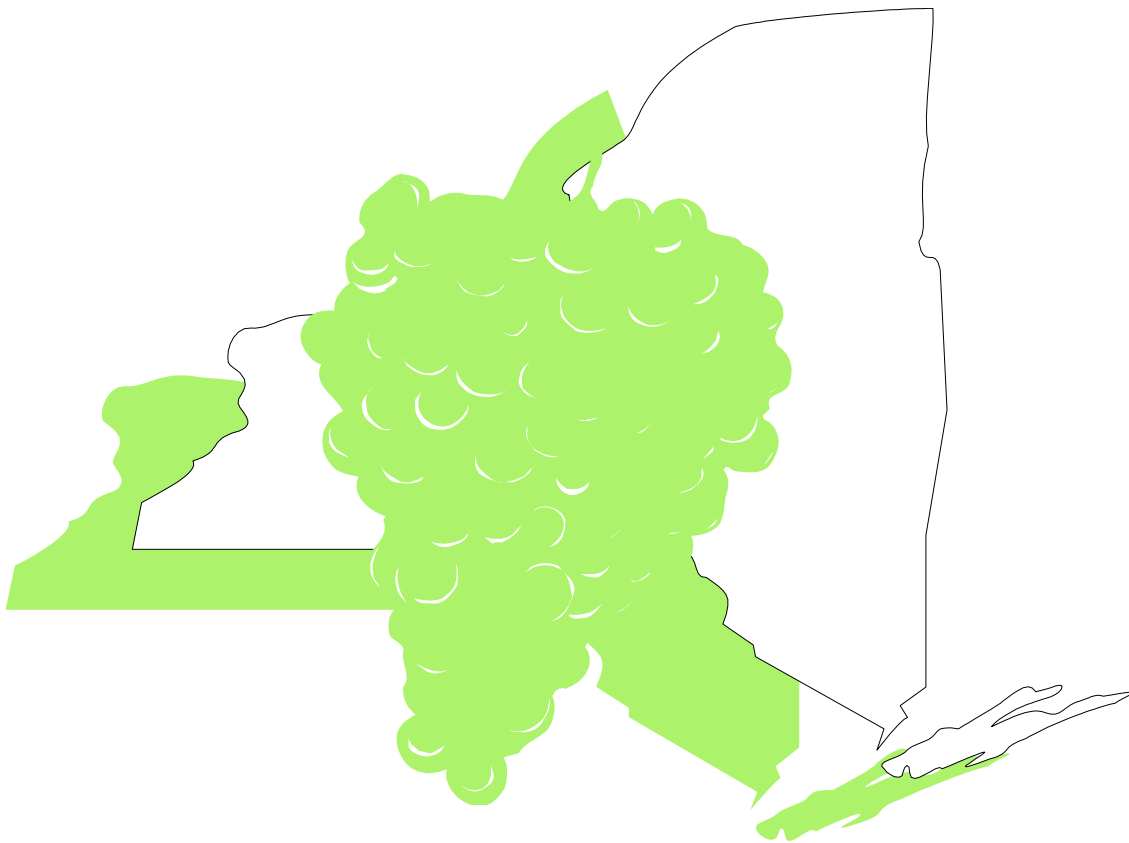


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COST OF ESTABLISHMENT AND PRODUCTION OF VINIFERA GRAPES IN THE FINGER LAKES REGION OF NEW YORK-1997



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COST OF ESTABLISHMENT AND PRODUCTION OF *VINIFERA* GRAPES IN
THE FINGER LAKES REGION OF NEW YORK,
1997

By Gerald B. White, David Peterson, and Timothy E. Martinson*

INTRODUCTION

In recent years there has been increased interest in the Finger Lakes, as well as in other producing regions in New York state, in planting *Vitis vinifera* grapes for premium wine production. Red varieties such as Pinot noir, Cabernet Sauvignon, and Cabernet franc all experienced increased acreage in the most recent orchard and vineyard survey compiled by The New York Agricultural Statistics Service.

