

# FINGER LAKES VINEYARD NOTES

Newsletter 8

August 3, 2000

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## GRAPE PRODUCTION ON THE NIAGARA PENINSULA OF ONTARIO

*Timothy E. Martinson*

In early May, a group of Finger Lakes growers and winemakers paid a two day visit to our neighboring wine and grape producing region of Ontario. Located a scant 2 1/2 hours from the Finger Lakes, the Niagara Peninsula shares a similar climate and common history of wine and juice grape production. In the past ten years, however, the Ontario industry has undergone a revolution. Following the 1991 North American Free Trade Act (NAFTA), tariffs on imported wine were eliminated. As a result, the Canadian government funded the 'Grape and Wine Industry Adjustment Program' to cushion the impact of this change. Under this program, growers received around Can\$4000 per acre to remove 'surplus' varieties and replant to new varieties. This infusion of capital sparked development of a burgeoning premium wine industry - with the number of wineries increasing from a handful to around 40 today (Sound familiar?). In this article, I will highlight a few key impressions on viticulture in Ontario.

**Geography and Acreage.** Grape production on the Niagara peninsula is centered in the zone between the escarpment - a slope running east and west delimiting the former shore of the prehistoric Lake Ontario - and the lake. The escarpment influences air circulation, bringing in warmer air from the Lake in the winter,

and moderating winter lows. The best sites tend to be about midway up the escarpment on the moderately to steeply sloping 'bench' area. The other concentrated area of production is on the eastern end of the lake plain near Niagara-On-The-Lake, on more level sites. Most native varieties are grown in higher elevation areas south of the escarpment.

Total acreage of 15,000 is split about evenly in thirds among native (*Labrusca*) grapes, hybrids, and *vinifera*. *Vinifera* acreage increased by 220% between 1991 and 1999, while hybrid acreage increased by 20% and native acreage declined by about 25%. Acreage of some hybrids increased dramatically (Baco noir by 500%; Chambourcin by about 10 times; Vidal by 40%), while acreage of other hybrids declined (Notably Dechaunac, down by 50%; Seyval blanc, down by 30%).

**Viticulture.** Since the early '90s, new *vinifera* vineyards have been planted with a great deal of site preparation. The practices that stood out most in contrast with the Finger Lakes are planting density, pre-plant earth moving, and drainage.

- **Earth Moving.** For many, vineyard site preparation starts with land leveling. It was hard to get an accurate picture of the costs involved, but Hugh Fraser (see following article) cites costs of C\$500-\$3000 per acre. Topsoil is typically stockpiled, and hillsides graded to cut and fill side slopes, after which the topsoil is again spread evenly over the surface. Advantages cited are more uniformity of soil depth and easier transit of equipment - presumably leading to more uniform vine size.
- **Planting Density.** The majority of recent *vinifera* vineyards we saw had very tight in-row spacing of 3-4 ft/vine - translating to 1200-1800 vines per acre. Vineyardists cited this as an attempt to reduce vigor, and improve canopy fill - by leaving shorter canes on each vine they felt they could reduce gaps in the canopy (due to apical dominance) found in vineyards with 6-7 ft vine spacing. My view is that this largely failed -

growers are still fighting excess vigor, and having less trellis space in which to leave buds is making it harder to achieve an appropriate balance between crop and vegetative growth. While dense plantings may make sense for some varieties and soils in the Finger Lakes, this is one practice that we don't necessarily want to emulate in NY.

- **Training Systems**. For the most part, vineyards are cane- or spur trimmed to a low wire, with vertical shoot positioning (VSP). More vineyards had arched-canecan (pendlebogen) instead of flat canes or cordons. One vineyard was using a vertically-divided canopy in which the upward pointing canopy was positioned with catch wires, while the downward pointing canopy was hand-separated at about 18-24 in shoot growth and allowed to 'droop'. Unlike the Scott-henry training system that relies on catch wires to hold the 'down' shoot 'down', this system uses no catch wires for the lower part of the canopy - it's basically like a four-arm kniffen with the top arms vertically shoot-positioned. Many growers were moving toward long (8-9 ft) metal line posts instead of wooden ones, citing lower cost and easier harvesting as the advantages.
- **Drainage Systems**. The most important contrast with Finger Lakes vineyards I observed was the intensive drainage systems installed before planting. Tile lines are typically placed in every other row or in EVERY row - that is, 9 to 18 feet apart. Lines are laid out before planting, with laterals running in the same direction as rows in row middles. Growers and viticulturists are almost unanimous in considering this to be a necessity, not a 'luxury'. One reason is that many sites have heavy slow-draining soils, and are on sites that slope less than those in the Finger Lakes. Yet even in vineyards with gravelly and sandy soils, growers cited intensive drainage as a 'must'. As noted by Hugh Fraser in the following article, even a substantial investment in tiling doesn't require much 'extra' yield to pay for itself over a 10-year time period - particularly with high-value grapes. Benefits include less winter injury potential, better soil aeration, longer periods of root function (roots less waterlogged in the spring, particularly), and less soil compaction. The following article, reprinted from the Ontario news letter Tender Fruit Grape Vine, details costs and potential benefits. Though costs may be somewhat different, in most cases the economics would work out better in the Finger Lakes, because of grape prices are higher than in Canada,

