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THE ECONOMICS OF GROWING GRAPES ORGANICALLY

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INTRODUCTION

For the past five growing seasons (1990 - 1994), we have tracked the economic results of three grape varieties (Concord, Elvira, and Seyval Blanc) grown under two different management regimes (conventional and organic) at Taylor Wine Company's Dresden, New York vineyards. The purpose of this paper is to give growers and other interested industry personnel a guide to determine the economic impacts of growing grapes organically compared to a conventional management system. Growing costs, yields, and prices of grapes and inputs were recorded carefully over the life of the project, in cooperation with researchers from the Geneva Experiment Station and the management of Taylor Vineyards.

This paper has two objectives:

(1) To summarize and compare the five year costs and other economic results of growing grapes using conventional management practices compared with organic management practices; and

(2) To suggest the operations, inputs, and resulting costs and returns for growing Concord, Elvira and Seyval grapes using organic management practices in a typical season.

METHODS

The impact of converting vineyards to organic management practices was assessed for each variety by comparing vineyard block revenues and costs for both organic and conventional management practices. In cooperation with management at Canandaigua Wine Company, Inc., procedures were established at the beginning of the project to collect data on labor time and cost, equipment time and cost, and materials cost for each of the six vineyard blocks. Throughout the season, the numbers of sprays were recorded for each block by the research team at the Geneva Experiment Station. Vintner's International, Inc. (now part of Canandaigua Wine Company) management team recorded all other data regarding growing and harvesting costs. In order to generalize the analysis, and to avoid disclosure of proprietary data, wage rates typical for the Finger Lakes Region were used to compute labor costs. Wage rates used in the analysis were $8.64 for skilled labor and $5.40 for unskilled and hand labor. Wage rates were unchanged from 1993 based on wage rate data from New York Agricultural Statistics, 1993-1994. Harvesting and hauling costs of $50 per ton (typical for custom rates in the Finger Lakes Region) were charged.

Commercial (machine harvest) yields as measured by the research team at the Geneva Experiment Station were utilized. Prices by variety as reported by the New York Agricultural Statistics Service were used to estimate receipts.

Interest on operating capital was charged based on the local Production Credit Association's (PCA's) rate for medium-sized commercial farms in 1994, or 9.25 percent annually. It was assumed that operating capital was borrowed for six months.

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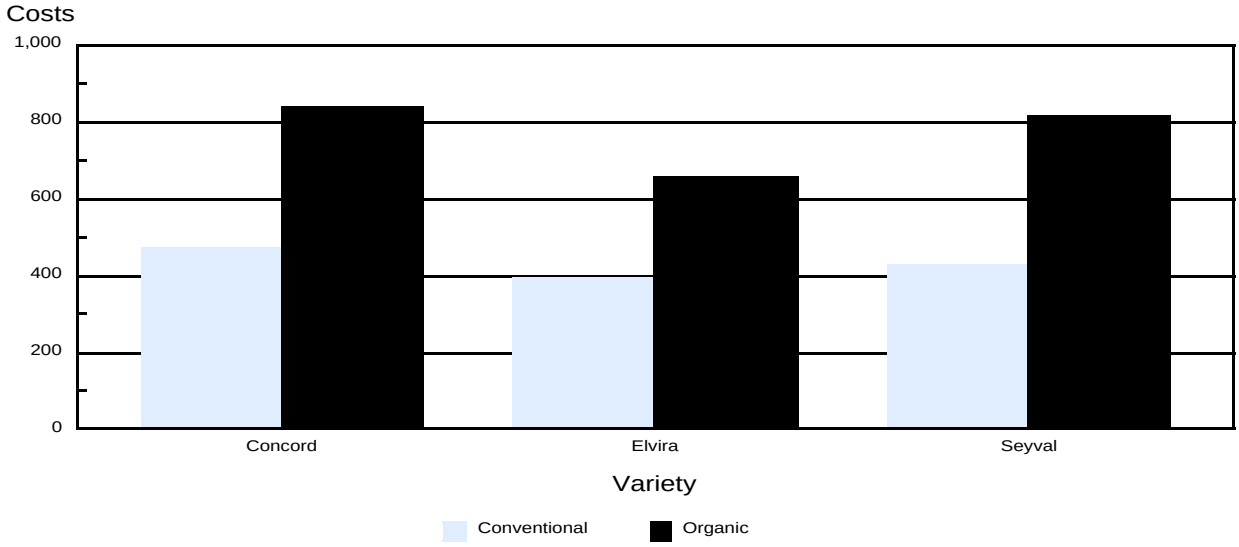
Figure 1. Annual Average Growing Costs Per Acre
Conventional and Organic Management Practices,
Three Varieties, 1990 - 1994



