



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

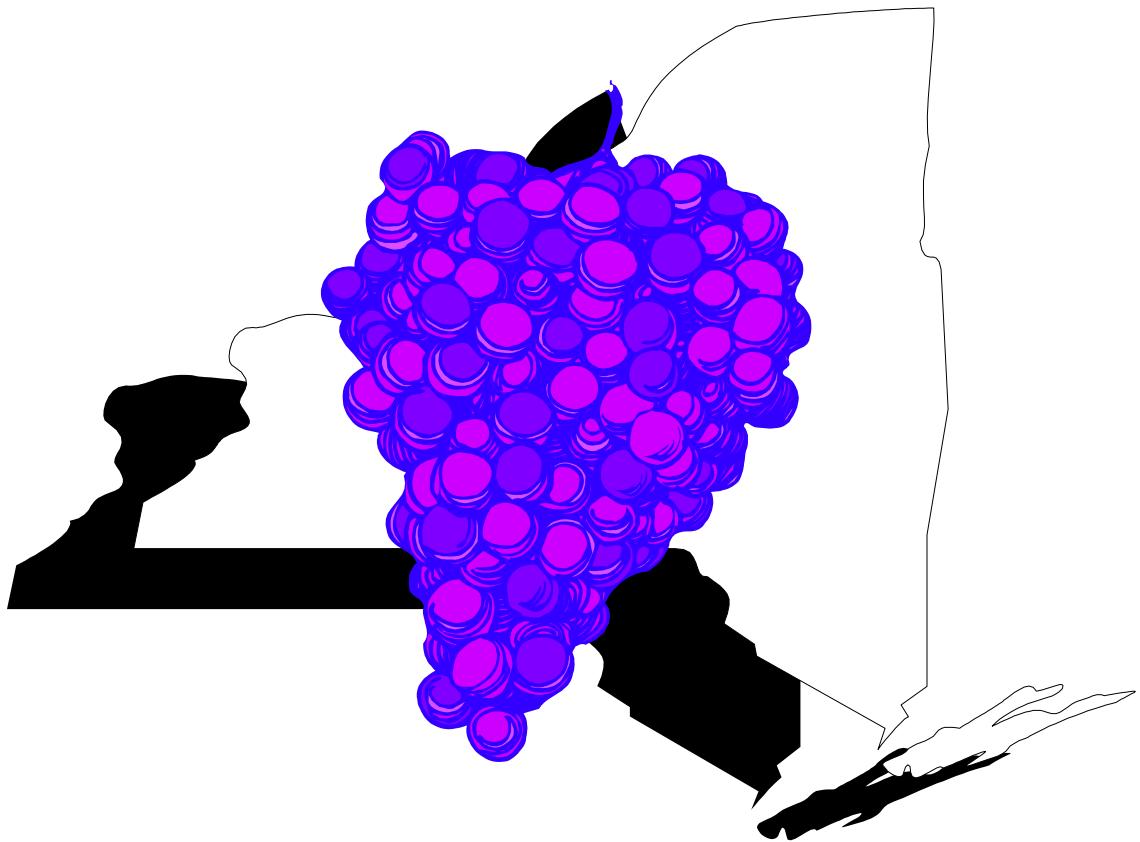
*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

OCTOBER 2006

E.B. 2006-19

LAKE ERIE GRAPE FARM COST SURVEY 2001-2005



**Barry E. Shaffer
Gerald B. White**

**Department of Applied Economics and Management
College of Agriculture and Life Sciences
Cornell University, Ithaca, New York 14853-7801**

It is the Policy of Cornell University actively to support equality of educational and employment opportunity. No person shall be denied admission to any educational program or activity or be denied employment on the basis of any legally prohibited discrimination involving, but not limited to, such factors as race, color, creed, religion, national or ethnic origin, sex, age or handicap. The University is committed to the maintenance of affirmative action programs which will assure the continuation of such equality of opportunity.

ABSTRACT

This report is a summary of five years of grape costs and returns data collected from Lake Erie Region grape growers for the 2001-2005 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, 42 to 49 growers participated, with total vineyard acreage ranging from about 4,400 to 5,200 acres.

Average costs per acre over the entire five year period were \$1,663, including an imputed value for the operator’s labor. Major cost categories were paid labor (\$380 per acre), depreciation (\$213), interest (\$114), operator labor (\$116) and chemicals (\$117). Average yield per farm was 6.4 tons per acre with a range of 2.8 to 8.6 tons per acre.

Growers suffered through some difficult circumstances (poor weather, declining prices) over the past five years. Juice grape cash market prices tended to drift down over the course of the five years. National Grape members’ returns moved upward through 2004 and then suffered a severe drop in 2005. Some growers had custom harvesting or other farm income not tied to grape prices. Some growers collected income from crop insurance, disaster payments, and/or Trade Adjustment Assistance (TAA) that helped to buoy income in the face of disappointing yields and unharvested grapes in 2003.

However, almost half of the farms who were in the survey for all five years had yields of 7 tons or better. These growers are able to compete with other growing regions such as Washington State. Lake Erie Grape Belt farm managers are responding to lower prices in a variety of ways, including becoming more labor efficient, dropping some poor vineyards (especially leased ones), increasing wine grape production, and increasing farm size.

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.

TABLE OF CONTENTS

INTRODUCTION.....	1
METHODS	1
RESULTS	2
2001.....	2
2002.....	4
2003.....	4
2004.....	6
2005.....	8
COSTS BY CATEGORY.....	10
FIVE YEAR AVERAGES BY FARM.....	11
SAMPLE BUDGET	17
CONCLUSIONS	18

TABLE OF CONTENTS FOR CHARTS

	<u>Page</u>
Chart 1. LEGFCS Vineyard Acres 2001-05	3
Chart 2. Record Farm Numbers and Acres in 2002!	3
Chart 3. 2002 LEGFCS Average Yield of 6.0 t/a	4
Chart 4. LEGFCS Growers are Averaging 50+ Acres per Worker	5
Chart 5. Profits Peaked in 2003 and 2004!	6
Chart 6. 2004's Results Showed Record High Costs per Acre.....	7
Chart 7. 2004's Average Income Per Acre Nearly Equalled 1999's Record of \$2026 ...	8
Chart 8. 2001-05 Average LEGFCS Yields	9
Chart 9. 2005 LEGFCS Interest Cost/Acre.....	10
Chart 10. Average Annual Costs, by Category, 2001-2005	11
Chart 11. 5 Year Average Yields Ranged from 8.6 to only 2.8 Tons per Acre!	12
Chart 12. Costs Much Above \$2,000 Per Acre Too High for Successful Juice Grape Production!.....	13
Chart 13. Even \$300 a Ton Costs Are Too High for Today's Market Conditions!.....	14
Chart 14. Under \$1,200 Income Per Acre is a Bad Sign!	15
Chart 15. Good Results from a Wide Range of Yields!	16
Chart 16. Average Yields Are a Strong Indicator of Profitability	17

LAKE ERIE GRAPE FARM COST STUDY, 2001-2005

INTRODUCTION

The grape industry, located along the eastern shore of Lake Erie, has a long history. Some vineyards have been in continuous production for over 100 years! However competitive pressure and changing consumer preferences pose significant challenges for the future of the industry. Growers have responded by increasing wine grape acreage and 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 and Pennsylvania 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 two different trellis systems, 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 Schedule F 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 more complete picture of each farm. For grape growers, inventories aren't usually very important. However, accounts receivable, especially with co-operative members, can be very important for a complete understanding of a grape farm's financial condition. 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, market outlets, other farm operating receipts, paid and unpaid farm labor, and form of business organization.

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

LEGFCS acreage varies each year, but is roughly two-thirds in NY and one-third in PA. The number of growers tends to be 75% in NY and 25% in PA. Participating farms are located in Cattaraugus, Chautauqua, Erie, Niagara, Seneca, and Yates Counties in New York State. All of the Pennsylvania cooperators 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.