and [English] 'tons' weigh less than [Metric] 'tonnes'.

In closing, I would highly recommend to interested growers that they make the short trip to Canada to observe firsthand the recent changes in the grape industry there. You may return to the US with some new ideas to try out in your vineyard.

## EXTRA GRAPE YIELDS NEEDED TO PAY FOR TILE DRAINAGE

*Hugh Fraser*

*Vineland Station, University of Guelph*

*Note: This article is reprinted from Tender Fruit Grape Vine 2-4, March/April 1998. It details expected costs and benefits of installing intensive drainage systems in new vineyards. Keep in mind that all costs are in Canadian dollars, and 'tonnes' are metric tons (equal to 2200 lb or 1.1 of our 'English' tons).*

### Case Study

Let's look at the costs of tiling a new vineyard and how much 'extra' yield per acre is required to completely pay for cost of installation over a 10 year period, assuming one had to borrow all the money. See the attached sketch of the farm layout. I've used the following assumptions:

- The farm is 968' long x 450' wide, or 10 acres
- 50 rows of grapes at 9' spacing; rows 910' long including the grape anchors; 29' headlands
- Option 1 has 3" lateral tiles between grape rows; Option 2 has 4" tiles every other row
- Tiles between grape rows are 950' long, extending into the headland on each end
- The main collector tile is 8", running into an adjacent Municipal Drain
- 3" tiles cost \$0.45/foot to supply and install; 4" tiles cost \$0.49/foot; 8" tiles cost \$2.05/foot
- 8" steel outlet pipe with grate costs \$100 to supply and install
- Tile connections into the main collector cost \$3 each to supply and install the fittings
- Endcaps on the lateral 3" or 4" tiles cost \$3 each to supply and install
- A one-way charge to transport the tiling equipment to the farm of \$110
- The work is financed over 10 years at an interest rate of 7%

- No crop in Years 1 or 2; 25% crop in Year 3; 50% crop in Year 4; 100% crop in Year 5
- Land-leveling costs are not included, but can range from \$500 to \$3000/acre
- The \$/tonne value for the grapes remains constant over the next 10 year period
- No extra operating costs are included as a result of increased yields (such as trucking grapes)
- Vidal yields at about 6 tonnes/acre; Baco Noir at about 5 tonnes/acre; Riesling at about 5 tonnes/acre; Chardonnay at about 5 tonnes/acre; Cabernet Franc at about 4 tonnes/acre
- The system must pay for itself within 10 years of planting, even though the life of the vineyard would be far in excess of this

Thanks to Tom Farr, Farr Drainage, St.Catharines and Dr. Helen Fisher HRIO, Vineland for their help in establishing these costs.

