IN THIS ISSUE
Timothy E. Martinson

It's been a challenging harvest season, but growers and wineries have brought in a normal crop of high quality grapes, for the most part. The improved supply of hybrid and V. vinifera fruit should help wineries replenish their inventories. Favorable articles in Wine Spectator and other consumer publications have raised the national profile for Finger Lakes wines and tourism. This is good news.

Meanwhile, there are lots of changes at Cornell, with 3 new faculty at Geneva and a new extension/research program in the Hudson Valley. Thomas Henick-Kling is leaving the Enology program for Australia.

In this issue we introduce new grape and wine faculty at Cornell, highlight some of Thomas Henick-Kling's contributions to winemaking techniques and variety development, the sustainable viticulture program, and international interns working the 'crush' at area wineries. As usual, we also will recap grape prices, the economic outlook, field meetings and tours, and cooperative research programs.

Viticulture 2007 (Feb. 7-9) and the 35th NY Wine Industry Workshop will take the place of our annual grape growers convention this year. We have an outstanding program and trade show organized that will have something for every grape grower, winemaker, and business owner in the Finger Lakes. Hope to see you there!

Review of the 2006 Growing Season

The 2006 growing season marked the rebound of cold-sensitive hybrid and V. vinifera grapes that had suffered previous winter injury. After two very light crops in 2004 and 2005, the size of the 2006 crop came in at close to pre-2004 levels. The first part of the growing season was warmer than average, but then the rains started, and cooler-than-average temperatures prevailed from August through the end of harvest. Growers and wineries—hopeful during the first part of the season (no winter injury) and somewhat worried after veraison (too much rain, too little sun)—came out OK in the end. Harvest was delayed by 1-2 weeks across the board, but the quantity — and in most cases the quality — was acceptable to excellent.

Following two years of bud-killing winter low temperatures, the winter of 2005-2006 was a mild one. (Figure 1). Only on two occasions - in mid-December and late February - did temperatures go below 0°F, and then

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Figure 1. Daily high and low temperatures at Geneva, NY, October - May during the winters of '04-'05 and '05-'06.
GROWING SEASON, continued from page 1
not by much. This gave vines across
the Finger Lakes a much-needed break
from winter injury. There was none.

Sub-freezing temperatures on April 24 and
28 (down to 26°F) gave growers a scare.
Grapes were at the late bud swell stage, but
the extent of frost injury was very minor
and spotty. In contrast, Michigan and parts
of the Lake Erie grape belt were hit hard
with spring frost injury. Developmentally,
these grapes were about 6-8 days ahead of
the Finger Lakes and at or past bud
burst. While it looked worse at the time
it happened, end-of-season losses were
estimated at around 20% of the potential
Lake Erie (PA, NY) crop. Reports from
Michigan indicate at least a 70% crop
loss, with (anecdotally) 1.5 T crops from
secondary buds) that barely reached brix
standards.

Temperature and Rainfall. Ev¬
everyone will probably remember
2006 as a wet, cool year, but
that is only half true.

Seasonal temper¬
atures and degree-day ac¬
cumulations were average
through the end of June (Figure 2), and bloom
occurred within a day or two of the long-
term average. July was hotter than average,
raising the seasonal accumulation of heat
units (growing degree days, or GDD) to
about 100 GDD above average. For the
remainder of the season, the surplus GDD
accumulations shrank—indicating below-
average temperatures—until the seasonal
GDD accumulations returned to ‘average’ by the end of
October. The bottom line is that GDD’s were lower than
average from veraison (color change) to harvest.

Similarly, there was lower-
than-average total rainfall in
April and May, after which we
saw major downpours—partic¬
ularly in June and September—
that made the year particularly
wet. Uncharacteristically,
many of these rains dumped several
inches of rain at one time, rather than
the more normal 1/4 to 1 inch rainfall
we usually receive. Rainfall amounts also
varied geographically (Figure 3). At Ge¬
neva, rainfall hovered near the long-term
average until the rains of September. At
Valois, after a single 4-inch rainfall at the
2006 FINGER LAKES GRAPE PROGRAM ADVISORY COMMITTEE MEMBERS

The Finger Lakes Grape Program Advisory Committee is a group of 13 grower
and industry representatives that provides guidance and direction in planning
meetings and activities of the program. Current members are:

**Ontario County:**
Rich Jerome, Naples
John Ingle, Bristol

**Seneca County:**
Cameron Hostler, Ovid
Bill Dalrymple, Lodi

**Schuyler County:**
John Santos, Hector
Phil Davis, Hector

**Steuben County:**
Ron Emery, Pulteney
Mel Goldman, Hammondsport

**Yates County:**
Eileen Farman, Branchport
Harry Humphreys, Dundee

**Processor representative:**
Tim Moore, Canandaigua Wine Co.

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beginning of June, had an excess for the remainder of the year, reaching as much as 6 inches higher than average by early September.

Consequences. Abundant moisture led to lush growth in well-drained areas. Many growers had to respond with more aggressive canopy management (including multiple shoot-tipping passes and leaf removal) to avoid excessive fruit shading. Shading may have been a particular problem with some hybrids trained to a top wire system. I saw a few (including the new ‘Corot noir’ [formerly NY70.0809.10] and ‘Noiret’ [formerly NY73.0136.17] varieties) with shaded fruit and uneven ripening around veraison. Will wines made from these varieties have more of a hybrid character or unripe flavors this year?

On the other hand, those with poorly drained heavier soils or pockets of heavier soils saw weak shoot growth, early growth cessation, and premature leaf yellowing in their vineyards. How do you get weak canopy growth where moisture isn't a limiting factor? My presumption is that this was a consequence of waterlogged roots that weren't able to respire or grow. Some days swell when they are wet, and present a formidable physical obstacle to expanding ‘feeder root’ root tips. My guess is that if one dug up a few of these vines, one would see very weak root growth compared to vines growing on well-drained soils.

In the very droughty 2005 season, vines on gravels (especially near Hector) suffered while those in low, moister pockets grew better. We saw the exact opposite in some of the same vineyards this year. This leads to the conclusion that managing water relations is one key to sustained production of quality fruit. It also supports the notion that, when it comes to drainage tile, 1) more is generally better than less; and 2) if you don't invest in proper drainage up front, you will pay for it later. Reinforcing this notion were a couple of 2 year-old vineyards that had had extensive preplant preparation, and exhibited strong growth (up to the top wire and out) and uniformity. Other poorly-drained (and with poor weed control) 4 year-old vineyards still struggling to reach the low wire provided a useful counter-example.

If I was a grower with vineyards in the ‘water-bound’ category, I'd be looking at ways to change soil conditions. These would include retrofitting more drainage (as some growers have done), consider-

The ripening season. It was a struggle getting grapes ripe this year. In short, there was too little sunshine and heat (Brian Hed of the Northeast PA vineyard lab reported 18% less solar radiation this year; normally it doesn't vary from year to year by more than 5%) and too much moisture. Almost everything was harvested 2 weeks late. In some ways, it was the opposite of the 1997 season, which was two weeks behind, but rescued by 3 weeks of warm, dry weather in October - a period in which fruit chemistry developed rapidly, and even the late-season reds had excellent maturity when it was all over.

The lesson I draw from this is that heat and sunshine are more critical after veraison than during the first half of the growing season. Favorable fall weather can overcome delayed development during the early season, but excess degree-days early in the season cannot offset poor weather post-veraison.

Disease management. Take your pick. Powdery mildew, downy mildew, black rot, Botrytis, sour rots. They were all there, all important, and significant across all classes of varieties. The season was not kind to growers who missed important spray windows. One Catawba grower, with a 24 d 'hole' between early June.

Fruit rots and Botrytis were common during the wet harvest season.

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and late June, had most fruit destroyed by downy, powdery, and black rot. In a 'Rosette' vineyard used for spray trials, the untreated check plot (early July) had clusters that looked like fur balls from downy mildew. Another treatment with a material that controlled everything except black rot had 50% of the berries mummified. Some Chardonnay (the most sensitive variety to powdery fruit infections) and a few Riesling vineyards had significant issues with powdery mildew. Growers that were timely with their sprays had clean fruit, for the most part.

Downy mildew will perhaps have the greatest long-term impact, again due to mid and late-season leaf infections that defoliated vines. Not just V. vinifera, but also hybrids and natives like Catawba and Delaware were defoliated. Phosphorous acid products seemed to make a difference, particularly when growers were able to get sprays on in early September between rainfall events.

