

# **COST OF ESTABLISHMENT AND PRODUCTION OF COLD HARDY GRAPES IN THE CHAUTAUQUA REGION OF NEW YORK - 2025**



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# **Cost of Establishment and Production of Cold Hardy Grapes in the Chautauqua Region of New York, 2025**

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## **Introduction**

New York State ranks among the leading grape-producing states in the United States. Of the more than 400,000 acres of grapes grown nationally, approximately 100,000 acres are located in New York, spanning juice, wine, and fresh-market production. In 2022, the total economic impact of the wine industry in New York State was estimated at approximately \$16.81<sup>1</sup> billion. While a substantial portion of these benefits accrue to second- and third-party stakeholders, the industry directly supports a robust agricultural and tourism economy. New York’s wine industry includes approximately 507 wine producers and 32,149 acres of vineyards, generating an estimated 83,193 jobs and \$5.76 billion in wages. In addition, wine-related tourism contributes approximately \$541.90 million annually, representing more than 2.84 million visits statewide.

The Chautauqua–Lake Erie grape-growing area forms part of the broader Lake Erie grape belt, one of the most concentrated grape-production regions in North America. The broader Lake Erie region spans western New York and northwestern Pennsylvania and contains approximately 30,000 acres of vineyards. On the New York side, grape production is centered in Chautauqua County, which accounts for roughly 20,000 to 22,000 acres of vineyards, while neighboring Erie County, Pennsylvania, contains an additional 12,576 acres. Concord grapes alone account for approximately 16,166 acres, representing roughly 70–75 percent of total regional acreage, followed by Catawba and other *Vitis labrusca* cultivars primarily destined for juice and processed markets. The scale and concentration of juice grape production have historically defined the region’s agricultural identity and supply chain infrastructure.

In recent decades, however, the Chautauqua–Lake Erie region has experienced gradual diversification into wine grape production. French-American hybrid varieties—including Vidal Blanc, Seyval Blanc, Chambourcin, and Traminette—represent a meaningful share of wine grape plantings, particularly on sites facing higher disease pressure or greater winter injury risk. *Vitis vinifera* varieties such as Riesling, Chardonnay, Cabernet Franc, Cabernet Sauvignon, and Merlot occupy a smaller but growing footprint, typically concentrated in lake-moderated microclimates where temperature buffering improves vine survival and fruit quality.

Cold-hardy grape varieties have emerged as an increasingly important segment of wine grape production in western New York. Developed primarily through the University of Minnesota breeding program, these varieties—including Frontenac, Marquette, La Crescent, and Brianna—have expanded steadily since the mid-2010s and now represent several hundred acres statewide, with a significant concentration in the Chautauqua–Lake Erie region. Cold-hardy varieties are attractive to growers because they offer improved winter survival, enhanced disease tolerance, and greater yield stability relative to *vinifera* planted on marginal sites. These traits can reduce long-term production risk and stabilize cash flow. Although market prices for cold-hardy grapes are generally lower than those for premium *vinifera*, production costs may also be lower due to reduced vine loss, fewer fungicide applications, and more consistent cropping levels.

Americans’ per capita wine consumption has declined in recent years, falling from approximately 3.16 gallons per person in 2021 to about 2.54 gallons per person in 2025 (roughly from 9.62 to 7.66 liters per capita). Total U.S. wine consumption in 2023–2024 was estimated at 870–901 million gallons, reflecting a continuation of a downward trend that began after consumption peaked in

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<sup>1</sup> Economic Impact of Wine Industry 2025 Data, New York – The national Association of American Wineries – Wine America

the late 2010s. While Millennials and Generation Z now represent a growing share of wine consumers, their overall participation remains lower than that of older cohorts. This pattern aligns with broader declines in alcohol consumption nationwide, with recent surveys indicating historically low shares of U.S. adults consuming alcohol. Despite declining volumes, dollar sales of wine have increased in recent years, driven in part by consumers shifting toward higher-priced products and premium offerings. As a result, the U.S. wine market, valued in the hundreds of billions of dollars, continues to generate revenue growth even as per capita consumption softens. Wine consumption patterns also suggest increasing episodic use, with many consumers drinking wine primarily on special occasions rather than regularly. Additionally, white wine has gained popularity and now rivals or slightly exceeds red wine in market share by volume.

In addition to traditional retail and distribution channels, the growth of in-premise wine consumption, particularly through winery tasting rooms, has become an increasingly important driver of consumer engagement in New York State. Direct-to-consumer, on-site sales allow wineries to capture higher margins while strengthening brand loyalty and consumer education. Tasting rooms, winery events, and curated wine experiences attract both residents and destination tourists, contributing to increased visitation and longer stays in wine regions such as the Finger Lakes. These in-premise experiences are especially effective at attracting younger consumers who place higher value on authenticity, local identity, and experiential purchasing. As a result, in-premise wine sales have become a critical marketing and revenue channel that supports both winery profitability and regional tourism development in New York State.

Vineyard establishment in the region remains a capital-intensive, long-term investment. Costs are incurred several years before full production is achieved, and payback periods often exceed ten years. Profitability is therefore highly sensitive to yield performance, varietal selection, site characteristics, and market access. In a region characterized by large and concentrated acreage, planting decisions can materially influence local supply conditions once new vineyards reach bearing age. At the same time, growers operate within a broader national and global wine market subject to cyclical oversupply and evolving consumer preferences. While many New York wineries benefit from strong regional branding and direct-to-consumer sales channels, grape markets are not fully insulated from broader supply–demand imbalances. As a result, careful economic evaluation is essential when considering new vineyard investments.

The objective of this study is to estimate the cost of establishment and annual production of cold-hardy grape varieties in the Chautauqua–Lake Erie region under commercial-scale conditions in 2025. The analysis develops detailed cost estimates for land preparation, vineyard establishment, machinery, labor, and operating inputs, reflecting production systems currently employed by regional growers. These budgets are intended to serve as benchmarks rather than statewide averages and assume suitable sites with competent management aimed at producing commercially viable fruit. By providing transparent, region-specific cost estimates, this study supports growers, lenders, and policymakers in evaluating the economic feasibility of cold-hardy grape production and its evolving role within New York’s grape and wine industry.

## **Methods**

Cost estimates were developed using a combination of (1) interviews with a panel of grower representatives and (2) economic engineering based on recommended production practices. In August 2025, a panel of four growers and vineyard managers reviewed cost data from the most recent Finger Lakes *Vitis vinifera* production budgets. Although production practices in the Chautauqua–Lake Erie region differ substantially from those in the Finger Lakes, many inputs—such as machinery and chemical costs—are comparable. Using prior studies of cold-hardy grape production in the Chautauqua region, consensus estimates were developed for land values, labor requirements, wage rates, and machinery complements for a commercial-scale vineyard. Cost assumptions and modeling approaches were further reviewed with Extension specialists from Cornell University and Penn State University to ensure accuracy and regional relevance.

### **Land**

The study assumes a land purchase price of \$4,500 per acre, representing a 31 percent increase from the value used in the 2019 study. This price reflects recent land market conditions in the Chautauqua region and accounts for the likelihood that some purchased land may require preparation before agricultural use. The estimate was developed in consultation with Farm Credit East and based on average land sales prices suitable for grape production since 2017.

The representative operation is assumed to total 15 acres, of which 13 acres are planted to cold-hardy grapes; the remaining two acres are allocated to roads, buildings, and other infrastructure. While the average vineyard operation in the region is substantially larger (approximately 200 acres across all grape varieties), this analysis focuses specifically on acreage dedicated to cold-hardy grapes. Because a 13-acre planting is too small to efficiently utilize vineyard machinery on its own, machinery and equipment costs are allocated based on a 200-acre grape operation, representing the average scale of regional vineyards regardless of variety. At the same time, a 13-acre cold-hardy vineyard is small enough to be operated as a family enterprise. Accordingly, some hand-labor operations are assumed to be performed by the grower, supplemented by hired part-time labor as needed.

### **Vineyard Layout**

The vineyard is assumed to be planted at a 9 ft × 7 ft spacing (row by vine), resulting in a planting density of 691 vines per acre. Each acre contains eight rows, with rows averaging 400 feet in length. Vine cost is estimated at \$4.25 per plant. Annual vine loss is assumed at 2 percent, reflecting replacement due to disease or environmental damage. Initial planting is assumed to be completed using contracted GPS planting services at a cost of \$1.10 per vine, with a total of 8,983 vines planted across 13 acres.

