—Assume the following:

1. You purchase 60 acres of raw, generally level, valley floor land in Napa Valley at \$135,000 per acre—\$8.1 million—for the business purpose of growing grapes and making wine.
2. The vineyard must be at least 50% Cabernet Sauvignon.
3. The owners-cum-investors want to make a profit (call the enterprise *Opus Too*).

Further assume that the vineyard is part of an integrated enterprise that includes a winery.

In *Part II: Making a Quality Wine*, the winery will be addressed. In *Part III: Marketing a Quality Wine*, the brand will be launched and sold into target markets.

Winegrowing Goal/Mission—Grow quality grapes to support the production of a profitable, estate-bottled Bordeaux blend that includes up to five cultivated varieties.

Variety	Percentage ⁱⁱⁱ	Block
Cabernet Sauvignon	80.0 ± 7.5	40 acres
Cabernet Franc	10.0 ± 3.0	5 acres
Merlot	5.0 ± 3.0	2.5 acres
Malbec	2.5 ± 2.5	1.25 acres
Petit Verdot	2.5 ± 2.5	1.25 acres

The target percentages are 80, 10, 5, 2.5, 2.5.

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The Vineyard

Planning Factors—Considerations include:

- Plantable acres net of the winery operation, tasting room, parking, roads, etc.
- “Blocks” of vines that translate into “lots” of wine that will be blended into the final product (or products).
- Vine row orientation.
- Trellis system architecture and vine-by-row spacing.
- Number of vines by variety, clone, rootstock.
- Expected yield per vine, per acre, per block.
- Cultivation practices (e.g., hand pick, cover crop, sustainable agriculture).

It is clear that the winemaker must be involved in most of these decisions. It is also clear that many of these variables interact and several iterations will be required to come up with a vineyard plan.

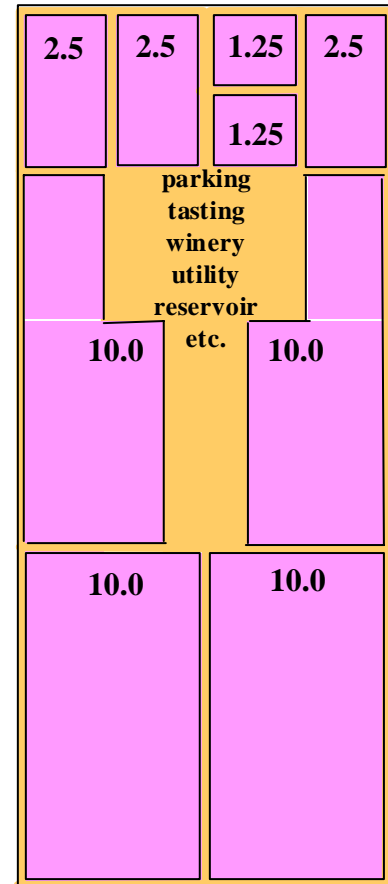
Site Layout—Set aside 10 acres, leaving 50 plantable acres. If five acres are allocated for vineyard roads, reservoir, *et al*, the cost per plantable acre is now \$148,500 as the vineyard has to carry 55 acres (the winery would carry five acres @ \$135,000). Each block can be subdivided into sub blocks if appropriate (e.g., different rootstocks, different clones, different spacing).

The rectangular 60-acre plot shown to the right—not to scale—includes:

- 10 acres reserved space for roads, parking, tasting, winery, utility, reservoir, etc. with 5 carried by the vineyard and 5 by the winery.
- 50 acres comprising 8 vineyard blocks with 4 non-Cabernet blocks and the 40-acres of Cabernet subdivided into four 10-acre blocks.

Yield—Assume that the yield per vine objective is 4 pounds.^{iv}

Opus Too
General Site Plan



Using *Vineyard Planner*, a spacing of 4' x 5' permits 2,178 vines per acre, and 4 pounds/vine yields 4.32 tons per acre. If the same spacing and yield assumptions are applied to all 50 plantable acres, the total annual yield would be 216 tons.

Vineyard Profits = Revenues - Costs

UC-Model Vineyard—*Vineyard Planner* uses the UC-Davis Model Vineyard^v for default vineyard establishment costs for Years 1 - 3 and operating costs for Year 4 and beyond. This baseline cost matrix is scaled to account for vineyard parameters that vary from the model. Plantable acres, vine-by-row spacing (and the number of vines), yield per vine (and block), cost (especially land cost), and grape sales price almost always differ from the model (see top of Page 4).