Several factors are affecting the interest in new *V. vinifera* plantings. First is the declining real prices (adjusted for inflation) or in some cases, declining nominal prices for traditional American wine varieties and some French American hybrid varieties (e.g. Aurore, Catawba, DeChaunac, Delaware, and Dutchess). A second factor has been an apparent increase in consumer demand for quality wines (roughly defined as French American hybrid or *V. vinifera* varietals or appellation wines mostly from leading European producing nations). Wine consumption in the United States has increased during the last five years, driven by good news regarding the health benefits of moderate wine consumption. A third factor is that most Finger Lakes wineries are reporting increased winery visitation by tourists as well as local area repeat purchasers. Well managed wineries in the Finger Lakes are reporting increased sales of ten to as high as 25 per cent over the last three years. In addition to efforts to attract tourists that have been made by several local agencies, New York is gaining stature as a producer of high quality wines that command premium prices.

Growers who are considering planting additional *V. vinifera* acreage need to carefully weigh the cost of planting and establishing a vineyard, the cost of production of a mature vineyard, and the expected yields and prices in order to determine whether the investment of \$10,000 per acre or more required to bring a *V. vinifera* vineyard into production will result in a profitable return on investment.

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This question is complicated by the long-run nature of the investment (payback periods which are in excess of ten years and can be even much longer), as well as the risk from an over supply from California, Washington or countries such as Chile, Australia, etc. which could lead to price cutting at the retail level. There has been a great increase in new plantings of *V. vinifera* in California. By some estimates, nonbearing or not yet mature acreage in California has reached nearly 100,000 acres. Although the New York industry is somewhat insulated by a market structure of the premium wine sector that is based on most wineries selling over 50 per cent of their wine (volume) through direct sales, wineries cannot expect to be completely unaffected if national supply outstrips demand in the future. Since the acreage of *V. vinifera* varieties in the Finger Lakes is so small (for example, for the two most widely planted *V. vinifera* varieties, Chardonnay and Riesling accounted for just 314 acres and 231 acres, respectively, in the most recent survey of acreage by New York Agricultural Statistics), a small increase in planted acreage can have a large impact on supply when the new acreage begins bearing.

The objective of this project was to determine the cost of producing *V. vinifera* grapes in the Finger Lakes region in a commercial sized operation. Estimates of the total investment in land, machinery, vineyard establishment and development costs, and annual operating costs were developed.

These estimates may be used by growers and potential investors to compute and analyze the costs and profit potential for their own situations. The estimates are not necessarily representative average costs for grape production in the Finger Lakes, but rather are typical costs for well managed vineyards using recommended practices. The yield estimates used for estimation of typical returns assume better sites (well-drained, productive soils with appropriate slopes for air drainage). Poorer sites and/or failure to follow optimal management practices can have a significant negative impact on the earnings estimates presented in this publication.

METHODS

The methods used to construct cost estimates were a combination of 1) a panel comprised of grower representatives, and 2) economic engineering using recommended practices. In June of 1997, we met with a panel of four growers. The growers reviewed the data prepared for the most recent (1993) estimates of the cost of establishing and growing *V. vinifera* grapes. Consensus estimates were developed for labor requirements and wage rates for the various operations in a *V. vinifera* vineyard and for a typical machinery complement for a full time commercial vineyard. The panel reviewed the machinery time estimates which had been updated from the '93 study and made recommendations for changes.

The panel also provided estimates, based on their own experience in the vineyard, of time required to perform various vineyard operations, such as tillage, spraying, mowing, etc., and hand operations such as pruning, tying and removal, and suckering and cluster and shoot thinning.

Pesticide costs were formulated using Cornell and Penn State Cooperative Extension's 1997 New York and Pennsylvania Pest Management Recommendations for Grapes. The program was reviewed by Dr. Wayne Wilcox, Plant Pathologist at the Geneva Experiment Station. Fertilizer practices were also based on current Cornell Cooperative Extension recommendations.

The size of the vineyard was decided in consultation with the grower panel. The specified size was 36 acres. The 36 acre vineyard is large enough to use vineyard machinery and equipment efficiently, but small enough to be operated by one working manager with one other full-time worker. Some hand labor operations would be done by hired part-time labor or, increasingly in recent years, by migrant labor crews.

