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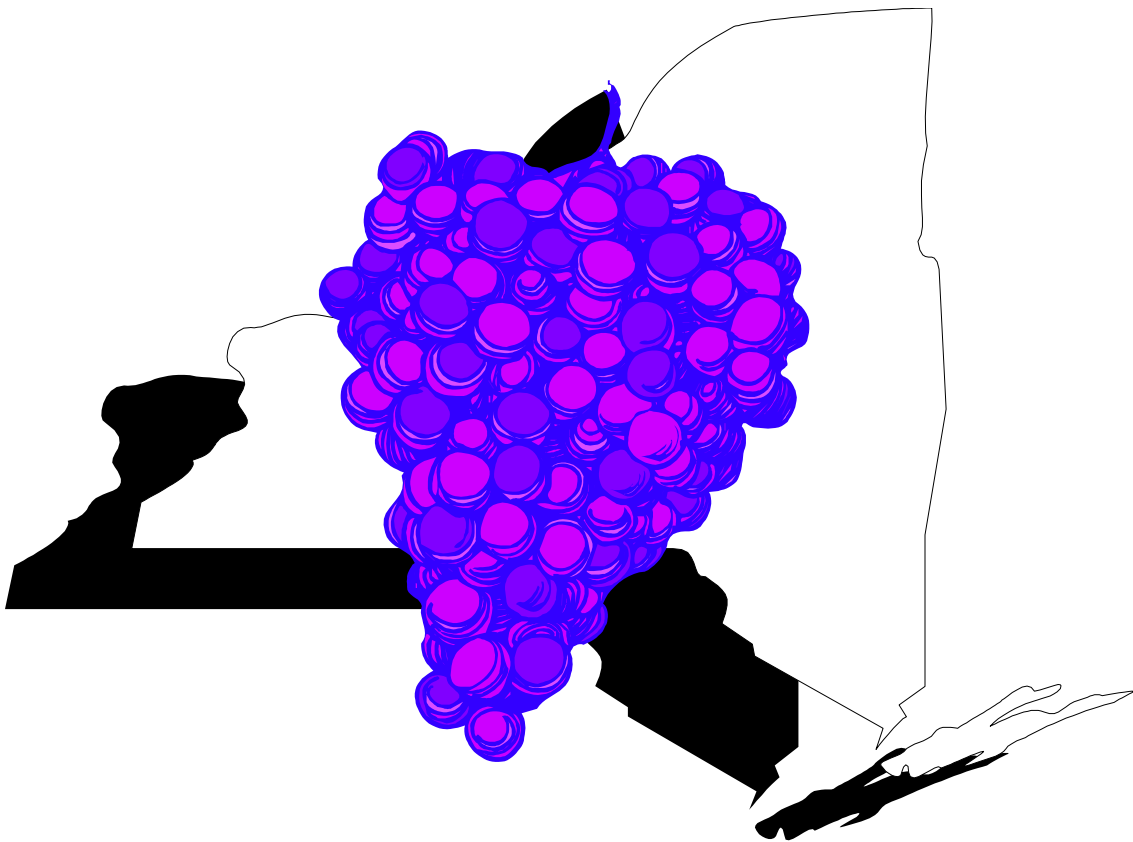
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# **LAKE ERIE GRAPE FARM COST SURVEY 1996-2000**



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## **ABSTRACT**

This report is a summary of five years of grape costs and returns data collected from Lake Erie Region grape growers for the 1996 – 2000 seasons. “Concord” and “Niagara” grapes utilized for juice and generic wine accounted for over 90 percent of the survey acreage. About two-thirds of the acreage surveyed was in New York and one-third from Pennsylvania. In recent years, about 40 growers participated, with total vineyard acreage of just over 4,000.

Average costs per acre were \$1,559 including an imputed value for the operator’s labor. Major cost categories were paid labor (\$341 per acre), depreciation (\$200), interest (\$126), operator labor (\$125) and chemicals (\$105). Average yield per farm was 6.4 tons per acre (with a range of 3.6 to 9.8 tons per acre).

Many Lake Erie Grape Belt growers were able to improve their operations during these five years of relatively high prices, especially in 1999 when favorable prices were coupled with high yields. Wise improvements made during this time should help these participants face looming challenges as prices soften.

## **ACKNOWLEDGMENTS**

The authors are Barry E. Shaffer, Area Grape Business Management Extension Educator and Gerald B. White, Professor, Department of Applied Economics and Management, Cornell University. Our appreciation is expressed to each grower who participated in the survey.

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# **LAKE ERIE GRAPE FARM COST SURVEY, 1996-2000**

## **INTRODUCTION**

The grape industry located along the eastern shore of Lake Erie has a long history. Competitive pressure and changing consumer preferences pose significant challenges for the future of the industry. Growers have responded with increased mechanization and other cost cutting measures.

The Lake Erie Grape Farm Cost Study (LEGFCS) was started in 1993 to:

1. Track costs and profitability for commercial grape producers as a group;
2. Establish benchmark data for comparisons between farms; and to
3. Identify production factors associated with varying levels of profitability.

Concord and Niagara grapes utilized for juice remain the base of the New York industry and is concentrated in the Lake Erie Grape Belt. Over 90% of surveyed acreage is in these two varieties. Grapes are being grown primarily on three different trellis systems, Umbrella Kniffen (UK), Hudson River Umbrella (HRU), and Geneva Double Curtain (GDC).

## **METHODS**

In the summer of 1993, the authors met with a panel of two lenders, one Cooperative Extension Agent, and one agribusiness representative to design a data collection form. It was decided to use tax information from growers' Schedule F's since all growers would have that information. Normally growers use cash accounting instead of accrual accounting for tax purposes. An analysis of accrual financial statements could give a better picture of each farm. The panel decided that increasing the number of farms sampled was more important than more detailed analyses of fewer farms. Over time, cash accounting of expenses and receipts can give an accurate measure of economic performance.

Other information collected included trellis system percentages, bearing acreage, tonnage produced, grape receipts, other farm operating receipts, paid and unpaid farm labor, and form of business organization.

The panel decided to get survey participants with a minimum of 80 percent of crop receipts from grapes. Many of the growers in the study get 100 percent of their crop receipts from grapes! Most growers in the Grape Belt are now specialized. Farm size ranged from 10 acres to over 400 acres. Yearly averages are weighted by acreage for computing average costs and returns. Some of the five-year averages are simple averages, adding the five individual yearly averages and dividing by five.

Acreage in the survey is roughly two thirds in New York and one third in Pennsylvania. The number of growers tends to be around 75% in NY and 25% in PA. Participating farms are located in Cattaraugus, Chautauqua, Erie, and Niagara Counties in New York State. All of the Pennsylvania participants are located in Erie County, PA.

The results are tabulated by tax year (usually calendar year). Multiple year averages are done for individual farms that participate for more than one year. It would be desirable to collect balance sheet data to present a more complete analysis of financial performance; however, time and data availability have precluded the collection of assets and liabilities information.