Fixed costs generally do not change between varieties and management systems; however, returns to management were computed to present a view of overall profitability. According to management, most equipment was more than 20 years old; therefore, depreciation was not included as a cost. Machinery repairs were relatively high, offsetting to a certain degree the exclusion of depreciation as a cost. Using similar logic, vineyard depreciation was not included in costs. These capital assets were assessed an opportunity cost of 9.0 percent, the PCA local association's rate for longer-term capital for medium-sized commercial loans in 1994. Interest charges were computed on the market value of all assets. Procedures were followed in estimating returns to management by the use of spreadsheet templates developed in White and Kamas.

Certain overhead items, such as property taxes, insurance, and utilities were assessed based on the most recent Grape Farm Business Summaries (Putnam, White, and Himelrick; Whitaker, White, and Zabadal). The costs from 1993 were updated by the index of prices paid by farmers (Agricultural Prices).

In order to provide information which will be useful to growers in assessing the feasibility of growing grapes organically, we developed growing costs and expected receipts and expenses for a typical growing season. For reasons to be explained later in the paper, we chose 1991 as a typical growing season.

For this section of the analysis, yields were specified at the average of the five seasons. Grape prices were also averaged by variety for the five years using data from the New York Agricultural Statistics Service. No difference in price was assumed for conventionally grown grapes compared to organically grown grapes. Prices of inputs, services, and fixed costs were taken from the final results of the most recent season, 1994.

SUMMARY AND COMPARISON OF RESULTS, 1990-1994

Growing costs were averaged for the five seasons. Results in terms of growing costs per acre are shown in Figure 1. Figure 1 shows clearly that the growing costs were higher for the organic management system. In fact, this was true for all varieties in all seasons, i. e. for 15 comparisons. On average, the growing costs for the

organic system were 79 per cent higher for the Concord variety, 69 per cent higher for the Elvira variety and 91 per cent higher for the Seyval variety.