Wage rates used represented the consensus of the grower panel. The rates assumed were \$10.40 per hour for skilled labor (i.e. \$8.00 per hour plus 30 per cent fringe benefits) and \$7.45 per hour for unskilled labor (\$6.00 per hour plus 24 per cent fringe benefits).

A management fee of five per cent of gross receipts was assessed for the mature vineyard. All labor requirements were assessed as a cash cost. Therefore, in situations where the owner or manager is performing vineyard tasks, actual cash expenses would be lower than is represented in these cost estimates.

Machinery depreciation and interest were charged on the basis of prices for new equipment. Diesel fuel at \$1.15 per gallon was budgeted for machine operations. Charges for custom harvesting and hauling at \$50 per ton were assessed.

A six per cent interest charge on capital investment and operating capital was charged. This rate represents a real rate based on an eight percent nominal rate of interest and an expected rate of inflation of two percent. (For a discussion of using the real rate of interest in capital investment analysis, see Casler, et al.)

On the receipts side, yields were specified as the long term average attainable on suitable sites (near the lake, sloping, good air drainage, somewhat well-drained with soil depth at least medium). These yields assume better than average management practices that are consistent with the attainment of quality *V. vinifera* wines. The yield level specified (4.0 tons per acre) is consistent with commonly grown cultivars such as Riesling and Chardonnay. Prices were the average of the most recent five year period (1994-1998). The prices were based on the average state price for all *V. vinifera* varieties; Chardonnay and Riesling accounted for over 60 percent of New York's production of *V. vinifera* in 1997; hence the prices are more representative of these two varieties. In general the average price level assumed for the base analysis (\$1,116 per ton) is somewhat above the average price for Riesling and below the average price for red varieties such as Merlot, Cabernet franc, and Cabernet Sauvignon.

RESULTS

Grape Prices

Prices for the five years ending in 1998 are shown in Table 1. The average price for all *V. vinifera* grown in New York was \$1,116 per ton. This price was assumed for the base analysis.

Table 1. Average Price *V. vinifera* Grapes, NYS
1994-1998, Dollars Per Ton

YEAR	
1994	1,000
1995	980
1996	1,130
1997	1,240
1998	1,230
5-YR AVG	1,116

Source: New York Agricultural Statistics Service, FRUIT No. 975-2 Series, 1996-1999.

Machinery and Buildings Costs

The investment costs and annual costs for new equipment and buildings are summarized in Table 2. The machinery investment required totals \$119,300, an average investment of \$3,314 per acre. The investment for a shop is estimated at \$18,400, or \$511 per acre. The total annual costs for depreciation and interest amount to \$16,961 for machinery and \$1,336 for buildings, or \$472 and \$37 annual costs per acre, respectively. Machinery investment would be much greater if a mechanical grape harvester is necessary.

Pesticide Program Spray Costs

Table 3 indicates the sample spray program and costs for years one, two and three through twenty-five. Beginning in year three, sprays are assumed to be approximately the same from year to year, with the necessity on average for nine sprays averaging \$220 per acre for spray materials annually. Of course, spray programs will have to be adjusted slightly from year to year to accommodate variable weather and/or pest pressure. Pesticide applications costs for labor and machinery, as well as herbicide costs, are developed in Tables 5 and 7 to follow.

Table 2.

Machinery, Equipment, and Building Capital Recovery and Interest Costs,
36 Acre *V.vinifera* Vineyard, Finger Lakes, NY, 1997. (FLCOP)