**Summary of Costs** (Ed Note: US Equivalent in parentheses, assuming CAN \$1 = US \$.70)

	OPTION 1	OPTION 2
<b>Lateral Tiles</b>		
• Size & cost to supply and install	• 3 inch @ \$0.45/foot	• 4 inch @ \$0.49/foot
• Lateral lines	• 51 @ 950 feet each	• 26 @ 950 feet each
• Total # of feet	• 48450 feet	• 24700 feet
• Cost to supply & install (S & I)	• \$21,802 (US\$15,261)	• \$12,103 (US\$8,472)
<b>Main Tile</b>		
• Size & cost to S & I	• 8 inch @ \$2.05/feet	• 8 inch @ \$2.05/feet
• Total # of feet	• 450 feet	• 450 feet
• Cost to supply & install (S & I)	• \$922 (US\$645)	• \$922 (US\$645)
<b>Connections and endcaps</b>		
• # of connections & cost to S & I	• 51 @ \$3 each	• 26 @ \$3 each
• # of endcaps & cost to S & I	• 51 @ \$3 each	• 26 @ \$3 each
• Total cost; connections/endcaps	• \$306	• \$156
• 8" steel outlet pipe S & I	• \$100	• \$100
• Transport charges; one-way	• \$110	• \$110
<b>Total cost of tiling 10 acres</b>	• \$23,240 (US\$16,268)	• \$13391 (US\$9374)
<b>Annual loan payment over 10 yrs</b>	• \$3328 (US\$2330)	• \$1917 (US\$1342)
<b>Total of loan payments over 10 yrs</b>	• \$33280 (US\$23,296)	• \$19170 (US\$13,420)
<b>Increased yield needed to pay off loan and % of normal yield this represents</b>		
• Vidal @ \$595/tonne (US\$379/Ton)	• 0.83 t/ac; 14% increase (0.91 Tons/acre)	• 0.48 t/ac; 8% increase (0.43 Tons/acre)
• Baco Noir @ \$750/tonne (US\$477/Ton)	• 0.66 t/ac; 13% increase (0.6 Tons/acre)	• 0.38 t/ac; 8% increase (0.35 Tons/acre)
• Riesling @ \$1204/tonne (US\$766/Ton)	• 0.41 t/ac; 8% increase (0.36 Tons/acre)	• 0.24 t/ac; 5% increase (0.22 Tons/acre)
• Chardonnay @ \$1515/tonne (US\$964/T)	• 0.33 t/ac; 7% increase (0.30 Tons/Acre)	• 0.19 t/ac; 4% increase (0.17 Tons/acre)
• Cabernet Franc @ \$1683/tonne (US\$1071)	• 0.29 t/ac; 7% increase (0.26 Tons/acre)	• 0.17 t/ac; 4% increase (0.15 Tons/acre)

**Increased Yields Required Each Year Over 10 Years**

eg. for Vidal, the 10 year minimum payback in extra yield/acre per year would be:

YEAR	1	2	3	4	5	6	7	8	9	10	TOTAL
Tile cost	\$3328	\$3328	\$3328	\$3328	\$3328	\$3328	\$3328	\$3328	\$3328	\$3328	\$33280
Crop	No crop	No crop	25% crop	50% crop	100% crop	100% crop	100% crop	100% crop	100% crop	100% crop	6.75 'crops'
Increased yield/ac to payback	No crop	No crop	+ 0.21 tonnes /acre	+ 0.41 tonnes /acre	+ 0.83 tonnes /acre	0.83 tonnes /acre	+ 0.83 tonnes /acre	+ 5.6 t/ac over 10 yrs			
Extra value	\$0	\$0	\$1232	\$2465	\$4930	\$4930	\$4930	\$4930	\$4930	\$4930	\$33280

**What Size Tile and Every Row or Every Other Row?** There is no reason to install a 4" tile every row, since they would never run close to full capacity. Smaller, less expensive tiles are more practical. However, 3" or 2" tiles do not cost much less to install than a 4" tile, so many growers install 4" tiles, 'just to be on the safe side'. Also, there is no 'theoretical' reason to tile every row. Tiles 18' apart should be close enough to draw water horizontally from between them. However, water can find it difficult to percolate downward in a vineyard. The reasons are; the constant pounding of tractors, equipment and harvesters right over the tile; cultivation that can create a fine, crusty soil material over the tiles; and 'hilling' of soil in the row itself that prevents surface water flow to adjacent rows. To reduce start up costs, some growers tile every other row initially, then retiling a year or two later splitting the tile spacing with another tile. In this case, growers might install a 3" or 4" tile initially every other row, then split them later with a 3". In the case study above, Option 2 could have included a 3" tile initially every other row, with the intention of splitting these later with a 3". Using a 3" instead of a 4" in Option 2 would have reduced the cost of tiling initially by about \$100/acre.

