

Monitoring and Managing Expenses and Cash Flow in the Vineyard

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Objectives

- ▶ Review the Budgeting Process
- ▶ Financial Analysis
- ▶ Sample Model
- ▶ Cash Flow Planning

What are enterprise budgets?

- ▶ Enterprise budgets –
 - An organized listing of your estimated gross income and costs which can be used to determine the expected net income for a particular enterprise
 - Budget on a per unit basis
 - – ex 1 acre, 1 bushel, 1 ton
 - Sections include
 - Income, Costs, Profit

6 Parts of a Budget

- ▶ Investment
- ▶ Gross Income
- ▶ Variable Costs
- ▶ Fixed Costs
- ▶ Net Income

Costs

- ▶ Variable costs - These are expenses that vary with output within a production period
 - Fuel, Fertilizer/Lime, Disease/Insect control
- ▶ Fixed Costs- Fixed costs are expenses that do not vary with the level of output.
 - Depreciation (Structures and Equipment), Interest, Repairs, Taxes, Insurance

Determining Variable Costs

- ▶ Utilize ag supply stores, catalogs
- ▶ Create a worksheet for labor and fuel
 - Make estimates and keep a log
 - Assign a value and/or price
 - Labor – Skilled (\$18.00) and Unskilled (\$8.00)
 - Gas .060*PTO Horsepower
 - Diesel .044*PTO Horsepower
 - Lube 15% of Fuel

INCOME		
GRAPE SALES	TON	\$1,350.00
VARIABLE COSTS		
LABOR (skilled)	HOUR	\$18.00
LABOR (unskilled)	HOUR	\$8.00
SOIL TEST	UNIT	\$2.33
SOIL/TISSUE TEST	UNIT	\$20.00
GRASS SEED - FESCUE K-31	POUND	\$1.20
GRAPEVINES	UNIT	\$3.75
FERTILIZER		
FERTILIZER (10-10-10)	POUND	\$0.59
NITROGEN	POUND	\$0.20
PHOSPHOROUS	POUND	\$0.20
POTASH	POUND	\$0.19
LIME	TON	\$45.00
PESTICIDES	UNIT	AVERAGE COST
HERBICIDES ESTABLISHMENT	ACRE	\$21.11
INSECTICIDES ESTABLISHMENT	ACRE	\$126.67
FUNGICIDES ESTABLISHMENT	ACRE	\$274.45
HERBICIDES YEAR 1-5	ACRE	\$24.12
INSECTICIDES YEAR 1-5	ACRE	\$144.73
FUNGICIDES YEAR 1-5	ACRE	\$313.58
HARVEST LUGS	UNIT	\$10.75

LABOR ESTIMATES									
Task	Labor	Hours	Cost	Total Labor	Fuel	Hours	Fuel Cost	Lube Cost	Total Fuel
Labor - Establishment									
Field preparation	Unskilled	20	8.00	\$ 160.00	Yes	20.0	\$ 48.40	\$ 7.26	\$ 55.66
Layout, distribute and drive posts	Skilled	15	18.00	\$ 270.00	Yes	15.0	\$ 36.30	\$ 5.45	\$ 41.75
Layout, distribute and drive posts	Unskilled	20	8.00	\$ 160.00	Yes	20.0	\$ 48.40	\$ 7.26	\$ 55.66
Auger and set end post	Skilled	3	18.00	\$ 54.00	Yes	3.0	\$ 7.26	\$ 1.09	\$ 8.35
Auger and set end post	Unskilled	3	8.00	\$ 24.00	Yes	3.0	\$ 7.26	\$ 1.09	\$ 8.35
Mark line post for wires	Unskilled	2	8.00	\$ 16.00					
Drill end post for wire vises	Unskilled	4	8.00	\$ 32.00					
Install line post staples for wire	Unskilled	8	8.00	\$ 64.00					
Install end post anchor sturcutre	Skilled	10	18.00	\$ 180.00					
Install bamboo stakes	Unskilled	6	8.00	\$ 48.00					
Vine Planting	Unskilled	55	8.00	\$ 440.00					
Apply Fertilizer, Lime – At Planting	Unskilled	3	8.00	\$ 24.00	Yes	3.0	\$ 7.26	\$ 1.09	\$ 8.35
Brace Wire	Unskilled	18	8.00	\$ 144.00					
Cordon Wire	Unskilled	20	8.00	\$ 160.00					
Irrigation	Skilled	40	18.00	\$ 720.00					
Herbicide Applications	Skilled	19	18.00	\$ 342.00	Yes	19.0	\$ 45.98	\$ 6.90	\$ 52.88
Fungicides/Insecticides	Skilled	10	18.00	\$ 180.00	Yes	10.0	\$ 24.20	\$ 3.63	\$ 27.83
Vine Training/Pruning	Skilled	20	18.00	\$ 360.00					
Field Care	Unskilled	10	8.00	\$ 80.00	Yes	10.0	\$ 24.20	\$ 3.63	\$ 27.83
Drill Fescue Alleys	Unskilled	2	8.00	\$ 16.00	Yes	2.5	\$ 4.84	\$ 0.73	\$ 5.57
TOTAL		288		\$ 3,474.00		105.5	\$ 254.10	\$ 38.12	\$ 292.22
Labor - Year 1									
Field Care	Unskilled	15	8.00	\$ 120.00	Yes	15.0	\$ 36.30	\$ 5.45	\$ 41.75
Vine Training and Pruning	Skilled	40	18.00	\$ 720.00					
Irrigation Maintenance	Unskilled	15	8.00	\$ 120.00					