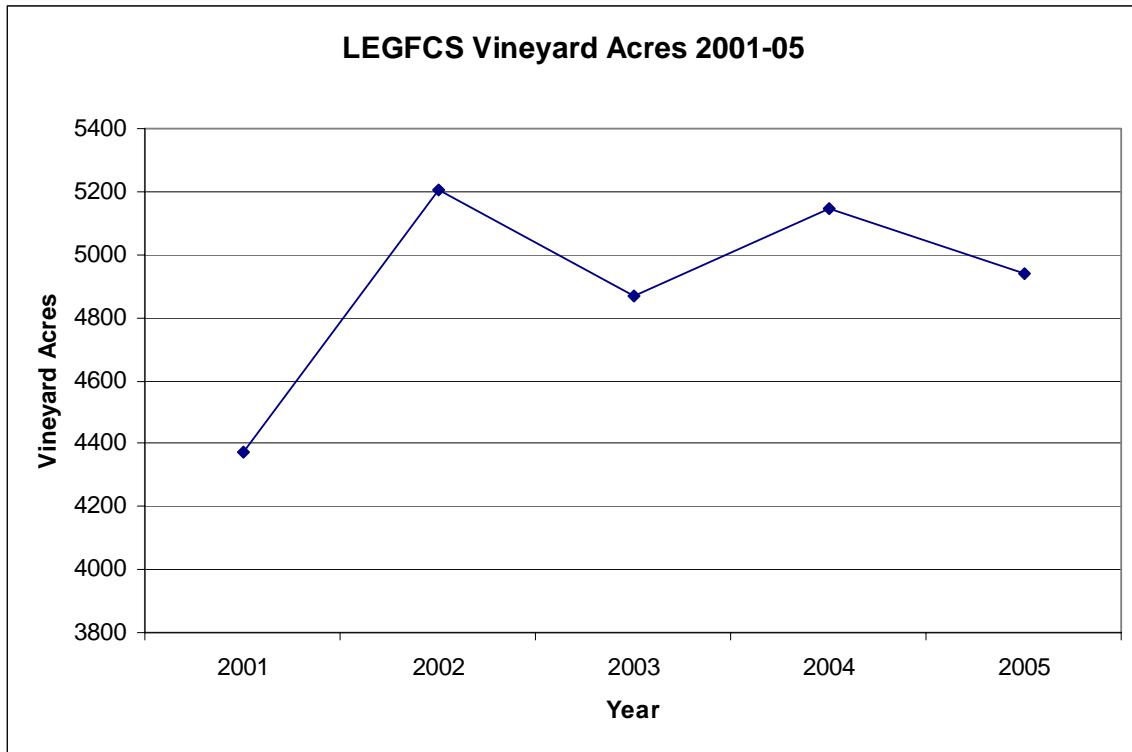
Since Schedule F does not normally result in the growers' or other unpaid family labor being counted as an expense, we valued this unpaid family labor at \$2,000 per month (about \$9.62 per hour) for 2001. For the years 2002 through 2005 we valued this unpaid family labor at \$2,100 per month (about \$10.10 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

2001

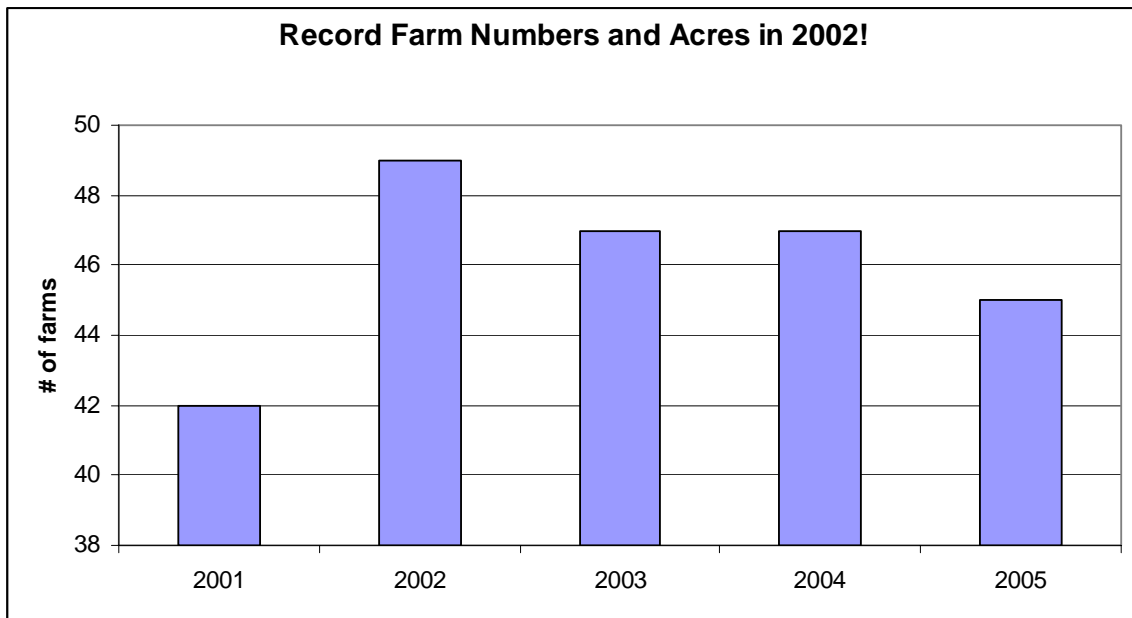
Growers averaged only 5.5 tons per acre down from 6.1 t/a in 2000. Schedule F cost per ton climbed up to \$278. Vineyard acres for 2001-05 are as follows:

Chart 1.



The number of farms fluctuated from year to year and peaked in 2002; see Chart 2.

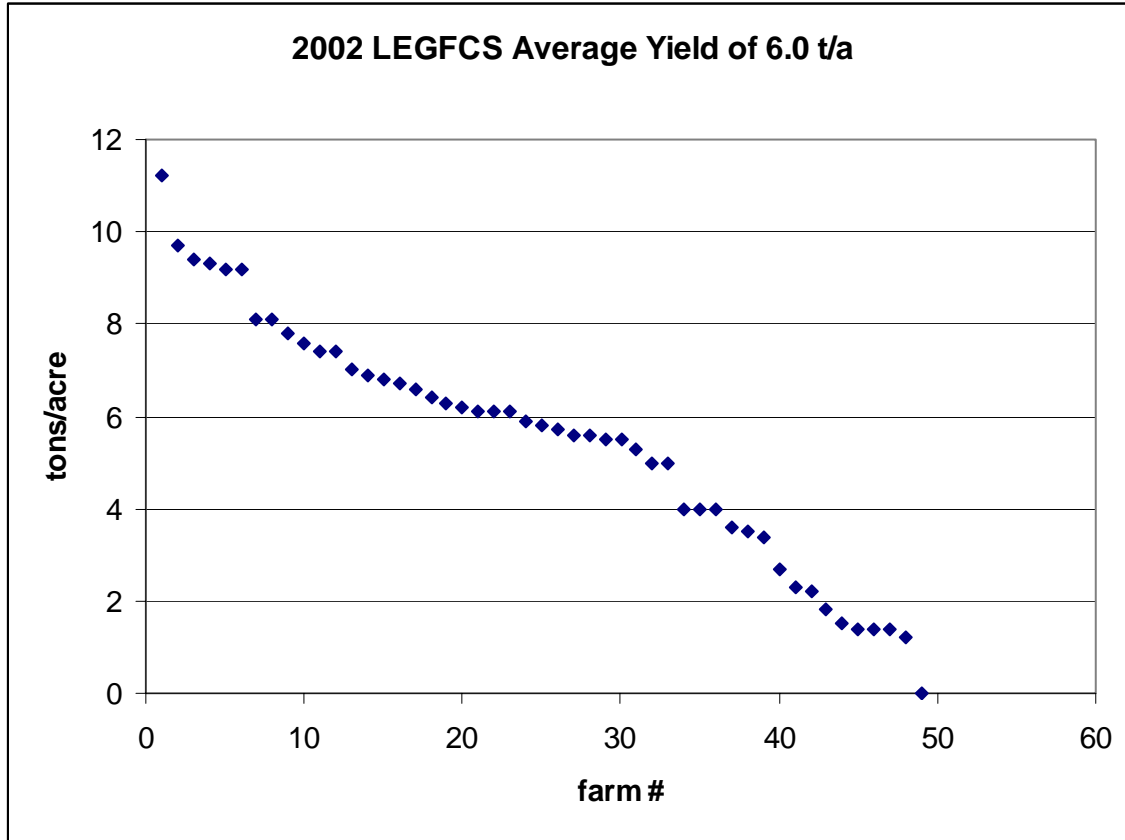
Chart 2.



2002

Widespread frost damage on both ends of the Lake Erie Grape Belt significantly reduced yields although average yields crept up to 6 t/a. Some farms had great yields while many had anemic yields:

Chart 3.