### **Varieties**

The 13-acre vineyard is assumed to be planted to four cold-hardy grape varieties: Brianna, Frontenac, La Crescent, and Marquette. These varieties were selected for their proven suitability to the extreme winter conditions of the Chautauqua region and their ability to produce premium-quality wines. Frontenac was the first cold-hardy variety established in the region, followed by Marquette and La Crescent, with Brianna representing the most recent addition. Frontenac and Marquette are primarily used in red wine production, while La Crescent and Brianna are used to produce white wines ranging from dry to dessert styles.

## **Tile Drainage**

Tile drainage is assumed to be installed at 27-foot intervals, corresponding to the center of every third row. The system consists of 4-inch lateral pipes running down the center of every second row, connected to a 6-inch mainline pipe that runs across the width of the vineyard.

## **Trellis System**

Vines are assumed to be trained using the vertically shoot positioned (VSP) system. The trellis system consists of two pairs of catch wires and two fruiting wires (six wires total), 8-ft wooden line posts (3-4 in. diameter) installed at every fourth vine, four catch-wire clips per line post, and 8-ft wooden end posts (4-5 in. diameter) with anchor support posts at the end of each row.

## **Herbicides and Fertilizer/Soil Program**

The sample herbicide program was developed in consultation with an advisory panel of four growers; details are provided in Table A1 (Appendix). Glyphosate spot applications are assumed to be applied using a shielded sprayer to prevent contact with green vine tissue. Given the scale of the operation, the study assumes use of an Enviromist sprayer for this purpose.

The sample fertilizer and soil management program was developed by Hans Walter-Peterson, Viticulture Extension Specialist with the Finger Lakes Grape Program, and reviewed by Kevin Martin, Associate Extension Educator with Penn State Extension and Business Management at the Lake Erie Regional Grape Program. Details are provided in Table A2 (Appendix).

## **Wage Rates**

Wage rates reflect the consensus of the grower advisory panel. Skilled labor is assumed at \$24.00 per hour, which includes a base wage of \$18.46 per hour plus fringe benefits such as workers' compensation, Social Security, medical insurance, and other benefits. Unskilled labor is assumed at \$21.70 per hour, inclusive of fringe benefits.

Piece-rate wages are used for pruning and tying operations in years 3-22. Pruning is paid at \$0.56 per vine and tying at \$0.28 per vine. These rates are based on base piece rates of \$0.45 and \$0.23 per vine, respectively, with an additional 13 percent contracting fee and 10 percent unemployment insurance cost, resulting in the final assumed piece-rate wages.

## **Harvesting & Hauling**

Grapes are assumed to be custom machine-harvested beginning in year four. The harvesting cost is estimated at \$95 per ton, with an additional \$30 per ton for transportation; hauling costs are included in this rate.

## **Machinery and Building Costs**

Investment and annual costs for equipment and buildings are summarized in Table A3. Total machinery investment is estimated at \$301,360, representing an average investment of \$1,507 per acre of total grape production area, including Concord grape acreage within the operation. Investment in a shop is estimated at \$82,500, or \$413 per acre. The shop is assumed to be 1,500 ft<sup>2</sup>, with construction costs of \$55 per ft<sup>2</sup>, including basic amenities such as water, electricity, concrete floors, and insulated walls.

Machinery depreciation and interest are calculated based on new equipment prices, with a minor exception for a used pickup truck. Diesel fuel is budgeted at \$3.09 per gallon and gasoline at \$2.89 per gallon (unleaded), reflecting average prices in west-central New York as of August 2025. Hourly machinery variable costs: including repairs, fuel, and lubrication, are reported in Table A4 and were estimated using American Society of Agricultural Engineers (ASAE) 2000 standards.

Total annual depreciation and interest costs are estimated at \$33,030 for machinery and \$4,209 for buildings, equivalent to \$165 and \$21 per acre, respectively. Machinery investment would be substantially higher if a mechanical grape harvester were required.

### **Overhead**

Annual insurance costs are estimated at 1 percent of the initial investment in buildings and machinery. Office expenses, including supplies and phone services, are estimated at \$3,000 per year. School and property taxes are assumed at \$25 per \$1,000 of the assessed value of the initial land investment.

### **Management Charge**

A management fee equal to five percent of gross receipts is included to represent the opportunity cost of the vineyard owner's management time. All labor requirements are treated as cash costs; therefore, if the owner or manager performs vineyard labor or management tasks, actual cash expenditures would be lower than those reflected in these estimates.

### **Cost of Capital**

A 3% interest rate is applied to capital investments and operating capital, representing a real rate derived from a nominal interest rate of 5% and an assumed inflation rate of approximately 2%.

### **Yields**

Yields are specified as long-term averages attainable on suitable sites characterized by sloping terrain, good air drainage, moderately well-drained soils, and at least medium soil depth. Yield assumptions reflect better-than-average management practices consistent with the production of premium-quality hybrid wines. Yield assumptions are summarized in Table 1.

Table 1: Yield Assumptions for Selected Cold Hardy Grapes, Chautauqua Region NY, 2025

Variety		Year 3	Year 4+
Brianna	1	tons/acre	5 tons/acre
Frontenac	1	tons/acre	5 tons/acre
La Crescent	1	tons/acre	4 tons/acre
Marquette	1	tons/acre	5 tons/acre

## Results

### Grape Prices

Prices for the previous three years ending in 2024 are shown in Table 2. These averages do not consider quality and/or quantity of grapes purchased by each processor. Since larger processors often pay less, the weighted average price is often lower than the average reported in Table 2. However, the prices in Table 2 are a reasonable indicator of price trends for the four varieties. The mean price of the four varieties was used as the price per ton when estimating revenues.

Table 2: Average Price Listings for Selected Cold Hardy Grapes, Chautauqua Region NY, 2022-2024, Dollars per Ton.

Year	Brianna	Frontenac	La Crescent	Marquette
2022	\$ 475	\$ 738	\$ 790	\$ 800
2023	\$ 475	\$ 738	\$ 800	\$ 833
2024	\$ 475	\$ 738	\$ 800	\$ 840
Mean	\$ 475	\$ 738	\$ 797	\$ 824
<b>Price used</b>	<b>\$ 475</b>	<b>\$ 738</b>	<b>\$ 797</b>	<b>\$ 824</b>

### Pesticide Program Spray Costs

Table 3.1 presents the recommended spray program and costs for years 2 and 3 (establishment). Table 3.2 indicates the recommended spray program and costs for years 4-22 (operation). In year three, three sprays are recommended. Beginning in year four, the spray programs are assumed to be approximately the same from year to year, with an average of five sprays during the growing season. Spray material costs were estimated at \$150.12 per acre on average from year four onwards. Fungicide applications may vary slightly among cold-hardy cultivars due to the differences in disease susceptibility. Of course, spray programs will have to be adjusted slightly from year to year to accommodate variable weather and/or pest pressure. Pesticide application costs for labor and machinery, as well as herbicides, are presented in Tables 6 and 8.

Table 3.3 shows the cost breakdown of the chemicals used, as well as potential additional/substitute products, in the example spray programs, and lists the market price for the chemicals as well as the per unit price.

Table 3.1: Sample Spray Program for Cold Hardy Grapes for Years 2 & 3, Chautauqua Region, NY, 2025

Year	Material	Target organisms	Rate/acre	Price	\$/acre
<b>Year 2</b>					
			<b>Spray 1</b>		
	Mancozeb 75DF	Downy mildew, botrytis, anthracnose	3 lbs.	\$8.33 lb.	\$25.00
	Vivando	Powdery mildew	15 oz.	\$2.19 lb.	\$32.81
				<b>Total per spray</b>	<b>\$57.81</b>
			<b>Spray 2</b>		
	Leverage 360	Grape berry moth, Japanese beetle	3 oz.	\$ 1.95 oz	\$ 5.86
			<b>Total per spray</b>	<b>\$ 5.86</b>	
			<b>Total for year 2</b>	<b>\$63.67</b>	
<b>Year 3</b>					
			<b>Spray 1</b>		
	Mancozeb 75DF	Downy mildew, botrytis, anthracnose	3 lbs.	\$8.33 lb.	\$25.00
	Surfactant		4 oz.	\$0.33 oz	\$1.31
				<b>Total per spray</b>	<b>\$26.31</b>
			<b>Spray 2</b>		
	Revus Top	Powdery mildew, downy mildew	7 oz.	\$3.47 oz	\$24.27
	Levearge 360	Grape berry moth, Japanese beetle	3 oz.	\$1.95 oz	\$5.86
	Vivando	Powdery mildew	15 oz.	\$2.19 oz	\$0.26
				<b>Total per spray</b>	<b>\$30.38</b>
		<b>Spray 3</b>			
Quintec	Powdery mildew	3 oz	\$3.21 oz	<b>\$9.63</b>	
Mettle	Powdery mildew, black rot	5 oz	\$3.87 lb	<b>\$19.33</b>	
			<b>Total per spray</b>	<b>\$28.96</b>	
			<b>Total per spray</b>	<b>\$85.65</b>	