Determining Fixed Costs

- ▶ Depreciation
- ▶ Interest
- ▶ Repairs/Maintenance
- ▶ Taxes
- ▶ Insurance

Equipment Item	Cost (Initial - trade-in)	Expected Life (years)	Per Year Charge
55HP4WD Tractor w/ Cab	\$ 30,000.00	15	\$ 2,000.00
4WD PickUp	\$ 20,000.00	10	\$ 2,000.00
50Gal Herbicide Sprayer	\$ 2,700.00	10	\$ 270.00
300Gal Airblast Sprayer	\$ 12,500.00	10	\$ 1,250.00
5ft Rotary Mower	\$ 1,600.00	10	\$ 160.00
Fertilizer Spreader	\$ 1,500.00	10	\$ 150.00
Trailer	\$ 2,000.00	15	\$ 133.33
Hand Tools/Safety Equipment	\$ 1,500.00	5	\$ 300.00
Total By Enterprise	\$ 71,800.00		\$ 6,263.33
<i>* Rent Post Driver, Drill and Auger for planting</i>			
Total Yearly Equipment	\$ 6,263.33		
Interest			
Interest on Fixed Cost	Total Fixed Cost	Rate	Per Year Charge
	\$ 71,800.00	7.0%	\$ 5,026.00
Total Interest Payment	\$ 5,026.00		

Net Income

- ▶ Break Even
- ▶ Income over variable costs
- ▶ Income over fixed costs
- ▶ Income over variable and fixed costs
- ▶ Per unit or per acre expense
- ▶ Decision making time....
 - Purchase new equipment, expand the vineyard, hire labor etc.....

Assumptions used in financial analysis

- ▶ Land is owned; purchase price not included in budgets
 - Have a \$63 land charge
- ▶ Models based on 1 acre + *Vitis vinifera* vineyard
- ▶ Excellent site, no crop reduction
- ▶ Labor at \$8.00 (unskilled) or \$18.00 (skilled)

Assumptions used in financial analysis

- ▶ Operating expenses borrowed at 9% interest for 6 months of expenses.
- ▶ Excellent vineyard management, including consultant
- ▶ Irrigation is included, Deer fence is not
- ▶ Fixed costs are calculated from custom rate charges
 - You should use your actual fixed costs

Assumptions used in financial analysis

- ▶ Grapes valued at \$600 to \$2,000/ton

	Tons	Price/Ton
Red	3–5 Tons	\$1,600–2,000
White	3–5 Tons	\$1,200–1,600
Hybrid	4–7 Tons	\$600–1,200

Model values used in financial analysis

Vineyard acreage	1
Training system	VSP
Row / vine spacing (feet)	10 x 6
Variety	White
Tons/acre at full crop	4.0
Value of crop (\$/ton)	\$1,450
Skilled labor (\$/hr)	\$18.00
“Unskilled” labor	\$8.00
Picking labor (\$/lug)	\$1.25