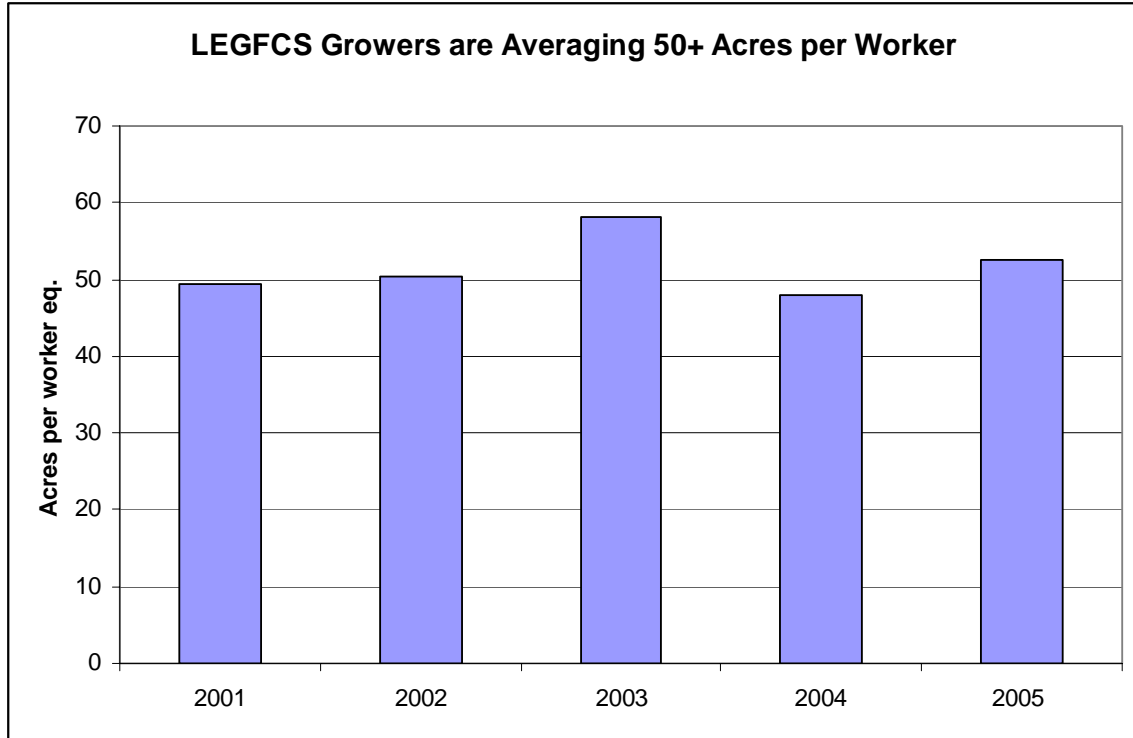
Costs per acre jumped up \$78 to \$1552. Management cost per acre moved up \$77 to \$1677. The higher yields reduced the cost per ton from \$278 to \$261. Interest cost dropped almost \$20 per acre to \$113. This was mainly due to lower interest rates and not lower debt loads.

2003

This year will be long remembered for being an extremely difficult year for most producers. This was due to mediocre weather conditions and huge crops causing, ripening problems. The areas hit with frost damage in 2002 came back with huge potential crops after bloom. Many growers tried crop estimation and mechanical thinning for the first time with varying success. Some processors reduced their sugar standards while National Grape actually paid members \$600 an acre NOT to bring in low-sugar grapes!

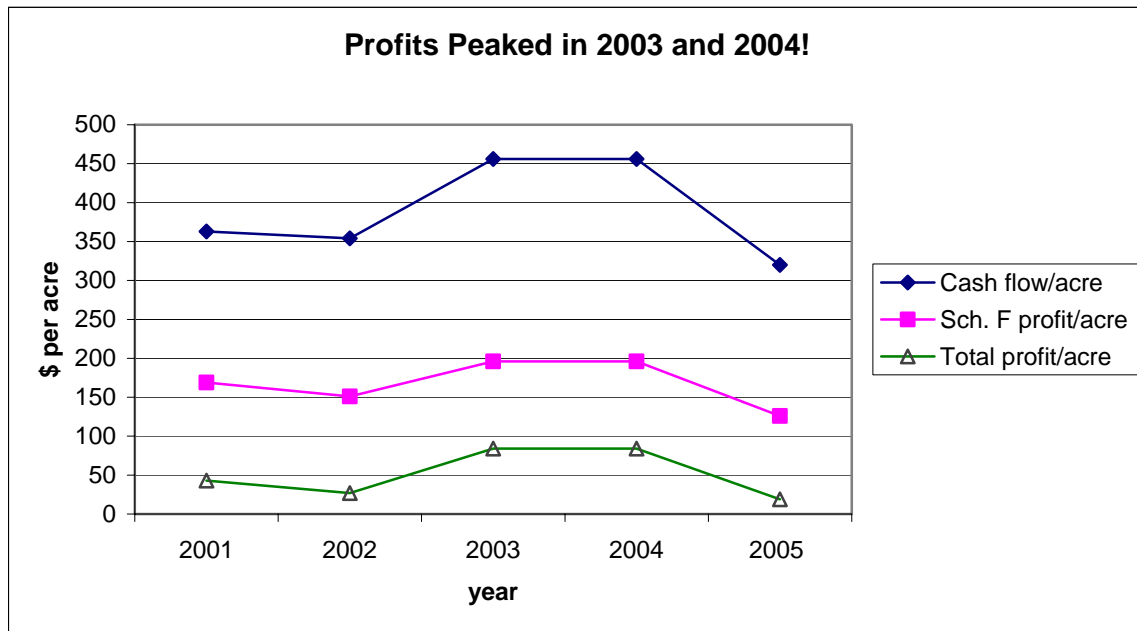
LEGFCS average yields were 5.9 tons per acre, but 15% of the participants' acreage was not harvested in 2003 (lowering yields per acre), primarily National Grape acreage. Acres per worker set a record of over 58 acres per worker equivalent:

Chart 4



Profitability actually increased despite the challenges of the growing season. (Total profit per acre is the profit after accounting for unpaid family labor.)