When I drove around the region in mid-October, I saw vineyard after vineyard with ragged-looking canopies – yellowing leaves, downy at the top, naked shoots stripped of leaves. Ripeness ground to a halt. It was the end result of a challenging disease year. Yet I also saw green, functional canopies at specific farms that continued to support ripening. This suggested to me that management did make an important difference. If you are a grower in the former category, it may be useful to visit a grower in the latter category and compare notes.

**Fruit Rots.** These were obviously significant, and sometimes difficult to separate from weather-related problems. Old Botrytis and sour rots cause Bacillus, Roux, and Seyval blanc to deteriorate rapidly, or was it berry splitting due to the rains? Was the sour rot in Pinot noir and Pinot gris caused by wet weather, or did bird injury provide a way for the sour rot to take hold? Problems with fruit breakdown before harvest were more prevalent with red hybrids (rain during the harvest window) than with other grapes. Pinot noir and Pinot gris (tight clustered, mid-season) had their issues – Pinot noir growers I talked to estimated losses from 10-30% of clusters not harvested due to rot. But the later whites (e.g., Riesling) and reds seemed to be fairly clean at harvest. It's hard to escape the conclusion that the high-valued varieties fared better than the hybrids because they received more intensive cultural controls (canopy management, shoot positioning, basal leaf removal) and botryticide sprays.

**Crop.** Tonnage is good to excellent, with a few exceptions. Processors were satisfied with the quantity of many varieties, and the white hybrids and V. vinifera rebounded in a big way. Timing was two weeks late, especially for the mid-season varieties. Sugars were on the low side, and acids definitely on the high side. By category:

**Natives.** Elvira, normally a reliable 8-10 ton producer, was reportedly down about 25%, following heavy crops last year. One third went for high-acid, while the remainder was harvested fully ripe. Concord harvest started late, and finished (at Centieria) about the 25th. Major processors hit their targets, and Concord from the Finger Lakes had hit 16 brix by the late Kosher window. Some National Grape growers finished early as more loads from the Finger Lakes were taken early to fill production schedules. Some pulled off 8-9 T crops at well above the 15 brix minimum by mid-October.

**Hybrids.** Aurora came off just before heavy September rains that would have undoubtedly degraded the fruit, and yields were up by about 30% (1100 more tons than last year, good prices too, at $400/ton), but it suffered, as their harvest coincided with the heavier rains. Harvest was forced on some varieties (Baco, Roux) while acids were still very high. Whites, with the possible exception of Seyval blanc (some of which had rot/fruit breakdown problems) did well. Cayuga White, after significant trunk injury and low yields in '04 made a comeback in the 6-8 T range.

V. vinifera. It has been a 'nail-biter', but tonnage recovered to the 3-5/acre range, and many growers were able to harvest clean fruit in the 'ripe' range. Pinot noir was harvested late (many blocks in the 2nd week in October), with significant amounts of dropped fruit from rot, but sugars and acids were in range. For Riesling, I've heard a lot of yields in the 4-5 T range, with brix around 17 or 18 and acids slightly higher than average. Late reds have significantly higher acids (around 9-10 g/l) and brix around 20. Following reduced yields in 2004 and 2005, it appears that mature vines have recovered. Replants of the 200 acres of vines killed by winter injury are still in the non-bearing phase, so total V. vinifera tonnage is still probably down from 2003 (before the big freeze), though much better than last year.

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Quality. It's definitely a good year for whites. Pinot gris should be good, and I saw some beautiful Gewurztraminer - the first real crop in three years. Riesling should do well, at 19 brix, with crisp acidity that can be balanced by winemakers with residual sugar. Lemberger came off a little late but fully ripe. For Cabernet Franc, the acids are higher than normal and seed tannins may not be fully ripe, but winemakers tell me that the berry flavors are ripe and colors are good.

Outlook. The late harvest and rainy, cool harvest season may affect wood maturity and winter acclimation. Vine reserves of carbohydrates may be down next spring, and winter lows could – as in 2003 – result in additional winter injury at a given temperature. My gut feeling is that vines were in worse shape following the 2003 harvest, and that more wood has matured this year and vines are better acclimated than they were then. But I'm hoping for another mild winter.

Financial Outlook. Last year, wineries were facing low inventories, and Concord growers were looking at the consequences of oversupply and wildly divergent prices ranging from $140-230 per ton. The prospect was that prices would be driven down to the low end. Spring frost in Michigan and the Lake Erie region helped, and growers were relieved to have prices migrate to $205-210 rather than $160 as had been feared. Nonetheless, the oversupply of Concord still hangs over the market, and prices are unlikely to rebound to $300 soon. Higher Aurore prices have certainly helped for those who grow it. But the growth in small winery demand for high-quality hybrids and V. vinifera is creating expanding markets for some growers.

One winery, for example, has increased purchases of Rougeon from about 20 tons three years ago to over 100 tons this year, and probably would have taken up to 200 tons if it was available. Another larger operation told me they have gone from selling less than 20 tons to small wineries to more than 300 tons this year. Finally, a 'new' grower with 40 acres of V. vinifera fruit has four well-known wineries buying his fruit, which is developing a reputation for quality. The Finger Lakes has a unique combination (in the East) of major processors that buy a lot of fruit and emerging small to medium sized wineries that are growing. This gives growers in this region more outlets for their fruit than other regions that only have one or the other. There are some great opportunities out there for growers, both old and new.

Reported prices for 2006 increased for all grape categories. Major native varieties saw a 3% gain in price, red and white hybrids rose 1% and 9%, respectively, and red and white V. vinifera increased 4% and 15%, respectively. The accompanying table was compiled from price lists submitted to the NYS Department of Agriculture and Markets and forwarded to our office. A detailed list of varietal prices was published in the August issue of Finger Lakes Vineyard Notes. Please note that these averages do not take into account the quantity of grapes purchased by each processor. Large processors buy more but typically pay a lower price, so the true average price is often lower than the average reported in our table.

Natives. Among the major varieties, Niagara, Elvira, Delaware and Concord all saw increases with Elvira leading the way in percent (8%) and price ($21) increases. Centerra's Cordice price was $20 below the 2005 price, but hauling allowances made up some of the difference. Average Catawba prices fell by $2. Ives showed the highest gain among minor varieties, while Diamond and Isabella had modest drops in price.

Hybrids. Among the red hybrids, Baco noir, Dechaunac and Rougeon continued their growth in price (up 5-9% from 2005). Vincent also saw an increase (3%), while Chambourcin (8%) and Chancellor (1%) saw declines. The price of white hybrids had a strong year with increases across the board. Vidal blanc and Vignoles were especially higher valued (9% and 6% increases, respectively). Aurore prices remained favorable ($358 average).

V. vinifera. Red varieties showed modest gains in price with the exception of Lemberger which was down 4%. The Cabernets, Merlot and Pinot noir all enjoyed 3-5% price increases. White V. vinifera varieties showed the best return versus 2005 with prices climbing 10-20% throughout. Riesling and Chardonnay led the way at 20%, reflecting the strong demand for these varieties.

We thank the following processors and wineries for providing copies of their price lists for this report.
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<th>Low</th>
<th>% Change (2005-2006) Average</th>
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**NEWSLETTER NO. 11**
MARKETING

2007 Agricultural Outlook
GRAPE AND WINE SITUATION AT HARVEST

Jerry White
Department of Applied Economics and Management
Cornell University

Grape Production. The New York grape harvest was estimated at 160 thousand tons. This represents a 10 percent decrease from last year. Growers in the Finger Lakes region received very little winter damage and were reporting a moderate to full crop. The crop was affected in April in the Lake Erie Region by frost damage that led to lower yields; however, due to the scattered frost effect, some growers were not hit. Lake Erie growers overall were predicting an average to below average crop.

U.S. grape production is forecast at 6.72 million tons, down 14 percent from 2005. The Michigan crop was decimated by the April frost, down about 75 percent from the large 2005 crop. California, which accounts for about 90 percent of U.S. production, expects a harvest of 6.0 million tons, down 13 percent from last year’s bumper harvest.

US Market Conditions. Early price announcements for open-market Thompson seedless and other low value bulk wine varieties in the San Joaquin Valley were discouraging. E&J Gallo offered just $125 per ton for non-contracted white grapes; $200 was offered for non-contracted red grapes. The bulk wine industry was not in a good position given the record ‘05 crush in California and more than a year’s supply already in storage tanks. The California situation underscores the fact that this market is affected by global supply and demand conditions: Argentina is exporting concentrate to the US cheaper than California can produce it.