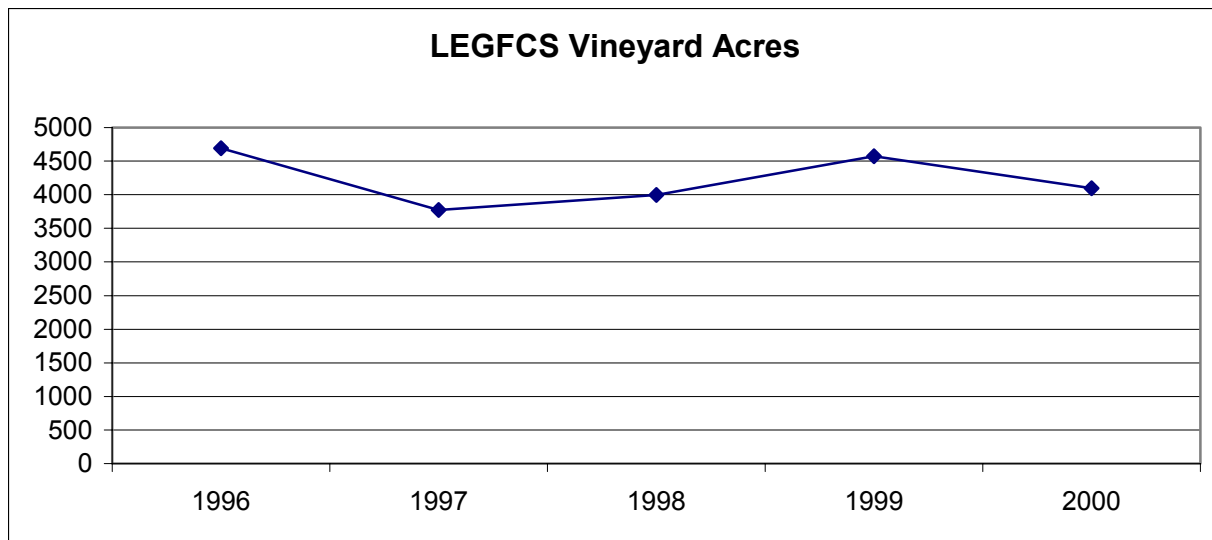
Since Schedule F does not normally result in the growers' or other unpaid family labor being counted as an expense, we valued this unpaid family labor at \$1,400 per month (about \$6.75 per hour) for 1996 through 1998. For the years of 1999 and 2000, we valued this unpaid family labor at \$1,600 per month (about \$7.70 per hour). Adding the calculated value of unpaid family labor to overall costs, we then subtract that total from farm income to give total profit.

## RESULTS

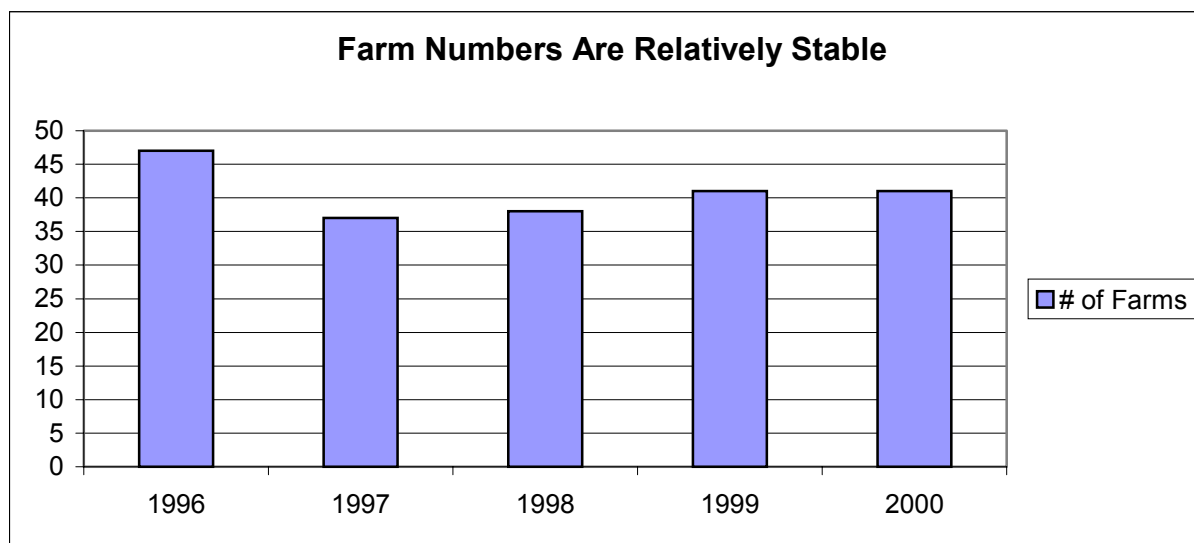
### 1996

Growers were blessed with above average yields. The group averaged over 7.5 tons per acre! The average farm yields ranged from 4.3 up to 11.7 tons per acre. 47 farms with 4693 vineyard acres participated. Both the number of farms and acreage were high water marks for the LEGFCS:

**Chart 1.**



**Chart 2.**



Schedule F costs per acre rose to \$1,280 up from 1995's record low of \$1,138. Cash flow (Schedule F profit plus depreciation) per acre rose from \$196 to \$422. Schedule F profit per acre rebounded from \$51 to \$240. Total (with unpaid family labor accounted for) profit per acre jumped from a loss of \$88 to \$88 in the black. Most of the improvement was due to the high yields, not to higher prices.

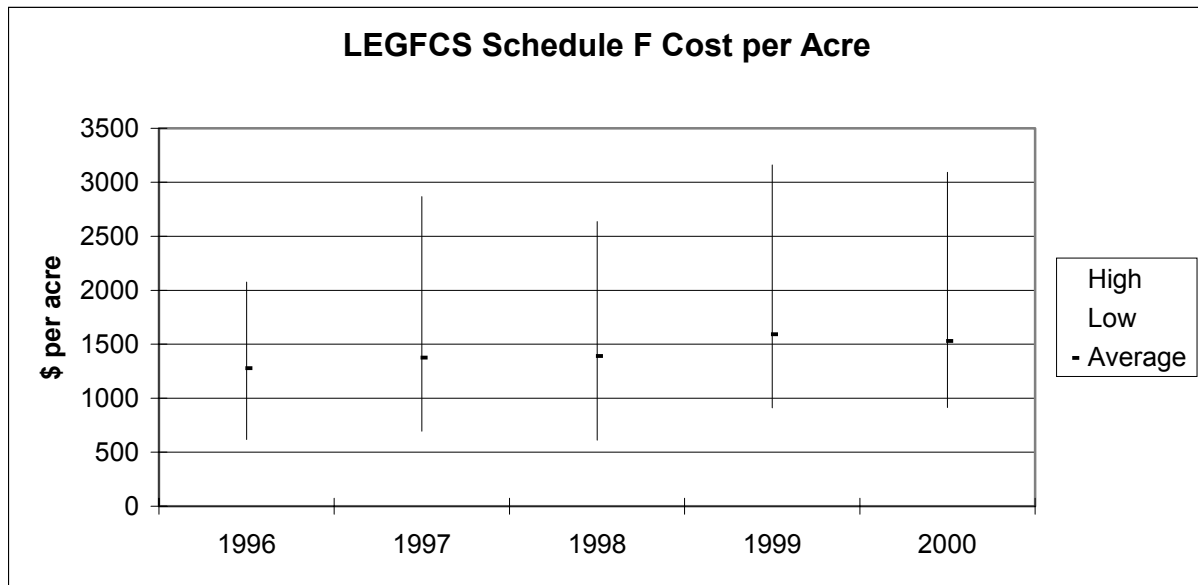
### 1997

Lake Erie Grape Belt vineyards experienced a very late spring. Industry observers were concerned that many vineyards would not ripen to acceptable levels. Very good weather in September and October helped greatly to ripen the crop averting a potentially disastrous harvest.