Generalized Equipment Inventory

55-hp, 4-wd tractor w/ spray cab	\$30,000
4-wd pick-up truck	\$20,000
50-gal herbicide sprayer	\$2,700
300-gal air blast sprayer	\$12,500
5-ft rotary mower	\$1,600
Fertilizer spreader/broadcaster	\$1,500
Post driver*	\$2,000
Auger*	\$1,200
Trailer (harvest, etc.)*	\$2,000
<i>* Can rent this equipment</i>	\$73,500

Cash Flow

- ▶ Once you have created your budget you have the tools for creating a cash flow statement and projecting income and costs
- ▶ This is an important tool for planning and expansion especially for farm operations because of their seasonal nature.
- ▶ Information needed for cash flow
 - Fixed Costs
 - Labor and Fuel
 - Inputs (variable costs)
 - Crop budget

Summary of Costs - Years 1-5							
		ESTAB	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
INCOME							
	ACRE	0	0	\$725.00	\$4,350.00	\$5,800.00	\$5,800.00
VARIABLE COSTS							
SOIL TEST	ACRE	\$2.33	\$20.00	\$20.00	\$20.00	\$20.00	\$20.00
GRASS SEED - FESCUE K-31	POUND	\$72.00					
GRAPEVINES	UNIT	\$3,225.00					
FERTILIZER (4OZ 10-10-10 PER VINE)	POUND	\$126.85					
NITROGEN	POUND		\$14.70	\$14.70	\$14.70	\$14.70	\$14.70
PHOSPHOROUS	POUND		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
POTASH	POUND		\$21.60	\$21.60	\$21.60	\$21.60	\$21.60
LIME	TON	\$22.50	\$8.75	\$22.50	\$22.50	\$22.50	\$22.50
HERBICIDES	ACRE	\$21.11	\$24.12	\$24.12	\$24.12	\$24.12	\$24.12
INSECTIDES	ACRE	\$126.67	\$144.73	\$144.73	\$144.73	\$144.73	\$144.73
FUNGICIDES	ACRE	\$274.45	\$313.58	\$313.58	\$313.58	\$313.58	\$313.58
TRELLISING/IRRIGATION MATERIALS	ACRE	\$2,923.83	\$595.00				
VINEYARD LABOR	ACRE	\$1,448.00	\$1,430.00	\$1,190.00	\$1,040.00	\$1,170.00	\$1,210.00
LUGS	UNIT			\$1,773.75		\$1,773.75	
INTEREST ON OPERATING CAPITAL		445.10796	138.91392	\$190.35	86.46642	189.26892	94.90392
TOTAL VARIABLE		\$8,687.85	\$2,711.39	\$3,715.33	\$1,687.70	\$3,694.25	\$1,866.13

Custom rates are used here – your own fixed costs should be inserted.

FIXED COSTS							
		ESTAB	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
FERTILIZER APPLICATION	ACRE	\$6.90	\$6.90	\$6.90	\$6.90	\$6.90	\$6.90
DRILL SEED PLANTING	ACRE	\$17.30					
PESTICIDE APPLICATIONS	ACRE	\$55.30	\$118.50	\$118.50	\$118.50	\$118.50	\$118.50
MOWING	ACRE		\$46.00	\$46.00	\$46.00	\$46.00	\$46.00
IRRIGATION	ACRE		\$95.00	\$95.00	\$95.00	\$95.00	\$95.00
INTEREST ON CUSTOM CHARGES		\$4.29	\$14.39	\$14.39	\$14.39	\$14.39	\$14.39
HAND TOOLS	UNIT	\$550.00					
SAFETY EQUIPMENT	UNIT	\$250.00					

LAND CHARGE	ACRE	\$63.00	\$63.00	\$63.00	\$63.00	\$63.00	\$63.00
TOTAL FIXED		\$946.79	\$343.79	\$343.79	\$343.79	\$343.79	\$343.79
TOTAL VARIABLE AND FIXED		\$9,196.05	\$2,942.09	\$4,020.70	\$1,993.06	\$3,999.62	\$2,172.24