Table 3.2: Sample Spray Program for Cold Hardy Grapes for Years 4 - 25, Chautauqua Region NY, 2025

Spray	Chemical	Target organisms	Measure	Unit/Acre	Cost	Spray Cost
1	Mancozeb 75DF	Downy mildew, botrytis, anthracnose	3	lbs.	\$ 25.00	\$ 26.31
	Surfactant		4	oz	\$ 1.31	
2	Mancozeb 75DF	Downy mildew, botrytis, anthracnose	3	lbs.	\$ 25.00	\$ 26.31
	Surfactant		4	oz	\$ 1.31	
3	Cevya	Powdery mildew	6	oz.	\$ 33.38	\$ 54.46
	Ranman	Downy mildew	4	oz	\$ 21.08	
4	Leverage 360	Grape berry moth, Japanese beetle	3	oz.	\$ 5.86	\$ 25.18
	Mettle	Powdery mildew, black rot	5	oz	\$ 19.33	
5	Zampro	Powdery mildew	3	oz	\$ 8.43	\$ 18.27
	Luna Experience	Black rot, downy mildew, ripe rot, botrytis bunch rot	3.5	lbs.	\$ 9.84	
					<b>Total Cost</b>	<b>\$ 150.52</b>

Table 3.3: Sample Cost Key of Chemicals Use in Spray Programs for Cold Hardy Grapes, Chautauqua Region NY, 2025

Chemical	Amount	Unit	Market Cost	Cost per	Unit
Leverage 360	1	gal	\$ 249.95	\$ 1.95	oz
Luna Experience	1	qt	\$ 188.95	\$ 5.90	oz
Mancozeb 75DF	12	lb	\$ 99.99	\$ 8.33	lb
Mettle	30	oz	\$ 115.95	\$ 3.87	oz
Quintec	30	oz	\$ 96.30	\$ 3.21	oz
Reason	1	gal	\$ 277.76	\$ 2.17	oz
Revus Top	1	gal	\$ 331.17	\$ 2.59	oz
Surfactant	1	gal	\$ 41.92	\$ 0.33	oz
Vivando	1	gal	\$ 228.00	\$ 1.78	oz
Ziram	10	lb	\$ 55.95	\$ 5.60	lb

### Drainage Construction Costs

Table 4 contains an estimate of drainage construction costs. These costs are transferred to the site preparation section of the establishment and development costs (see Table 6). Costs will vary greatly from site to site, depending on the soil conditions and preferences of the vineyard manager. Growers should consult with their county's Soil & Water District staff to determine the proper amount of drainage a particular site requires. This study assumed that tile drainage was placed in the middle of every third row (27 feet apart). Costs were estimated to total \$7,517 per acre.

Table 4: Tile Drainage Costs per acre for Cold Hardy Grapes,  
Chautauqua Region NY, 2025

Item	Quantity (ft)	Price \$/ft	Total Cost per acre
Main line: 6" pipe	29.00	\$4.00	116.00
Laterals: 4" pipe	2,723	\$1.00	\$2,723
Installation	2,752	\$1.70	\$4,678
<b>Total Drainage Construction per acre</b>			<b>\$7,517</b>

### Trellis Construction Costs

The trellis was designed for Vertically Shoot Positioned (VSP) vines. It consisted of two pairs of movable catch wires and two fixed fruiting wires (a total of six wires). Wooden line posts were used for every fourth vine, and four catch wire clips were used on each post to hold the catch wires in place. Wooden anchor posts were used to support each end post. Rows were 400 feet long and there were 8 rows to an acre and vines per row.

Table 5 contains an estimate of trellis construction costs. The total cost for materials is estimated at \$4,179 per acre. These costs are transferred to Table 6 in the first year of establishment and development. Labor and machinery costs for trellis establishment are also shown in Table 6. The total cost of trellis construction, including materials, labor, and machinery, is \$5,971 per acre.

Table 5: Trellis Construction Costs per acre for Cold Hardy Grapes,  
Chautauqua Region NY, 2025

VSP Trellis Construction Materials per Acre	Quantity	Price	Total per acre
Wood end posts (8 ft X 4-5" diameter)	16 posts	\$19.79 post	\$317
Anchor Kit	16 posts	\$10.00 post	\$160
Line Post (8 ft, 3-4" diameter, every 4th plant)	145 stakes	\$21.71 stake	\$3,148
12.5-gauge HT foilage & cordon wire (\$143 roll of 3846 ft)	19,555 ft	\$0.025 ft	\$489
Catchwire clips (4 per line post)	580 clips	\$0.08 clip	\$46
Staples, lbs.	2.5 lbs.	\$3.99 lb.	\$10
Crimping sleeves (for joining wire ends)	37 crimps	\$0.25 crimp	\$9
<b>Total Trellis Construction materials</b>			<b>\$4,179</b>

## **Establishment and Development Costs**

The costs for labor, machinery, and materials for site preparation and in years one through three constitute the establishment and development (E&D) variable costs in Table 6. First year variable costs, including site preparation, trellis construction, and planting, are substantial and amount to \$18,772 per acre. A planting density of 9' x 7' spacing (row by vine) resulting in a planting density of 691 vines per acre. The largest cost in the first year is for site preparation, for a total of \$8,438. This includes installing drainage which in total costs \$7,517. In year two, costs are a relatively modest at \$1,316 per acre with less labor required than for mature vines. In the third year, a three-spray program is recommended, and hand harvesting is required to protect the young vines. Total costs for the third year are estimated at \$1,989 per acre. Note that the usage of pickup truck is estimated at 40,000 miles for a 200-acre farm per year, which is \$189 per acre (including gas and maintenances costs).

The total costs for the entire E&D period (years 1-3) are summarized in Table 7. The totals from Table 6 for each of the three years are brought into the row labeled 'annual variable costs'. Hand harvesting costs are added for the third year only. Fixed costs (capital recovery for machinery and equipment and buildings, property taxes, office supplies, land charge, insurance, and management) are added. Interest at a real rate of 2% is added to the cumulative costs. Credit is given for the revenue from the estimated one ton of grapes per acre harvested in year three. The price of grapes in year three is the average price of the four varieties produced. The total cumulative cost for the E&D period is \$25,735 per acre. Amortized at a two percent real rate of interest for the estimated years of life from year four through 22, the annual cost for capital recovery (interest and depreciation) is \$1,313 per acre. This amount was charged as a fixed cost labeled 'vineyard capital recovery' in Table 10, which summarizes the costs and returns for a mature vineyard. Cash costs for establishment, including labor, are \$22,077 per acre for site preparation and the first three years.