These difficulties are not carrying over to the premium varieties. Consumers are still moving to higher priced varietal wines. According to AC Nielsen, which tracks laser-scanning data from 3000 supermarkets across the country, U.S. supermarket sales increased by more than 10 percent in volume for wines priced $5 and above. Further evidence of the importance of higher valued wines is indicated by the fact that wines priced at $14 per bottle and up now account for 12 percent of the volume, and 35 percent of California wineries’ sales revenue. Wines priced at $7 to $14 account for 23 percent of volume and 31 percent of winery sales revenue. Thus wines, priced at $7 and up, account for almost two-thirds of California winery sales. In terms of the California structure of the wine industry, these are primarily vinifera wines. Red wines made in California, with a 42 percent share of total volume, recently surpassed white wines as the predominant color of wine marketed.

What does this tell us that is relevant for New York and Eastern wines? This bodes well for producers of vinifera and high-end hybrids, especially for those wineries that can target upscale customers through internet sales and/or out of state distribution. In the national market, red is going strong, which is not necessarily the strong point for the Finger Lakes industry, but growers who can grow red varieties should continue to be rewarded by higher prices for their premium vinifera and hybrid grapes. In local direct marketing channels, which predominate for farm wineries in New York and the east, native varieties and hybrids still make up a majority of sales by volume for most wineries. About 70 percent of the production of farm wineries is sold directly to consumers. It is more difficult for wineries that rely mostly on direct sales at the winery to target customers who are willing to pay more for premium vinifera wines.

The Big Picture - The US and International Wine Markets
Performance in the US wine market continues to be driven by increased table wine consumption. Total US consumption reached 703 million gallons in 2005 (Figure 1), an increase of over five percent from the previous year. Growth is fueled by increased table wine consumption. Research by the Wine Market Council indicated that from 2000 to 2005, the number of wine drinkers in the US increased by 31 percent in households with incomes greater than $35,000.

It was Baby Boomers (born in 1946-1964, accounting for 77 million persons) who drove the wine boom in the 1970s and early 80s, and still comprise the largest group of core consumers. Generation X adults (now 30 to 41 years old), after a slow start, are beginning to consume more wine. However, it is currently the millennial generation (70 million persons, the eldest who are now age 29) who are showing a receptivity to wine that is likely to drive the beverage alcohol market for decades to come. This group is accepting wine as the Baby Boomers did 30 years ago. Another positive development is the growth in wine consumption among Hispanic consumers, the fastest growing ethnic group in the US. According to the Wine Market Council, 31 percent of Hispanic wine consumers are now consuming more wine than they were during the last few years. These factors are extremely encouraging for the future growth in wine consumption.

It is projected that the US wine market will be the largest in the world by about 2008, surpassing France, Italy, and Spain in total consumption. On a per-capita basis, however, at just over 9 liters per person, US consumption is dwarfed by that of these three countries. The total number of affluent consumers in the American

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market and the increasing interest of wine makes the US an extremely attractive market to foreign producers, and intense import competition can be expected for the foreseeable future. Imports now account for over a quarter of US wine consumption, helped by a two-year high in the value of the US dollar relative to the Euro. 

While wine consumption is increasing at a rate of five percent annually, imports are increasing by seven percent annually, capturing a larger share of the US market.

Exports in 2005 declined 17 percent in value and 16 percent in volume, following spectacular growth in 2004. The primary reason for the decrease involves a change in European sales. To save costs, some wineries are shipping their brands as bulk wine instead of bottled product. The bulk wine is then bottled abroad for distribution throughout Europe. The dollar’s two-year high against the Euro is also a contributing factor in the decline last year. U.S. wine exports, 95 percent from California, totaled $658 million with 101 million gallons.

Retail wine sales in the US reached $26 billion in 05 (Figure 2). With the increased interest of consumers in higher priced wines, sales dollars increased by more than volume. While growth in volume consumed was up 5.2 percent, growth in retail dollars was up 8.8 percent. In the last decade, retail wine sales have more than doubled, a remarkable growth rate that averages nearly eight percent annually!

To sum up the situation in the US wine market and the near term outlook for the rest of 2006 and 2007, supplies of premium grapes are in balance with overall demand, and prices for grapes are firming up. The situation for grapes used in lower valued wines sold in national distribution is less rosy, and is affected more by global supply and demand of wine and juice concentrate.

Finger Lakes Grape Prices. Grape prices were generally up for all major categories (Native, Hybrid, and V. vinifera). Centerra Wine Company (CWC), the major buyer of wine grapes in New York, listed big price increases of $75 per ton for Aurora and $20 per ton for Elvira (ripe). CWC prices for Concord and Niagara were down from $15 to $20 per ton. CWC offered across the board increases in freight allowances to its growers, as well as prepaying 50 percent of the freight allowance up front. The cash market for juice grape growers recovered to $205 per ton for Concorde, well above the $165 (for 16 BR/6 grapes) price last year.

The overall average listed prices for the major native varieties was up three percent, led by Elvira with an eight percent increase. White hybrid list prices increased significantly, with Vidal Blanc leading the way with a nine percent increase. Red hybrids price listings as a group were virtually unchanged, but Rougeon increased by 7 percent.

Prices offered by Finger Lakes wineries for vinifera grapes were higher than last year for most major varieties except for Lemberger. Stronger price increases were registered by white varieties than for red, with Chardonnay and Riesling both up by 20 percent. Vinifera prices are expected to remain strong for at least the next year or two as replanted vines from the winter damage in January 2004 have just begun to reach pre-freeze production levels. Consumer demand for vinifera, especially for red varieties, is also encouraging.

Most wine grape growers’ revenues and profits will be above last year, with a moderate to average crop in the Finger Lakes, but improved prices across the board. Growers who derive a substantial portion of revenue from Concord and Niagara grapes sold to juice and/or large winery processors are not in as strong a position. Revenues will be up for these growers, but prices are mediocre by historical standards. Growers’ net incomes will be negatively affected by relatively high costs for fuel, fertilizer, pesticides and labor even though fuel prices have decreased in the last few months.

Thoughts for the future: capitalizing on the growth of New York small wineries. The year 1976, when the Farm Winery Act was passed, was a pivotal year for the New York industry, and set in motion the rapid development of the small winery sector in New York State.

At that point, there were fewer than 20 small wineries in the state. In thirty years, that number has increased to over 200. There were 52 farms wineries established in the 1980’s, 52 additional wineries in the 1990’s, and 74 wineries have already been established since the beginning of 2000, according to MKF Research in their 2005 Economic Impact study of the New York industry. In 1990, the Finger Lakes Vineyard Notes Harvest Issue indicated price listings by variety for just seven wineries. In the 2006 Harvest Price List, there were 25 wineries listing prices. In addition, many wineries are sourcing grapes from Long Island and as far away as California.

With over 200 wineries in the state, and healthy growth continuing, it is clear that the demand for grapes for small wineries will continue to grow. Someone will supply grapes to those wineries. Having many more buyers offers opportunities, but makes the marketing function more complex for growers. The situation for Finger Lakes growers is encouraging in that there are now many more marketing options for those who have the varieties that wineries are demanding.

The current problem is that well over two thirds of the market for grapes in the Finger Lakes is still with major processors, and prices are depressed in these markets, especially for native varieties. National Grape Cooperative is going through challenging times at the moment. The 2005 Concord national crop of 563 thousand tons, which was 17 percent over the previous record crop of 480 thousand tons, still hangs over the market. Cash prices for these varieties increased to over $200 per ton in 2006, but largely because of the freeze in Western New York and Michigan, not because of increased demand. For the types of grapes being marketed to large, cash market processors (mostly native varieties for wines sold through national distribution), the low cost producer rules! So how can growers succeed in marketing to small wineries? They will need a different set of skills. In addition to growing grapes more efficiently (higher yields and/or

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Cooperative Research and Demonstration Projects in the Finger Lakes

Timothy E. Martinson

Several research programs at Geneva and Ithaca carry out projects and experiments in area wineries and vineyards. This allows them to complete applied research that would be difficult to do in Experiment Station vineyards. Here are brief descriptions of projects that have taken place over the past year with the assistance of industry cooperators. We appreciate the extra effort made by growers and wineries to support ongoing research projects in the region.

Incidence and potential insect transmitters of Leafroll Virus Strain #1 in Finger Lakes Vineyards. Marc Fuchs (Plant Pathology), Greg Leeb (Entomology), Tim Martinson and Bill Wilsey (Finger Lakes Grape Program). A previously unreported strain of grape leafroll virus (#1; previous strain was #3) has been found in the Finger Lakes, and may be transmitted through insect vectors (mealybugs and scale insects) or nursery stock. Surveys were conducted with leaf samples collected from 30 growers on over 100 vineyard blocks in the Finger Lakes to determine how common this strain is, what varieties it is infecting, and the potential for transmission to un-infected vines by insect vectors. Grower Cooperators: 30 vineyards in the Finger Lakes.