Item	Purchase Price	Years of Life	Salvage Value	Capital to be Recovered	Cost Recovery Factor	Annual Recovery	Interest on Salv. Value	Total Cap Recovery & Int.
Machinery and Equipment (Comment-updtd9/9/97)								
Tractor, 62-HP, 2 WD, AC spray cab	32,000	10	3,200	28,800	0.1359	3,914	192	4,106
Tractor, 45-HP	22,000	10	2,200	19,800	0.1359	2,691	132	2,823
Air-blast sprayer (trailer)	15,000	10	1,500	13,500	0.1359	1,835	90	19,25
Mower/brush chopper (7 ft.)	1,500	5	150	1,350	0.2374	320	9	329
Fertilizer spreader	3,500	10	350	3,150	0.1359	428	21	449
Small disc (used)	900	10	90	810	0.1359	110	5	115
Herbicide sprayer	2,000	10	200	1,800	0.1359	245	12	257
Grape hoe	4,000	10	400	3,600	0.1359	489	24	513
Post driver	1,800	10	180	1,620	0.1359	220	11	231
Trailer	900	10	90	810	0.1359	110	5	115
Pickup truck	17,000	5	1,700	15,300	0.2374	3,632	102	3,734
Auger	1,200	10	120	1,080	0.1359	147	7	154
Mechanical hedger (used)	2,000	10	200	1,800	0.1359	245	12	257
Bird control equipment	2,500	10	250	2,250	0.1359	306	15	321
Leaf remover	6,000	10	600	5,400	0.1359	734	0	734
Shop equipment	7,000	10	700	6,300	0.1359	856	42	898
Total Mach. & Equip. costs	\$119,300							\$16,961
Cost Per Acre	\$3,314							\$471
BUILDINGS								
Shop(30'X40')	\$18,400	30	0	18,400	0.0726	1,336	0	1,336
Cost Per Acre	\$511							\$37

Table 3
Sample Spray Program – *V. vinifera* Grapes (1997)

Fungicide & Insecticide	Material	Rate/Acre	Price (\$)	\$/A vineyard
Year 1				
Sprays 1-4	Mancozeb 80WP	3 lb	2.48 lb	7.44
	Sulfur	4 lb	0.22 lb	0.88
	spreader	4 oz	13.13 gal	0.41
				34.92
Year 2				
Sprays 1-5	Mancozeb 80WP	3 lb	2.48 lb	7.44
	Sulfur	4 lb	0.22 lb	0.88
	spreader	4 oz	13.13 gal	0.41
				43.65
Year 3 - 25				
Sprays 1-3	Mancozeb	3 lb	2.48 lb	7.44
	Rubigan	2 fl oz	2.00 fl oz	4.00
	spreader			0.41
				35.55
Sprays 4 & 5	Abound 2SC	11 fl oz	1.80 fl oz	19.80
				39.60
Spray 6	Mancozeb	4 lb	2.48 lb	9.92
	Sulfur	4 lb	0.22 lb	0.88
	Sevin 80WP	2.5 lb	4.22 lb	10.55
	spreader			0.41
				21.76
Spray 7	Abound 2SC	11 fl oz	1.80 fl oz	19.80
				19.80
Spray 8	Captan 80WP	2.5 lb	4.00 lb	10.00
	Sulfur	4 lb	0.22 lb	0.88
	Rovral 50WP	2 lb	20.23 lb	40.46
	spreader			0.41
				51.75
Spray 9	Captan 80WP	2.5 lb	4 lb	10.00
	Sulfur	4 lb	0.22 oz	0.88
	Rovral 50WP	2 lb	20.23 lb	40.46
	spreader			0.41
				51.75
Total cost per year (years 3-25)				\$220.21

Trellis Construction Costs

Table 4 contains an estimate of trellis construction costs. The total cost for materials is estimated at \$1,749 per acre. These costs are transferred to Table 5 in the first year of establishment and development. Labor and machinery costs for trellis establishment are also shown in Table 5.

Table 4: Trellis Construction Costs,
Finger Lakes Region, 1997

Item	Quantity	Price	Total
Posts (3-in., treated)	250	4.88	1,220.00
High ten. wire (#12 1/2 gauge), ft	29,040	0.02	516.91
Nicopress fasteners	32	0.11	3.52
Staples, lbs.	7	1.16	8.09
Total cost per acre			\$1,748.52

Establishment and Development Costs

The costs for labor machinery and materials for site preparation and years one through three constitute the establishment and development (E&D) costs (Table 5). First year costs, to include trellis construction and planting, are substantial, amounting to \$4,823 per acre. A planting of 778 vines (8' x 7') was assumed. The largest cost in the first year is the expenditure of \$2,412 for vines. In year two, costs are a relatively modest \$460 per acre with lower spray costs and less labor required than for mature vines. In the third year, a full spray program is required, and hand harvesting is required to protect the young vines. Total costs for the third year are \$1,065 per acre.

Table 5.