Table 6: Cold Hardy Grape Establishment and Development Costs, Chautauqua Region NY, 2025

	(Unit: Acre)	Labor Used	Labor Hours	Equipment Hours	Labor Cost	Equipment Cost	Materials Cost	Total Cost
<b>Site Preparation – Year 0</b>								
Drainage (see table 5 for details)		Custom						\$7,517
Lime (2 tons/acre)		Custom					\$100.00	\$100
Herbicide application		Custom				\$10.50	\$22.46	\$33
Stone removal & land maint.		Unskilled	10	10	\$217.00	\$154.53		\$372
Soil Sampling		Skilled	0.2		\$4.80		\$4.00	\$9
Fall fertilization		Skilled	0.6	0.5	\$14.40	\$7.91	\$100.00	\$122
Plowing		Custom						\$50
Discing (2X)		Custom						\$46
Pickup truck (40,000 miles for 200 ac/year)		n/a	n/a	n/a		\$188.67		\$189
<b>Total</b>			10.8	10.5	\$236.20	\$361.60	\$226.46	<b>\$8,438</b>
<b>First Year</b>								
Floating/dragging		Skilled	1	1	\$24.00	\$14.25		\$38
Laser Planting (\$1.10/vine)		Custom			\$852.00		\$2,938.57	\$3,791
Fertilization (banded)		Skilled	0.6	0.5	\$14.40	\$7.91	\$9.74	\$32
Hilling up		Skilled	1.5	1.2	\$36.00	\$20.20		\$56
Hilling up		Unskilled	1.5		\$32.55			\$33
Chem. weed control -trellis		Skilled	1.25	1.25	\$30.00	\$19.65	\$27.03	\$77
Trellis construction (see table 6 for details)		Skilled	60	16	\$1,440.00	\$352.25	\$4,179	\$5,971
Spot herbicide-hand application		Skilled	1		\$24.00		\$41.49	\$65
Cultivation (2X)		Skilled	1.2	1.2	\$28.80	\$20.20		\$49
Seed cover crop		Skilled	0.6	0.5	\$14.40	\$7.91	\$11.25	\$34
Pickup truck (40,000 miles for 200 ac/year)		n/a	n/a	n/a		\$188.67		\$189
<b>Total</b>			79.45	21.65	\$2,496.15	\$631.05	\$7,207.17	<b>\$10,334</b>
<b>Total for first year and site preparation</b>								<b>\$18,772</b>

	(Unit: Acre)	Labor Used	Labor Hours	Equipment Hours	Labor Cost	Equipment Cost	Materials Cost	Total Cost
<b><u>Second Year</u></b>								
Pruning & brush removal		Skilled	3		\$72.00			\$72
Tying & renewal		Unskilled	2		\$43.40		\$5.60	\$49
Vine Replacement		Skilled	2	2	\$48.00	\$44.51	\$58.77	\$151
Spring Fertilization		Skilled	0.6	0.5	\$14.40	\$7.91	\$9.74	\$32
Chem. weed control-trellis		Skilled	1.25	1.25	\$30.00	\$28.45	\$71.97	\$130
Suckering		Unskilled	2.5		\$54.25			\$54
Cluster removal		Unskilled	2.5		\$54.25			\$54
Take away (de-hilling)		Skilled	3	2.5	\$72.00	\$42.09		\$114
Hand hoe		Unskilled	4		\$86.80			\$87
Spot herbicide treatment		Skilled	0.4	0.3	\$9.60	\$4.72	\$14.46	\$29
Spot herbicide treatment		Skilled	0.4	0.3	\$9.60	\$4.72	\$14.46	\$29
Hilling up		Skilled	3	1.5	\$72.00	\$25.25		\$97
Spray 1		Skilled	0.4	0.3	\$9.60	\$8.92	\$57.81	\$76
Spray 2		Skilled	0.4	0.3	\$9.60	\$8.92	\$5.86	\$24
Mowing (4X)		Skilled	2.6	2	\$62.40	\$43.17		\$106
rogueing		Unskilled	1		\$21.70			\$22
Pickup truck (40,000 miles for 200 ac/year)		n/a	n/a	n/a		\$188.67		\$189

<b>Total for Second Year</b>			<b>29.05</b>	<b>10.95</b>	<b>\$669.60</b>	<b>\$218.65</b>	<b>\$238.66</b>	<b>\$1,316</b>
	(Unit: Acre)	Labor Used	Labor Hours	Equipment Hours	Labor Cost	Equipment Cost	Materials Cost	Total Cost
<b>Third Year</b>								
Pruning and brush pulling (\$0.45/vine)		Custom	piece rate		\$387.20			\$387
Tying & renewal (\$0.23/vine)		Custom	piece rate		\$193.60		\$5.60	\$199
Brush chopping (1X)		Skilled	1.2	1	\$28.80	\$20.98		\$50
Vine replacement		Skilled	2	2	\$48.00	\$44.51	\$58.77	\$151
Chem. weed control- trellis		Skilled	2.6	2	\$62.40	\$31.45	\$71.97	\$166
Suckering		Unskilled	4		\$86.80			\$87
Cluster removal		Unskilled	4		\$86.80			\$87
Take away (de-hilling)		Skilled	3	2.5	\$72.00	\$42.09		\$114
Hand hoe		Unskilled	4		\$86.80			\$87
Bird control		Skilled	3		\$72.00			\$72
Spot herbicide treatment		Skilled	0.4	0.3	\$9.60	\$4.72	\$14.46	\$29
Spot herbicide treatment		Skilled	0.4	0.3	\$9.60	\$4.72	\$14.46	\$29
Spray 1		Skilled	0.6	0.5	\$14.40	\$14.87	\$26.31	\$54
Spray 2		Skilled	0.6	0.5	\$14.40	\$14.87	\$30.38	\$60
Spray 3		Skilled	0.6	0.5	\$14.40	\$14.87	\$28.96	\$58
Mowing (4X)		Skilled	2.6	2	\$62.40	\$43.17		\$106
Hilling up		Skilled	1.7	1.5	\$40.80	\$25.25		\$66
Pickup truck (40,000 miles for 200 ac/year)		n/a	n/a	n/a		\$188.67		\$189
<b>Total for third year</b>			<b>30.7</b>	<b>13.1</b>	<b>\$1,290.00</b>	<b>\$450.14</b>	<b>\$250.91</b>	<b>\$1,989</b>

Table 7: Summary of establishment and development costs by year,  
Cold Hardy Grapes, Chautauqua Region NY, 2025

Item	Year 1	Year 2	Year 3
<b>Revenue</b>			
Yield per acre (tons)	0	0	1
Market price (average of 4 varieties)	n/a	n/a	\$709
Total revenue	\$0	\$0	\$709
<b>Costs</b>			
Site preparation	\$8,438	\$0	\$0
Annual variable costs			
-Preharvest	\$10,334	\$1,316	\$1,989
-Harvest (hand)+hauling	\$0	\$0	\$300
<b>Total Variable Costs &amp; Site preparation</b>	<b>\$18,772</b>	<b>\$1,316</b>	<b>\$2,289</b>
<b>Annual fixed costs</b>			
-Machines & equipment depreciation	\$165	\$165	\$165
-Buildings depreciation	\$21	\$21	\$21
-Property taxes	\$113	\$113	\$113
-Land opportunity cost	\$135	\$135	\$135
-Office Supplies, phone, etc.	\$231	\$231	\$231
-Insurance (fire, liability)	\$19	\$19	\$19
-Management	\$0	\$0	\$0
<b>Total Fixed Costs</b>	<b>\$684</b>	<b>\$684</b>	<b>\$684</b>
Interest on cumulative costs	\$584	\$661	\$770
<b>Total costs</b>	<b>\$20,039</b>	<b>\$2,660</b>	<b>\$3,743</b>
<b>Net returns</b>	<b>(\$20,039)</b>	<b>(\$2,660)</b>	<b>(\$3,035)</b>
<b>Total cumulative costs</b>	<b>\$20,039</b>	<b>\$22,700</b>	<b>\$25,735</b>
<b>Amortization of vineyard (in 22 years)</b>			<b>\$1,313</b>
<b>Cash costs of vineyard establishment (3 years)</b>			<b>\$22,077</b>

## **Costs and Returns for a Mature Vineyard**

Annual growing costs for years four through 22 are presented in Table 8. Total growing costs for a typical year in the mature vineyard are estimated to be \$2,915 per acre. The costliest operations are canopy management (\$984 per acre), pruning and brush pulling (\$387 per acre), and spraying (5 times, for a total of \$297 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 each year for the duration of its life.

Table 9 summarizes the growing, establishment, and development costs for a Cold Hardy Grape vineyard. Growing costs are largest in the first year when a significant amount must be spent preparing the site, planting the vines, and constructing the trellis. Growing costs are \$2,915 per acre in years 4 through 22, and these costs are transferred to Table 10 for the computation of costs and returns for the mature vineyard. The cost of crop insurance is added at an average cost of \$109 per acre, which generally starts at the fifth year of positive production (i.e. year 8). Crop insurance costs will vary by a few dollars per acre depending on the grape variety planted.

