T · H · E
OHIO STATE UNIVERSITY
EXTENSION

2001 Grape Production Budget [1,2]
Summary
French Hybrid - 1 Acre

ITEM		YEAR					Through Life of Vineyard	YOUR BUDGET
		0	1	2	3	4 - 20		
INCOME								
Grapes	Yield (T/A)	0	0	0	3	5		
Price	950 /ton	$0	$0	$0	$2,375	$4,750	$83,125	
VARIABLE COSTS/A								
Cover Crop Seed		15					15	
Vines			2,316				2,316	
Fertilizer		20	50	50	50	50	1,020	
Lime		45	0	0	0	0	45	
Pesticides		30	196	294	411	411	7,918	
Hired Labor		0	1,710	513	702	567	12,564	
Harvesting Costs		0	0	0	1,050	500	9,550	
Machinery Operating Expense			432	167	179	193	4,059	
Custom Machine Hire		38					38	
Miscellaneous		75	75	75	75	75	1,575	
Interest on Oper. Cap.		10	215	49	111	81	1,760	
TOTAL VARIABLE COSTS		233	4,994	1,148	2,578	1,877	40,860	
FIXED COSTS/A								
Operator Labor Charge		50	50	50	50	50	1,050	
Mach. And Equip. Charge			5,020				5,020	
Land Charge		100	100	100	100	100	2,100	
Trellis			2,624				2,624	
Liability Insurance			50	50	50	50	1,000	
Management Charge		100	100	100	100	238	4,438	
TOTAL FIXED COSTS		250	7,944	300	300	438	16,232	
TOTAL COSTS		483	12,938	1,448	2,878	2,314	57,091	
RETURN OVER VAR. COSTS		(233)	(4,994)	(1,148)	(203)	2,873	42,265	
RETURN OVER TOTAL COSTS		(483)	(12,938)	(1,448)	(503)	2,436	26,034	
PRESENT VALUE RETURNS [3]		(483)	(11,762)	(1,197)	(378)	1,664	859	

[1] This budget is a summary of production budgets for the individual years of a grape production system. For a detailed listing of revenue, costs, and production items refer to Grape Production Budgets Year 0-4.

[2] The vineyard is expected to have a life of 20 years. Years 0-4 are listed individually. Years 5-20 are assumed to be the same as year 4. The final column is the cumulative revenues and expenses through year 20.

[3] **Present Value Calculations, Explanation, and Interpretation**

Since a grape operation occurs over as many as 20 years, it is important to examine the time value of money associated with the enterprise. Time value of money is based on the premise that $1 today is worth more than $1 in the future. This is basically because the $1 today can be invested and appreciate in value until some time in the future. Therefore in regards to the grape enterprise, $1 of return in year one would be worth more than $1 of return in year 20. Returns in future years need to be discounted to reflect the time value of money. The following table lists the future value and present value of returns from the enterprise. Explanations and interpretations of the table follow on the next page.

Year		Returns Over Total Costs	Cumulative Returns Over Total Costs	Annual Present Value	Cumulative Present Value
	0	-$483	-$483	-$483	-$483
	1	-$12,938	-$13,421	-$11,762	-$12,245
	2	-$1,448	-$14,870	-$1,197	-$13,442
	3	-$503	-$15,373	-$378	-$13,820
	4	$2,436	-$12,937	$1,664	-$12,157
	5	$2,436	-$10,501	$1,512	-$10,644
	6	$2,436	-$8,066	$1,375	-$9,269
	7	$2,436	-$5,630	$1,250	-$8,019
	8	$2,436	-$3,194	$1,136	-$6,883
	9	$2,436	-$759	$1,033	-$5,850
	10	$2,436	$1,677	$939	-$4,911
	11	$2,436	$4,113	$854	-$4,057
	12	$2,436	$6,548	$776	-$3,281
	13	$2,436	$8,984	$706	-$2,576
	14	$2,436	$11,420	$641	-$1,934
	15	$2,436	$13,855	$583	-$1,351
	16	$2,436	$16,291	$530	-$821
	17	$2,436	$18,727	$482	-$339
	18	$2,436	$21,162	$438	$99
	19	$2,436	$23,598	$398	$497
	20	$2,436	$26,034	$362	$859

Discount Rate = 10.00%

Annuity Equivalent = $101

Sensitivity Analysis of Discount Rate

	Discount Rate				
	6%	8%	10%	12%	14%
Cumulative Present Value	$7,026	$3,533	$859	-$1,205	-$2,809
Annuity Equivalent	$613	$360	$101	-$161	-$424

Returns Over Total Costs(ROTC) = Annual net revenue generated by the enterprise

Cumulative Returns Over Total Costs = Running total of the ROTC generated by the enterprise (explained below).

Annual Present Value = ROTC (defined above) generated by the enterprise discounted to present values.