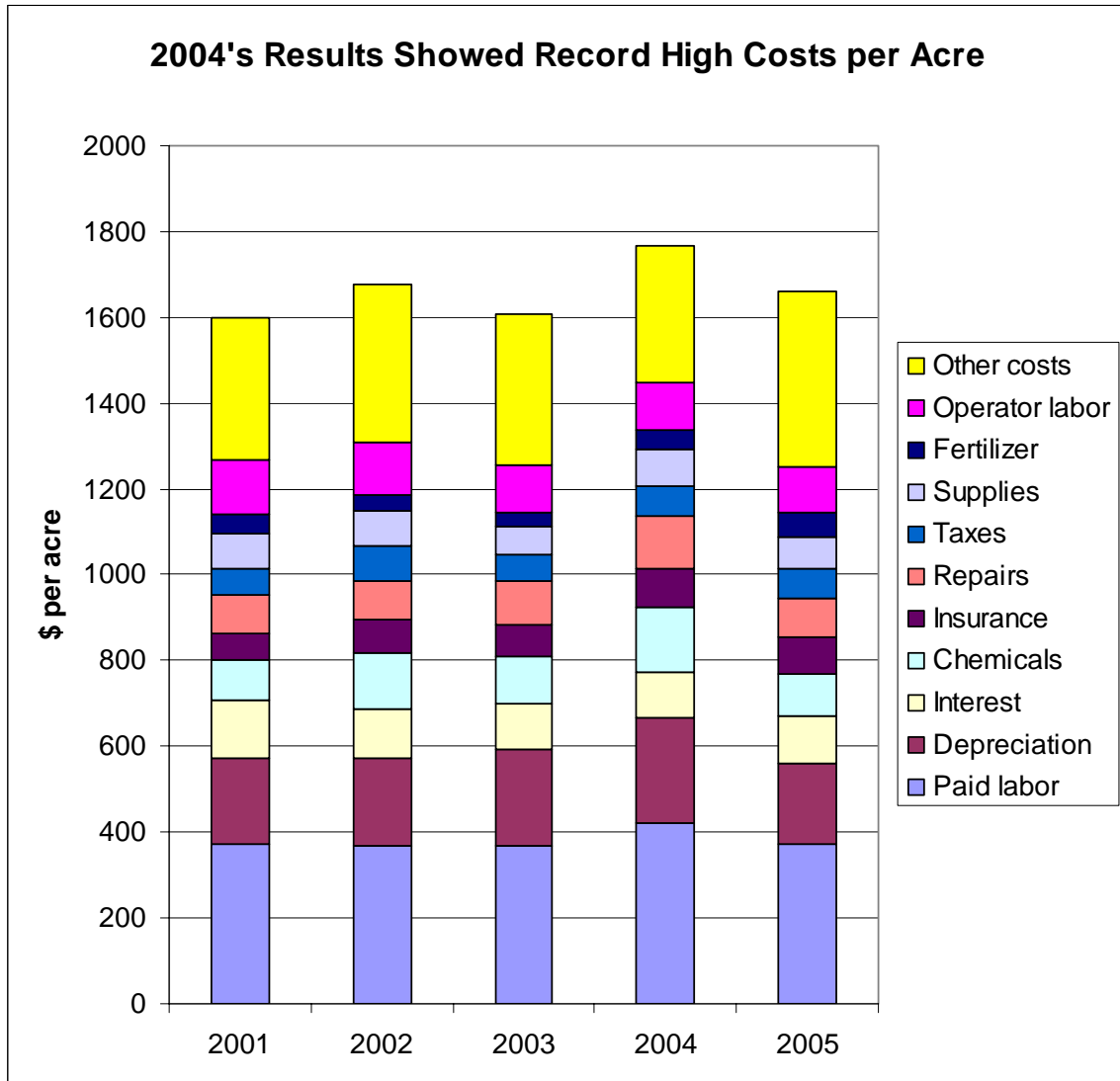
Chart 5



2004

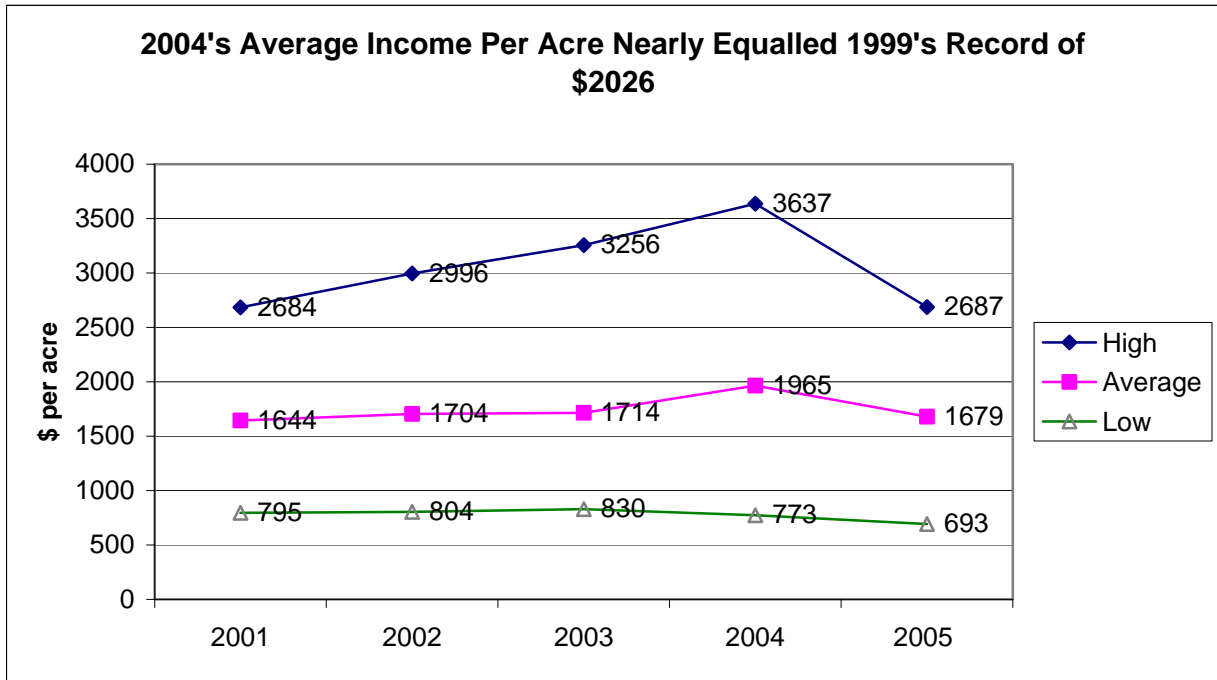
Growers had to manage vineyards with another wetter than normal growing season. Many vineyards on heavier soils suffered, resulting in poor growth or vine death in severe cases. Costs went up considerably; we saw record crop chemicals, depreciation, repairs, paid labor and overall costs per acre:

Chart 6



Income per acre peaked in 2004 due primarily to very strong payments (for previous years' crops) from National Grape to their members:

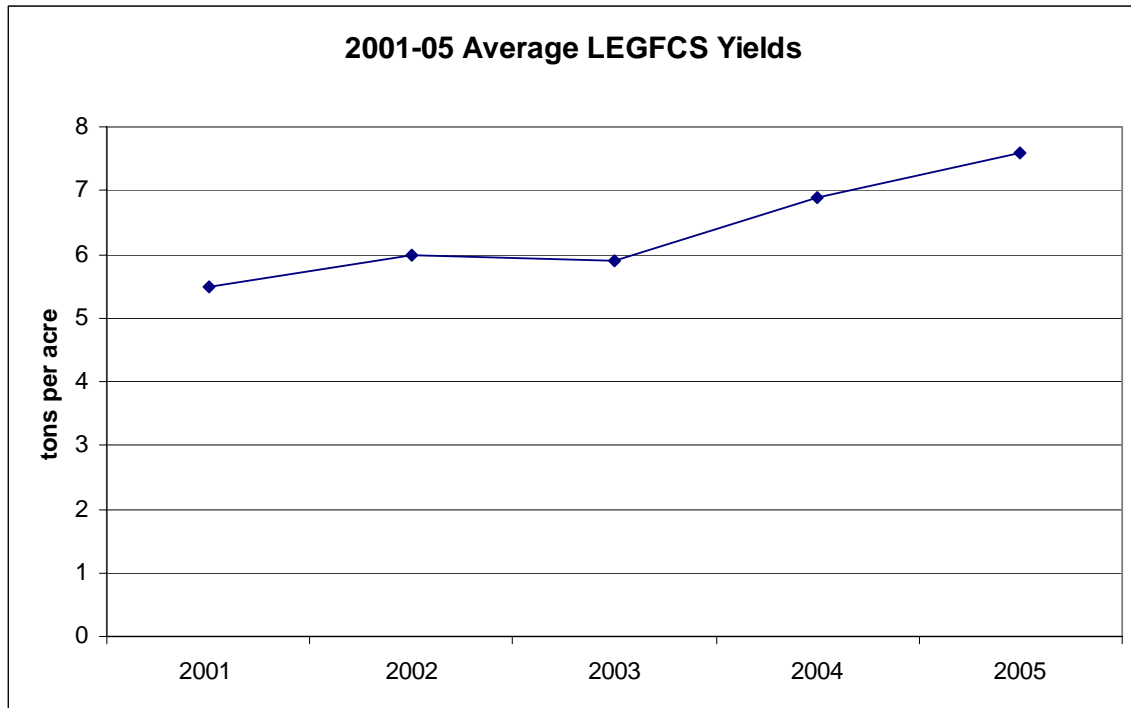
Chart 7



2005

Dry weather was a concern until we got soaking rains from the remnants of both Hurricanes Katrina and Rita. Growers and processors got the rare combination of high yields and high sugar which also helped returns per acre. The juice quality was excellent partially due to low disease and insect pressure during the growing season. Average yields increased to 7.6 t/a, topping the last five years' yields:

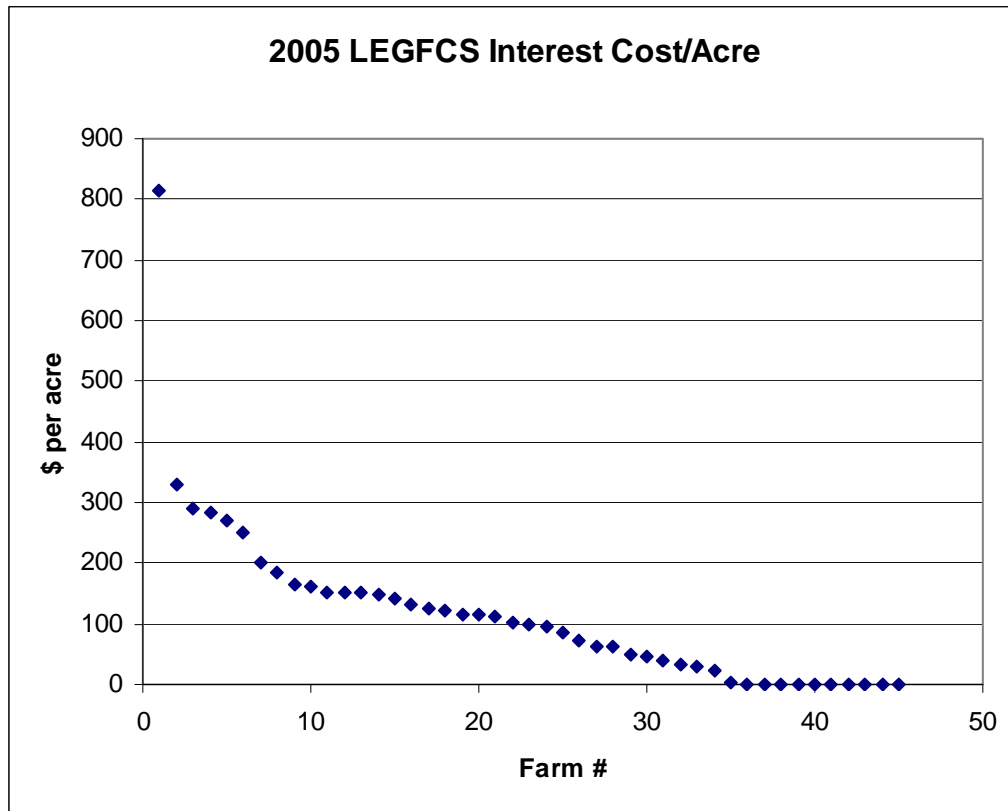
Chart 8



Income per acre and profitability suffered even with higher yields. Average income per acre dropped almost \$300 from 2004 to 2005. This resulted from very low prices-cash market prices were around \$165 per ton for 16° brix grapes, although most growers received closer to \$200 per ton when the higher brix was accounted for. Most cost categories were down from 2004's high levels, although fertilizer jumped up due in part to higher prices for nitrogen fertilizers. Due to higher yield, the cost per ton declined to \$208 and total cost per ton (including operator labor) was only \$222, the lowest numbers in this five-year period.