Table 8: Growing Costs, Years Four through Twenty-two, Cold Hardy Grapes, Chautauqua Region NY, 2025

	(Unit: Acre)	Labor Used	Labor Hours	Equipment Hours	Labor Cost	Equipment Cost	Materials Cost	Total Cost
Operation								
Pruning+brush pulling		Custom	piece rate		\$387.20			\$387
Brush chopping		Skilled	1.2	1	\$28.80	\$20.98		\$50
Trellis maintenance		Skilled	4	1	\$96.00	\$15.45	\$30.00	\$141
Tying & renewal		Custom	piece rate		\$193.60		\$3.92	\$198
Vine replacement		Skilled	2	2	\$48.00	\$44.51	\$58.77	\$151
Chem.weed control-trellis		Skilled	2.6	2	\$62.40	\$31.45	\$27.23	\$121
Soil applic of Solubor (w. herb. Spray)		n/a					\$6.60	\$7
Spot herbicide treatment		Skilled	0.4	0.3	\$9.60	\$4.72	\$41.69	\$56
Suckering		Unskilled	4		\$86.80			\$87
Cluster removal		Unskilled	4		\$86.80			\$87
Shoot thinning		Unskilled	6		\$130.20			\$130
Take-away (de-hilling)		Skilled	3	2.5	\$72.00	\$42.09		\$114
Bird control		Skilled	3		\$72.00			\$72
Spray 1		Skilled	0.6	0.5	\$14.40	\$14.87	\$26.31	\$56
Spray 2		Skilled	0.6	0.5	\$14.40	\$14.87	\$26.31	\$56
Spray 3		Skilled	0.6	0.5	\$14.40	\$14.87	\$54.46	\$84
Spray 4		Skilled	0.6	0.5	\$14.40	\$14.87	\$25.18	\$54
Spray 5		Skilled	0.6	0.5	\$14.40	\$14.87	\$18.27	\$48
Mowing (4X)		Skilled	2.6	2	\$62.40	\$43.17		\$106
Lime (1 in 5 years)		Skilled	0.1	0.1	\$2.40	\$4.73	\$10.00	\$17
Shoot positioning/move catch wires (first path)		Unskilled	6		\$130.20			\$130
Shoot positioning/move catch wires (second path)		Unskilled	6		\$130.20			\$130
Mechanical leaf removal		Skilled	3.2	3	\$76.80	\$31.72		\$109
Summer pruning (2X)		Skilled	2.6	2.4	\$62.40	\$51.43		\$114
Petiole sampling (\$88 for every 2 years)		Skilled	0.1		\$2.40		\$3.84	\$6
Soil sampling (every 5 years)		Skilled	0.1		\$2.40		\$0.40	\$3
Hilling-up		Skilled	1.7	1.5	\$40.80	\$25.25		\$66
Fall fertilization		Skilled	0.3	0.3	\$7.20	\$4.74	\$27.50	\$39
Crop insurance								\$109
Pickup truck (40,000 miles for 200 ac/year)		n/a	n/a	n/a		\$188.67		\$189
<b>Total</b>			55.9	20.6	\$1,862.60	\$583.23	\$360.47	<b>\$2,915</b>

Table 9: Summary of Growing Costs for Cold Hardy Grapes Vineyard, Trained to a Vertically Shoot Positioned System, Chautauqua NY, 2025

Item	Year 1	Year 2	Year 3	Year 4+
Site preparation	\$8,438			
Vines & planting	\$3,829			
Trellis materials & construction	\$5,971			\$141
Replanting & Rougeing		\$173	\$151	\$151
Dormant pruning & removal		\$72	\$387	\$387
Weed control	\$225	\$188	\$223	\$177
Fertilization	\$32	\$32		\$72
Canopy management		\$158	\$373	\$984
Disease & insect control	\$0	\$101	\$172	\$297
Take away & hilling up	\$89	\$298	\$267	\$180
Mowing		\$106	\$155	\$155
Bird Control			\$72	\$72
Pick-up (fuel, maintenances...etc)	\$189	\$189	\$189	\$189
Crop Insurance*				\$109
<b>Total Growing Costs</b>	<b>\$18,772</b>	<b>\$1,316</b>	<b>\$1,989</b>	<b>\$2,915</b>

\*Crop Insurance generally starts at the fifth year of positive production (i.e., year 8)

Table 10 summarizes the costs and returns expected from a mature vineyard. The estimated revenue per acre varies from \$2,375 to \$4,122, depending on the variety. Total costs vary from \$3,459 to \$3,584 per acre by variety. The break-even prices and yields are shown at the bottom of Table 10. A yield of 14.5 tons per acre is the break-even yield for Brianna, and a yield of 7.4 tons per acre would be necessary to break even for Marquette, assuming the price per ton stays constant. Yields at these higher levels are unlikely to meet quality requirements.

Brianna shows a large loss (-\$3,324 per acre) given the assumed yield and prices. At the assumed yield and prices, all varieties exhibited negative net returns. Marquette is the closest variety to breaking even at the assumed yields and prices with a loss of (-\$1,665 per acre). To put this in perspective, it should be remembered that we assumed recommended practices throughout the model. Some growers will be able to reduce some of these costs considerably. All labor, including the owner's, is charged at a cash wage. There is an imputed charge on all capital used.

The vineyard capital expense (establishment costs from Table 7) is written off after 22 years, which increases the fixed costs by \$1,313. In Table 13, we will discuss the scenario that vineyard holds a positive value which may be as much, or even more, than it was worth in the early years of the planting.

Table 10: Costs and Returns for a Mature Cold Hardy Grapes Vineyard - 1,  
Chautauqua Region NY, 2025

Item	Brianna	Frontenac	La Crescent	Marquette
<b>Receipts:</b>				
Yield target, tons per acre	5.0	5	4	5
Price, \$ per ton	\$475	\$738	\$797	\$824
<b>Total receipts</b>	<b>\$2,375</b>	<b>\$3,690</b>	<b>\$3,187</b>	<b>\$4,122</b>
<b>Costs:</b>				
Variable Costs:				
Growing (incl. crop insurance \$109/Ac)	\$2,915	\$2,915	\$2,915	\$2,915
Interest on operating capital	\$44	\$44	\$44	\$44
Machine Harvesting (\$95/ton)	\$475	\$475	\$380	\$475
Trucking (\$30/ton)	\$150	\$150	\$120	\$150
<b>Total variable costs</b>	<b>\$3,584</b>	<b>\$3,584</b>	<b>\$3,459</b>	<b>\$3,584</b>
Fixed Costs:				
Vineyard capital recovery	\$1,313	\$1,313	\$1,313	\$1,313
Machinery and equipment capital recovery	\$165	\$165	\$165	\$165
Buildings capital recovery	\$21	\$21	\$21	\$21
Property taxes	\$113	\$113	\$113	\$113
Land opportunity cost	\$135	\$135	\$135	\$135
Office supplies, phone, etc.	\$231	\$231	\$231	\$231
Insurance	\$19	\$19	\$19	\$19
Management	\$119	\$185	\$159	\$206
<b>Total fixed costs</b>	<b>\$2,115</b>	<b>\$2,181</b>	<b>\$2,156</b>	<b>\$2,203</b>
<b>Total costs</b>	<b>\$5,699</b>	<b>\$5,765</b>	<b>\$5,615</b>	<b>\$5,787</b>
<b>Profit or loss</b>	<b>-\$3,324</b>	<b>-\$2,075</b>	<b>-\$2,428</b>	<b>-\$1,665</b>
Breakeven price (\$ /ton)	\$1,140	\$1,153	\$1,404	\$1,157
Breakeven yield (tons)	14.5	8.4	7.6	7.4

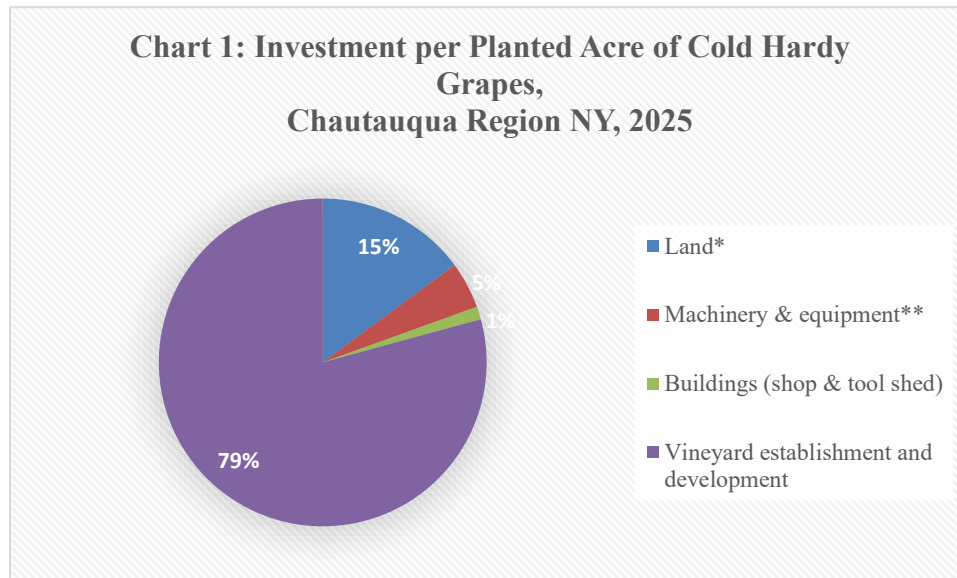
## Capital Requirements

Table 11 indicates the capital investment per acre necessary to get into grape production in the Chautauqua-Lake Erie region, assuming a vineyard of 13 total planted acres with an additional 2 acres for roads, buildings, and reliance on either custom hand or machine harvesting of grapes. The table uses the value of new machinery, equipment, and buildings. Land costs assume a prime site with land suitable for production of grapes. Table 11 indicates that it would cost \$32,664 per planted acre to bring a vineyard to maturity in the Lake Erie region under the assumptions 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. This is due to less efficient use of the machinery. Unless these smaller growers hire custom operators and/or vineyard management companies to handle vineyard operations, they may be able to buy fewer pieces of machinery and equipment.