### **Is Tiling Worth It?**

Obviously, the higher the value of the grapes, the more easy it is to justify the cost of tiling. However, from the Tables above, it is obvious that the cost of tiling can be justified strictly on the potential for yield increases alone. Don't forget that the tiles will continue to work for the entire life of the vineyard, probably at least 30 years or more. Don't tile just for the potential for more yield, since there are many other good reasons to tile. Other benefits of tiling include:

- improved grape quality, because more of the season is devoted to growing and maturing of the crop and not just surviving the weather
- higher soil temperatures, since evaporating water requires heat which reduces the soil temperature, and warm spring rains can penetrate deeper
- increased aeration of the soil, improving nitrogen release from organic matter and making fertilizer more useful
- improved drought resistance, since tiles lower the water table, forcing roots to grow deeper and allowing the plant to withstand drought longer

- better soil structure, since wet soils have less wetting and drying cycles that promote good drainage fissures
- increased bearing strength, reducing damage from tractors and harvesters, and allowing growers to do the field work and harvesting when the crop is ready, not when the soil is ready. In some really wet years, tiles could be the difference between 'getting' and 'not getting' the crop harvested.
- reduced soil erosion on steeper ground, since more water soaks into the soil
- more efficient use of machinery as work can be done more quickly, timely, with less energy and wear and tear

Intensive tiling of new vineyards in Niagara is not even considered an option by most growers, but a necessity, and it is easier to do right at the time of planting.

## PETIOLE TESTING IN 2000

*Timothy E. Martinson*

As we move into August, it is time to plan for nutritional analyses to determine your fertilizer needs. Petiole analysis is the most reliable method for determining the status of most major nutrients in grapevines. While soil tests, when used together with petiole tests, can be helpful in making fertilizer recommendations, they are not as reliable for indicating nutrient status of the plant. Here are some guidelines:

### **What tests are available?**

Complete analyses (including nitrogen) and no-nitrogen petiole tests are available through our office. We generally recommend the no-nitrogen test, for several reasons. Fall foliar analysis of nitrogen is not considered to be a reliable indicator of nitrogen needs and status. Nitrogen tests may be useful in comparing weak and strong vineyard sections, or for testing the effects of different rates on a particular variety. However, bloom-time samples are considered to be better for these purposes. Shoot growth and trellis fill are considered to be the most practical indicators of N status in the field.

### **When should samples be collected?**

More than 70 days (10 weeks) after bloom. Samples can be taken later, as long as leaves remain in good condition, but should be collected before harvest. This year (Here in the Finger Lakes) that puts us into

the last two weeks in August for Aurore, and early September for other varieties.

### **What blocks should I sample?**

- Accuracy of the recommendations depends on the representative sample. Thus a sample taken from a particular block may not necessarily apply to another block of the same variety, or even another part of the vineyard block, if it is large. Generally one sample should not be expected to provide useful information for more than 10 acres.
- Sample different varieties separately.
- For young vines just coming into bearing, sample every year for a few years. Production generally changes rapidly during the first few crops, and fertilizer needs also change.
- For mature vines that have had no major additions of fertilizer, sample every 2 to 3 years. If high rates of fertilizers were made over the past few years to improve the nutrient status of the vines, collect samples yearly to track changes in the vines, and to determine if additional amendments are needed.
- For nonbearing vines or lightly-cropped vines, samples may not be useful unless distinct visual symptoms or obvious problems appear. Without crop stress, most nonbearing and lightly cropped vines have higher levels of nutrients.
- For problem areas in vineyards, collect two samples - one in the area showing the problem, and one in a 'normal' area. Doing so and comparing samples will allow you to diagnose whether or not the problem is related to nutrient status of the vine.
- Soil tests are recommended every 3 to 5 years, and prior to planting new blocks.

### **Where do I get petiole and soil test kits?**

Petiole and soil test kits are available through the Finger Lakes Grape Program office. Show up in person between 8:00 AM and 4:30 PM to pick them up, or send a request to the program through the mail. Kits are paid for at the time they are picked up or mailed out after payment has been received in our office. Make checks payable to: Finger Lakes Grape Program. Fees are as follows:

\$18 for no-nitrogen petiole analysis

\$25 for complete petiole analysis

\$13 for soil test kit

## **GETTING A HANDLE ON INFORMATION MANAGEMENT**

*Tim Weigle*

*Sr. Area Extension Educator – Grape IPM*

Implementing a sound vineyard IPM strategy depends heavily on information. While information on the current growing season is usually easy to find, it is often a difficult task for growers to find records from previous years. Information on the current growing season is important, but it provides only a snap shot of the many variables that need to be examined before making a pest management decision. It is not uncommon for a grower to dig through their pockets, or in the pickup, for scraps of paper containing spray information, scouting records, or observations of pest problems. Often times, key information is missing and generally information from previous years is not close at hand or difficult to locate. This is where information management comes in.

