
VERAISON TO HARVEST

Statewide Vineyard Crop Development Update #9



Cornell University
Cooperative Extension

October 25, 2013

Edited by Tim Martinson and Chris Gerling

Around New York...

Statewide (*Tim Martinson*).

Cooler weather and frost predicted for tonight or tomorrow signal the tail end of the harvest season. In our final weekly sample, we are down to six blocks (from 20 last week) – a couple of Cabernet Franc blocks, Riesling, one Concord, and one Merlot and Malbec block each from Long Island. There is not much to say about the numbers, except that by the numbers these remaining blocks look ripe. Compared with final 2012 samples, most of the varieties we sample ended up with similar brix and titratable acidity – but arrived there two to three weeks behind last year's early harvest. Riesling is an exception, with brix averaged over 12 blocks running about 2° below last year's numbers.

According to Kevin Martin of the Lake Erie Regional Grape Program, the Concord harvest is about 75% complete, with major processors planning on receiving grapes for another week to 14 days – which will push the end of the Concord harvest into November 5 or 6 this year. Contributing to the extended harvest is the high tonnage. Welch's has been running above capacity, and Rich Erdle, director of grower relations for National Grape Cooperative, is expecting final tonnage (from NY, PA, and OH) of Concords and Niagaras to total around 155,000 tons – a record crop. Constellation finished this past week.

This year, David Mann of Anna Katharine Mansfield's program has been running analyses of individual acid composition (malic, tartaric, and citric) for all the *Veraison to Harvest* samples. Chris Gerling (p 3-5) reports results in our Project Focus article this week.

Our final issue next week will provide an overview of the vintage and fruit composition trends over the past 5 years.

Long Island (*Alice Wise and Libby Tarleton*).

Harvest is winding down on Long Island. Canopies are declining in large part due to the lack of rainfall for the last few months. The streak of warm fall weather is finally over.

Temperatures this week were more typical of late October, in the 50's and low 60's. While a few blocks of Merlot linger, for the most part growers are finishing up with Cabernet Franc, Cabernet Sauvignon and Petit Verdot. Flavors have been intense and nicely balanced; it has been great fun to taste fruit in the vineyard.

Due to the extended drought, this was not a big year for disease. However, given the very ripe fruit in most vineyards, there has been a bit of sour rot and *Botrytis* in the reds. This was easily field cleaned during harvest.



Grapevines ready for final frost in this machine-harvested Riesling block trained to vertically-divided 'Scott Henry' system.

Photo by Tim Martinson

The favorable conditions and good fruit condition has permitted growers to harvest a few more blocks by machine, a major time and money saving practice. Growers and wine-makers can agree on one point – this was a great harvest. We cannot proclaim it a benchmark year until we taste the wines but that designation remains a possibility.

Finger Lakes (*Hans Walter-Peterson*).

The 2013 harvest season will be wrapping up over the next week or so. A few Riesling blocks are getting picked this week, but the focus has shifted to later season varieties like Cabernet Franc, Cabernet Sauvignon, Catawba and Vidal.

Concord harvest at Constellation Brands wrapped up at the end of last week, and finished with acceptable brix levels despite the heavy crops in a lot of Concord vineyards this year.

The phrase that comes to mind when I think about the 2013 growing season in the Finger Lakes is “defying the odds.” We managed to avoid any significant spring frost this year, which was good, but the conditions during and after bloom and berry set were less than ideal, to say the least.

Cool, cloudy and damp conditions dominated during Concord bloom this year, which caused some concern for the potential of poor fruit set to have a major impact on yields. As it turned out, many varieties “defied the odds” and set larger than average crops this year despite the conditions during much of set.

This was particularly true in Concord and Niagara vineyards, with growers estimating 12-18 tons/acre in July. Some growers responded to these large crops by thinning to encourage better sugar accumulation in the remaining fruit and reducing the stress that such a large crop can impose on vines. Even so, the Concord and Niagara crops in the region this year was one of the largest ever.

There was great potential for late season rots to develop as we entered harvest due to high levels of early season botrytis infections on flower parts and small berries. Fortunately, September helped us “defy the odds” once again by staying dry and sunny for most of the month, which helped to keep a lot of these early infections from really wreaking havoc in a lot of vineyards during harvest.