Evaluation of grape harvester output. Andrew Landers, NYSAES and Rick Dunst, Tuscanburg Lab, Cornell University, Fredonia, and Rich Erdle of National Grape Cooperative, Westfield. Two trials were conducted comparing traditional grape harvesters such as Chenyolm Ryder and Pick-Ryte with modern designs such as Gregoire and Korvan. Harvester evaluation was conducted on Niagara and Concord grapevines in mid-harvest season. Time taken to harvest, grapes left on the canopy and weight picked were noted. Cooperators on the Niagara trial were: Don Chess, Andy Knight, Scott Bill Jr., and Bill Klenz. Cooperators on the Concord trial will be the Beckman, Fennell and Woods families.

Quantifying and optimizing vine crop load. M. Oakes (graduate student) and A.N. Lakso, Hort. Sciences, Geneva. The optimal ripening of wine grapes requires a crop level in balance with the ability of the vine to support full maturation of the berries before the end of the season. Current experiments focus on how best to define just what is the capacity of different Cabernet Franc and Riesling vines and vineyards to support fruit development with vine capacities and varying crop levels. Effects on fruit composition, especially the bell pepper flavors will be related to “crop load” expressions as predictors of wine quality. Cooperators: Verrill Vineyards.

High resolution monitoring of temperatures in Finger Lakes vineyards. A.N. Lakso and R.C. Seem, Hort. Sciences and Plant Pathology, Geneva, A. DeGaetano, NE Climate Center, Cornell. Since vineyard sites in the Finger Lakes are on varying topog-
National Effort to Implement IPM Decision Support Tools Using Site-Specific Weather Technology. Robert C. Seem and David M. Gadouey, Plant Pathology, Geneva. The project’s goal is to increase implementation of IPM decision-support tools by making it easier for growers to obtain the weather information needed to operate these tools. Site-specific forecasts provide a cheaper and more grower-friendly way to operate disease and pest warning systems than do-it-yourself weather monitoring. Each cooperator receives a daily weather forecast for the next 72 hours via email that is specific for their vineyards. Preliminary indications are that the weather forecasts are both highly accurate and very useful for driving disease forecast models. Cooperators: Lamoreaux Landing Wine Cellars (Mark Wagner), Sheldrake Point Vineyard (Dave Wieman), and Knapp Vineyards (Ron Cazzetta).

Nitrate dynamics in clay and gravel vineyard soils under varying ammonium nitrate and compost additions. Jamie Hawk, Tim Martinson and Bill Wilsey, CCE. Small-scale plots were established to compare nitrate dynamics in clay and gravel soils under 6 treatments: inorganic N only (23 and 50 lbs/acre); compost only (6 and 12 tons/acre); both inorganic N and compost (25 lbs/acre and 6 tons/acre, respectively); and no additions. Samples were collected pre-bloom through veraison. This project also tested the effectiveness of a Cardy Nitrate Meter as a practical tool for immediate and accurate measurements of nitrate availability in vineyard soils. Cooperator: Matt Doyle, Centera Wine Company.

Replacing Under-the-trellis Pre-emergence Herbicides with Low, Permanent Ground Covers in Northeast Vineyards. Jamie Hawk, Art Hunt and Tim Martinson. This SARE Grower Grant Program project is testing establishment of ground covers (English ground ivy and a fescue) both beneath (ivy, fescue and bare earth treatments) and between (fescue and mowed treatments) Coverage under Concord rows is virtually complete at the end of the second year of this SARE-funded project. Subsequent years will measure changes in yield in relation to potential economic and environmental benefits of the modified practices. Cooperator: Art Hunt, Hunt Country Vineyards.

Impact and management of Grape Cane Borer in eastern US vineyards. Greg Loeb and Steve Hesler, Dept. Entomology, NYSAES and Tim Martinson and Bill Wilsey, CCE. We have completed a second year of more intensive research on the ecology and management of Grape cane borer (GCB) Amphimicrus bicaudatus. This year we 1) set up another large-scale insecticide efficacy trial to test the efficacy of currently labeled insecticides for control; 2) compared survival and productivity of canes with and without GCB damage last winter; 3) again tested the hypothesis that removal of dead wood from the canopy and vineyard floor will reduce problems with GCB. 4) will survey a number of vineyards in the Finger Lakes region this fall and winter for GCB to better quantify which canes are most vulnerable to tunneling. This winter we will put together an IPM Fact Sheet on biology and management of GCB. Cooperators: Bill Dalrymple, Dalrymple Farms and Martha & Tom Machtz, Standing Stone Vineyards, and other growers in the area for survey work in the fall.

Testing Isomate GBM+ for Managing Grape Berry Moth. Greg Loeb and Steve Hesler, Dept. Entomology, NYSAES. We set up two vineyard trials this year to test the efficacy of Isomate GBM+ for disrupting the mating success of grape berry moth thereby reducing successful mating and egg-laying. The advantage of this new mating disruption system over the older Isomate twist ties is that the new twist ties have been re-designed to continue releasing pheromone for the entire growing season. We compared pheromone-baited trap catches and damage in roughly five-acre plots with: 1) conventional pesticide program for grape berry moth, 2) conventional insecticide program plus GBM+ at a rate of 200 twist ties/Acre (label recommendation), 3) insecticide plus GBM+ at a rate of 50 twist ties/Acre and 4) insecticide plus GBM+ at 400 twist ties/Acre at edges and 50/Acre in the interior of plot. This trial is part of a cooperative project with researchers in Western NY (Tim Weigle), Pennsylvania (Mike Saunders) and Michigan (Ruth Isaacs). Cooperators: Tom Hunt and Ryan Bossert (Norbud Farms, Hector).

Albuz ATR hollow cone versus TVI hollow cone air induction nozzles. Andrew Landers and Wayne Wilcox, NYSAES, Cornell University, Geneva. A season-

Continued on page 14
Three New Faculty Members Join Cornell Viticulture/Enology Program

Timothy P. Krakowiak
Communications Services, NYSAES

A wise man once said that experience is the greatest teacher of all. But he who is wise could learn from another person’s experience.

One of the constraints to the continuing growth of the New York State grape and wine industries over time has been the lack of trained professionals who could manage the vineyards and wineries. Consequently staff either had to be recruited from somewhere else in the country, overseas, or people learned on-the-job. While it’s been determined that the New York grape, grape juice and wine industries have a multibillion dollar impact on the state’s economy, the industry can no longer afford to lose through trial and error.

Thus, three specialists are joining Cornell University’s viticulture and enology team in January 2007 to help secure a future source of personnel for the cool-climate grape-growing industry in the east.

Ramón Mira de Orduña Heidinger—hired as an associate professor of enology, and Gavin Sacks—hired as an assistant professor of enology, will both work in the food science and technology department of the New York State Agricultural Experiment Station (NYSAES) in Geneva, with half-time responsibilities for teaching in the college’s undergraduate degree program on the Ithaca campus. Jutistine Vanden Heuvel—hired as an associate professor of viticulture, will also have shared responsibilities with 60% of her time devoted to the horticultural sciences department in Geneva and 40% to teaching students at Cornell.

Three years ago, Susan A. Henry, the Ronald P. Lynch Dean of Agriculture and Life Sciences at Cornell, officially launched an undergraduate curriculum in enology and viticulture, with ten faculty currently teaching new or expanded courses. It is the first time bachelor’s degrees of this kind are offered in the Eastern United States, and adds significant strength to already strong research extension programs.

“We are delighted that Cornell will be adding three new people to its viticulture and winemaking team, which is vital to the continued success of the New York grape and wine industry,” said Jim Trezise, president of the New York Wine and Grape Foundation.

“The industry contributes more than $3.4 billion to New York’s economy each year, so its continued growth is vital for everyone, and Cornell is vital to that growth. The creation of a new undergraduate enology and Viticulture Program is truly exciting in terms of educating and training tomorrow’s leaders in the grape and wine industry, and Dean Henry deserves tremendous credit for her commitment and leadership in making it happen.”

Born and raised for the most part at the Northern edge of the Black Forest in Southwest Germany, and having spent a stretch of time in Eastern Spain as a child, Ramón Mira de Orduña Heidinger grew up bilingual, speaking Spanish and German. He learned English and French in school, and improved through his studies, work and marriage. He speaks all four languages fluently.