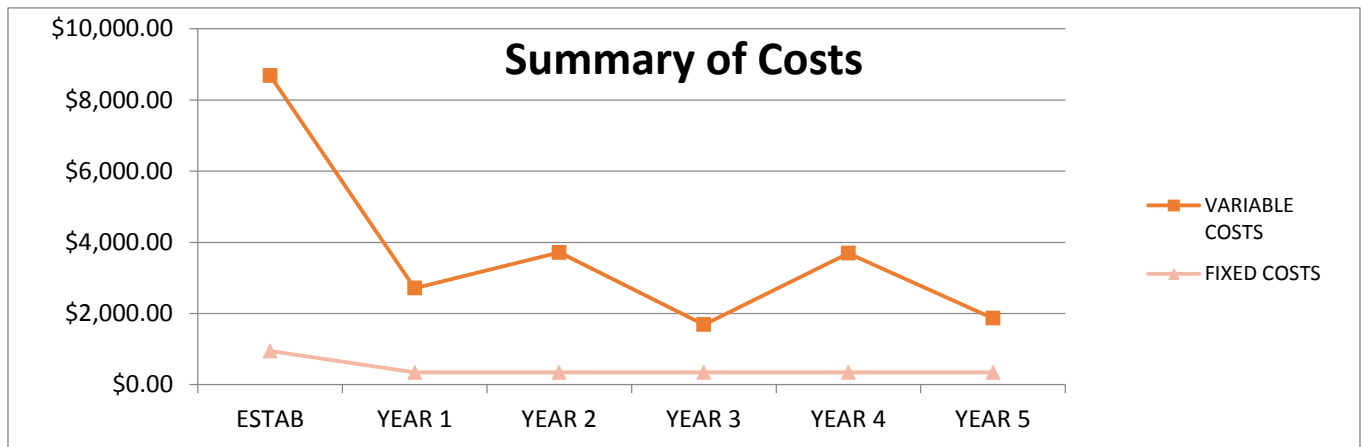
2014 Summary

- ▶ Establishment Cost - \$9,634.64 Cost, \$0 Income
- ▶ Year 1 - \$3,055.18 Cost, \$0 Income
- ▶ Year 2 - \$4,059.11 Cost, \$725 Income
- ▶ Year 3 - \$2,031.48 Cost, \$4,350 Income
- ▶ Year 4 - \$4,038.03 Cost, \$ 5,800 Income
- ▶ Year 5 - \$2,209.92 Cost, \$ 5,800 Income