Demand and prices went up by harvest due to the release in March 1997 of favorable medical research into the health benefits of purple grape juice (Concord-based). Overnight, demand boomed and inventories went from more than optimum to a shortage.

Yields declined to 5.2 tons per acre across the 37 farms and 3,772 vineyard acres surveyed. Average Schedule F cost per acre climbed nearly \$100 to \$1,376 and total cost per acre spiraled up \$72 to \$1,503:

**Chart 3.**

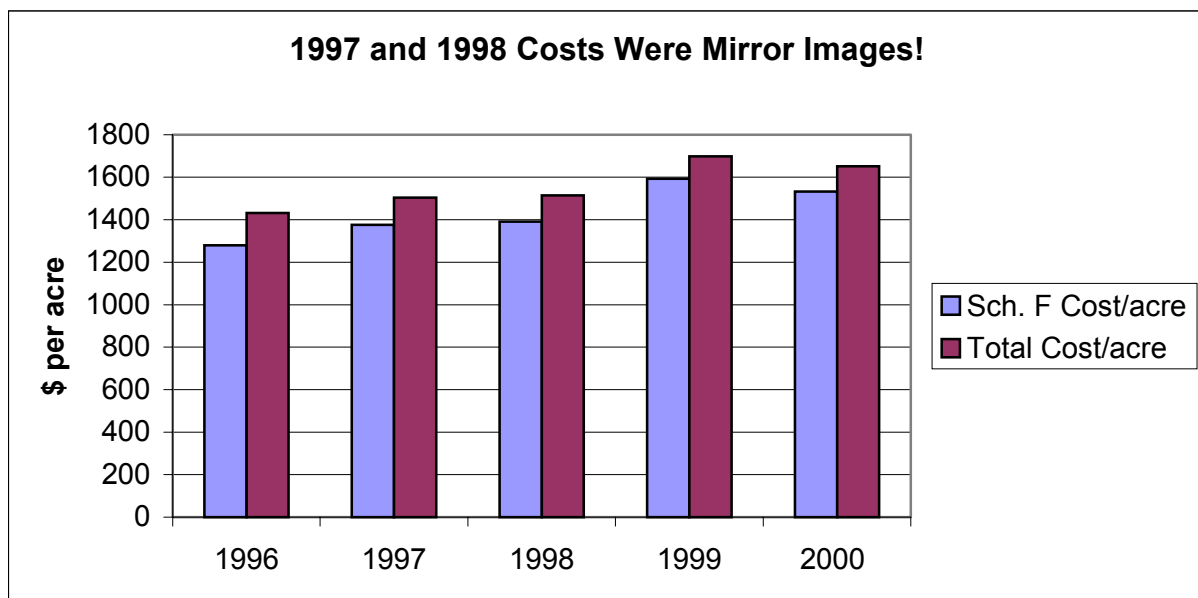


Even with costs per acre rising and yields down, cash flow and profits rose. For instance, average cash flow per acre increased from \$70 to \$482.

1998

Overall 1998 results resembled 1997's. Spring frost damage mainly hurt yields on usually good sites. The damage may have been more severe because the good sites with gravel soils were probably further along developmentally when the damaging weather occurred. Cash market prices peaked. Cost per acre was stable:

**Chart 4.**

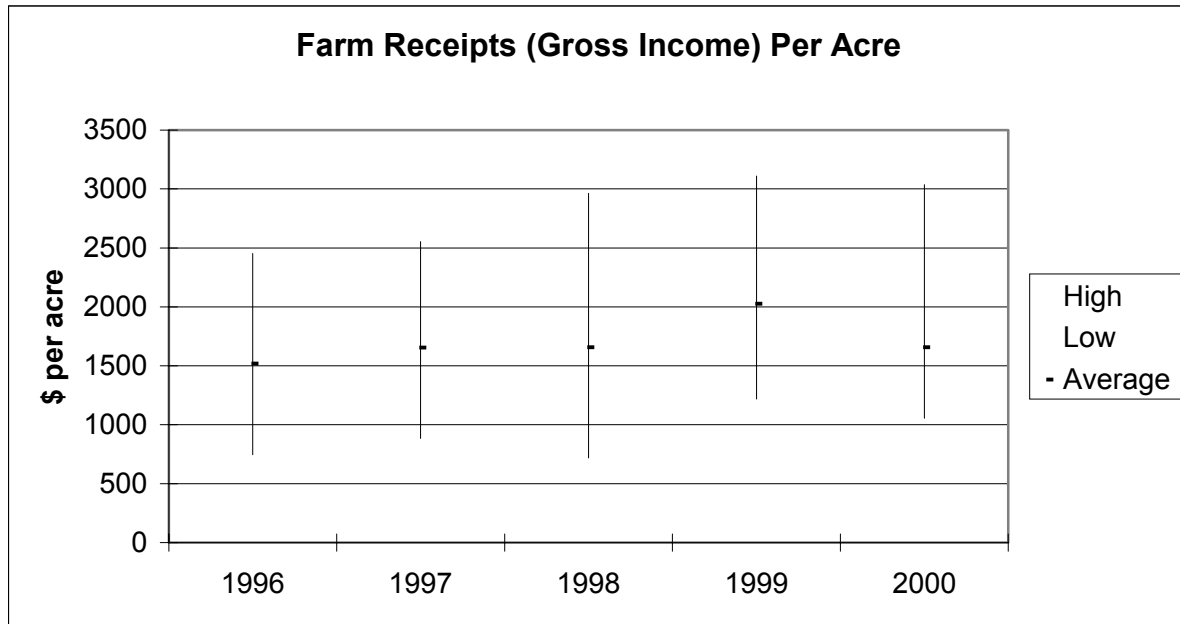


Schedule F cost per ton increased \$27 to \$296. Total cost per ton inched up \$28 to \$322.