V. vinifera Grape Establishment and Development Costs,
Finger Lakes Region, New York, 1997. (FLCOP)

Operation	Labor Hours	Equip. Hours	Labor Cost \$	Equip. Cost \$	Materials Cost \$	Total \$
<u>Site preparation</u>						
Drainage	custom		120.00	120.00	316.00	556.00
Lime	custom				66.00	66.00
Herbicide applic.	custom				30.00	30.00
Stone removal & land maintenance	1.0	0.8	7.45	2.26		9.71
Soil Sampling	0.2		2.08		1.50	3.58
Miscellaneous						33.00
Total	1.2	0.8	129.53	122.26	413.50	698.29
<u>First Year</u>						
Plowing	custom			14.75		14.75
Discing (2X)	custom			21.00		21.00
Floating	0.25	0.2	2.60	0.60		3.20
Row marking	2.5	1.5	26.00	4.50		30.50
Planting	10.0	2.5	137.75	25.00	2,411.80	2,574.55
Fertilization (hand application)	0.6	0.5	6.24	1.42	12.41	20.07
Hilling-up	1.5	1.2	15.60	4.62		20.22
Chem. weed control under trellis	2.5	2.0	26.00	6.10	13.58	45.68
Trellis constr.	41.0	8.0	202.40	24.00	1,748.52	1,974.92
Chem. weed control row middle(1X)	0.6	0.5	6.50	1.53	8.36	16.39
Spraying 1	0.3	0.3	3.12	1.30	8.73	13.15
Spraying 2	0.3	0.3	3.12	1.30	8.73	13.1525
Spraying 3	0.3	0.3	3.12	1.30	8.73	13.1525
Spraying 4	0.3	0.3	3.12	1.30	8.73	13.1525
Mowing (2X)	1.3	1.0	13.52	3.03		16.55
Miscellaneous						33.00
Total	61.4	18.4	449.09	111.75	4,229.59	4,823.43

Table 5 continued.

	Labor Hours	Equip. Hours	Labor Cost \$	Equip Cost \$	Materials Cost \$	Total \$
<u>Second Year</u>						
Pruning & br. rem.	6.0		62.40			62.40
Tying & renewal	4.0		29.80			29.80
Vine replacement	2.0	2.0	20.80	5.66	49.60	
Fertilization	0.6	0.5	6.24	1.47	24.61	32.32
Chem. weed control under trellis	2.5	2.0	26.00	6.10	13.46	45.56
Suckering & cluster removal	10.0		74.50			74.50
Take away	3.0	2.5	31.20	9.63		40.83
Hand hoe	8.0		59.60			
Chem. weed control row-middle (1X)	0.6	0.5	6.50	1.53	8.36	16.39
Push-up	1.5	1.2	15.60	4.62		20.22
Spray 1	0.4	0.3	4.16	1.30	8.73	14.19
Spray 2	0.4	0.3	4.16	1.30	8.73	14.19
Spray 3	0.6	0.5	6.24	2.61	8.73	17.58
Spray 4	0.6	0.5	6.24	2.61	8.73	17.58
Spray 5	0.6	0.5	6.24	2.61	8.73	17.58
Mowing (2X)	1.3	1.0	13.00	3.03		16.03
Rogueing	1.0		7.45			7.45
Miscellaneous						33.00
Total	43.1	11.7	380.13	42.45	139.68	459.59
<u>Third Year</u>						
Pruning	18.0		187.20			187.20
Brush removal	2.0		20.80			20.80
Tying & renewal	10.0		74.50			74.50
Vine replacement	2.0	2.0	20.80	5.66	49.60	76.06
Spr. fertilization	0.6	0.5	6.45	1.47	12.60	20.51
Chem. weed control- under trellis	2.6	2.0	27.04	6.08	13.58	46.70
Suckering & cluster removal	15.0		111.75			111.75
Take away	3.0	2.5	31.20	9.63		40.83
Hand hoe	8.0		59.60			59.60
Chem. weed control row middle	0.6	0.5	6.45	1.53	13.58	21.55
Spot herbicide treatment	0.4	0.3	3.87	0.92	6.27	11.05
Spraying 1	0.6	0.5	6.45	2.61	11.85	20.90
Spraying 2	0.6	0.5	6.45	2.61	11.85	20.90
Spraying 3	0.6	0.5	6.45	2.61	11.85	20.90
Spraying 4	0.6	0.5	6.45	2.61	19.80	28.85
Spraying 5	0.6	0.5	6.45	2.61	19.80	28.85