“I am looking forward to teaching some of the brightest students in America in my chosen discipline and I am also eager to start collaborating with the other new enology professor and existing faculty members in the department on projects in and around wine,” said Mira de Orduña.

For the past 4 years, Mira de Orduña has served as assistant professor in the food science department at the University of Guelph in Canada. Before that he worked as a postdoctoral fellow at the Cool Climate Oenology and Viticulture Institute of Brock University in Canada. He received two biology degrees—a B.S. in 1992 and M.S. in 1997, both from the University of Tübingen in Germany; and a Ph.D. in microbiology from Massey University in New Zealand, in 2001. At Cornell, he will teach undergraduate courses in winemaking.

A thesis on the arginine metabolism of malolactic bacteria and its oenological implications was his first academic contact with wine, though he worked in a wine shop as an undergraduate and was surrounded by vineyards growing up. "Wine was an everyday essential on my mother’s and father’s side," he said.

“Dr. Mira de Orduña’s balanced research experience on basic and applied fields—such as the study of yeast and bacteria interactions, bacterial nutrition and the metabolism of several compounds relevant to wine quality and aroma—will have a major impact on quality in the New York wine industry,” said Chang Y. Lee, department Chair of food science and technology at the Experiment Station.

Gavin Sacks’ initial interest will be managing methoxypyrazine compounds (which contribute green, vegetative aromas to wine) of concern to the Finger Lakes and other cool-climate grape-growing sites in difficult years. He has already talked to horticulture faculty about joint projects on methoxypyrazine research and is currently writing a proposal with Olga Padilla-Zakour, director of the food venture center at the Experiment Station, to study the effects of food processing on certain bioactive compounds found in tart cherries.

“Dr. Sacks brings in-depth knowledge of analytical chemistry by using sophisticated modern instruments such as the HPLC and GC-mass spectrometer for identifying the chemical make-up of various compounds associated with desirable and undesirable qualities in wine and other beverages,” said Lee. "He will be able to find out the biochemical mechanisms of specific aroma compounds in wine so that he can help the New York wine industry in producing vare-added premium quality wine, year after year.”
Sacks received his three college degrees in chemistry. Since 1999—after he received a B.S. from the University of Virginia—he has been at Cornell, where he earned a M.S. in 2001 and a Ph.D. in 2004. He became a postdoctoral fellow in earth and atmospheric sciences and currently holds the position of research associate in the division of nutritional sciences.

Before beginning his appointment as a postdoc, he worked during the summer and fall of 2004 at Shalestone Winery in Lodi, NY. An avid homebrewer, Sacks most recently experimented with making wine from Traminer grapes. He points out that his previous work has been united by an interest in characterizing complex matrices, and feels it is easy to draw an analogy between that and studying the formation and degradation of wine flavor compounds. “To call wine merely ‘a complex matrix’ is rather unromantic, but it is far from an inaccurate characterization,” he said.

“New York growers and winemakers are very adventurous and curious, and there is a recognition that this region’s wine will only improve in both its quality and prestige in coming years,” said Sacks, adding that he is excited to join the Enology and Viticulture Program while the local wine industry is still relatively young, especially when compared to Europe. He will teach an undergraduate course on wine and grape flavor development at Cornell.

Justine Vanden Heuvel was introduced to wine grapes and research as an undergraduate when she participated in cooperative education, working in the grape program at the Horticultural Research Institute of Ontario, in Vineland. For her Ph.D. thesis, she looked at how training systems affect vine physiology and fruit composition in Chardonnay and Cabernet Franc wine grapes in the Niagara Peninsula. Since 2002 her research as an extension assistant professor at the University of Massachusetts Amherst, has focused on optimizing yield and fruit composition in cranberry. Additionally, she conducts studies in Southern New England commercial vineyards.

She obtained her higher education at the University of Guelph, where she received a B.S. in horticultural science and business in 1996, and a M.S. and Ph.D. in 1999 and 2002, both in plant agriculture. Before she entered the masters degree program, she spent time at a commercial apple orchard in the Netherlands.

“Dr. Vanden Heuvel demonstrated an excellent combination of broad experience in viticulture with an engaging teaching style. Her research focus on viticulture effects on fruit and wine composition and quality, her experience as a faculty member at UMass Amherst and her collegiality were also very attractive to our Cornell grape and wine team,” said professor of grape physiology Alan Lakso from the Experiment Station, who acted as the viticulture search committee chair.

Vanden Heuvel looks forward to working with graduate students interested in furthering their education in viticulture. She will assume the leading role in instructing the two vineyard management courses offered at Cornell that Lakso has been teaching. This will allow Lakso and viticulturist Terry Bates—also from the Experiment Station—to begin teaching a new graduate level viticulture course.

“Students graduating from this program will have the knowledge and experience to help secure the future for the growing wine industry in the northeast and help move our wines to the forefront in cool-climate wine production,” said Vanden Heuvel.

Passing the Baton
The three new faculty members will help to continue the success of the director of Cornell’s wine research and extension program, Thomas Henick-Kling, until the leadership position is filled. Next year Henick-Kling starts his new job as director of the National Wine & Grape Industry Centre at Charles Sturt University in South Wales, Australia. While he is excited to begin in another place, he is sad not to have the chance to work with the larger enology and viticulture group at Cornell.

“The new enology and viticulture undergraduate program is well set to deliver an outstanding education for our students. Interest among students is high and the wine industry in New York and in the rest of the US is eagerly awaiting the graduates from the new program,” he said. “I think our focus in the research and extension program on wine quality has been a key factor in the success of the New York wine industry, in producing wines that can compete with the best wines in the world.”

Steve Hoying Starts Hudson Valley Grape Research Program

Joe Ogrodnick
Communications Services, NYSAES

Stephen A. Hoying has been appointed Senior Research Associate, pomology and viticulture, in the department of horticultural sciences at the Station's Hudson Valley Lab. The extension component of the position (55%) involves planning an innovative program with a concentration on apple and pear production, stone fruit production and viticulture in Eastern New York State. Hoying will be conducting an applied research program (45%) working with the same commodities.

“The Department of Horticultural Sciences is most pleased to have Steve Hoying accept the position at the Hudson Valley Lab,” said Alan Taylor, Horticultural Sciences department chair at Geneva. “Steve is already well known to the Station in his former role as Extension Educator with the Lake Ontario Fruit Team. The position at the Hudson Valley Lab will allow him to continue his excellent work in Extension and also develop a research program on apples, other tree fruits and grapes.”

Hoying believes that his previous position, Area Extension Educator, with Cornell’s Lake Ontario Fruit Program, was the perfect training ground for this position. “With this experience, I should be able to conduct applied research with very practical applications for the fruit industry,” he said.

As an Area Extension Educator, Hoying coordinated and conducted Extension educational programs for commercial tree fruit in a five to seven county region of Western New York. He served as the leader for programs in Cultural Practices and was a source of information for topics related to pest management, production economics, labor issues, harvest maturity and post-harvest storage and handling.

NEWSLETTER NO. 11
Optimising spray penetration and deposition using an improved deflector on a Kinkelder sprayer. Andrew Landers and Wayne Wilcox, NYSAES, Cornell University, Geneva. Season-long field trials were conducted in three vineyards in the Lake Erie Grape Region. Three cooperating growers sprayed large blocks of native grapevines using their traditional design Kinkelder sprayer and compared its performance to the new Cornell design of air deflector in single canopy vineyards. The air deflector was designed at NYSAES last year and manufactured for the trial by Mercury aircraft in Hammondsport. Drift reduction, canopy deposition and biological efficacy were measured throughout the season. Cooperator: Tim Moore, Matt Doyle and Steve McCann, Centerra, Valois.

Software to determine the optimal volume rate for pesticides. Andrew Landers and Emilio Gil, NYSAES, Cornell University, Geneva. A computer program was developed by Emilio Gil at the University Politecnica du Catalonia in Barcelona, Spain, to determine application volume based upon canopy dimensions at the time of application, pesticide, trellis and sprayer type. Three cooperating growers conducted season-long trials using recommended rates from the program. Biological efficacy between the reduced rate and growers own rate was noted. Cooperator: Bill Dalrymple, Lodi, John Wagner, Lodi and Mike Jordan, Westfield.