Going forward, interest rates have been rising and interest costs are very likely to rise for many borrowers. How much interest are current LEGFCS participants paying per acre? The average interest cost per acre was \$109 in 2005, although there was a wide range. Nine farms actually had no debt. Disregarding the \$813 per acre outlier, we still had commercial grape farms with interest costs ranging from zero to over \$300 per acre:

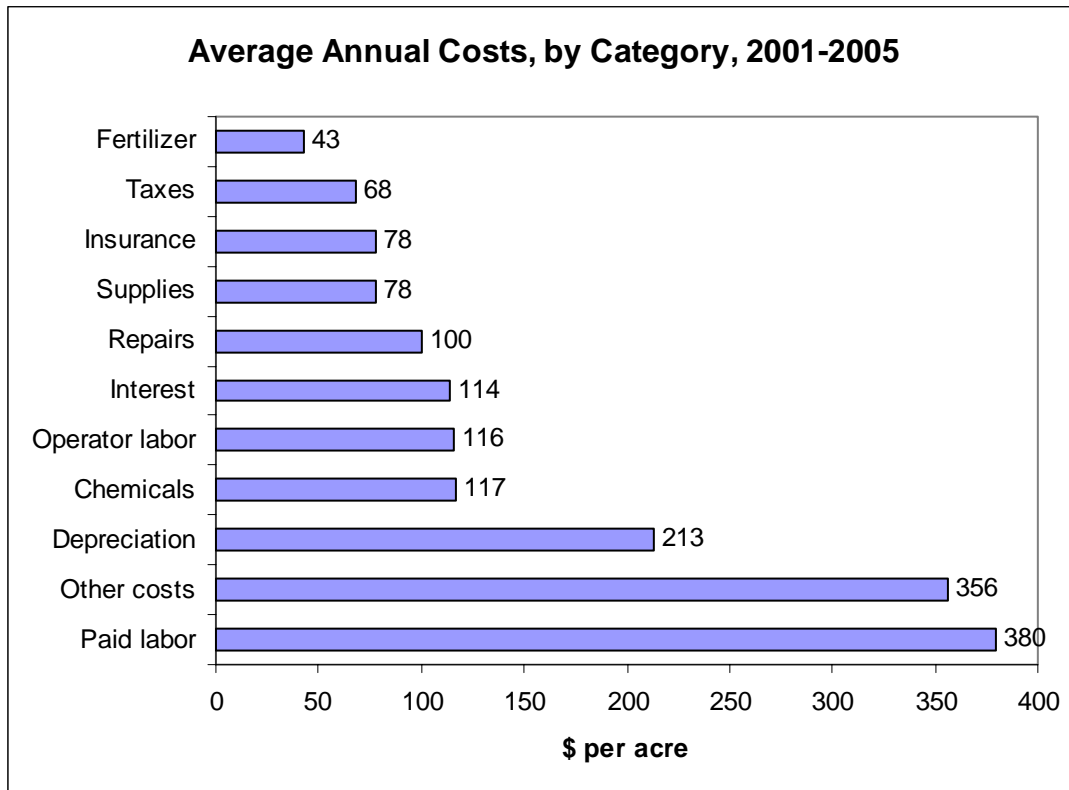
Chart 9



COSTS BY CATEGORY

Overall costs stayed fairly constant except for the bump up in 2004 due to higher returns in 2004 and tax management strategies by participants. There was little padding of expenses in 2005 with depreciation costs dropping over \$50 per acre from 2004 to 2005! The 2001-05 simple average cost per acre of \$1663 (including operator labor), an increase of \$104 or 7% higher than the 1996-2000 LEFGCS average of \$1,559. Many category costs went up, but a few actually went down including fertilizer and interest. Category costs were as follows:

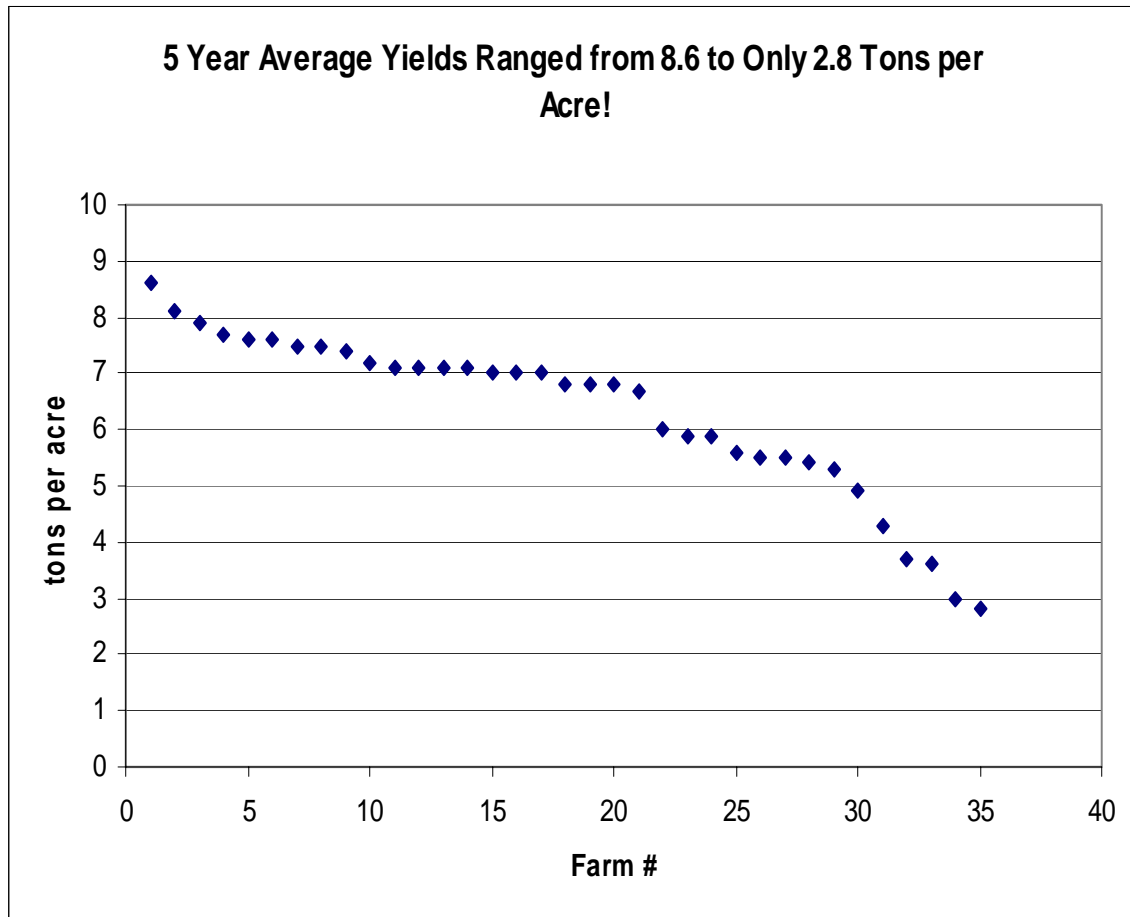
Chart 10



FIVE-YEAR AVERAGES BY FARM

Thirty-five farms participated all five years. The LEGFCS simple average (yearly averages added together and divided by five) for yield is 6.4 tons per acre equaling the 1996-2000 LEGFCS average yield. However, five-year average yields by farm ranged from 2.8 to 8.6 tons per acre:

Chart 11.