Table 5 continued	Labor Hours	Equip. Hours	Labor Cost \$	Equip. Cost \$	Materials Cost \$	Total \$
Spraying 6	0.6	0.5	6.45	2.61	21.76	30.81
Spraying 7	0.6	0.5	6.45	2.61	19.80	28.85
Spraying 8	0.6	0.5	6.45	2.61	51.72	60.77
Spraying 9	0.6	0.5	6.45	2.61	51.75	60.80
Mowing (2X)	1.2	1.0	12.48	3.03		15.51
Brush chopping (1)	1.2	1.0	12.48	5.04		17.52
Hilling-up	1.5	1.2	0.00	4.62		4.62
Rogueing	1.0		7.45			7.45
Petiole test	0.1		1.16		1.56	2.71
Fall fertilization	0.6	0.5	0.00	1.47	10.20	11.67
Miscellaneous						33.00
Total	73.4	16.0	641.25	62.87	327.57	1,064.69

Labor: Unskilled = \$7.45/hour,
 skilled = \$10.40/hour
 Petiole sampling: 0.1 hour/acre
 (\$14/analysis, 1 analysis/10 ac.)
 Soil sampling: 0.2 hour/acre
 (\$15/analysis, 1 analysis/10 ac).

The total costs for the entire E&D period are summarized in Table 6. The totals from Table 5 for each of the three years are brought into the row labeled 'annual variable costs'. Harvesting costs are added in for the third year only. Fixed costs (capital recovery for machinery and equipment and buildings, property taxes, land charge, insurance, and management) are added. Interest, at a real rate of six per cent, is added to the cumulative costs. Credit is given for the revenue from the estimated one ton of grapes harvested in year three. The total cumulative cost for the E&D period is \$10,407 per acre. Amortized at a six per cent real rate of interest for the estimated years of life from year four through 25 (or 22 years), the annual cost for capital recovery (interest and depreciation) is \$864 per acre. This amount was charged as a fixed cost in Table 8, which summarizes the costs and returns for a mature vineyard. Cash costs for establishment, including labor, are \$7,046 for site preparation and the first three years.

Costs and Returns for a Mature Vineyard

Annual growing costs for years four through 25 are developed in Table 7. Total growing costs for a typical year in the mature vineyard are estimated to be \$1,474 per acre. The most costly operations are pruning (\$312 per acre) and spraying (nine times, for a total of \$302 per acre, including labor, machinery and materials costs). By year four, the well managed vineyard will nearly have reached its full yield potential and will require approximately the same management for the duration of its life.

Table 6.

Summary Of Establishment and Development Costs By Year
V. vinifera Grapes, Finger Lakes Region NY, 1997
 (FLCOP)

Item	Year of establishment and development		
	Year 1	Year 2	Year 3
<u>Revenue</u>			
Yield per acre (tons)	0	0	1.0
Market price (\$)	1,116	1,116	1,116
Total revenue (\$)	0	0	1,116
<u>Costs</u>			
Site preparation (\$)	698	0	0
Annual variable costs (\$)			
Preharvest	4,823	460	1065
Harvest (Hand)	0	0	130
Total	5,522	460	1195
Annual fixed costs (\$)	937	937	937
Interest on cumulative costs (\$)	388	495	652
Total costs (\$)	6,847	1892	2784
Net returns (\$)	-6,847	-1,892	-1,668
Total cumulative cost(\$)	6,847	8,738	10,407
Amortization of vineyard:			864
Cash costs of vineyard establishment (3 Yrs.)			7,046

Table 7.

Growing Costs, Years Four Through
Twenty-Five, *V. vinifera* Grapes,
Finger Lakes Region, New York, 1997.