Cumulative Present Value = The running total of the ROTC generated by the enterprise discounted to annual present values (explained above).

Discount Rate = the degree to which the future values are discounted to reflect current values. It is the amount you expect to earn in alternative investment opportunities.

Annuity Equivalent = An annuity equivalent is the average amount of net revenue that the enterprise must generate every year to produce the total present value equivalent. For example, the grape enterprise must average $101 in net revenue every year in order to generate $859 in present value revenue over the life of the enterprise.

The annuity equivalent also provides an excellent means of comparing the average return of various enterprises that may have different lengths of production lives. For example, a producer could use annuity equivalents to compare the average annual return on grapes with a 20 year life ($101) versus raspberries with a 10 year life ($561 to $1,255). The raspberries, with a larger annuity equivalent, are expected to be a more profitable investment than the grapes.

ROTC vs. Annual Present Value Returns: Over the life of the vineyard, the enterprise will generate $26,034 in total returns. However, since much of the cost comes in early years, it is not the same as having $26,034 in the operator's pocket today. The cumulative present value column indicates that if the operator was given the equivalent return in one lump sum today, it would be worth $859. The difference between the ROTC and the cumulative present value is a result of considering the time value of money.

Sensitivity Analysis of discount Rate: This table gives the cumulative present value and annuity equivalent for four different discount rates. It allows the user to examine the implications of alternatate discounts rates.

Internal Rate of Return(IRR): The IRR is found on the interactive versions of this budget by adjusting the discount rate until the annuity equivalent is equalt to $0. The sensitivity analysis table can be used as a starting point. The IRR will be between the two discount rates where the annuity equivalent goes from positive to negative, in this case 10% & 12%. If the annuity equivalent is positive then adjust the discount rate up and visa versa. For this example, the IRR is 10.77%. If the IRR exceeds the required rate-of-return established by the producer then the enterprise should be engaged in or continued, if the IRR is less than the required rate-of-return then the enterprise should not be engaged in or discontinued.

Income Taxes

Income taxes are not computed in the budgets because of the wide range of possible tax rates and options, but are important in the final analysis. Most operators will need the help of an accountant knowledgeable about Uniform Capitalization rules to help them look at the tax implications of establishing a vineyard. This person may also assist with the analysis of the financial impact of the projected vineyard.

In brief, taxpayers electing to comply with the Uniform Capitalization rules will be allowed **no deductions for preproductive costs**, except Section 179 expensing, until the time that a marketable quantity is harvested, but can then depreciate all preproductive costs over a **10-year** period commencing with the first year of production.

Taxpayers electing out of the Uniform Capitalization rules **must still capitalize the cost of the initial planting** but **may deduct all other preproductive costs**. However, to offset the benefit of deducting other preproductive costs they must **depreciate** the initial planting costs on a **straight-line basis over a 20-year** period commencing with the first year of production. In addition, the taxpayer, and any person related to the taxpayer, **must use the alternative depreciation system for any property used predominantly in a farming business** that is placed in service in a taxable year for which the election is in effect. (Reference, Agricultural Tax Issues and Form Preparation, Fall 2000 by Phil Harris and Zoel Daughtrey, pp. 258-266)

Calculation Formulas:

Interest on Operating Capital =
(Sum of expenses accruing interest) x interest rate x (# months accruing interest/12)

Returns Over Variable Costs = Total Revenue - Total Variable Costs

Returns Above Total Costs (ROTC) = Total Revenue - Total Expenses

Cumulative ROTC = ROTC for year 1 + ROTC for year 2 + ROTC for year 3 + ...

Present Value Returns = ROTC / (1 + discount rate)^{year}
Example for Year 5 = $2,463 / (1+ 0.10)^5 = $1,512

Annuity Equivalent =
$$\frac{\text{Discount Rate x Cumulative Present Value in Final Year}}{1 - \left[\frac{1}{(1 + \text{DiscountRate})^{\text{Years in analysis}}}\right]}$$

$$\frac{0.10 \text{ x } \$859}{1 - \left[\frac{1}{(1 + 0.10)^{20}}\right]} = \$101$$

Formula Template: Enter data in yellow boxes for results in blue boxes.

Interest on Operating Costs:

Sum of expenses accruing interest =	
Interest Rate (%) =	
Months accruing interest =	
Interest on Operating Costs =	0

Returns over Variable Costs:

Total Revenue =	
Total Variable Costs =	
Returns over Variable Costs =	0

Returns over Total Costs :

Total Revenue =	
Total Costs =	
Returns over Total Costs =	0

Present Value Returns:

Returns over Total Costs =	
Discount Rate (%)=	
Year of Analysis =	
Present Value Returns =	0

Annuity Equivalent:

Cumulative Present Value in Final Year =	
Discount Rate (%)=	
Years in Analysis =	
Present Value Returns =	#DIV/0!