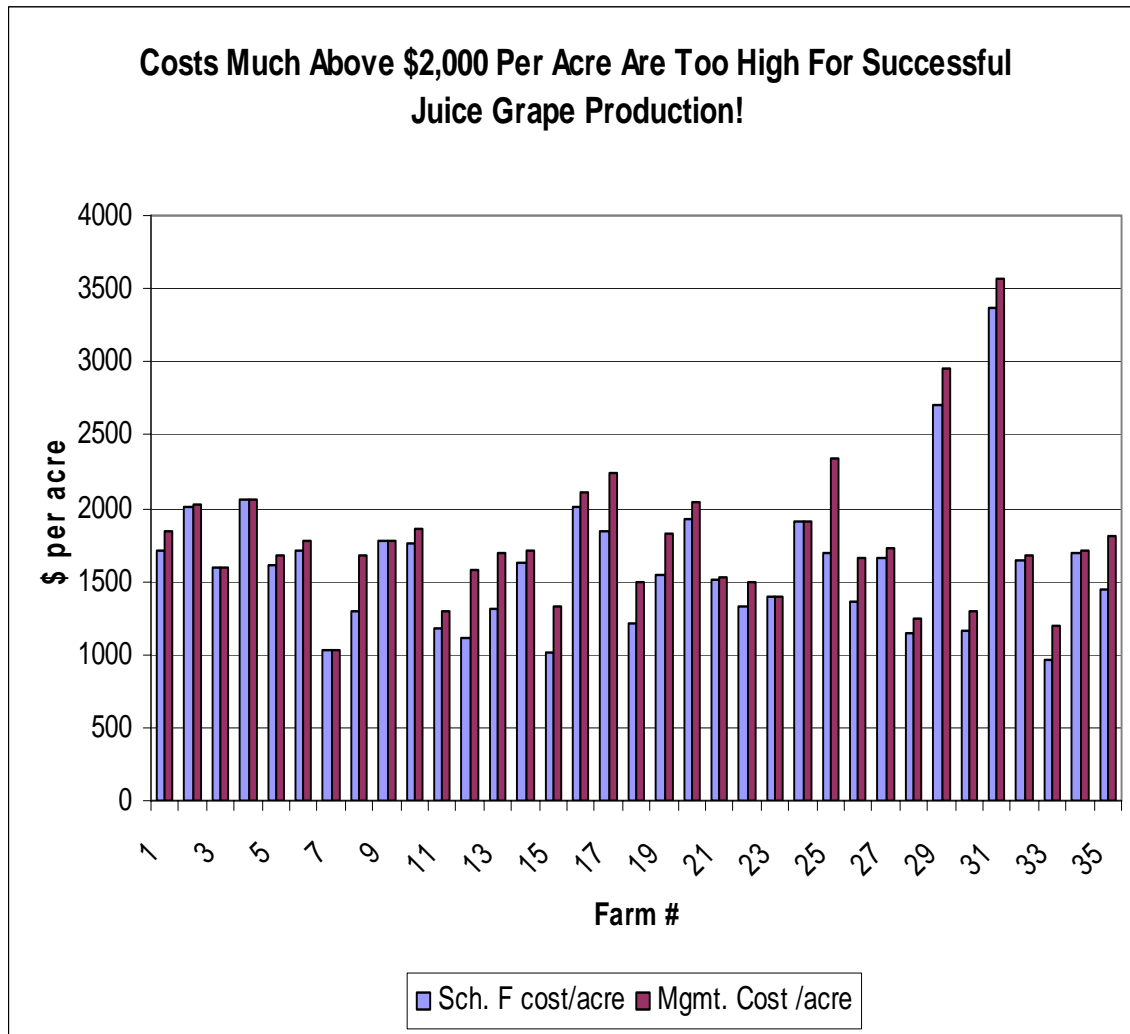


The bottom five farms, in terms of average yields per acre, have other sources of family income, i.e. these are considered part-time growers. All of these farms continue to stay in business.

In general, higher yields contribute to greater profits and efficiency. However, as the following analysis will show, the relationship between yields, profits, and efficiency are complex. In the following charts we examine several profit and efficiency factors (average cost per acre, average cost per ton, average income per acre, tons of grapes per worker equivalent, and profit per acre) with farms arrayed in the same order of descending five-year average yield per acre, as in Chart 11 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 12 shows average costs per acre for these thirty-five farms:

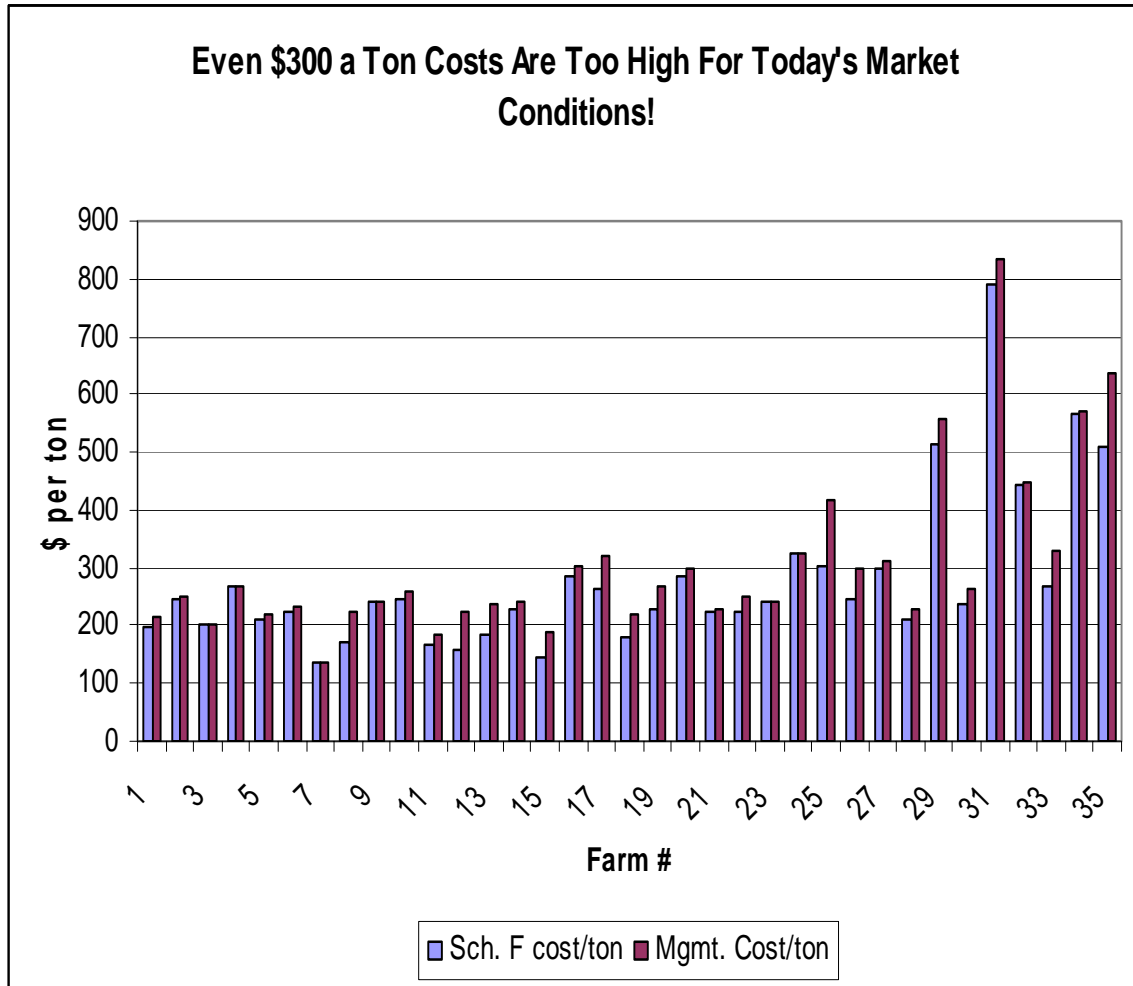
Chart 12



Two farms that stick out with high cost per acre are farms 29 and 31. Farm 31 is unusual for the LEGFCS; this farm is not managed to maximize profit and usually shows a huge amount of depreciation expense. Other cost categories look similar to LEGFCS averages. Farm 29 has some other fruit crops that inflate per acre costs and returns. Both farms share the problem of mediocre grape yields.