1999

This is a year growers remember fondly. Cash market prices were still on the high side coupled with a large crop with good sugar levels. The weather cooperated with above average temperatures although there was some drought stress. Harvest was largely uneventful. Average farm receipts per acre broke the \$2,000 barrier for the first time:

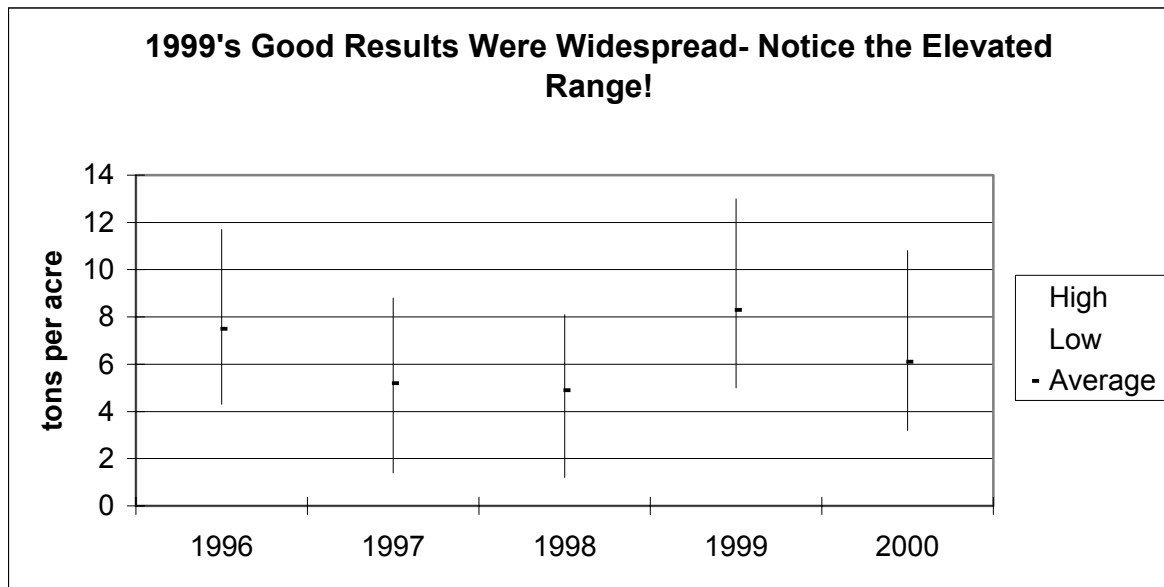
**Chart 5.**



The farms with low farm receipts had below average yields and different market outlets only played a minor effect. Farm receipts under \$1,000 per acre is a recipe for financial losses. Average farm receipts per acre ranged from a low of \$1519 in 1996 to a high of \$2026 in 1999. The other three years averaged \$1657 with very little variation among those years.

Growers achieved these results with outstanding crops across the board:

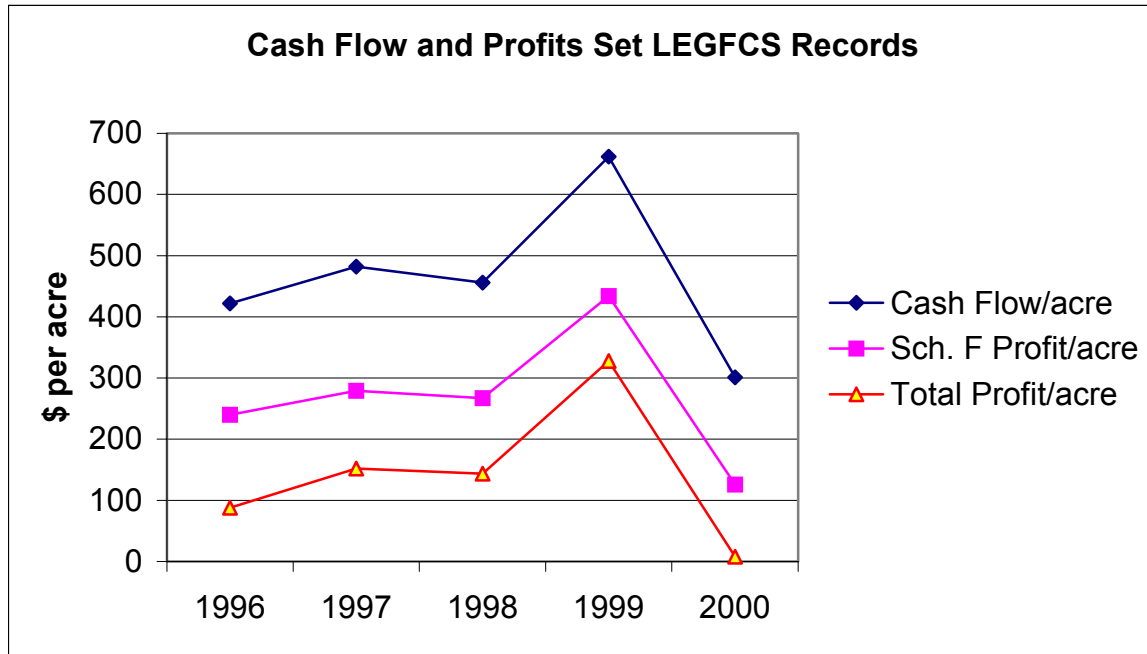
Chart 6.



In both 1997 and 1998 we had a number of farms that had average yields of less than 4 tons per acre. In 1997, the low yielding farms were mainly due to over cropping in previous years, poor sites, and localized drought stress. In 1998 we had 12 out of 38 farms (over 30%) that averaged less than 4 tons per acre. Spring frost damage was the leading cause with more damage done to farms east of Fredonia. Higher juice grape prices helped keep profitability up in both 1997 and 1998 and crop insurance proceeds for some growers helped as well. In 1998, many growers were averaging around \$300 a ton or better due to high cash market price and good sugar levels boosting returns. Results in the 1999 LEGFCS were excellent because everybody had a good production year!

Cash flow and profits set LEGFCS records, edging out 1991 results:

Chart 7.

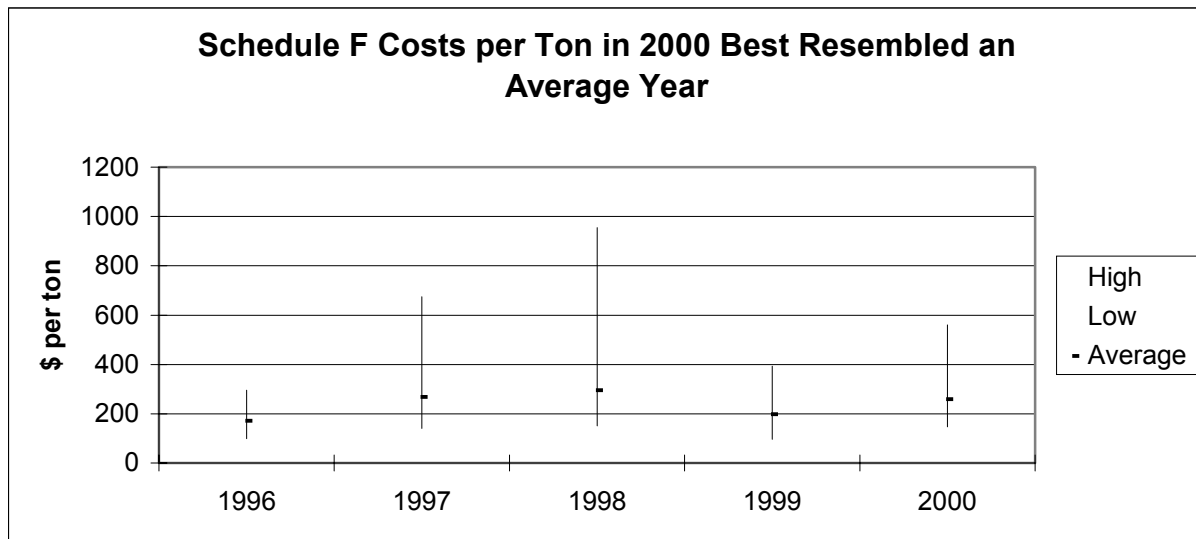


Results in 1999 helped strengthen most grape growers' balance sheets. Some growers have described 1999 as a once in a decade (or longer) year!