Riesling Terroir Project: Clone 239 and 90 Comparison. Thomas Henick-Kling, Tim Martinson, and Steve Letch. Wines are being made from four pairs of Clone 90 and 239 planted next to each other. Wines are vinified under standard conditions at Geneva, and flavor profiles at each site and clone pair will be evaluated in industry tastings. Bud hardiness will be sampled at three times during the dormant season. Cooperator: Cameron Hosmer, Hosmer Winery; Mark Wagner, Lamoreaux Landing Wine Cellars; John Santos, Hazlitt 1852 Vineyards; and Tom Mitchell, Fall Bright Winemakers Shoppe.

Effect of Harvest Maturity and Vinification Techniques on the Wine Quality of White Riesling. Thomas Henick-Kling, Carl Shively, and Tim Martinson. Preharvest grape samples were collected weekly from 5 vineyards and analyzed for juice composition. A total of 14 vinification practices are being evaluated for their impact on flavor characteristics of Riesling at the Geneva Vinification and Brewing Laboratory. Results will help winners modify their practices to improve flavor characteristics. Cooperators: Anthony Road Vineyards.

Effect of Harvest Maturity and Vinification Techniques on the Wine Quality of Cabernet Franc and Lemberger. Thomas Henick-Kling, Dragana Dimitrijevic, and Tim Martinson. Wines from Cabernet Franc (CF) and Lemberger (L) have the potential to be signature red wines for NY because the climatic conditions of NYS are uniquely suited to the ripening of these two varieties. It is necessary for NY producers to explore the potential flavor profile and wine texture of these two varieties more fully. Several winemaking options are being tested in vinification trials at Geneva. Cooperator: Sheldrake Point Vineyards and Anthony Road Vineyards.

Full 3-day registration will be $220 for the first registrant and $195 for additional registrants (early registration). One-day registration is available at reduced rates. Registration includes admission to the sessions, trade show, and meals. Special hotel rates ($79) are available at the Clarion Hotel, adjacent to the convention center. Conference information is posted at www.viticulture2007.org. A complete agenda will be printed in the December Vineyard Notes.

One of the areas that becomes most important is related to quality of the product. Your customer (the winery) wants disease free fruit ripened to a certain brix level to make the wine that consumers are willing to pay a premium for. Of course there has to be a give and take relationship here; there is more risk in leaving grapes longer on the vine to reach the desired maturity level. Growers should be rewarded for taking the risk and performing practices (e.g. appropriate training systems, light exposure, cluster thinning, leaf removal) to meet the quality requirements of the wines selling premium wines. Two-tiered pricing, in which higher prices are paid for higher quality grapes, is fairly common in the Finger Lakes.
An important strategic question for growers is the following: which wineries are most likely to succeed in this new era of opportunity. You need to have a good understanding of both your customers (the wineries) and the end consumer. Learn as much as you can about potential customers' sales, distribution, and terms of trade (e.g., timing of payment). How marketing oriented are your potential winery customers? Becoming the preferred supplier for a winery that has superior growth potential is a definite plus.

Which wineries will succeed in the new environment in which direct shipments to other states are permitted? One of the necessary attributes for ultimate success will be the ability of the wineries' management and marketing teams to use the internet as a communications and marketing tool to attract target customers. Growers should attempt to become long-term, preferred suppliers of those wineries that are best positioned to succeed in the new market environment with interstate shipping and broader national acceptance of New York wines.

In the May 31 issue of the Wine Spectator, there was a cover story about the New York wine industry. The story, New York Rising, featured three major wine regions (Long Island, the Finger Lakes, and the Hudson River Valley). With the opportunity for direct shipments nationally, as a Finger Lakes winery owner pointed out to me, the national press is more willing to feature coverage of New York State wines since readers now have the opportunity to become customers. Another example, from the same Finger Lakes winery, was the response to winning a national award for one of their wines recently. The winery received numerous e-mails and telephone calls from all over the US to order the wine. These examples point out the opportunities for growth, particularly with higher-priced wines produced by small premium wineries, that are now offered in the new environment with direct shipments, electronic mail and the internet. We can expect to see much more coverage of the New York industry by wine writers and the press in the future, and such opportunities should continue to grow.

The New York grape and wine industry is rapidly changing in structure. Selling grapes to major processors will be an important part of the landscape in Western New York for a long time to come. However, there are new opportunities and challenges that more entrepreneurial and marketing-oriented growers should consider. Both suppliers (growers) and customers (wineries) have changes to make in order to take maximum advantage of these new opportunities!

The diversity of New York's wine industry provides aspiring winemakers the opportunity to expand their abilities, whether it's through new varieties and techniques or the nuances of cold climate viticulture and enology. Finger Lakes winemakers, in need of skilled labor during the harvest season, likewise benefit from employing interns who bring experience and enthusiasm not often found in seasonal employees.

This fall, two interns from opposite sides of the globe are developing their skills at Finger Lakes wineries: Australian Melissa Mazzarolo works with Fox Run Vineyards and Gregoire Perron from Burgundy, France, assists Ravines Wine Cellars. Both arrived in late summer and will continue with their enology internships through the weeks following harvest.

Interns share the common goal of gaining experience in enology and viticulture outside of their home region, yet each possesses unique stories about what they are hoping to learn and how they came to be in the Finger Lakes region.

After graduating from the University of Adelaide with an enology degree, Melissa spent the better part of a year working at two Australian wineries before coming here. "I've been interested in cool climate wine making," Melissa explains. "At home, there is a small region where I did my last internship, which I really loved, that is in the higher elevations – it's a little more like here but not as cold. I really like the way that the style comes out in cool climate wine making, and I just wanted to get that experience overseas as well."

Her connection with Fox Run had its beginnings in Australia. "Peter Bell [Fox Run's winemaker] was a lecturer at my university back home – so that's where I met him, and it just went from there."

The varieties Peter works with also interested her. "I think Pinot is something that isn't done well in Australia where I'm from, so that was a variety that I was looking forward to learning how to make. He also makes a Tawny Port which I find really exciting."

Melissa loves her experience here and is impressed with the cooperation within the

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Focus on flavors:
Thomas Henick-Kling reflects on 19 years of Enology Research & Extension

Timothy F. Martinson
Finger Lakes Grape Program

Thomas Henick-Kling will be moving to Australia in January 2007 to take a new position as Director of the National Wine and Grape Industry Centre at Charles Sturt University in Wagga Wagga, New South Wales. His research and extension program in enology has had an enormous influence on the wine industry in New York and the USA. While growers know that winemaking is important, most don’t have an understanding of the technology involved, and how it has changed since 1987 when Thomas started his program. I asked Thomas to explain what technologies winemakers have adopted and how these technologies

What was the starting point for your program?

The overall goal was to focus on varieties, growing and winemaking practices that will produce unique wines of exceptional quality that fit our climate, justify a higher price, and bring a decent return to growers and wineries. It’s clear that New York can’t compete in the low-price, bulk wine market like California, Australia or South America. We needed to focus on varieties and styles that fit our unique cool climate. There were some wines with outstanding quality that showed that potential 20 years ago when I came. Riesling and Cayuga White, for example. Pinot Noir was another one. My colleague in viticulture, Dr. Bob Pool had started a variety and clone evaluation trial before I came to Cornell.

Screening varieties and clones with Bob Pool and Bruce Reisch has been a major, ongoing task. What role did the winemaking part have in evaluating these varieties and clones?

As I mentioned, Bob Pool had started a Pinot Noir clonal trial. Our evaluations of these clones identified clones PN Mariafeld, 113, 115, and clone ’V’ that produced outstanding flavor in our climate and were well adapted to commercial production in the Finger Lakes. We also have a good group of Chardonnay clones from Bob’s Chardonnay trial. Lemberger, which Bob had planted in with the Pinot Noir, had interesting characteristics that fit well in New York. It starts ripening earlier than other reds, producing very attractive berry, plum and earthy flavors, a full body and very good color, and it doesn’t hold on to the ‘green’ flavors like Cabernet Sauvignon and Cabernet Franc. It hangs longer than some other varieties and makes excellent full-bodied wines. It also is a very good blender with Pinot Noir, Cabernet Franc and Cabernet Sauvignon. Even if it’s underripe, it makes lighter, but still pleasant wines. Several wineries have planted Lemberger and are making varietal wines or using it as a blending tool.