Cost per ton is a key factor for all grape farm managers to keep track of. Management (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 a high percentage of operator and family labor with larger farms having typically higher paid labor costs. Five-year average cost per ton by grower is as follows:

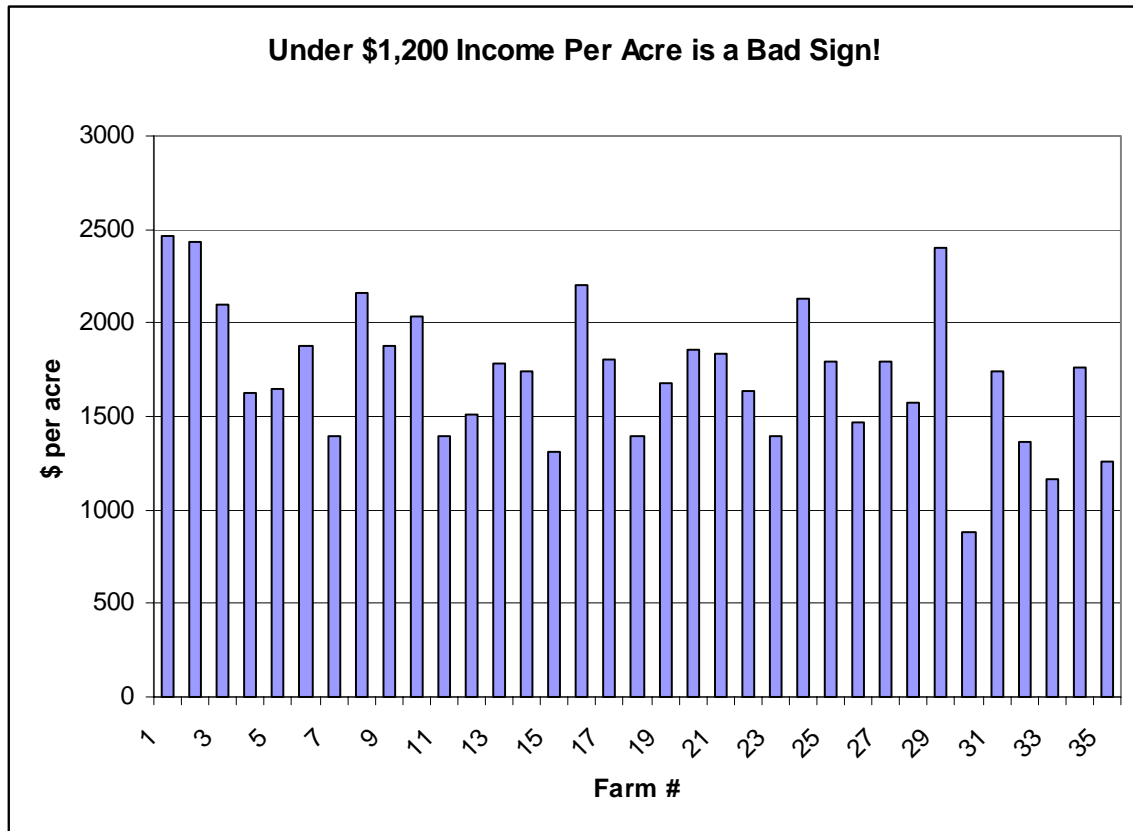
Chart 13.



Farm 7 has outstanding results of \$136 per ton cost per ton stemming from good cost control per acre and high yields (7.5 t/a). On the other end of the spectrum, Farms 29 and 31 were joined with 34 and 35 for costs being over \$500 per ton! With juice grape pricing of \$200 per ton, this is a recipe for poor results.

Market conditions caused differences in income received per acre and per ton. Juice grape cash market prices tended to drift down over the course of the five years. National Grape members' returns moved upward through 2004 and then suffered a severe drop in 2005. Some growers had custom harvesting or other farm income not tied to grape prices. Some growers collected income from crop insurance, disaster payments, and/or Trade Adjustment Assistance (TAA) that helped to buoy income in the face of disappointing yields. Below are the thirty-five farms' average income per acre:

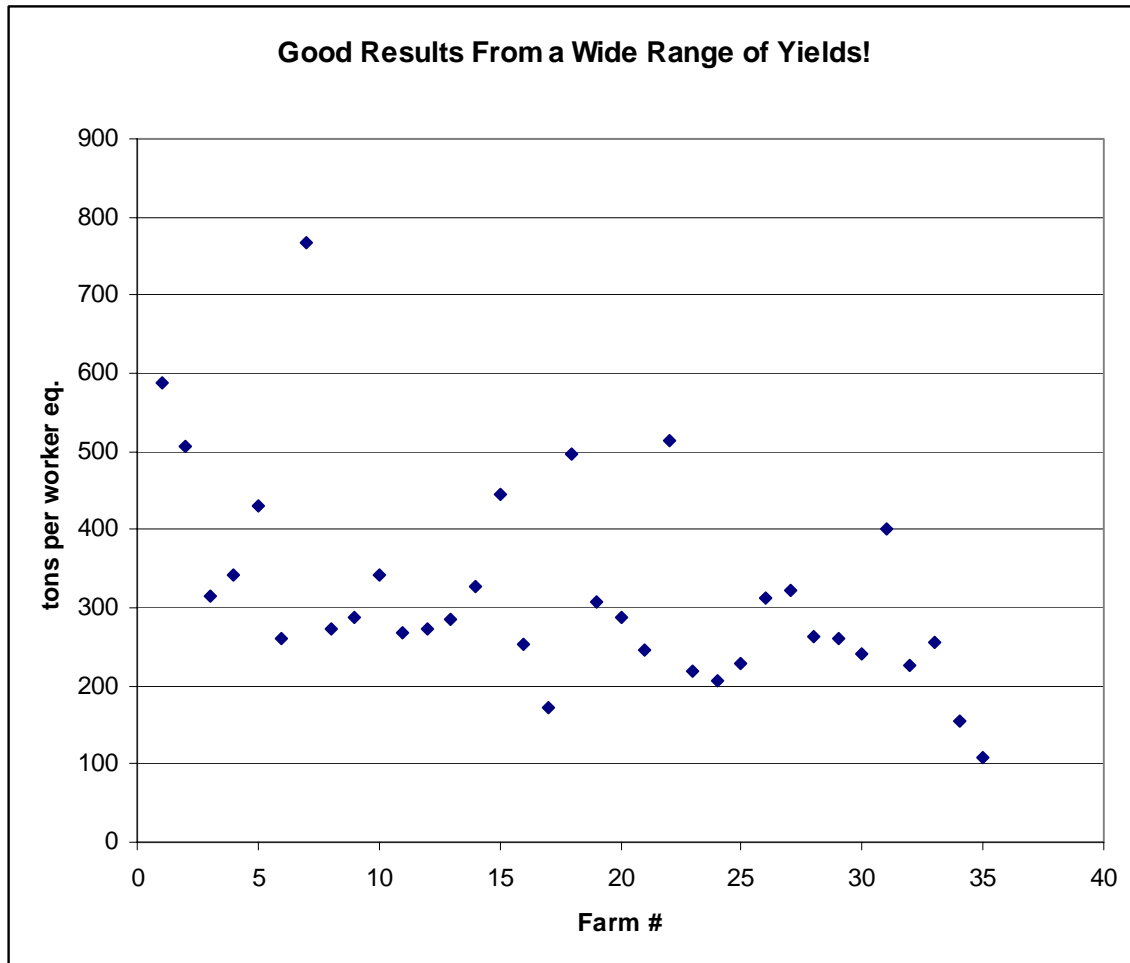
Chart 14



Farm 30 has significantly less income per acre (\$884) than any other farm. This was due to a combination of mediocre yields and exclusively marketing with a low-return grape processor. Farm 7 also sold exclusively to a low-return grape processor, but had good yields on to lessen the brunt of low pricing.