2000

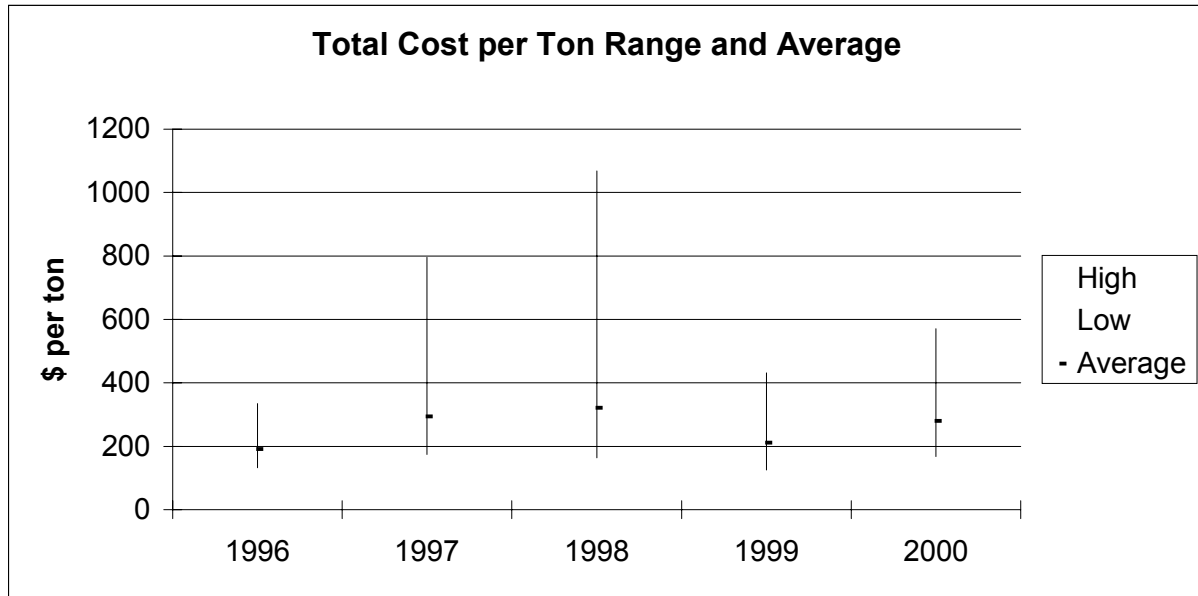
Yields eased back to 6.1 tons per acre. Average Schedule F cost per ton jumped up \$60 to \$259:

Chart 8.



Average total cost per ton moved up \$68 to \$280 following 1999's outstanding results. We had some very high cost per ton farms in 1997 and 1998. The farms on the high end had low to moderate yields in common. We had two high cost per acre farms that were among the highest in total cost per ton with yields near 5 tons per acre. In other situations, farms had yields under 3 tons per acre, causing a soaring cost per ton.

Chart 9.

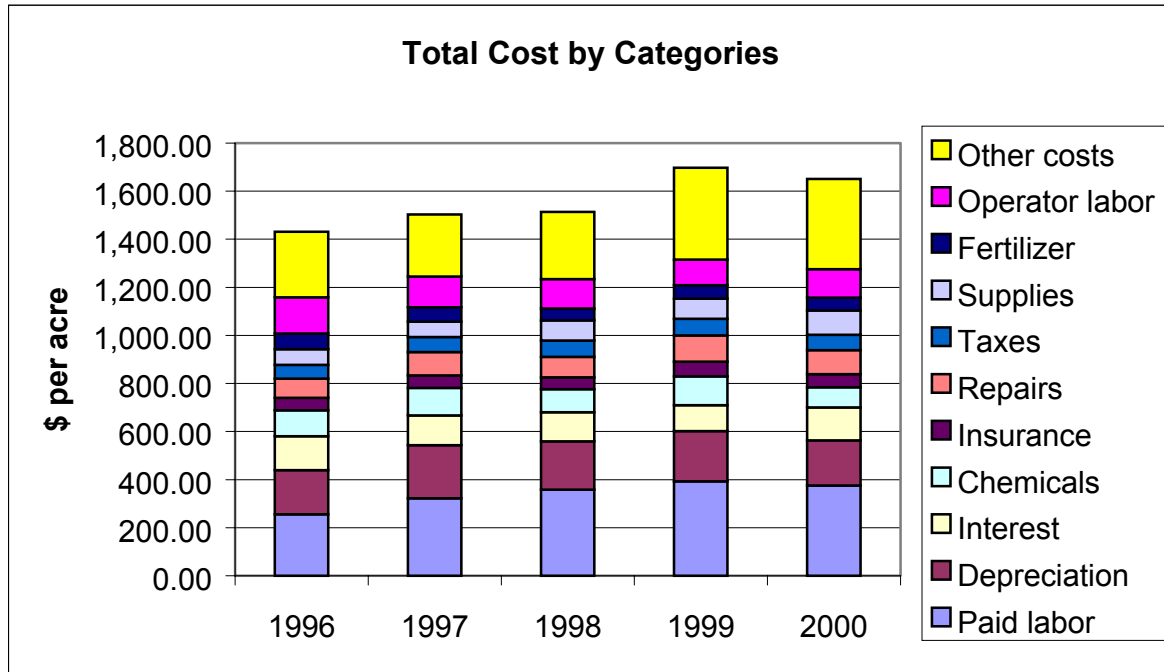


The biggest surprise was the drop in cash flow and profits from 1999 to 2000. Some drop was expected, but not as severe as what transpired. Cash flow per acre dropped more than half and total profit dropped from a high \$328 to only \$8!