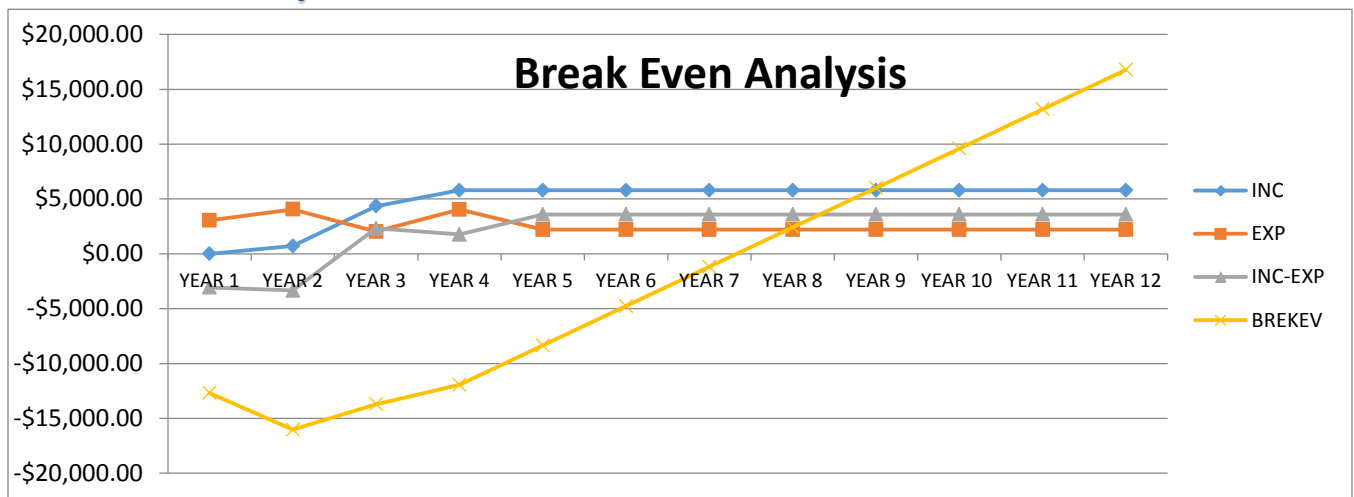
Positive Cash Flow in Year 3

Break Even (without crop reduction) Year 8

Summary of Costs



Break Even Analysis



Fixed Costs

- ▶ University of Maryland uses custom rates to estimate machinery, labor and fuel practices. **You should create your own fixed costs for your situation.**
- ▶ Be Aware of Fixed Costs – they affect your bottom line!
- ▶ Fixed Cost example using assumptions
 - Depreciation (\$71,800)
 - Yearly \$6,263.33
 - Interest – 7%
 - Yearly \$5,026
 - Repairs and Maintenance
 - Yearly \$2,500
 - Taxes
 - Yearly \$1,500
 - Insurance
 - Yearly \$1,700
 - **TOTAL \$15,939.33 per year**

	2008	Year 1 or 1st quarter	Year 2 or 2nd quarter	Year 3 or 3rd quarter	Year 4 or 4th quarter	Total
Cash Flow Budget						
3 acre vineyard						
Cash inflow						
1. Beginning cash balance	5,000	9,591	15,303	21,015	26,726	32,438
2. Crop sales	17,400	17,400	17,400	17,400	17,400	69,600
3. Livestock sales						0
4. Other farm income						0
5. Capital sales						0
6. Non-farm receipts	40,000	40,000	40,000	40,000	40,000	160,000
7. Total cash inflow (total 1 to 6)	62,400.00	66,991.24	72,702.91	78,414.58	84,126.25	262,037.92
Cash outflow						
8. Chemicals	1447.32	1500.00	1500.00	1500.00	1500.00	6000.00
9. Custom hire						0.00
10. Feed purchased						0.00
11. Fertilizer and lime	163.95	175.00	175.00	175.00	175.00	700.00
12. Freight and trucking						0.00
13. Gasoline, fuel, and oil	434.16	450.00	450.00	450.00	450.00	1800.00
14. Insurance	1700.00	1700.00	1700.00	1700.00	1700.00	6800.00
15. Labor hired	600.00	600.00	600.00	600.00	600.00	2400.00
16. Rent or lease						0.00
17. Repairs and maintenance	2500.00	2500.00	2500.00	2500.00	2500.00	10000.00
18. Seeds and plants purchased						0.00
19. Supplies purchased	1500.00	1500.00	1500.00	1500.00	1500.00	6000.00
20. Taxes	1500.00	1500.00	1500.00	1500.00	1500.00	6000.00
21. Utilities	1200.00					0.00
22. Vet., breeding, medicine						0.00
23. Other farm expenses	500.00	500.00	500.00	500.00	500.00	2000.00
24. Capital purchases						0.00
25. Family living or withdrawals	35000.00	35000.00	35000.00	35000.00	35000.00	140000.00
26. Term loan payments	6263.33	6263.33	6263.33	6263.33	6263.33	25053.32
27 Total cash outflow (total 8 to 26)	52808.76	51688.33	51688.33	51688.33	51688.33	206753.32
Cash flow summary						
28. Inflow minus outflow (lines 7-27)	9,591.24	15,302.91	21,014.58	26,726.25	32,437.92	\$5,284.60
29. New borrowing: term						
30. New borrowing: credit line	1,695	1,695	1,695	1,695	1,695	
31. Credit line payments	1,695	1,695	1,695	1,695	1,695	
32. Ending cash balance (28+29+30-31)	\$9,591.24	\$15,302.91	\$21,014.58	\$26,726.25	\$32,437.92	\$55,284.60