Table 11: Investment per Planted Acre of Cold Hardy Grapes,  
Chautauqua Region NY, 2025

Assets	\$/acre
Land*	\$4,860
Machinery & equipment**	\$1,507
Buildings (shop & tool shed)	\$413
Vineyard establishment and development	\$25,884
<b>Total Investment per acre</b>	<b>\$32,664</b>



\*Assume 54 acres purchased (including support land) for 50 planted acres

\*\*Assumes all equipment is split between the 200 total acres which includes Concord production

## Sensitivity Analysis

Costs per ton of grapes and profits for Cold Hardy vineyards will vary widely due to factors such as land prices, site-specific conditions, farm size, managerial ability, and labor efficiency. The cost and return estimates in this publication represent typical costs for well-managed vineyards producing premium-quality grapes on prime sites.

The grower panel did not believe there was sufficient data to adjust costs for varietal differences. The total cost per ton, or breakeven price, is quite sensitive to yield as shown in Table 12. If yields are 3 tons per acre or less and/or with low yielding cultivars, prices around \$1,816 per ton would be required to break even. Even the highest prices paid in the most recent seasons would result in significantly unprofitable production with such a low yielding scenario.

The average yield for each of these varieties is around 4.75. However, during stochastic weather changes, for example, the record low in temperature in 2014, the yield can drop to as low as 3 tons per acre or lower. The ideal yield for premium wine will depend greatly on the characteristics of the given growing season and the contractual agreement between grower and winery purchasing the fruit.

Table 12: Total Cost per Ton (Breakeven price) at Varying Yields,  
Cold Hardy Grapes, Chautauqua Region NY, 2025

Brianna		Frontenac		La Crescent		Marquette	
Yield (tons/acre)	Cost/ton*	Yield (tons/acre)	Cost/ton*	Yield (tons/acre)	Cost/ton*	Yield (tons/acre)	Cost/ton*
1.5	\$3,508	1.5	\$3,552	1.5	\$3,535	1.5	\$3,566
2	\$2,662	2	\$2,695	2	\$2,682	2	\$2,706
2.5	\$2,155	2.5	\$2,181	2.5	\$2,171	2.5	\$2,190
3	\$1,816	3	\$1,838	3	\$1,830	3	\$1,846
3.5	\$1,575	3.5	\$1,594	3.5	\$1,586	3.5	\$1,600
4	\$1,394	4	\$1,410	4	\$1,404	4	\$1,415
4.5	\$1,253	4.5	\$1,267	4.5	\$1,262	4.5	\$1,272
5	\$1,140	5	\$1,153	5	\$1,148	5	\$1,157
5.5	\$1,048	5.5	\$1,060	5.5	\$1,055	5.5	\$1,063
6	\$971	6	\$982	6	\$977	6	\$985
6.5	\$906	6.5	\$916	6.5	\$912	6.5	\$919

\*Cost at different yield levels adjusted for harvesting and hauling at \$95/ton, trucking at \$30/ton

### **Discussion: Costs and Returns for a Mature Vineyard An established vineyard holds positive value**

Table 13 indicates the estimated annual cash flow for a mature vineyard (similar to Table 10), but assuming that an established vineyard is able to partially recover selected capital investments after 22 years of operation.

In this study, we do not discuss the returns from land investment, as they are mostly case-specific and are not included in the vineyard's establishment capital recovery costs in Table 10. Implicitly, the study thus assumes that land values increase by a rate equal to the real interest rate over the 22 years of operation. Instead, we assume that the trellis maintenance is done annually, so the trellis system has half of its value after 22 years. In addition, certain practices, such as drainage, lime application, land maintenance, and herbicide application systems, do not need to be implemented at the start of a new production cycle and can add value to the vineyard. The costs of these activities are therefore dropped from the annual vineyard capital recovery estimates. As a result, the capital recovery costs per acre decrease from \$1,313 (Table 10) to \$714 (Table 13). Even accounting for these changes, all four varieties show a loss ranging from -\$931 to -\$2,590 per acre per year.

Table 13: Cash and Returns for a Mature Cold Hardy Grapes Vineyard - 2,  
Assuming that E&D costs can be partially recovered, Chautauqua Region NY, 2025

Item	Brianna	Frontenac	La Crescent	Marquette
<b>Receipts:</b>				
Yield target, tons per acre	5.0	5	4	5
Price, \$ per ton	\$475	\$738	\$797	\$824
<b>Total receipts</b>	<b>\$2,375</b>	<b>\$3,690</b>	<b>\$3,187</b>	<b>\$4,122</b>
<b>Costs:</b>				
Variable Costs:				
Growing (incl. crop insurance @\$109/Ac)	\$2,915	\$2,915	\$2,915	\$2,915
Interest on operating capital	\$44	\$44	\$44	\$44
Machine Harvesting (\$95/ton)	\$475	\$475	\$380	\$475
Trucking (\$30/ton)	\$150	\$150	\$120	\$150
<b>Total variable costs</b>	<b>\$3,584</b>	<b>\$3,584</b>	<b>\$3,459</b>	<b>\$3,584</b>
Fixed Costs:				
Vineyard capital recovery*	\$714	\$714	\$714	\$714
Machinery and equipment capital recovery	\$165	\$165	\$165	\$165
Buildings capital recovery	\$21	\$21	\$21	\$21
Property taxes	\$113	\$113	\$113	\$113
Land opportunity cost	\$0	\$0	\$0	\$0
Office supplies, phone, etc.	\$231	\$231	\$231	\$231
Insurance	\$19	\$19	\$19	\$19
Management	\$119	\$185	\$159	\$206
<b>Total fixed costs</b>	<b>\$1,381</b>	<b>\$1,447</b>	<b>\$1,421</b>	<b>\$1,468</b>
<b>Total costs</b>	<b>\$4,965</b>	<b>\$5,031</b>	<b>\$4,881</b>	<b>\$5,052</b>
<b>Profit or loss</b>	<b>-\$2,590</b>	<b>-\$1,341</b>	<b>-\$1,694</b>	<b>-\$931</b>
Breakeven price (\$ /ton)	\$993	\$1,006	\$1,220	\$1,010
Breakeven yield (tons)	12.4	7.2	6.5	6.3

\*Discounting practices generally need not to be redone or remains positive salvage value

## Discussion: Projected 20 Year Cash Flows

Chart 2 shows the projected cash flows for 20 years of operations. This includes both variable and fixed costs. In year 20, it is assumed the vineyard and all equipment associated with it are sold off. The land is estimated to be worth \$1,311,130 after 20 years, and the equipment is estimated to have a salvage value of \$15,068. If the vineyard is sold at the end of 20 years of operations, then cash flows end with a net positive of \$853,743. With current market conditions, the vineyard's revenues do not make up the initial establishment costs even after 20 years of operations.