### COSTS BY CATEGORY

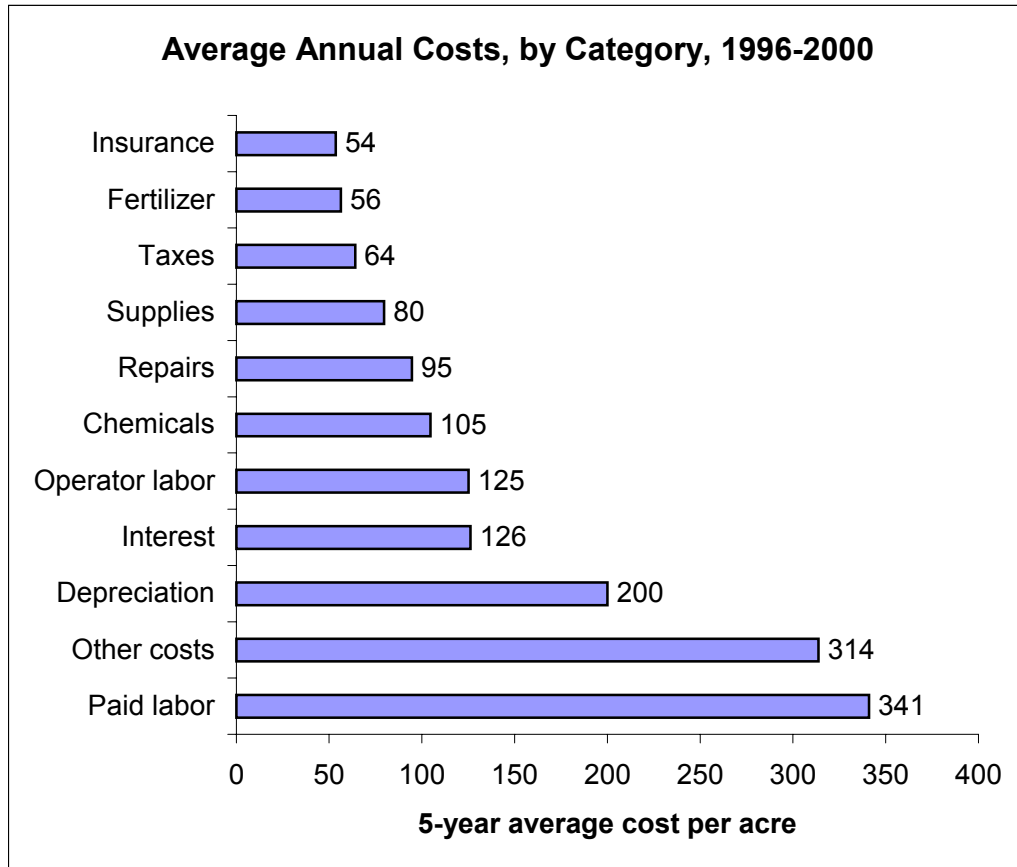
Overall costs trended upward during the five-year period. This happened in a period of higher demand and relatively high prices received. Some managers, especially in 1999, plowed more money into their operation to make up for previous stinting on operating costs and for tax planning purposes. Notice that 1999 costs are higher than any other year:

Chart 10.



Many growers are quite concerned by crop chemical and fertilizer costs; however, more attention should be given to reducing costs and improving results in the largest cost categories such labor depreciation, and interest. Another way to look at the relative size of expenditures, including operator and unpaid family labor, is the 5-year simple average cost per acre of \$1,559, broken down as follows in Chart 11:

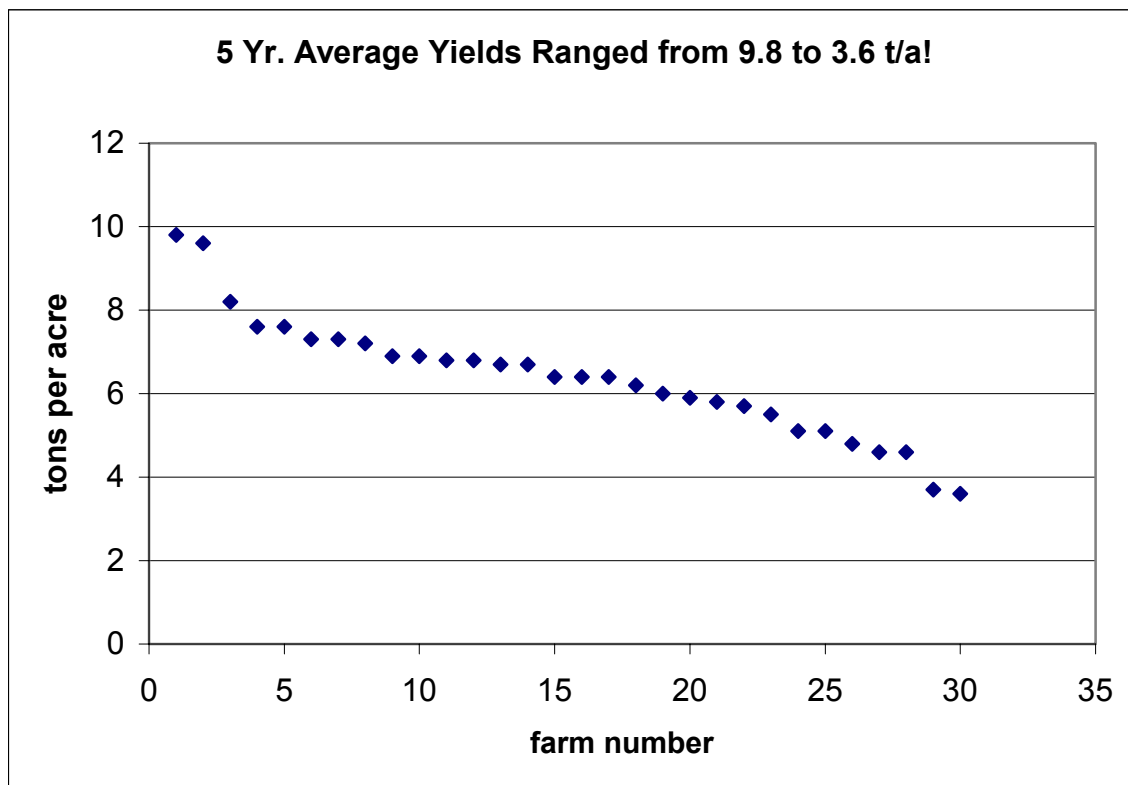
**Chart 11.**



### **FIVE-YEAR AVERAGES BY FARM**

Thirty growers participated all five years. The LEGFCS simple average (yearly averages added together and divided by five) for yield is 6.4 tons per acre. However, five-year average yields by farm ranged from 3.6 to 9.8 tons per acre:

Chart 12.