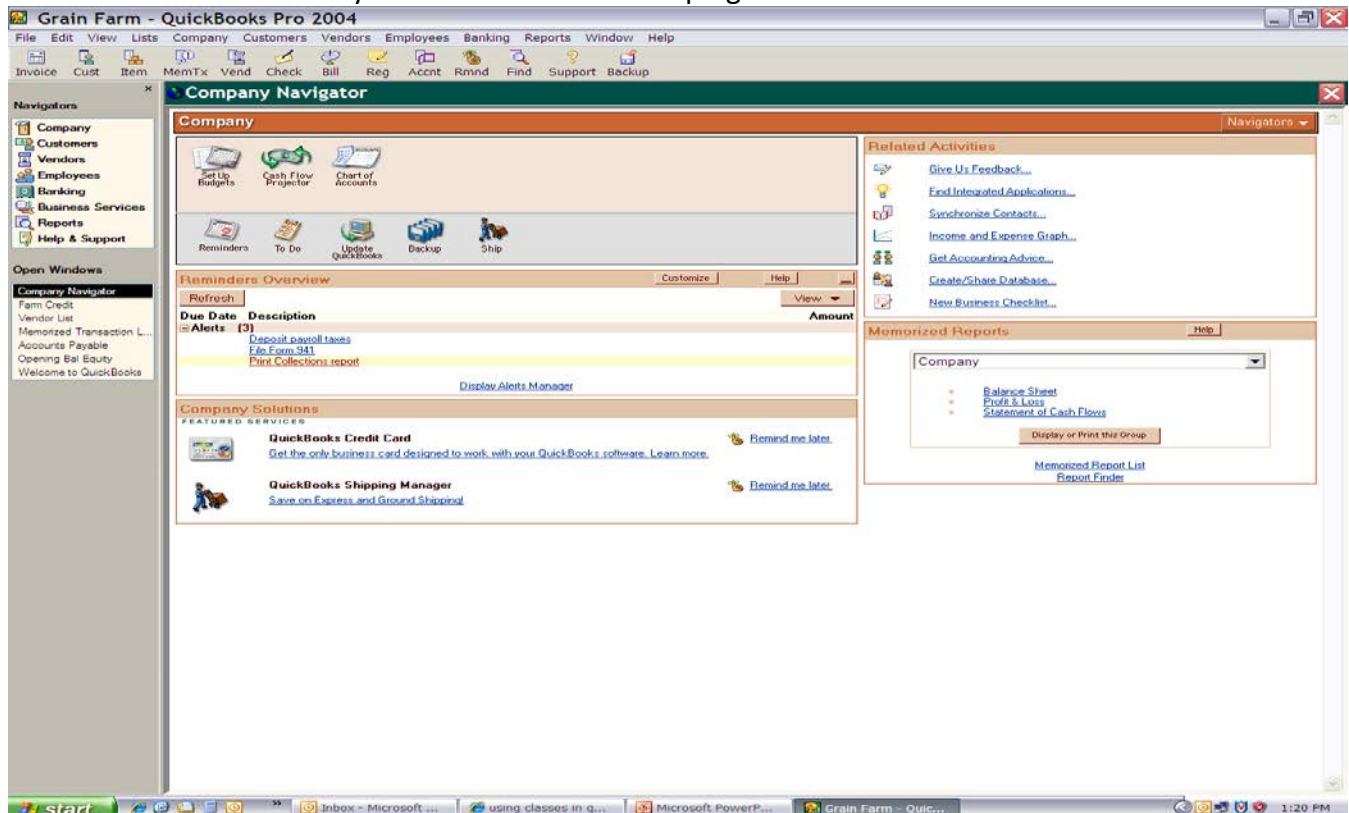
Interactive Enterprise Budgets

- Available at <http://extension.umd.edu/smallfruit/grapes>

WINE GRAPE ESTABLISHMENT				
ITEM	UNIT	QUANTITY	PRICE	TOTAL
GROSS INCOME				
YIELD	TON	0	1350	0
VARIABLE COSTS				
SOIL TEST	ACRE	1	2.33	\$2.33
GRASS SEED - FESCUE K-31	POUND	60	1.10	\$66.00
GRAPREXNDS	UNIT	3	56.00	\$168.00
FERTILIZER (40Z 10-10-10 PER VINE)	POUND	215	0.30	\$64.50
LIME	TON	0.5	17.50	\$8.75
GRAMOZONE EXTRA	GALLON	0.25	31.44	\$7.86
SURFLAN	GALLON	0.5	65.43	\$32.73
DEVINOL 59DF	POUND	3	9.92	\$29.79
NEMACUR	GALLON	1	95.00	\$95.00
CAPTAN	POUND	9	5.13	\$46.17
DITHANE	POUND	38	2.23	\$84.74
SEVIN 4L	GALLON	1.5	39.50	\$59.25
NOVA	OUNCE	10	4.70	\$47.00
SULFUR	POUND	35	1.20	\$42.00
TRELLISING MATERIALS				
3"x4"x8 TREATED POSTS CCA	ACRE	150	5.75	\$862.50
5"x10 TREATED END POSTS CCA	ACRE	20	10.00	\$200.00
12.5 GAUGE ALUMINUM CLAD WIRE	FEET	4500	0.01	\$57.38
14 GAUGE ALUMINUM CLAD WIRE	FEET	3000	0.05	\$143.00
TIGHTENERS	UNIT	38	5.50	\$209.00
WIRE CRIMPING SLEEVES	UNIT	6	6.60	\$39.60
BAMBOO SUPPORTS	UNIT	1500	0.16	\$243.60
EARTH ANCHORS	UNIT	75	8.00	\$600.00
TAPENERS & VINE TIES	UNIT	2	53.57	\$107.13
TRELLISING LABOR				
FIELD PREPARATION (UNSKILLED)	HOUR	30	8.00	\$160.00
LAYOUT DISTRIBUTE AND DRIVE POSTS (SKILLED)	HOUR	15	18.00	\$270.00
LAYOUT DISTRIBUTE AND DRIVE POSTS (UNSKILLED)	HOUR	20	8.00	\$160.00
AUGER AND SET END POST (SKILLED)	HOUR	3	18.00	\$54.00
AUGER AND SET END POST (UNSKILLED)	HOUR	3	8.00	\$24.00
MARK LINE POST FOR WIRES (UNSKILLED)	HOUR	2	8.00	\$16.00
DRILL END POST FOR WIRE WIRES (UNSKILLED)	HOUR	4	8.00	\$32.00
INSTALL LINE POST STAPLES FOR WIRE (UNSKILLED)	HOUR	8	8.00	\$64.00
INSTALL END POST ANCHOR STRUCTURE (SKILLED)	HOUR	10	18.00	\$180.00
INSTALL BAMBOO STAKES (UNSKILLED)	HOUR	6	8.00	\$48.00
VINE PLANTING (UNSKILLED)	HOUR	55	8.00	\$440.00
INTEREST ON OPERATING CAPITAL		\$6,378.62	9.0%	\$344.43

Tracking Enterprise Costs

- It is important to know the cost of each enterprise you have
 - Can be by grain/livestock or tomatoes/peppers
- This can easily be tracked in record keeping software