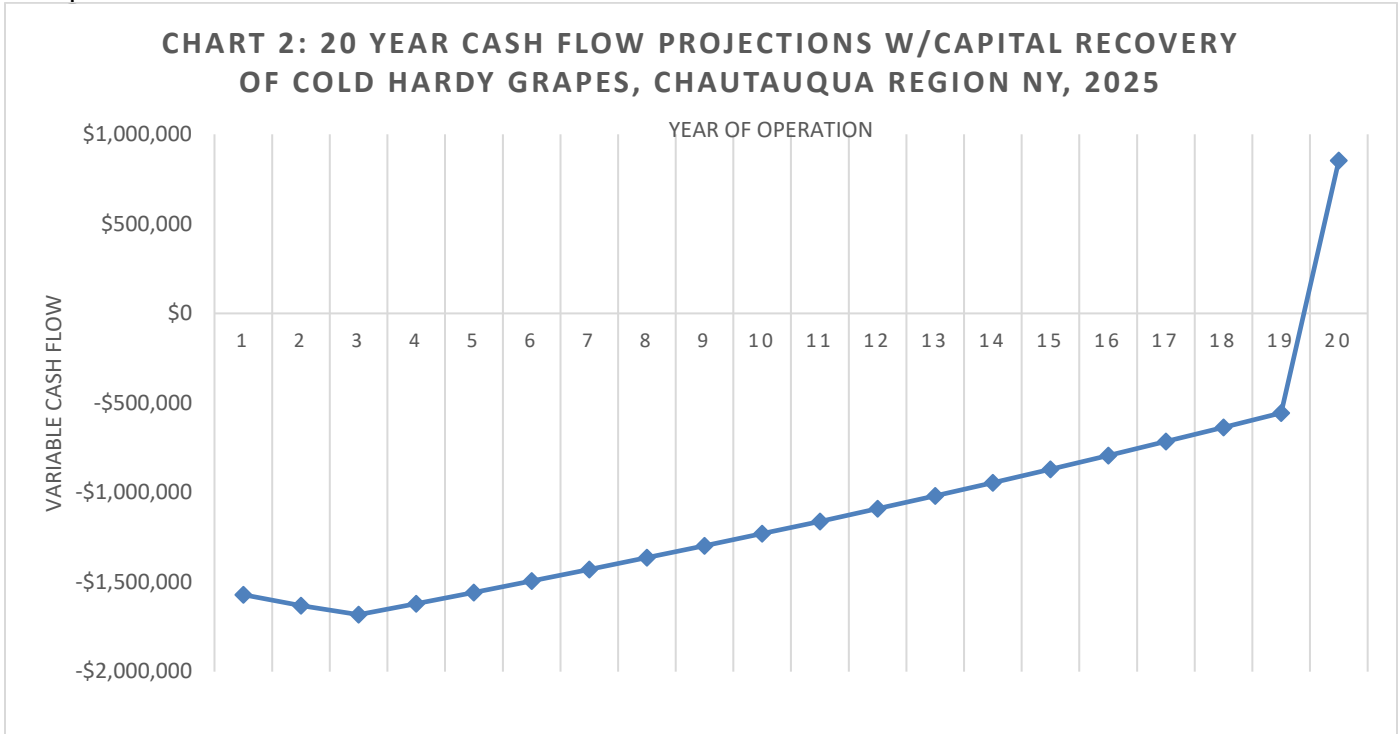
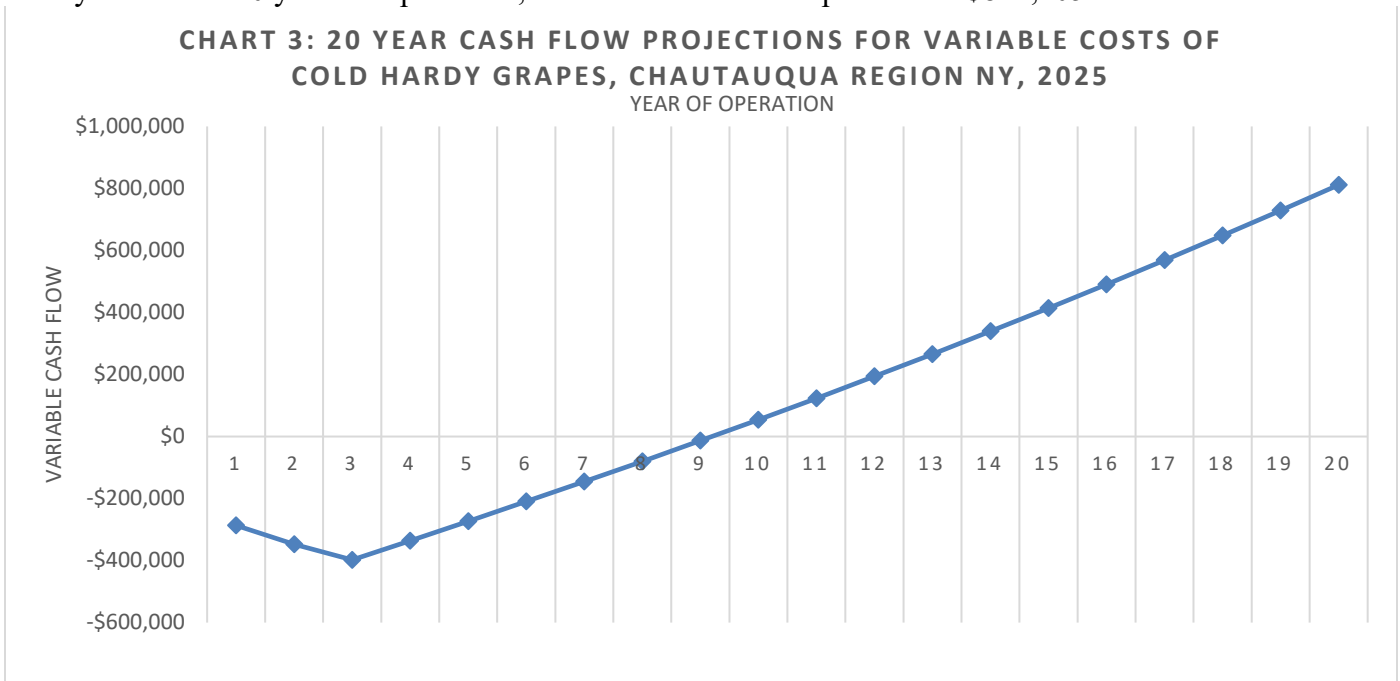


Chart 3 shows the projected cash flows for 20 years of operations regarding variable costs, assuming a 2% inflation rate. By year 12 of operations, the vineyard has recovered the initial variable costs of establishment and becomes cash flow positive regarding variable costs. By the end of 20 years of operations, cash flows show a net positive of \$811,405.



## Concluding Comments

The cost and return estimates presented in this publication reflect cold-hardy grape production in the Chautauqua–Lake Erie region of New York under the assumptions of well-suited sites, recommended production practices, competent management, 2025 input prices, and grape prices that reflect quality-enhancing practices such as leaf pulling and canopy management. These budgets are intended to represent commercially managed vineyards operating under favorable conditions and should not be interpreted as regional averages.

Potential investors should recognize that the economic environment for grape production in the Chautauqua region is subject to change. Markets for many cold-hardy varieties remain relatively thin, and because total planted acreage is still limited, even modest expansions in acreage can result in temporary surplus conditions. When a few growers plant additional acres—or when a single large planting enters production—the resulting increase in supply may depress prices in the short run. Many cold-hardy varieties remain in an early stage of regional adoption, and growers often have only a few years of historical yield and price data. As production practices become more standardized and markets mature, yields, costs, and price stability may evolve.

Labor represents a significant share of total production costs in cold-hardy grape systems. Efficient labor management is therefore critical to maintaining profitability. Strategies such as improving worker productivity, optimizing task timing, and evaluating alternative labor sources can materially influence costs. In smaller vineyard operations, particularly in regions such as the Thousand Islands, owner-managed systems or family labor can reduce labor costs. In some cases, growers have relied on volunteers during harvest, further lowering direct labor expenses. While such arrangements may not be feasible for all operations, labor efficiency remains one of the most important determinants of cost control.

Despite these risks, long-term prospects for cold-hardy grape production in the Chautauqua region may remain favorable. Continued consumer interest in table wines, the expansion of regional tourism, and the growing recognition of Chautauqua wines create potential market opportunities. However, investors must be prepared to withstand cyclical fluctuations associated with agricultural production, including weather variability, disease pressure, and shifts in consumer demand. Additional uncertainty arises from ongoing varietal development; newer cold-hardy cultivars may alter competitive dynamics in the coming decades. Climate variability and long-term climate change may also influence varietal suitability and production risk.