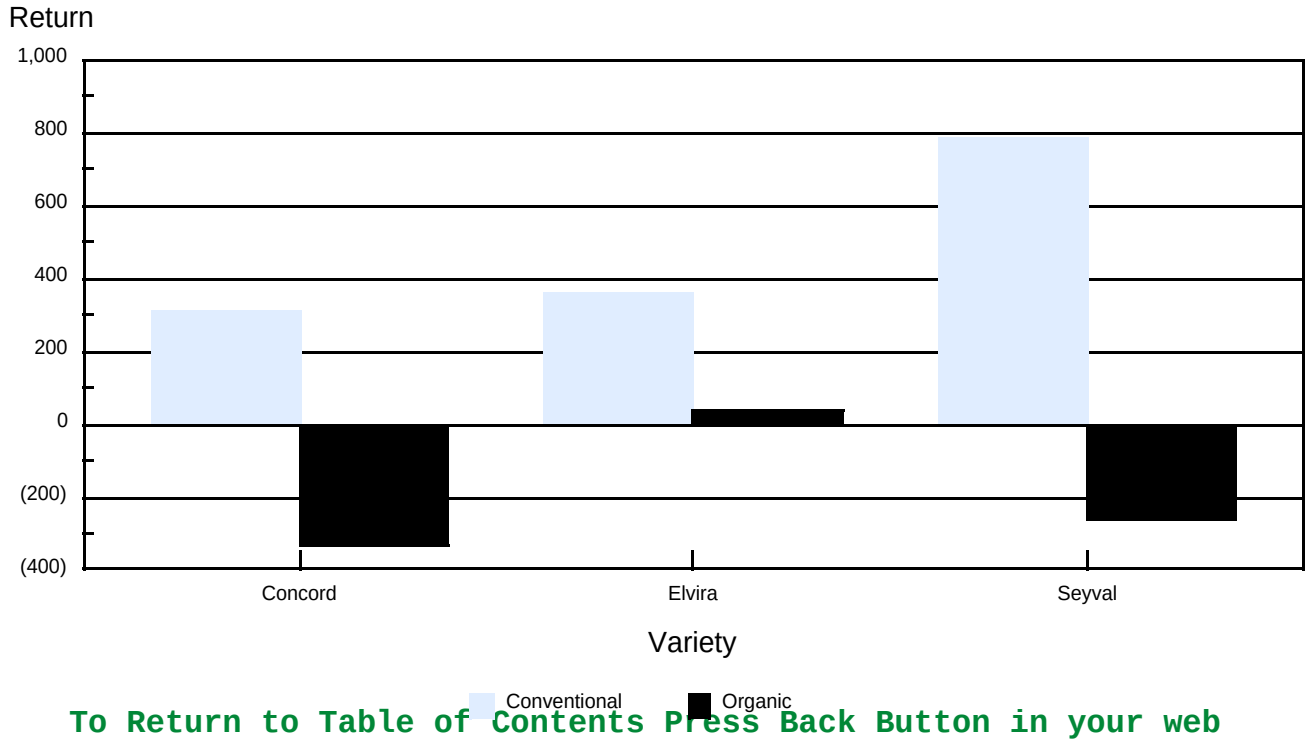
Operations which were expensive in the organic system included fertilization, to include the expensive chicken manure at $228 per ton, but also the extra cost for labor and machinery for handling the bulky material; tillage operations which replaced herbicides in the conventional system; and hand hoeing which was occasionally necessary to supplement weed control in the organic system.

The organic system had a clear advantage in the cost of the spraying operations. In a wet season (1992), however, when disease pressure was exceptionally high and the organic Seyval block required 17 spray applications, the cost of spraying was higher for the organic management system for the Seyval variety because of higher labor and machinery costs for the additional spray applications required.

Average annual returns to management was the measure of profitability employed in this study to summarize five-year results. Figure 2 indicates that the conventional management system was more profitable than the organic system for all varieties. The difference was greater than the difference in growing costs alone because average yield for the five-year period was greater for the conventional management system for all three varieties. Average yields for the conventional system were 28 percent higher for the Concord variety, five percent higher for Elvira, and 55 percent higher for Seyval compared to the organic management system.

In the short to intermediate term, growers can operate as long as cash costs are covered by cash operating receipts. The organic management system met this criterion for all three varieties on average. For the Elvira variety, fixed as well as variable costs were covered by average cash receipts, giving a positive return to management of $35 per acre for organic management prac-

Figure 2. Average Annual Returns to Management Per Acre, Conventional & Organic Management Practices, Three Varieties 1990 - 1994



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tices. This indicates long-run profitability, implying that with the Elvira variety, long term survival is feasible using organic management practices given the yields, costs, and prices realized at Taylor's Dresden vineyard.

It should be realized that all labor, including that of the owner, was charged as a cash cost; therefore owners who furnish all or a part of the labor for their grape enterprises would receive a return for their own labor that is used in the enterprise when receipts exceed other variable cash costs.

ECONOMIC RESULTS FOR A TYPICAL ORGANIC MANAGEMENT PROGRAM

Those growers who are growing, or are contemplating growing grapes organically, will need economic information for planning purposes. The intent of this section of the paper is to suggest the inputs, and operations necessary for organic production in a typical growing season. In some respects, there was not a "typical" season in the five-year period for the organic management system. In 1990, the vineyards were converted to organic management practices, and thus results were not representative of long run results. In addition, we had a problem getting an adequate amount of nutrients on the organic blocks because of difficulties in handling dairy farm manure. The 1991 season was extraordinarily favorable for grape yields and quality. The 1992 growing season was unusually wet, with abnormally high disease pressure. The 1993 season marked the lowest grape yields in the Finger Lakes Region and in the State of New York since 1977. The Concord blocks demonstrated abnormally low yield in 1994 for yet to be determined reasons.