Operation	Labor Hours	Equip. Hours	Labor Cost \$	Equip. Cost \$	Materials Cost \$	Total \$
Pruning	30.0		312.00			312.00
Brush removal	5.0		37.25			37.25
Trellis maint.	3.0	1.0	31.20	2.83	29.28	63.31
Tying & renewal	18.0		134.10			134.10
Spring fert.	0.6	0.5	6.50	1.47	12.60	20.57
Vine replacement	2.0	2.0	20.80	5.66	49.60	76.06
Chem. weed control- trellis	2.6	2.0	27.04	6.10	6.00	39.14
Chem. weed control row middle	0.6	0.5	6.50	1.53	8.36	16.39
Spot herbicide treatment	0.4	0.3	3.90	0.92	6.27	11.08
Suckering & trunk ren	17.0		126.65			126.65
Take-away	3.0	2.5	31.20	9.63		40.83
Hand hoe	8.0		59.60			59.60
Spraying 1	0.6	0.5	6.50	2.61	11.85	20.96
Spraying 2	0.6	0.5	6.50	2.61	11.85	20.96
Spraying 3	0.6	0.5	6.50	2.61	11.85	20.96
Spraying 4	0.6	0.5	6.50	2.61	19.80	28.91
Spraying 5	0.6	0.5	6.50	2.61	19.80	28.91
Spraying 6	0.6	0.5	6.50	2.61	21.73	30.84
Spraying 7	0.6	0.5	6.50	2.61	19.80	28.91
Spraying 8	0.6	0.5	6.50	2.61	51.75	60.86
Spraying 9	0.6	0.5	6.50	2.61	51.75	60.86
Mowing (2X)	1.3	1.0	13.00	3.03		16.03
Brush chopping	0.7	0.5	7.28	2.52		9.80

Table 7 continued.

	Labor Hours	Equipment Hours	Labor Cost \$	Equip. Cost \$	Materials Cost \$	Total \$
Lime	custom				6.20	6.20
Pickup truck				34.44		34.44
Shoot positioning	6		44.70			44.70
Leaf removal	1.25	1.0	13.00	3.59		16.59
Summer pruning	1.3	1.0	13.52	10.00		23.52
Petiole sampling	0.1		1.04		0.78	1.82
Soil sampling	0.2		2.08		0.39	2.47
Hilling-up	1.5	1.2	15.60	4.62		20.22
Rogueing	1.00		7.45			7.45
Fall fertilization	0.3	0.3	3.25	0.73	10.20	14.18
Bird Control	0.25		2.60			2.60
Miscellaneous						35.00
Total	109.7	18.25	\$978.76	\$110.50	\$349.85	\$1,474.11

Fall fertilization: every other year (Murate of Potash)

Petiole sampling: every other year (\$14/analysis, 1 analysis/10 ac)

Soil sampling: 1/5 years (\$10/analysis, 1 analysis/10 ac.)

Vine replacement: 2% every year.

Bird control: Equipment cost based on purchase price, 10 years use, and 36 acres.

Lime application: \$31/ton (\$28/ton lime + \$3 spreader rental)

Labor: unskilled= \$6.00/hour + fringe benefits, or \$7.45/hour;

skilled=\$8.00/hour + fringe benefits, or \$10.40/hour.

Table 8 summarizes the costs and returns expected from a mature vineyard. The estimated revenue is \$4,464 per acre. The growing costs from Table 7 are added to the harvesting costs and the cost of operating capital to obtain the total variable costs of \$1,740 per acre. Fixed costs, to include the amortized costs for E&D of the vineyard from Table 6, are added. The result is total annual fixed costs of \$1,801 per acre. Total costs are \$3,542 per acre leaving a profit of \$922 per acre.

The break-even price, when yields are four tons per acre, is \$885 per ton. The break-even yield, when the price is \$1,116 per ton, is 3.1 tons per acre.