In collaboration with Bruce Reisch, I set the goals of the grape breeding program to focus on expanding the range of flavors beyond what was available from the existing hybrids. We already had Cayuga White, with favorable vineyard characteristics, and very attractive flavors from barely ripe to 17-18° Brix. Cayuga fits into a variety of styles, from dry to sweet, and is also a very good blender with other varieties. We knew we didn’t need something similar, so the breeding objectives were to look for other hybrids with similar vineyard characteristics (disease tolerance, winter hardiness) that could produce different flavor profiles. We looked for Gewürztraminer-like, Muscat-type, and Chardonnay-type flavors. The program has released varieties with these flavors - Traminerette, Valvin Muscat, and Chardonnel. In our grape variety evaluations we conducted trials to find out what winemaking techniques would allow the wines to express these flavors.

With the red grape varieties, I realized we needed to change the winemaking practices used to screen new selections. Red wines used to be made in very small lots, with standard SO2 and yeast additions and no temperature control. The wines often came out thin and green, with poor flavor expression. We started using larger volumes, temperature control, different yeasts and malolactic fermentation. Once we changed techniques, we found red selections in the breeding program that had nice tannins and mouthfeel. NY73-1036,17 and NY70,8080,10 [Recently released Noiret and Corot Noir] had been here and tested, but never selected because the winemaking techniques didn’t express the flavors and tannin textures. Their tannins and mouthfeel, along with nice berry and plum flavors make them superior, and quite different from current red hybrids planted in the Finger Lakes.

These new Cornell varieties give wineries in the Finger Lakes a wide range of flavors to work with—the ones that weren’t previously available to them. They make a nice addition to the premium vintners, and allow winemakers to make lower-priced wines with different flavors.

Now that we have these varieties, the next step is to produce ones with much greater disease resistance. During our collaboration I encouraged Bruce Reisch to establish a ‘nospray’ block to find highly disease-resistant selections with similar wine qualities.

How has winemaking changed? What are the key practices and technologies that have been adopted by winemakers?

We focused on winemaking techniques to express the diverse flavors. Two key ones are malolactic fermentation and heat treatment for red wine fermentations. Small wineries often fermented reds in one ton grape bins with no temperature control, and many didn’t use malolactic fermentation. The result was often thin, pale red wines, lacking flavor, and texture. Saccharomyces
yeast doesn't grow well at 10° C (50° F), and this offers an opportunity for other microorganisms to grow and impart off flavors. By warming the must to 20-25 ° C (70-75°F), winemakers could ensure that Saccharomyces yeast predominated, and avoid growth of spoilage micro-organisms. Malolactic fermentation, used with both reds and some whites such as Chardonnay, lowers the wine acidity and improves mouthfeel. We have worked for many years with yeast and malolactic starter cultures to improve the selection and functionality of yeast and bacteria starter cultures for wine. Winemakers now have access to appropriate starter cultures and techniques to monitor and use malolactic fermentation to produce better wines.

Another area where we did a lot of work was in using different yeast and malolactic starter cultures to enhance certain wine flavors. We first did small-scale trials in our experimental winery to see if they would result in different wine flavors. They did, and we moved on to cooperative trials in wineries with commercial sized lots. Winemakers adopted these quickly, and I feel that NY winemakers are perhaps more knowledgeable about which strains to use under certain conditions than are winemakers elsewhere.

We also did a lot of work with yeast nutrients. We did extensive surveys across NY that showed that the content of yeast available nitrogen (YAN) was low. This lack of nitrogen results in stressed yeast that produce reduced sulfur off-odors and stuck fermentations. As winemakers added yeast nutrients (Diammonium phosphate or DAP and other nutrients such as Fermaid and Yeast Superfood), the incidence of reduced sulfur (stinky wines) went down dramatically, and there were fewer stuck fermentations.

The only common problem causing stuck fermentations that remains is the imbalance of glucose/fructose towards the end of fermentation. Saccharomyces yeast prefer glucose to fructose. In some cases they deplete the glucose so fast that only fructose (a different form of sugar) remains, and fermentation stops. When winemakers have tried to restart and failed, they send us a sample to analyze, and it's almost always the glucose problem. I learned from my colleague and long time collaborator, Dr. Jürg Gaffner (Swiss Federal Research Institute, Wädenswil) that adding glucose can restart these stuck fermentations. There is also a newly selected yeast strain of Zygosaccharomyces that can ferment fructose and can restart these fermentations.

Atypical aging (ATA) of white wines is another major area where we have identified a problem and have started to do something about it. It is very important that we have been able to show [through a vineyard trial] that drought stress is a problem in NY State. I just retasted 2001 wines from our ATA trial, and after four years there are still consistent differences between the irrigated and non-irrigated blocks, and those we treated with ascorbic acid or not. The 'irrigated' wines still had more flavor ripeness, and those treated with ascorbic acid are holding up even after four years. The ones which had no ascorbic acid added are not. There is still more work to be done, but we have a better handle on it, and should be able to produce more consistent wines from year to year—particularly in those drought years.

The New York Wine Analytical Laboratory that Ben Gavitt manages is a service your program started in 1988. How did this influence your overall program?

We started this service because many small wineries didn't have the capacity to do even routine wine analysis needed for winemaking. We process about 450 samples each year. Most are sent to us when winemakers realize they have a problem—it would be better if samples were sent earlier, before problems become apparent. That way corrections could be made earlier for better wine quality. This service is valuable to us, because it gives the program a good idea of what problems are out there. We learn from it, and it gives us information for research projects and extension advice. The winemakers that send in samples get the numbers, and they also get a lot of advice.

What will you be doing in Australia?

I will be responsible for strengthening the research program at the National Wine and Grape Industry Centre. Charles Sturt University has an undergraduate program of 600 students. Faculty are primarily involved in teaching these students, but there is also a State-run research unit there. With new funding, the University will be hiring 10 to 15 people to add to their research capacity, both in Viticulture and Enology reaching a number of about 30 scientists. I'll be involved in overall research planning, hiring, facilities planning at the Centre, providing a link in industry relations, communication with funding agencies, and long term strategic planning with the Australian wine industry.

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Finger Lakes industry. “The wine making community really collaborates with each other, which I found pleasantly surprising. At home it’s more of a competition – no one really gives out their secrets and no one likes to compare notes, but here it’s very open and everyone is trying to make the best wine they can. They’re learning from each other which is really interesting—definitely a better way to do it.”

Gregoire’s story highlights his own perspective and expectations of his internship. His experience is part of his education toward his planned estate in Burgundy which he will be setting up in 2007. He specifically chose a winemaker with similar styles to what he is used to so instead of a desire to broaden his varietal and climate experiences, he has chosen to specialize on those styles and techniques he hopes to master on his own estate. Asked what brought him to the Finger Lakes, his answer was simple, “English”. In addition to developing his viticulture and enology skills, Gregoire sought to enhance his proficiency in the English language.

Gregoire also values his experience here and is amazed at the number of varieties grown in the Finger Lakes. “I have enjoyed working with varieties such as Vignoles and Cayuga White, but growing grapes here is the biggest challenge I see. In Burgundy we have two or three varieties, and the harvest is done in 10 days. We work hard in those days, but it is done quickly and we are in the cellar after that.”

For area winemakers, interns are a valuable resource when it’s not practical to hire year-round staff, and by choosing a Finger Lakes winery, interns are afforded a wide range of viticultural and enological experiences. Both Peter Bell and Morton Halgren (Ravines Wine Cellars’s winemaker and owner) employ interns each year during harvest season. Peter seeks interns that are at least on their way to a degree in enology, while Morton looks for interns with a background in the European winemaking style—both scenarios require little instruction time to get the intern intricately involved, minimizing the winemakers’ resources allocated to the intern. Recruitment varies, as Peter relies on word-of-mouth, while Morton uses a French agency that matches the desires and needs of interns and winemakers, but the end results are the same. Skilled, enthusiastic interns gain valuable knowledge and experience while filling an important role during the winemaker’s busiest season.
2006 FIELD MEETINGS

Tina Hazlitt, Sawmill Creek Vineyards and Bob Madill, Sheldrake Point Vineyards talk with students and CALS Dean Susan Henry (right) at the Grape Expo, held in February at Cornell.

February 24. CALS Grape Career Expo, Roberts Hall, Cornell University. This event, organized by the CALS Career Development Office and the CALS Viticulture and Enology Steering Committee, brought winery and vineyard businesses together with CALS students seeking summer jobs and internships. Participants: 16 wineries and vineyards from throughout New York, Career Development Office, New York Wine and Grape Foundation.