In consultation with Vineyard manager, Bill Dunn, 1991 was chosen as the most typical season in terms of operations to be included in the planning budget. In some instances, practices and operations were modified from the 1991 season where "better" practices have been established as a result of research in subsequent season. For example, the typical organic budget includes a pass with the weed burner for sucker control, which was actually accomplished in 1991 by a hand operation.

Growing costs for a typical season are shown in Table 1 (for the Concord and Elvira varieties) and Table 2 (for the Seyval Blanc variety). Although growing costs have consistently been lower for Elvira (five -year average costs of $658 per acre compared with $839 per acre for Concord), when viewed on an operation by operation basis, no differences could be speci-

Table 1.
Growing Cost Per Acre, Concord and Elvira Grapes, Organic Practices. (CONGCFIN)

Operation	Labor Hours	Equip. Hours	Labor Cost	Equip. Cost	Materials Cost	Total Cost/Acre
Pruning	14.50	1.70	125.28	20.45	0.00	145.73
Brush removal	1.00	0.25	8.64	2.09	0.00	10.73
Chicken manure (1X)	3.00	1.50	25.92	15.00	184.00	224.92
Fertilizer (potash)	1.25	1.25	10.80	10.04	115.20	136.04
Plow (2X)	2.50	2.00	21.60	16.00	0.00	37.60
Takeout (2X)	4.50	2.50	38.88	34.78	0.00	73.66
Hand hoe	13.00	0.00	70.20	0.00	0.00	70.20
Mowing (3X)	1.50	1.50	12.96	16.95	0.00	29.91
Diggers (3X)	2.50	2.50	21.60	26.78	0.00	48.38
Disc (1X)	1.25	1.25	10.80	10.00	0.00	20.80
Suckering (propane)	0.70	0.70	6.05	9.88	13.87	29.79
Vine spray (5X)	2.50	2.50	21.60	23.20	12.87	57.67
Trellis repair (1)	0.60	0.70	5.18	2.59	4.32	12.09
TOTALS	48.80	18.35	379.51	187.75	330.26	897.52

(1) Maintenance performed every fifth year. One fifth of cost is included in annual budget.

Table 2.

Growing Cost Per Acre, Seyval Grapes, Organic Practices. (SEYGCFIN)

Operation	Labor Hours	Equip. Hours	Labor Cost	Equip. Cost	Materials Cost	Total Cost/Acre
Pruning	18.50	1.70	159.84	20.45	0.00	180.29
Brush removal	1.00	0.25	8.64	2.09	0.00	10.73
Chicken manure (1)	3.00	1.50	25.92	15.00	184.00	224.92
Fertilizer (potash) (1X)	0.40	0.40	3.46	3.21	38.40	45.07
Plow (2X)	2.50	2.00	21.60	16.00	0.00	37.60
Takeout (2X)	4.50	2.50	38.88	34.78	0.00	73.66
Hand hoe	13.00	0.00	70.20	0.00	0.00	70.20
Mowing (3X)	1.50	1.50	12.96	16.95	0.00	29.91
Diggers (3X)	2.50	2.50	21.60	26.78	0.00	48.38
Disc (1X)	1.25	1.25	10.80	10.00	0.00	20.80
Suckering (propane)	0.70	0.70	6.05	9.88	13.87	29.79
Vine spray (11X)	5.50	5.50	47.52	51.04	10.25	108.81
Trellis repair (2)	0.60	0.70	5.18	2.59	4.32	12.09
TOTALS	54.95	20.50	432.65	208.76	250.84	892.25

(1) Applied every third year. One-third of cost is included in annual budget.