Recommendations

- ▶ A vineyard is a labor- and capital-intensive enterprise
- ▶ It takes considerable time (7 to 12 years) for a vineyard to become profitable, perhaps never if scale of operation is too small relative to capital investment.
- ▶ Row spacing and vine training, which affect yield, will have a major impact on vineyard profitability.
- ▶ Continue research and attend trainings on vineyard production and management
- ▶ Do your own budgets - estimated budget and an actual budget using
- ▶ Write and implement a farm business plan to set goals, manage finances and develop marketing

“Ideal” Vineyard

- Manage capital assets (purchase used equipment, avoid buying unnecessary equipment, etc.)
- Use your own equity rather than paying interest
- Excellent site to avoid catastrophic crop loss
- High value crop with “high” yields of high quality fruit (close rows and divided canopy training)
- Acreage of 15 to 30 acres to make most efficient use of capital purchases, such as a sprayer or tractor

Conclusion

- ▶ Research Training Systems – including yield, labor requirement and establishment
- ▶ Research available markets
- ▶ Crunch the numbers and talk with your family, friends and lender
- ▶ Make decisions on profits, responsibilities and your farm business
- ▶ Enjoy your Vineyard

References

- ▶ **Joe Fiola, University of Maryland**
- ▶ **Tony K. Wolf, Professor of Viticulture**
- ▶ **Bill Boyd, Surry Community College**

Resources

<http://extension.umd.edu/smallfruit/grapes>

<http://extension.umd.edu/mredc>

- The Economics of Wine Grape Production in Virginia (1998) VCE Publication #463-008

www.ext.vt.edu/pubs/viticulture/463-008/463-008.html

- Vineyard Economics, IN: Oregon Viticulture (2003), Oregon State University Press, Corvallis.

- Cost of establishment and production of vinifera grapes in the Finger Lakes region of New York, 2005. White and Pisoni, Cornell University (2005)

- Production budgets for Arkansas wine and juice grapes, #976 (2005)

<http://www.uark.edu/depts/agripub/Publications/bulletins>