The use of vineyard maps is not a new idea and I have written about it numerous times. Vineyard maps are an excellent way to start your information management system. Create a notebook with vineyard maps and notepaper to carry around in your pickup and/or tractor. Record pest, crop, weather, spray and business records in the notebook as you go through the season. At harvest you can record tonnage harvested and Brix readings for each vineyard block. This notebook can be used to record information on all aspects of your vineyard operation. While a vineyard practice or event might not seem to have an impact on pest populations at the time, this information could become useful in finding solutions to problems in the future. Use this notebook this winter to help plan your pest management strategy for the 2001-growing season. Start another notebook for 2001 or add a section to your current notebook and use it throughout the season. After a few years you will have a valuable collection of information which is easily accessible. If you have a computer, you can input the information into a database or spreadsheet and easily follow how things are going in your various vineyard blocks.

It is not too late to start building your information management system this year. The hardest part about information management is getting started and becoming used to recording the information. I think you will find the little extra effort that it takes to develop this habit will pay large dividends in the years to come.

## STRENGTHENING THE FARM OPERATIONS THROUGH WISE USE OF EXCESS CASH

*Barry Shaffer*

*Area Business Management Extension Educator*

I know most growers would say they never have excess cash or profits! I mean over and above loan payments. Most growers have experienced this due to the outstanding 1999 crop. Keeping the money within the farm gives you three options:

- Save the Cash
- Purchase Assets
- Reduce Liabilities

All three options for the excess profits you have earned leave you with increased equity, but the options do not act alike with regard to how you can use the increased equity to finance future investments.

Excess profits enhance both assets and equity (boldface type indicates the balance sheet location of the change):

**ASSETS = LIABILITIES + EQUITY**

**Save the Cash.** Of all the options for excess profits, this one preserves the greatest flexibility for future investment decisions. You can pay for a future investment with past profits. The investment will not place a cash flow demand on future profits.

**Purchase Assets.** With asset purchases, your balance sheet changes still rest with assets and equity, although the asset increase will likely be in less liquid form. Instead of cash (very easy to use or liquid) your increased assets would likely be in equipment and/or vineyards. This means it will not be so simple to finance future investments. You no longer have cash available, so you will have to borrow against the increased asset base. A loan also means that future cash flow will be required to pay for the investment, and there will be interest costs.

**ASSETS = LIABILITIES + EQUITY**

**Reduce Liabilities.** The last option is to reduce liabilities ahead of the scheduled amortization. You can tap the increased equity only by borrowing against the increased equity much like the purchase assets option. This option can reduce production costs (reducing interest cost). Remember to reduce current debt first.

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Newsletter No. 8  
August 3, 2000

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is published monthly by

**Cornell Cooperative Extension**

**Finger Lakes Grape Program**

Ontario, Schuyler, Seneca, Steuben, and Yates Counties

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## UPCOMING EVENTS

**August 17. NYS Agricultural Experiment Station, Geneva, NY.** Fruit Field Day. 8:00 AM – 4:30 PM. This field day is aimed at Apple, small fruit, and grape growers, and will feature visits to experimental plots, equipment demonstrations, and a free lunch. Look for more information in future Vineyard Notes.

**August 23. New Tripoli, Pennsylvania (just North of Allentown).** Summer Vineyard Walk Around. 8:00AM – 4:00 PM. Sponsored by the Southeast Grape Industry Association of Pennsylvania (SEGA) and Penn State Cooperative Extension. The program will feature an extensive tasting of Cabernet Franc wines from around the region and the world, with comments by winemakers from PA, LINY and VA. A large equipment showcase is planned as well as sessions on wine making, canopy management, crop management (thinning, sampling, estimating), sprayer calibration and more. A barbecue lunch is provided. The cost is \$50 for SEGA members, \$60 for non members. Late registration add \$5. Registration and information may be obtained from Mark Chien, 717 394-6851, mlc12@psu.edu. Registration deadline is August 17.

Growers can do any or some combination of these options. I would lean towards the paying down of debt for older growers or growers with high debt loads (\$200 + interest costs per acre for juice grape producers). I would consider assets purchases to upgrade the operation and/or reduce your cost per ton. Cash is especially attractive with declining revenues. Cash can either shore up your operation or allow you to take advantage of deals that may arise.



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