(2) Maintenance is performed every fifth year. One-fifth of cost is included in annual budget.

fied. Therefore, it was decided to use the same set of practices for both varieties. For the Seyval block, more pruning is expected in a typical year than for the Concord and Elvira varieties. Potash fertilizer would be required for Seyval only once every third year, compared to every year for the Concord and Elvira varieties. Seyval grapes would require more spray applications—an estimated 11 applications per year compared with 5 applications in a typical season for Concord and Elvira. As noted in the tables for growing costs, eight different cultivation operations are required for weed control; operations identified as plowing (2 times), takeout (2 times), diggers (3 times), and disc (1 time). The estimated typical growing costs would be $892 per acre for Seyval and $898 per acre for Concord and Elvira. It should be noted that we believed it was necessary to include a hand hoeing operation which cost $70 per acre to maintain acceptable weed control, even though hand hoeing was seldom done on the organic blocks because the Taylor operation did not have the necessary manpower to accomplish this task whenever it might have seemed beneficial. That this cost was seldom incurred should be kept in mind when interpreting the data on growing costs of the five year experience (e. g. Figure 1). Perhaps hand hoeing would result in a slightly higher yield, but we have no basis for estimation of the incremental yield increase.

Tables 3, 4, and 5 show the complete accounting for projected expenses and receipts for Concord, Elvira, and Seyval, respectively. To compute receipts, five year average yields and prices were used. Projected total variable costs are greater than total receipts for the Concord variety, indicating that a grower would not choose to farm that variety organically even in the short run unless he or she could obtain some combination of higher yields, higher prices, or lower costs. The other two varieties have positive returns over variable costs, but negative returns to management in the amounts of ($238) for Elvira and ($359) for Seyval.

MARKETING AND PRICES

Since it costs more to grow grapes organically, and since not having used inorganic pesticide could be looked upon as a favorable attribute by some consumers, should not the price for organic grapes be higher than for grapes grown conven-

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tionally? In 1990 and 1991 we investigated this issue with a survey of organic growers. Through the sources available at that time, we identified 40 organic vineyards and/or wineries, of which 34 were located in California and four were located in the Finger Lakes region of New York. By initial response and telephone follow-up, 23 usable surveys were obtained. These vineyards had acreages of grapes farmed organically which ranged from one acre to 250 acres.

In order to charge a higher price for organically grown grapes, the wine must be designated as produced with organically grown grapes. Only 11 of the 21 producers who marketed wine indicated that they used an organic label. It was interesting to note that the two largest organic producers (250 and 240 acres, both in California) did not distinguish that the grapes were grown organically. One winery was not yet willing to be bound to organic guidelines, even though they were following them on a large portion of their acreage. The other was concerned that selling both organic and conventionally labeled bottles of the same variety would be potentially confusing to their customers and could hurt sales. Larger wineries may also fear that if organic wines are promoted, consumers will wonder what is “wrong” with their non-organic wines (New York Times).

Fewer wineries responded to the second half of the survey, which asked for the amount of price premium for organic wine. The few vintners who responded indicated that there was no difference in the bottle price of organic wine compared to conventional wine. This may be due to the complexity of the wine market and also because consumers are more concerned with sulfite content than whether or not the wine is organic.

These results suggested that it is unlikely that organic wines bring a price premium. It is possible that consumers’ attitudes have changed since this survey was done in 1990. If there were a price premium for wine, then organically grown grapes could be expected to command a higher price. The breakeven price in Tables 3, 4, and 5 were as follows: Concord, $319 per ton breakeven compared to five-year average price of $230 per ton; Elvira, $235 breakeven price compared to $202 for the five year average; and Seyval, $339 per ton breakeven compared to $269. These breakeven prices suggest the price premium that would be necessary to induce growers to produce organically grown grapes.

SUMMARY AND CONCLUSIONS

Our five years of experience suggest that grapes can be successfully grown using organic management practices, although at a higher cost than is necessary for conventional management systems. Growing costs were from 69 to 91 percent higher, depending upon variety. Yield per acre for the organic system over the five years was 22 percent lower for the Concord variety, five percent lower for the Elvira variety, and 35 percent lower for the Seyval Blanc variety. The incidence of higher costs and lower returns meant that returns to management (a measure of profitability) were significantly lower for the organic management practices for all three varieties. The most favorable economic results were obtained for the organic management practices employed with the Elvira vineyard.

The results point out the importance of herbicides in growing grapes using conventional management practices. Conversely, the results indicate the difficulty of viticulture without herbicides, resulting in a high cost of labor and machinery for the eight machine operations and the hand hoeing that is necessary for weed control in organic grape productions. Negative results are exacerbated by the lower yields obtained from the additional competition from weeds.