Establishment Costs—The net accumulated establishment costs for Years 1-3 are \$1,172,750.

Operating Costs—The operating costs for Year 4 (and beyond) are \$937,200.

Revenues—Sales revenues is simply the tons produced times the sales price per ton.

Assume:

1. The Opus Too Vineyard is a separate profit center (or strategic business unit).
2. The 50 plantable acres yield 216 tons in Year 4 and thereafter through Year 25.
3. The Sales price negotiated with the Winery and Marketing profit centers is \$4,925 per ton for internal price transfer purposes.

Revenues = \$1,064,096 for Year 4 and beyond.

Profits—Profits for Year 4 and beyond are:

$$\$1,064,096 - \$937,200 = 126,896$$

If this profit persists for 22 years, the internal rate of return at 0.2%, near the break-even point.

These estimates are from the *Vineyard Planner* for the most-likely-case (MLC) scenario of 216 tons.

The best-reasonable-case (BRC) scenario is 1.2 times the MLC and the worst-reasonable-case (WRC) scenario is 0.8 times the MLC.

Step 5: Generate Profit Part of Vineyard Block Scenario

Step 5a: Estimate Annual Vineyard Block Revenue (Years 4 - N)

Block ID: Opus Too Variety: Bordeaux

Block Attributes	Yield (Tons)	Sales Price/Ton	Revenue
Acres: 50	BRC: 259.27	4,925	BRC: 1,276,905
Vines: 108,900	MLC: 216.06		MLC: 1,064,096
Spacing: 4.0 x 5.0	WRC: 172.85		WRC: 851,286
Lin feet: 435,600			

Step 5b: Estimate Annual Vineyard Costs

Accumulated Vineyard Cash Estab Costs	Annual Vineyard Total Operating Costs (Years 4-N)	Profit Estimates
Total Accum Cash Costs: 1,172,750	BRC: 939,550	BRC: 337,355
Multiplier: 1.0	MLC: 937,200	MLC: 126,896
	WRC: 934,800	WRC: -83,514

Internal Rate of Return for N=25 Years

BRC IRR: 8.8% OK

MLC IRR: 0.2% OK

WRC IRR: failed nok

Cost Scenario Descriptor: Med estab, med op costs

Buttons: Quit, Print Form, Go to VMP Start, View Baseline Cost Model, Save Vineyard Block Scenario, Go to Step 4, About Step 5, Go to Step 6 Summary

Step 5 in the Vineyard Planner process is to generate the profit part of the vineyard scenario.

Given yields in tons, the revenues are simple to generate for different sales price assumptions.

Establishment and Operating Costs are more difficult to estimate due to the number of variables and the fact that costs differ by vineyard location, topography, climate (e.g., rainfall), trellis system, cultural practices, etc. See top of the next page.

Profits are easy given revenues and costs.

Wine Estimates

Given vineyard yield in tons, it is easy to estimate wine volume.

Assume:

1. A conservative pressing regimen emphasizing free run.
2. 150 gallons (and 63 cases) of finished wine per ton.

The winery output for the most-likely-case scenario is 13,630 cases, but could be lower (say 10,900 cases) or higher (say 16,350 cases).

In practice, yield for each block would be used to estimate wine for each corresponding lot.

Initial Conclusion & Next Steps

Profits are Feasible—Although numerous assumptions were made to get this far with Opus Too, it seems that the integrated winegrowing,

Special Wine Yield Estimate (for Stored Scenario from Step 6)

Block ID: Opus Too Variety: Bordeaux Blend

Estimate Volume of Wine

Volume & Weight: 150 gallons/ton, 63 cases/ton

Select Option: Low Yield, Mid-Yield, High Yield, Custom Yield

Buttons: OK, Cancel, Reality Check, Print Form, Go to VPM Start

Block Yield	Tons	Wine Estimates for this Block Scenario*			
		Gallons	Barrels	Bottles	Cases
BRC	259.27	38,891	648.18	196,283	16,356.9
MLC	216.06	32,409	540.15	163,570	13,630.9
WRC	172.85	25,928	432.13	130,858	10,904.8

* 60-gallon barrels, 750 ml bottles, 12-bottle cases

winemaking, marketing enterprise could make a modest profit if the wine could be sold at the \$50 per bottle retail price point, could make a nice profit at \$75 per bottle, and a very nice profit at \$100 per bottle. (Given ultra-ultra quality wine.)