Table 8. Costs and Returns For A Mature *V. vinifera* Vineyard,
Trained To a Vertical Shoot Positioned System
Finger Lakes Region, 1997. (FLCOP)

Item	Per Acre
Receipts:	
Yield, tons per acre	4.0
Price, \$ per ton	1,116
Total receipts	\$4,464
Costs:	
Variable Costs:	
Growing	1,474
Interest on operating capital	66
Harvesting	200
Total variable costs	1,740
Fixed Costs:	
Machinery and equipment capital recovery	472
Buildings capital recovery	37
Vineyard capital recovery	864
Property taxes	60
Land cost (\$1500 land value X 6 %)	90
Insurance	55
Management	223
Total fixed costs	1,801
Total costs	3,542
Profit	922
Breakeven price (\$ /ton)	885
Breakeven yield	3.1

Capital Requirement

Table 9 indicates the capital investment necessary to get into grape production in the Finger Lakes region, assuming a vineyard of 36 total acres and reliance on custom harvesting of grapes. The table uses the value of new machinery and equipment and buildings. Land costs assume a prime site close to the lake. Table 9 indicates that it would require \$15,732 per acre to get a vineyard into maturity in the Finger Lakes under the assumptions indicated above. Established growers, with depreciated vineyards, machinery and equipment, and buildings, would have lower capital investment (book value) depending upon the age of their depreciable assets. Growers with smaller acreage will typically have higher investment costs per acre due to less efficient use of the machinery complement unless they hire more tasks to be done by custom operators, thus giving them the possibility to buy fewer pieces of machinery and equipment.

Table 9. Investment Per Acre of *V. vinifera* Grapes, Finger Lakes Region of New York, For a 36 Acre Vineyard.

Assets	\$/Acre
Land*	1,500
Machinery & equipment	3,314
Buildings (shop and tool shed)	511
Vineyard establishment and development	10,407
Total investment per acre	\$15,732

*Prime site close to the lake

DISCUSSION AND SENSITIVITY ANALYSIS

Costs per ton of grapes and profits for Finger Lakes vineyards will vary widely due to factors such as land costs, site factors, size of farm, managerial ability and labor efficiency. The costs and returns estimates developed in this publication represent typical costs for well-managed vineyards on prime sites.

The panel did not believe there was sufficient data to adjust costs for varietal differences. In reality, vigorous cultivars such as Cabernet Sauvignon and Cabernet franc may require a greater labor input for pruning, brush removal, tying and other hand labor tasks. Differences in fungicide applications may be necessary due to the differences in disease resistance among the various varieties.

The total cost per ton, or breakeven price, is quite sensitive to yield as shown in Table 10. If yields are two tons per acre or less and/or with low yielding cultivars, \$1,649 per ton would be required to break even. Even the highest price paid in the most recent two sessions of relatively high prices would result in unprofitable production with such a low yielding scenario.

Table 10. Total Cost Per Ton (Breakeven Price) At Varying Yields, *V. vinifera* Grapes, Finger Lakes Region of New York, 1997

Yield (tons/acre)	Cost/ton*
2.0	\$1,649
2.5	1,344
3.0	1,140
3.5	995
4.0	885
4.5	801
5.0	733

*Cost at different yield levels adjusted for harvesting and hauling at \$50/ton. Assumes 6% real interest rate and a \$1,500 per acre land value.

CONCLUSIONS

The cost and returns estimates derived in this publication indicate that growing *V. vinifera* grapes in the Finger Lakes is a profitable venture under the assumption of prime sites, the use of recommended practices, good management, and current prices for inputs and grapes.

Potential investors should be forewarned that the current economic climate for grape growing in the Finger Lakes can change. There is current concern about the potential impact of large plantings of *V. vinifera* in California (White) and the increasing availability of inexpensive, high quality imported wine. In some years, given the thin markets for certain varieties, a surplus situation can develop when a few growers plant additional acres. The total acreage of some varieties in New York state is quite limited. For example, in 1996, the New York Crop Reporting Service estimated acreage of certain varieties in New York state as follows: Cabernet franc, 130 acres; Cabernet Sauvignon, 231 acres; Merlot, 260 acres; Pinot gris, 29 acres, and Pinot noir, 139 acres. With such limited acreage, a few small plantings or one large planting of these varieties can lead to a large percentage increase in grapes produced, temporarily depressing the cash market. This happened with Chardonnay in the Finger Lakes in the early 1990's.

Nevertheless, given the growing consumption of table wine in the United States, the developing tourist trade in the Finger Lakes, and the growing reputation of Finger Lakes wine quality, the long run potential appears favorable for investors who can weather the inevitable ups and downs associated with an agricultural enterprise subject to the usual vagaries of weather and market forces.

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