Growers who are considering growing grapes organically should carefully consider the potential costs and returns. Receipts and expenses for

Table 3.

Receipts and Expenses, Concord Vineyard, Organic Practices. (CONORGF)

Item	Per Acre
Receipts:	
Yield, tons per acre	5.0
Price, $ per ton	230
Total receipts	$1,150
Costs:	
Variable	
Growing	898
Interest on operating capital (9.25 % for 6 months)	42
Harvesting & hauling (@ $50 per ton)	250
Total variable costs	$1,190
Fixed	
Interest on machinery & equipment (9.0 % X market value (1)	45
Interest on buildings (9.0 % X market value) (1)	10
Interest on vineyard ($2500 X 9.0 %)	225
Property taxes (2)	70
Insurance (1), (3)	35
Utilities (3)	22
Total fixed costs	$408
Total costs	$1,597
Returns to management	($447)
Breakeven price	$319
Breakeven yield (tons/acre)	7.5

(1) White and Kamas. Value of buildings and equipment assessed at 50 percent of new cost per acre of vineyard.

(2) Value from 1993 adjusted by 5 % according to index of prices paid for taxes, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

(3) Value from 1993 adjusted by 0.0 % according to index of prices paid for farm services and rent, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

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Table 4.

Receipts and Expenses, Elvira Vineyard, Organic Practices. (ELVORGF)

Item	Per Acre
Receipts:	
Yield, tons per acre	7.3
Price, $ per ton	202
Total receipts	$1,475
Costs:	
Variable	
Growing	898
Interest on operating capital (9.25 % for 6 months)	42
Harvesting & hauling (@ $50 per ton)	365
Total variable costs	$1,305
Fixed	
Interest on machinery & equipment (9.0 % X market value) (1)	45
Interest on buildings (9.0 X market value) (1)	10
Interest on vineyard ($2500 X 9.0 %)	225
Property taxes (2)	70
Insurance (1), (3)	35
Utilities (3)	22
Total fixed costs	$408
Total costs	$1,712
Returns to management	($238)
Breakeven price	$235
Breakeven yield (tons/acre)	8.9

(1) White and Kamas. Value of buildings and equipment assessed at 50 percent of new cost per acre of vineyard.

(2) Value from 1993 adjusted by 5.0 % according to index of prices paid for taxes, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

(3) Value from 1993 adjusted by 0.0 % according to index of prices paid for farm services and rent, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

Table 5.

Receipts and Expenses, Seyval Blanc Vineyard, Organic Practices. (SEYORGF)

Item	Per Acre
Receipts:	
Yield, tons per acre	5.1
Price, $ per ton	269
Total receipts	$1,372
Costs:	
Variable	
Growing	892
Interest on operating capital (9.25 % for 6 months)	41
Harvesting & hauling (@ $50 per ton)	255
Total variable costs	$1,188
Fixed	
Interest on machinery & equipment (9.0 % X market value) (1)	45
Interest on buildings (9.0 X market value) (1)	10
Interest on vineyard ($4000 X 9.0 %)	360
Property taxes (2)	70
Insurance (1), (3)	35
Utilities (3)	22
Total fixed costs	$543
Total costs	$1,731
Returns to management	($359)
Breakeven price	$339
Breakeven yield (tons/acre)	6.7

(1) White and Kamas. Value of buildings and equipment assessed at 50 percent of new cost per acre of vineyard.

(2) Value from 1993 adjusted by 5.0 % according to index of prices paid for taxes, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

(3) Value from 1993 adjusted by 0.0 according to the index of prices paid for farm services and rent, AGRICULTURAL PRICES, NASS, USDA, July 29, 1994.

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a typical growing season were presented to aid interested growers in planning organic production.

A key to economic success with organic production will be whether or not a premium can be realized for organic wine. Our survey of five years ago suggested that a price premium was not being realized at that time. However, some vintners in selected markets may be able to sell for a premium over conventional wine. Vintners who are selling wine direct to consumers where the market area is characterized by a relatively high proportion of higher educated and higher income consumers would have the best opportunity to realize a price premium for organic wine.

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