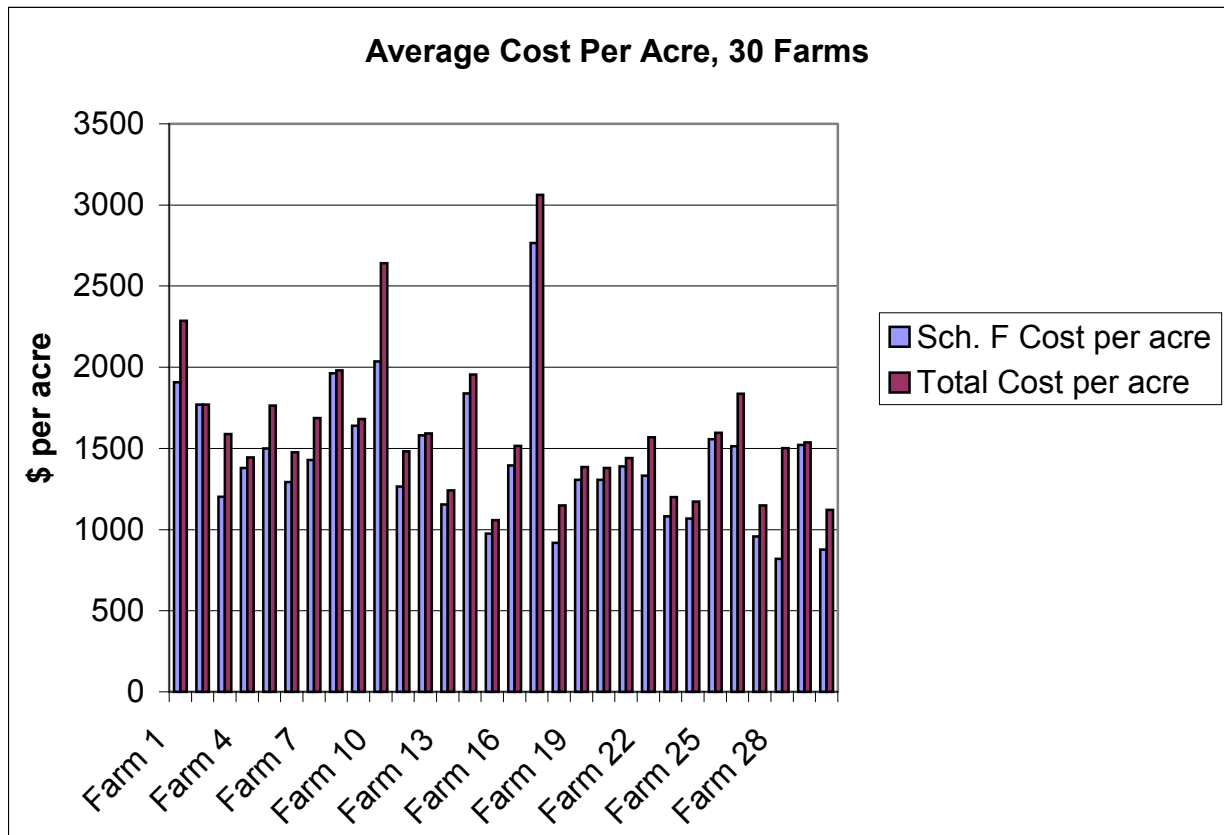


Most of the lowest yielding farms have other sources of family income. All of these farms continue to stay in business.

In general, higher yields contribute to greater profits and efficiency. However, as the following analysis will show, the relationship between yields and profit and efficiency are complex. In the following charts, Charts 13 through 16, we examine several profit and efficiency factors (average cost per acre, average cost per ton, tons of grapes per worker, and profit per acre) with farms arrayed in the same order of descending five-year average yield per acre, as in Chart 12 above. An examination of each chart will reveal that yield per acre is an important determinant, but not the only determinant, of increased profit and efficiency.

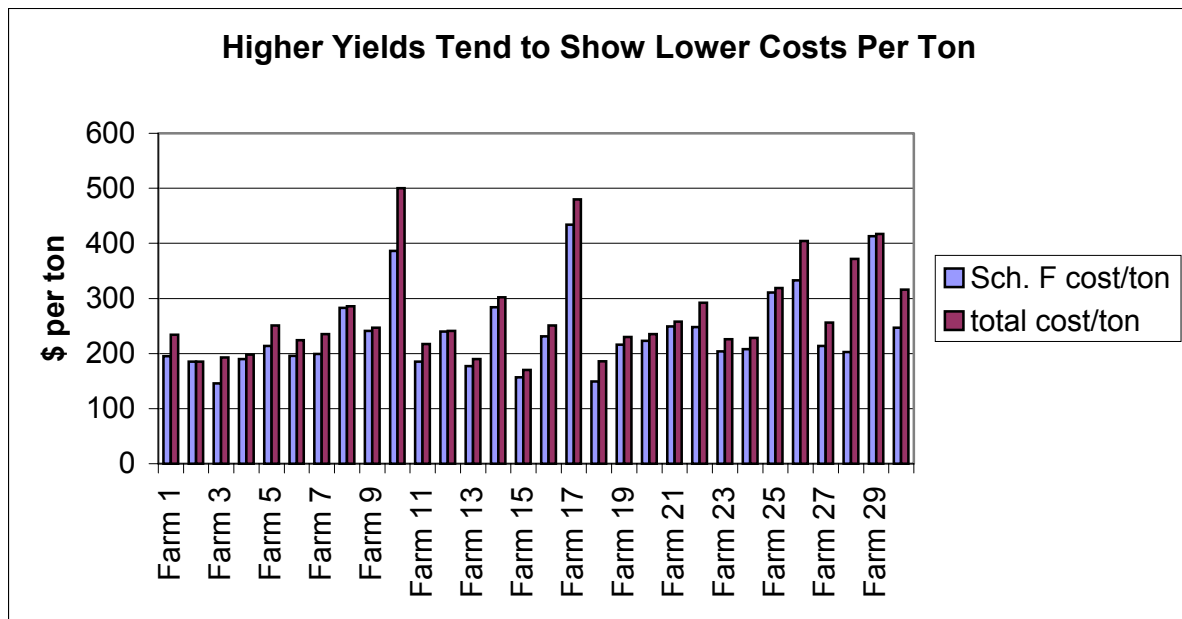
We can see definite differences in the cost structure of the individual farms. Chart 13 shows average costs per acre for these thirty farms:

Chart 13.



Five-year average cost per ton by grower is as follows:

Chart 14.

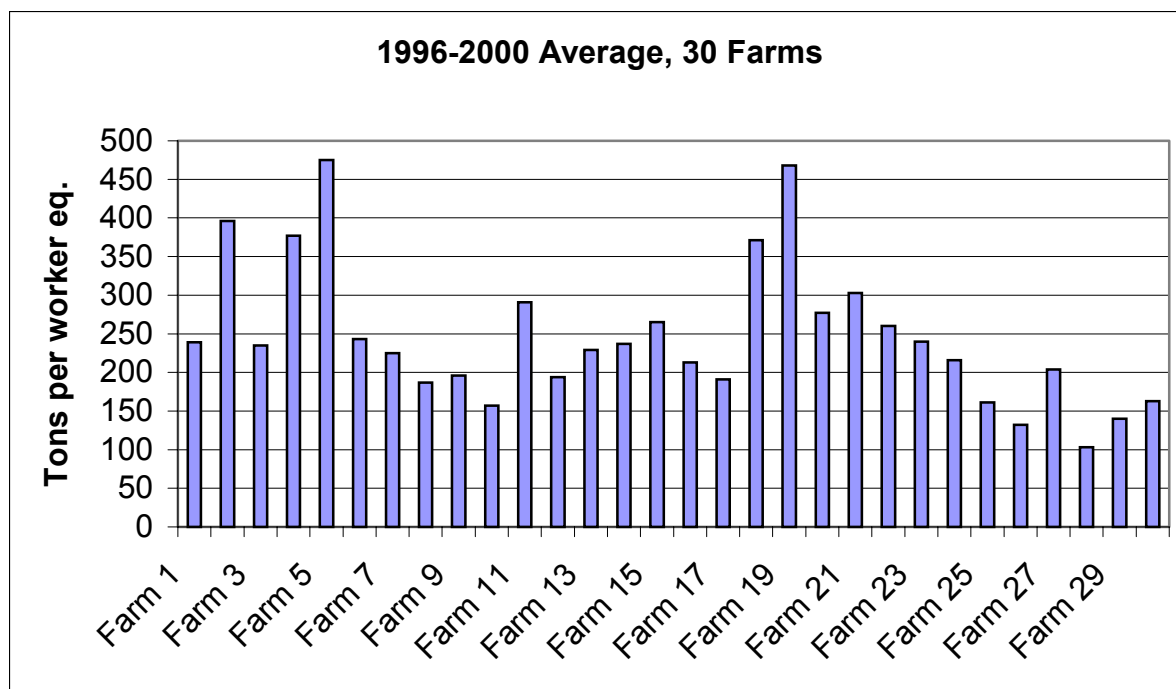


Total cost per ton could be viewed as a better way to compare the efficiency for growers of differing sizes. This evens out farms with high percentage of family labor (usually lower paid labor) with larger farms having typically higher paid labor costs.