May 19. Spring Pest Management Update. Our annual Pest Management meeting was held at Lakewood Vineyards near Watkins Glen. It featured updates from the DEC, insect, disease and weed management updates, a spray technology update, and industry updates. Jamie Hawk informed growers about the Sustainable Viticulture project, and Jim Bittner of the NY Farm Viability Institute updated growers on the mission of the institute. The meeting closed with a barbecue and wine tasting hosted by Lakewood Vineyards and catered by Smoke 'n Bones of Burdett. Special thanks to the Stamps at Lakewood vineyard for hosting this event, and providing the tractors and vineyard for the spray demonstration, and for suppliers who sponsored the barbecue. Participants: Ed Hanbach, (NY DEC), Greg English-Loeb (Entomology), Wayne Wilcox (Plant Pathology), Jamie Hawk (Finger Lakes Grape Program), Jim Bittner (NY Farm Viability Institute), Rick Dunst (Fredonia Lab), Regina Reichenberg (Valenti), Charlie Smith (VAP Northeast), Chris Daum (Helena), Jake Pieczarka (Gowan), Dave Stamps, and Lakewood Vineyards Host.

Rick Dunst talks about weed management at the Spring Pest Management Update.

July 20. Compost field meeting. Centerra Vineyard Manager Matt Doyle has started a new project to compost grape pomace generated at Hammondsport and return it to company vineyards. They are currently using it on adjacent 'Elviira' vineyards and hope to do more in the future, including the much larger quantity generated at the Canandaigua winery. Our program set up small scale plots to look at the patterns of nitrate-nitrogen release following both compost and ammonium nitrate applications. Informal discussion included: Jean Bonhotal, Cornell Waste Management Institute, presented the general principles of composting. Jamie Hawk, described his fertilization research underway in conjunction with Centerra's composting program and presented preliminary results. Participants: Jean Bonhotal (Cornell Waste Management Institute), Matt Doyle (Centerra), Jamie Hawk (Finger Lakes Grape Program). Hosted by Centerra Vineyards.

August 18. Chris Verrill Harvest Ridge Vineyard, Ovid, NY. Chris and Kristin Verrill came into my office in 1998 as medical professionals and said 'we want to become grape growers'. Eight years later, they have 40 acres of high-value grapes, marketed to 4 small wineries. They are becoming known for their high-quality fruit. Chris described how they overcame deer pressure (installed invisible fence and huskies), drought (dug a pond and installed drip irrigation), and winter injury (hilling up) in getting their business up and running. This year, after investing $15K per acre, they are in 'positive cash flow' territory. The second part of the meeting focused on research projects by graduate students Michelle Oakes (Canopy management and fruit quality of Cabernet Franc), Dr. Alan Lakso is advisor), Vinay Pagay (Physiology of grape ripening process, how to hasten to achieve more uniform grape quality, Dr. Laila Cheng is advisor), and Dr. Alan Lakso, who has numerous small temperature sensors to study small scale temperature variability at this and other vineyards. Participants: Chris Verrill, Dr. Alan Lakso, Michelle Oakes (Graduate Student), Vinay Pagay, Host: Chris Verrill (Harvest Ridge Vineyards), Ovid, NY.

Focus on New Cornell Varieties featured a field tour and tasting of wines made from...
August 23. Focus on new Cornell varieties - Viticulture and Wine Tasting. Swedish Hill Vineyards has had the largest and oldest plantings of the 3 newly-released Cornell varieties, including the two 'red' varieties Corot noir (NY70.0809.10) and Noiret (NY73.0136.17) and the white 'Muscat' type Valvin Muscat (NY62.0122.01). Grower, winemaker, and owner David Peterson described how the varieties performed in the vineyard, and particular challenges in growing them. He also noted that the new varieties fill some 'gaps' in variety choices for the Finger Lakes. The two reds produce more full-bodied, tannic wines than current red hybrids, and the white 'Muscat' provides other options not previously available in aromatic white varieties. Grape Breeder Bruce Reisch also provided additional commentary. The excitement grew when we went inside to taste barrel samples from Swedish Hill and Presque Isle Wine Cellars and commercial blends (Maren 4 is a Swedish Hill blend of the two reds that retails for $14). These wines are definitely different than Baco noir, Marachel Foch, and Dechaunac, current red hybrids grown in the region. These are varieties that will provide new options to Finger Lakes wineries that didn't exist previously.

Richard Smart at Sawmill Creek Vineyards.

August 24. Dr. Richard Smart Seminar. 1:30 to 4:30 PM, Hector Fire Hall and Sawmill Creek Vineyards. Jim, Eric, Tina, and Sue Hazlitt hosted this field meeting and indoor seminar by Australian/Tasmanian viticulturist and world-wide consultant Dr. Richard Smart. Dr. Smart studied with Nelson Shaulis at Cornell in the 1970s, and wrote an acclaimed, grower-friendly book entitled Sunlight into Wine. He presented a one-hour indoor talk on 'Canopy Management in a Variable Climate', after which we made several stops at many locations in Sawmill Creek vineyards to look at a variety of vineyard problems/opportunities. Participants: Dr. Richard Smart, Hosts Jim, Eric, and Tina Hazlitt of Sawmill Creek Vineyards

Sustainable Viticulture Workbook to Be Released

Jamie Hawk
Finger Lakes Grape Program

New York's sustainable viticulture program, established through a cooperative effort between the Finger Lakes Grape Program, Lake Erie Regional Grape Program and Long Island's grape extension program, is designed to both document sustainable grape growing practices already in use and promote sustainable practices throughout the industry. The foundation of the program is its grower self-assessment workbook - 140 questions in 8 sections covering the multitude of management decisions faced by New York State grape growers.

The workbook sections evolved from materials of two separate programs in New York: NYS Agricultural Environmental Management (AEM) worksheets and a similar workbook developed for Long Island growers by the Long Island grape program. A steering committee composed of extension, research, industry and grower representatives (from National Grape Cooperative, Centera Wine Company, the New York State Wine Grape Growers, and Finger Lakes and Long Island vineyards), tackled the task of reviewing and developing questions that encompass the wide variety of practices used in the diverse growing regions of New York. The workbook serves as a roadmap for evaluating viticultural practices, addressing the diversity of the state's grape growing industry with a broad range of questions.

Five growers from each of the three regions volunteered to field-test the workbook and provide feedback on the draft version. Unanimously, the growers saw no need for major revisions, and a working draft has been submitted for final design and formatting before being published this winter.

Continued outreach has been funded through a grant from the New York Farm Viability Institute. To date, a total of twenty-two growers from the Finger Lakes, Lake Erie region, Long Island, and Hudson Valley have completed the workbook. The next step with these growers, slated to start this fall, is the development and implementation of an action plan based on the results of their self-assessment. The workbook has been adopted by the State Soil and Water Conservation Committee as the new AEM workbook for viticulture. Soil and Water Conservation District personnel will work with us in developing action plans and connecting growers with cost-sharing opportunities available to them. Completion of the workbook and action plans with additional growers will start again after harvest.

Complementing the workbook is the Sustainable Viticulture in the Northeast newsletter, which provides an in-depth examination of the economic, environmental and social implications of specific production practices. Two newsletters have been published thus far, "Optimizing Nitrogen Use in Vineyards" and "Soil and Water Conservation Practices for Vineyards." Future topics will include innovative weed management, reduced risk pesticides, scouting and biofuels, among others. We hope to publish six newsletters per year, which, taken together, will create a valuable resource for growers.

A website dedicated to the program will be launched this winter, which will contain an interactive version of the workbook. Growers will have the ability to create an account and password to complete the workbook on-line at their own pace.

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on-one assistance from Jamie Hawk (Finger Lakes), Edith Byrne (Lake Erie) and Libby Tarleton (Long Island and Hudson Valley) will continue as well. The 22 growers participating thus far manage 2,500 acres of grapes. Our goal is to have 35 growers active in the program by mid-2007 and 100 in the program by the end of 2008 (based on the average farm presently active with the program, these 100 growers will represent about 11,400 acres or 36% of the vineyard acreage in New York).

The potential benefits to participating growers include: 1) Cost-sharing opportunities for financing conservation needs through the Soil and Water Conservation Districts; 2) increased product marketability for grapes and grape products; 3) economic and environmental savings through efficient use of fertilizers and agri-chemicals; and 4) improved neighbor relations and industry reputation. Wine production is a high-profile agricultural enterprise. By making it an industry-wide goal to produce grapes, juice, and wine utilizing practices that minimize environmental impacts and are economically viable and socially responsible, growers will reduce risks, improve profitability and stay competitive with other regions.

If you have questions about the sustainable viticulture program or would like to participate, please contact Jamie Hawk at (315) 536-5134 or jdh73@cornell.edu or contact your local grape extension team.

Note: This project funded by the Northeast Center for Risk Management Education and the New York Farm Viability Institute.

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