Appreciation is extended to the grower panel and industry specialists who contributed expertise, cost information, and technical review to support the development of these budgets. Their practical knowledge and industry insight remain essential for maintaining the relevance and accuracy of cost-of-production estimates for the Lake Chautauqua.

Special recognition is given to Mark Pisoni (M.S., Department of Agricultural, Resource, and Managerial Economics, Cornell University, 2001), who developed the Excel program used in earlier Cornell grape cost publications. His work under a New York State Department of Agriculture and Markets “Grow New York” grant provided the foundation for cost-of-establishment and production analyses used throughout New York’s grape industry.

## Appendix

Table A1: Sample Herbicide Program for Cold Hardy Grapes, Chautauqua County NY, 2025

Year	Reason for Spray	Material	Rate/acre	Price	\$/acre
<b>Year 0</b>					
Site	Custom Herbicide	Glyphosate	4 qt	\$4.00 qt	\$16.00
Preparation		Ammonia Sulfate	1.7 lbs.	\$3.80 lb.	\$6.46
				<b>Total per spray</b>	<b>\$22.46</b>
<hr/>					
<b>Year 1</b>					
	Chem. Weed control - Trellis	Surflan	1.5 qt	\$18.02 qt	\$27.03
				<b>Total per spray</b>	<b>\$ 27.03</b>
	Chem. Weed control-spot	Glyphosate	2 qt	\$4.00 lb.	\$8.00
		Ammonia Sulfate	1.7 lbs.	\$3.80 lb.	\$6.46
				<b>Total per spray</b>	<b>\$41.49</b>
<hr/>					
<b>Year 2 - 3</b>					
	Chem. Weed control - Trellis	Prowl H20	6 qt	\$12.00 qt	\$71.97
				<b>Total per spray</b>	<b>\$71.97</b>
	Spot herbicide treatment	Glyphosate	2 qt	\$4.00 qt	\$8.00
		Ammonia Sulfate	1.7 lbs.	\$3.80 lb	\$6.46
	Spot herbicide treatment	Glyphosate	2 qt	\$4.00 qt	\$8.00
		Ammonia Sulfate	1.7 lbs.	\$ 3.80 lb.	\$6.46
				<b>Total per spray</b>	<b>\$14.46</b>
<hr/>					
<b>Year 4 - 20</b>					
	Chem weed control - trellis	Chateau	12 fl. Oz.	\$0.68 fl. Oz	\$8.11
		Rely 280	24 fl. Oz.	\$0.80 fl. Oz	\$19.12
				<b>Total per spray</b>	<b>\$27.23</b>
	Spot herbicide treatment	Glyphosate	2 qt.	\$4.00 qt	\$8.00
		Ammonia Sulfate	1.7 lbs.	\$3.80 lb	\$6.46
				<b>Total per spray</b>	<b>\$41.69</b>

Table A2: Sample Fertilizer/Soil Program for Cold Hardy Grapes, Chautauqua NY, 2025

Year	Material	Rate/acre	Price/Unit	\$/acre
<b>Year 0</b> <b>Site</b> <b>Preparation</b>	Soil sampling 1 test/5 acres, 2 depths	0.4 acre	\$ 10.00 test	\$ 4.00
	Lime	2 tons	\$ 50.00 ton	\$ 100.00
	Fall fertilization (Muriate of potash)	300 lbs	\$ 550.00 ton	\$ 82.50
<b>Total cost - year 0</b>				<b>\$ 186.50</b>
<b>Year 1</b>	Fertilization 10:10:10	30 lbs	\$0.32 lb	\$9.74
	Mulch (if irrigation not installed - optional)	20 bales	\$ 15.00 bale	\$ 300.00
<b>Total cost - year 1</b>				<b>\$309.74</b>
<b>Year 2</b>	Spring fertilization (10:10:10)	30 lbs	\$0.32 lb	\$9.74
<b>Total cost - year 2</b>				<b>\$9.74</b>
<b>Year 3+</b>	Soil application Solubor	2.5 lbs	\$2.64 lb	\$6.60
	Muriate of potash (every 3rd year)	300 lbs	\$ 550.00 ton	\$ 27.50
	Lime (1 in 5 years)	1 ton	\$ 50.00 ton	\$ 10.00
	Petiole sampling	0.16 acre	\$ 24.00 test	\$ 3.84
	Soil sampling (every 5th year)	0.2 acre	\$ 10.00 test	\$ 2.00
<b>Total cost - year 3+</b>				<b>\$ 49.94</b>



Table A4: Hourly Machinery and Equipment Variable Costs, Cold Hardy Grapes, Chautauqua Region NY, 2025

Item	Purchase Price	Hours of life	Total Repairs	Repairs	Fuel	Lube (15% of fuel)	Total Hourly Variable Costs
Tractor, 62-HP, 2WD, spray cab	\$ 72,500	7000	100%	\$10.36	\$8.12	\$1.22	\$19.70
Tractor, 45-HP	\$ 34,400	7000	100%	\$4.91	\$8.12	\$1.22	\$14.25
Air-blast sprayer- 400 gallon	\$ 33,464	2000	60%	\$10.04			\$10.04
Herbicide sprayer- 50 gallon	\$ 4,900	2000	60%	\$1.47			\$1.47
Enviro-nmist sprayer	\$ 28,363	2000	60%	\$8.51			\$8.51
Mower (6ft)	\$ 5,900	2500	80%	\$1.89			\$1.89
Brush Chopper	\$ 4,000	2500	80%	\$1.28			\$1.28
Fertilizer Spreader	\$ 2,345	1200	80%	\$1.56			\$1.56
Small disc (used)	\$ 10,599	2000	60%	\$3.18			\$3.18
Grape hoe	\$ 8,607	2000	60%	\$2.58			\$2.58
Post driver	\$ 5,400	2000	80%	\$2.16			\$2.16
Trailer	\$ 4,500	3000	80%	\$1.20			\$1.20
Pickup truck (used)	\$ 25,000	2500	83%	\$8.30	\$7.00	\$1.05	\$16.35
Auger	\$ 2,800	2000	80%	\$1.12			\$1.12
Mechanical hedger (used)	\$ 17,943	2000	80%	\$7.18			\$7.18
Mechanical leaf remover	\$ 26,433	2000	80%	\$10.57			\$10.57
ATV	\$ 12,000	1200	80%	\$8.00			\$8.00
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<b>Tractor Fuel Factors</b>	<b>Factor</b>						
Diesel	0.0438						
Gasoline	0.0600						

**OTHER A.E.M. EXTENSION BULLETINS**

<b>EB No</b>	<b>Title</b>	<b>Fee (if applicable)</b>	<b>Author(s)</b>
2026-10	Cost of Establishment and Production of Cold Hardy Grapes in the Chautauqua Region of New York - 2025		Pinto, A. F., Gomez, M. I., Moss, R., Bekelja, K. M., and Walter-Peterson, W.
2026-09	2025 New York Berry Price Information		Park, K.
2026-08	2025 Farm Product Price Reports: Farmers Markets & Grocery Stores in NY		Santilana, S., Rigotta, L., and LeRoux, M.
2026-07	Trends in Local and Regional Food Systems in New York State		Jablonski, B.B.R., and Bauman, A.
2026-06	The Cost of Raising Grass-Fed Beef in the Northeast United States		Waro, M., Gomez, M.I., and Park, K.
2026-05	2024 Farm Product Price Reports Farmers Markets & Grocery Stores in NY		Santillana, S., Naugler, A., Rigotti, L., and LeRoux M.
2026-04	Cost of Establishment and Production of V. Vinifera Grapes in the Finger Lakes Region of New York - 2025		Pinto, A.F., Gomez, M.I., Moss, R., and Walter-Peterson, H.
2026-03	Dairy Farm Home-Grown Grain Production: Characteristics and Trends in Financial Performance		Koval, H.L., and Karszes, J.
2026-02	Factors Influencing Grape Growers' Adoption of Clean Plant Materials		Li, J., Gomez, M.I., and Fuchs, M
2026-01	Six Year Trend Analysis 2024, New York State Dairy Farms		Karszes, J. and Koval, H.L.
2025-10	How-To Financial Feasibility Tool: Agrivoltaics Solar-Shep Cooperative		Santillana, S., Schmit, T., Tommell, N., Li, Y., and Severson, R.M.
2025-09	NY_VT Land Value Trends Report		Zhang, W, Guay, R, Stone, R, Sweeney, S, McDowell, K, Herrington, P, Lagerquist, J, Loomis, C, and Guyer, N

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