The two farms with the highest total cost per ton are Farm 10 and Farm 17 (Chart 14). Both these farms have decent yields but high costs per acre. Both farms have less than 30 acres of grapes and have high equipment costs on a per acre basis. Farm 10 was also in an expansion mode with a high percentage of non-bearing vineyards (resulting in increased costs with no immediate income). The operator of Farm 17 has outside income and doesn't manage for maximum profits from the farm!

Labor efficiency is important to track since paid labor and operator labor together average 30 percent of the total cost of production:

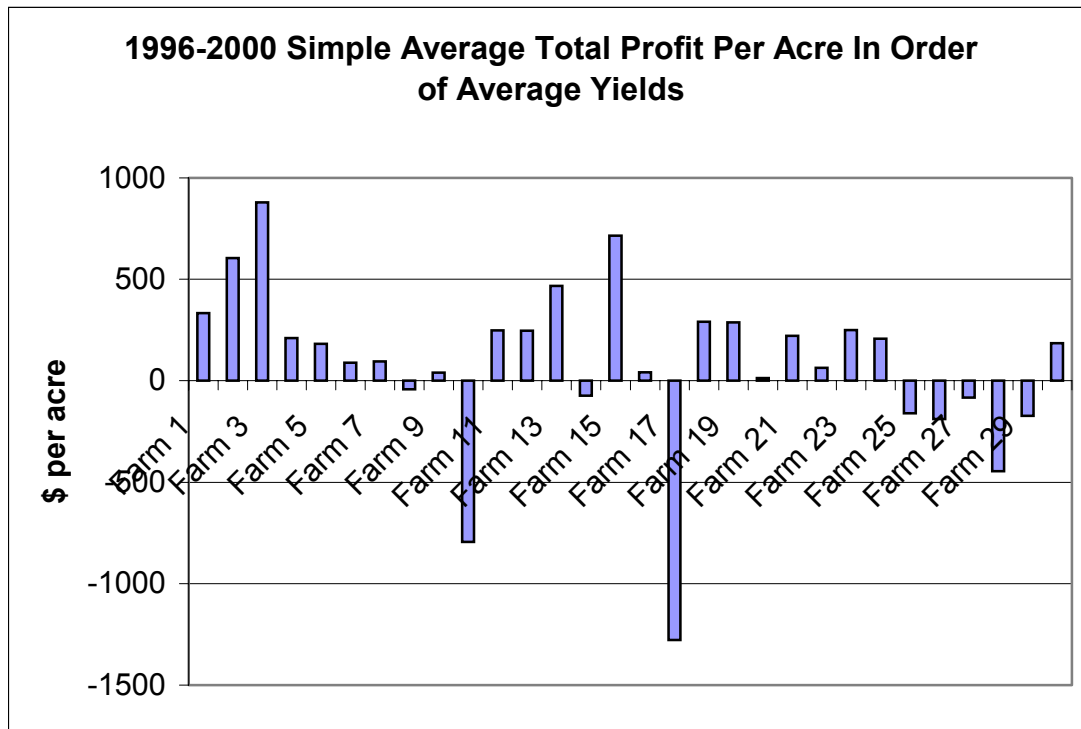
**Chart 15.**



Farms should aim for at least 250 tons of total production per worker equivalent. One third of the farms met this guideline. Five year average yields for these farms range from 5.7 to 9.6 tons per acre. The middle of the road, or yellow range, is 180-249.9; 14 farms out of 30 were in that category with yields ranging from 4.6 to 9.8 tons per acre. Weak numbers for tons per worker equivalent are under 180 tons and we had 6 farms (20 percent) ranging from 3.6 to 6.9 tons per acre. These statistics suggest that good results can be achieved either with high yields or average yields and high labor efficiency.

How about profitability? Not all farms are trying to maximize profits, but we can see some trends once we take into account operator labor:

Chart 16.



Our highest cost per ton farms, Farms 10 and 17, show the largest losses even though their yields were reasonable. Farm 30 did show a profit with the lowest average yields on a poor site because of below average cost per acre and a high level of crop insurance receipts to buffer yield variations. Even in times of good juice grape market prices, average yields under 5 tons per acre are likely to cause managers negative returns on their labor, much less their investment in land, vineyards, and equipment!

Higher profit farms include Farms 1, 2, 3, 13, and 15. Three of these farms market primarily through cooperatives and two farms market primarily through cash markets. Farms 1 and 2 tend to have above average cost per acre, exhibiting traits of a high input-high output system. Farms 3 and 15 tend to have good yields coupled with below average cost per acre to resemble a medium input-high output system. Farm 13 showed a marked response to higher prices coupled with decent yields and efficient farm size of over 150 vineyard acres.

## CONCLUSIONS

Five years of cost analysis is enough to demonstrate differences in vineyard and financial management performance. Some growers will normally make positive returns above the value of all costs, including their labor. Others normally won't make enough to pay themselves for their labor. Still others follow with the general trend of the industry, usually with variable crop sizes.

Yields fluctuated more than per acre costs. Custom harvest operations are generally profitable. Custom harvest income is generally included in Schedule F income but separated from grape

receipts. Usually custom harvest costs are aggregated with other operating costs in the Schedule F.

For many growers, yields of 5 tons per acre or more are needed to generate profits and provide funds for family living expenditures in times of high prices. This breakeven yield will increase when prices fall.

Growers had more consistent high yields with mechanical-pruned single curtain and hand-pruned Geneva Double Curtain (GDC) vineyards. GDC acreage probably has been shrinking in the Lake Erie Grape Belt. Results point towards well managed GDC vineyards having lower costs per ton. Growers may want to consider retaining GDC trellises rather than replacing with single curtain trellises, especially on vigorous sites. Most commercial juice grape growers are not using the Umbrella Kniffen (UK) training system except for some 'Niagara' acreage.

A high yield per acre does not guarantee profitability, nor do low yields guarantee losses. Market outlets did have some impact on profitability with one cooperative returning outstanding payments per ton during much of this timeframe (1996-2000) allowing some LEGFCS participants to show good financial results with mediocre yields.

Cash market prices peaked in 1998 but income per acre peaked in 1999. In 1999 the most profitable combination of factors (including large crops, close to peak prices, and good growing conditions) resulted in average farm receipts per acre of greater than \$2,000, the highest in the 10 year history of the survey.

Many Lake Erie Grape Belt grape growers were able to improve their operations during these five years, especially in 1999. Wise improvements made during this time should help these participants face looming challenges as prices soften.