Labor efficiency is important to understand and strive for improvement since paid labor and operator labor combine to average 30 percent of the total cost of production:

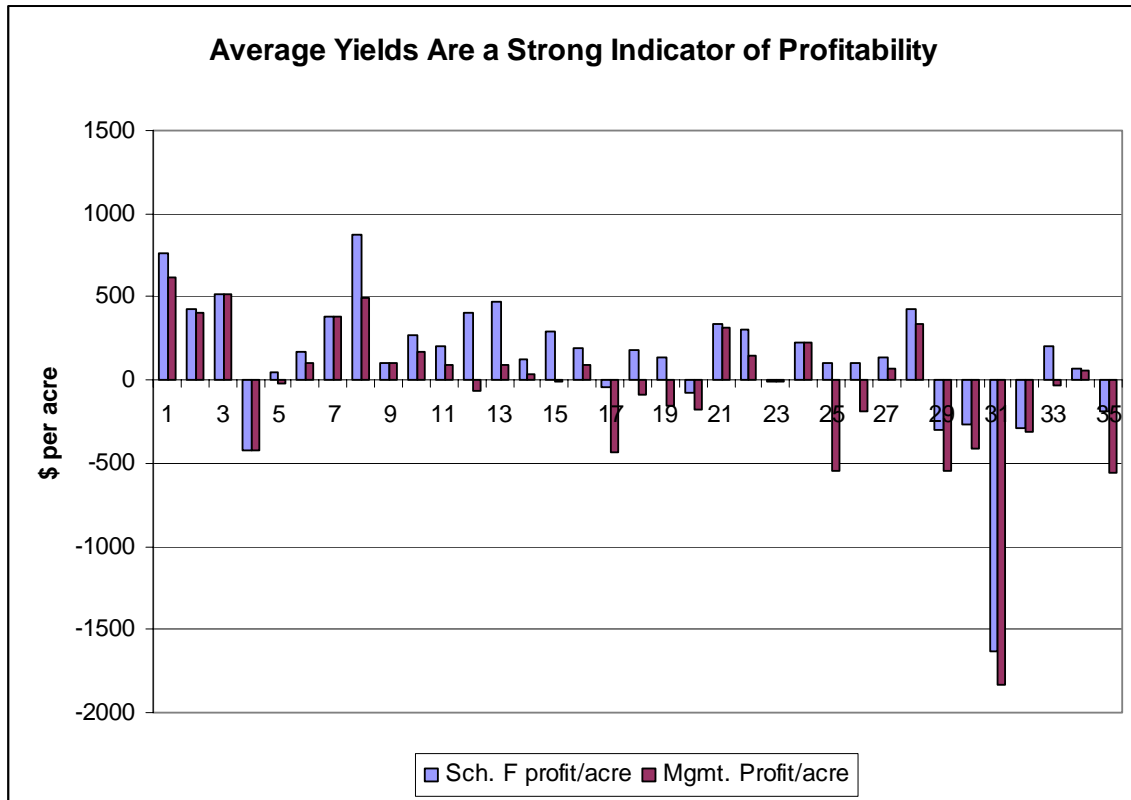
Chart 15



Farms should aim for at least 250 tons of total production per worker equivalent. Twenty-six farms (74 percent) of the farms met or exceeded this guideline! This was much better results than the 1996-2000 LEGFCS average of 33 percent. Five-year average yields ranged from 3.6 to 8.6 tons per acre for these farms. The middle of the road, or yellow range, is 180-249.9; only six farms (17 percent) fit in that category with yields ranging from 3.7 to 6.7 tons per acre. Warning (red range) numbers for tons per worker equivalent are less than 180 tons, and we had only three farms (9 percent) represented in that category with yields ranging from 2.8 to 7 tons per acre. These statistics suggest that good results can be achieved either with high yields or average yields and high labor efficiency. We have also seen a big improvement in tons per worker from 1996-2000 to 2001-2005 with average yields (6.4 tons per acre) staying constant.

Profitability seems to be down from the 1996-2000 LEGFCS five-year averages. While not all farms are trying to maximize profits, we can see some trends:

Chart 16



Farm 31, our highest cost per acre farm, shows the deepest losses as the manager is actually trying to **show a loss**. Others, such as 29 and 30, are trying to stay profitable, but aren't profitable, due to chronic low income per acre for farm 30 and unprofitable crops in 29's case.

Our highest profit farms seemed to average 7.5 tons per acre or better; however, that is not a guarantee of profitability. The farms most in trouble seem to be around 5.5 tons per acre or less, although we show a couple of farms in that range earning a little profit.

SAMPLE BUDGET

This budget is based on average 2001-05 LEGFCS yields of 6.4 tons per acre, 2006 average cash market price of \$205 per ton, a representative amount of other farm receipts from the LEGFCS, and 2001-05 LEGFCS average costs (see Chart 10). Operator labor is included in the cost column.

Your yields, prices, and costs are likely to vary. Please use your numbers if you have the records as that will give you the best picture for your own situation. You can use this budget to benchmark your farm to point out strengths and weaknesses in your operation.

Table 1. Costs and Returns For A Mature *V. Labrusca* Vineyard, Lake Erie Region, 2005.

<u>Item</u>	<u>Unit</u>	<u>Per Acre</u>	<u>Your Farm</u>
Receipts:			
Yield	tons/acre	6.4	_____
Price	\$ per ton	<u>\$205</u>	_____
Grape Returns		\$1312	_____
Other farm receipts (i.e. custom work, crop insurance, government payments)		<u>150</u>	_____
Total receipts		\$1462	_____
Costs:			
Paid labor		380	_____
Other costs (i.e. rent, custom work, fuel, trucking)		356	_____
Depreciation		213	_____
Chemicals		117	_____
Operator labor		116	_____
Interest		114	_____
Repairs		100	_____
Supplies		78	_____
Insurance		78	_____
Taxes		68	_____
Fertilizer and lime		<u>43</u>	_____
Total Farm Costs		\$1663	_____
Profit		(\$201)	_____
Breakeven price (\$/ton)		\$236	_____
Breakeven yield @ \$205/ton		7.4	_____

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 or show positive returns for their investment in the farm. Still others follow with the general trend of the industry, usually with variable crop sizes.

For many growers, yields needed to be at least 5.5 tons per acre or higher to generate profits. Growers with average per acre costs will need 7 tons or better to stay profitable with current market prices. Growers can reduce their cost per ton by either increasing yields and/or reducing costs per acre.

A high yield does not guarantee profitability, nor do low yields guarantee losses. Risk management strategies such as mechanical-pruning (high node numbers) and/or crop insurance help some growers keep their income up despite adverse weather conditions. Market prices tended to drift downward during the five years.

Good yields are very important but **how** you get the good yields is less important. Our top producers do seem to have a lot of Geneva Double Curtain (GDC) blocks, but our best yielding farm (8.6 tons per acre) in the five-year average happened to be a hand-pruned HRU farm!

Growers have suffered through some tough circumstances (poor weather, declining prices) over the past five years. However, almost half of the farms with five-year averages stayed at 7 tons or better! A good portion of growers are able to compete with other growing regions such as Washington State. Lake Erie Grape Belt farm managers are responding to lower prices in a variety of ways including becoming more labor efficient, dropping some poor vineyards (especially leased ones), increasing wine grape production, and increasing farm size.

OTHER A.E.M. EXTENSION BULLETINS

EB No	Title	Fee (if applicable)	Author(s)
2006-18	Dairy Farm Business Summary, New York Dairy Farm Renters, 2005	(\$16.00)	Knoblauch, W. and L. Putnam
2006-17	Farm Family Transitions	(\$15.00)	Richards, S. and G. Conneman
2006-16	Estate Planning for Farm Families	(\$15.00)	Richards, S.
2006-15	Income Tax Management and Reporting For Small Businesses and Farms: 2006 Reference Manual for Regional Schools	(\$20.00)	Cuykendall, C., Bouchard, G. and J. Bennett
2006-14	Health Care Planning for Farm Families	(\$15.00)	Richards, S. and L. Shipman
2006-13	Dairy Farm Business Summary, Central Valleys Region, 2005	(\$12.00)	Knoblauch, W., Karszes, J., Radick, C., Allhusen, G. and L. Putnam
2006-12	Dairy Farm Business Summary, Northern New York Region, 2005	(\$12.00)	Knoblauch, W., Putnam, L., Karszes, J., Murray, P., Vokey, F., Ames, M., Van Loo, W., Deming, A., Tillinghast, C. and J. Viveiros
2006-11	Fruit Farm Business Summary, Lake Ontario Region, 2005		White, G., DeMarree, A. and J. Byrna
2006-10	The Organic Decision: Transitioning Toward Organic Dairy Production	(\$15.00)	Richard S. and S. Bulkley
2006-09	Dairy Farm Business Summary, New York Small Herd Farms, 80 Cows or Fewer, 2005	(\$16.00)	Knoblauch, W., Putnam, L., Kiraly, M. and J. Karszes
2006-08	Dairy Farm Business Summary, Southeastern New York Region, 2005	(\$12.00)	Knoblauch, W., Putnam, L., Kiraly, M., Walsh, J., Hadcock, S. and L. Hulle
2006-07	Dairy Farm Business Summary, Intensive Grazing Farms, New York, 2005	(\$16.00)	Conneman, G., Grace, J., Karszes, J., Schuelke, J., Munsee, D., Putnam, L., Staehr, E. and J. Degni

Paper copies are being replaced by electronic Portable Document Files (PDFs). To request PDFs of AEM publications, write to (be sure to include your e-mail address): Publications, Department of Applied Economics and Management, Warren Hall, Cornell University, Ithaca, NY 14853-7801. If a fee is indicated, please include a check or money order made payable to Cornell University for the amount of your purchase. Visit our Web site (<http://aem.cornell.edu/outreach/materials.htm>) for a more complete list of recent bulletins.