These profit expectations are based on a popular planning factor:

If wine grapes sell for X per ton, the retail price point of the resulting wine should be 0.01 X (or 1% of the per ton price).

Next Steps—The following steps merit consideration:

1. The various assumptions embedded in this vineyard analysis need to be reviewed and refined.
2. Market research needs to be undertaken to determine if a per bottle retail price point can be established as reasonable at the ultra-premium wine level of \$75 to \$100.

Step 5c: Cost Scenario Summary (Cost per Acre)

Vineyard Block Scenario & Cost Scenario IDs
 Block **Opus Too** Cost **Med estab, med op costs**

User Block Summary Information

Variety Bordeaux	Most-Likely-Case Cost per...	
Acres 50 Spacing 4.0 x 5.0	...ton 4,338	
Vines 108,900 Vines/Acre 2,178	...acre 18,744	
Linear Row Feet 435,600	...vine 8.61	
	...lin ft 2.15	

Return to Profit Scenarios

Tons/Acre

WRC	MLC	BRC
3.46	4.32	5.19

MEDIUM COST PER ACRE: BASED ON 30-ACRE MODEL VINEYARD

<i>Cost Categories</i>	<i>Medium Estab Costs</i>			<i>Medium Ops Costs</i>		
Click on Category for Details	Year 1	Year 2	Year 3	WRC	MLC	BRC
Site Preparation	1,529	0	0	0	0	0
Infrastructure	2,840	1,189	0	0	0	0
Vine Planting	8,095	269	0	0	0	0
Vine & Crop Management	1,341	2,622	2,409	3,505	3,505	3,505
Vineyard Floor Management	541	142	131	216	216	216
Crop Harvest @ \$120/Ton	0	65	217	190	238	285
Interest on Operating Capital	399	122	73	91	91	91
Overhead Costs (Cash)	1,512	1,530	1,515	1,635	1,635	1,635
TOTAL CASH COSTS/ACRE	16,257	5,939	4,345	5,637	5,685	5,732
ACCUM NET ESTAB COSTS	16,257	21,579	23,455	0	0	0
Capital Recovery Costs	11,796	11,836	11,836	13,059	13,059	13,059
Tons per Acre	0.00	.31	1.23	3.46	4.32	5.19
Revenue per Acre	0	1,527	6,058	17,041	21,276	25,561
TOTAL COST PER ACRE	28,053	17,775	16,181	18,696	18,744	18,791
Profits per Acre	-28,053	-17,155	-13,721	-1,757	2,430	6,617

Given feasibility, a number of policies, strategies, and plans need to be developed (by the actors), for example:

1. *Financial*—Emphasis on obtaining sufficient funding for the project.
2. *Organizational*—Emphasis on key executives-cum-leaders for the vineyard, winery, and marketing profit centers.
3. *Winegrowers*—Emphasis on a world-class vineyard with quality grapes that could get \$4,000 or \$5,000 or \$6,000 per ton on the open market^{vi} (although they are being sold internally to the winery)
4. *Winemakers*—Emphasis on an extraordinary wine that can retail at \$75 to \$100 per bottle or more.
5. *Marketing & sales*—Emphasis on identifying target markets and marketing and promotional mixes that deliver value to stakeholders (including owners, employees, and investors).

ⁱ *Vineyard Planner* is a proprietary, copyrighted software product developed by *Shiloh Estate LLC*.

ⁱⁱ These are the givens for problem assigned to Napa Valley College's Winery Management class by instructors Rick Jones and Sheldon Parker.

ⁱⁱⁱ The 1996 Dominus blend, priced around \$100 per 750 ml bottle, comprised: 82% Cabernet Sauvignon, 10% Cabernet Franc, 4% Merlot, and 4% Petit Verdot; for reasons unknown, Malbec was not included.

^{iv} Opus One averages about 4 pounds/vine yield for about 5 tons/acre on 4' x 4' spacing. Dominus targets 3 tons per acre by dropping cluster to improve overall grape quality. Both use bilateral cordons.

^v Rhonda Smith et al, "Sample Costs to Establish a Vineyard and Produce Wine Grapes," U.C. Cooperative Extension Farm Advisor Sonoma County (1999)

^{vi} In Napa Valley, Vintage 2000 Cabernet Sauvignon grapes sold for \$3,170/ton—\$536/ton above the 1999 average. The 2001 average will approach \$4,000 - \$4,500/ton in Napa Valley.