It also made for some excellent conditions in which to pick grapes. Most wineries were doing some sorting at the crushpad at points during harvest to remove overly rotten clusters and prevent them from impacting final wine quality.

Heavy yields this year have also made it a challenge for many wineries to find enough storage capacity to contain all of the grapes that they received this year. Some places have been digging out old tanks, steel barrels and carboys that haven’t been used in years in order to hold this year’s crop. The New York Grape & Wine Classifieds has been getting a lot of ads this year with grapes for sale, and it seems likely that some fruit may end up without a home this year.

While it’s difficult to make any real assessment about the quality of the fruit from this season before the final product goes in the bottle, the overall impression at this point is that 2013 was good for growers from the standpoint of healthy yields of fruit, and good for winemakers as the fruit that was delivered had nice flavors and good acidity levels, which should result in some very good wines being bottled next year.

Lake Erie (Luke Haggerty).

The rain is making things difficult and very sloppy. Most areas in the Lake Erie region have seen rain for



Parts of the Lake Erie region have seen rain for the last 10 to 13 days in a row. Many vineyards have standing water—especially in the low spots.

Photo: Luke Haggerty

the last 10 to 13 days in a row. Most vineyards have standing water especially in the low spots (see picture). We are hoping to see a break from the rain next week. Rain or shine the grapes will continue to be harvested.

Even with the wet conditions we are seeing reports of higher than expected sugar levels and of course a heavy crop load. Cabernet Franc, Cabernet Sauvignon, and Concord are the few cultivars left to be harvested in the region. With cold weather moving in, vine leaves continue to yellow and in some blocks have begun to drop. The end of the harvest season is near.

In terms of heat accumulation the 2013 growing season was about average, however the amount of precipitation was higher than average. These conditions set the stage for a good growing season that contributed to one of the region’s heaviest crops. This year’s heavy crop load lead to ‘crop thinning’ across the Lake Erie grape belt. On approximately 50% of the acreage, Concord growers thinned their crops in order to bring the crop loads down to a manageable size.

With the good growing conditions this year we’ve also seen heavy weed and disease pressure which resulted in more spray applications than most growers are used to applying. We also saw fair amount of grape berry moth (GBM) damage on the Concord crop, especially next to wooded areas. Most of the GBM damage was followed by secondary problems of fruit fly infestations and disease.

I would like to thank the CLEREL staff for collecting this year’s fruit samples and putting up with all the mud. New to this position, I would also like to thank the area growers who have invited me to their farms and the many Cornell and Penn State researchers and extension associates who have been very welcoming. Thank you!



High Pressure Liquid Chromatography (HPLC) unit was used this year to analyze individual acids present in *Veraison to Harvest* samples.

Photo: Chris Gerling

PROJECT FOCUS: THE YEAR IN ACID

Chris Gerling and David Manns

Sometimes two acid measurements just aren't enough. This year, in addition to the usual pH and titratable acidity (TA), we also collected individual organic acid profiles for every sample. For more on the basics of how we analyze for organic acids and why we might want to do this, see issue #4. Now that we have finished the analysis for the season, we can take a preliminary look at some of the data we gathered. This look is extremely preliminary, because just like the rest of V to H we only finished gathering it this week. There is more analysis to be done, but here are some observations at first sight.

I highlighted three potential areas of interest in the first article, and now, with the benefit of a second look, I wish I hadn't. No, that's not entirely true. I'll update where we are in each case.

- **Acid Makeup of Hybrids.** There are a number of projects currently underway focusing on hybrid grapes and/or wines, but *Veraison to Harvest* isn't really one of them. While we have a few hybrids in the mix here, look for far more information to come from the Northern Grapes, NE 1020 and VitisGen projects.
- **Succinic Acid Riddle.** In the first article we mentioned that we seemed to be seeing succinic acid where we shouldn't be seeing it: before fermentation. After a couple weeks of consistent results, we ran a standard against shikimic acid, and found out that a very little bit of shikimic looks exactly like a lot of succinic acid. Mystery solved. You won't see shikimic in any of the figures because we hate it for messing up the analysis. No, you won't see it because it is present in very tiny amounts, and while it shows up large on the HPLC, it makes no significant contribution to the acidity of the juice. For comparison, imagine seeing a photo of

a dinosaur footprint in a supermarket tabloid. Upon further review, it's actually highly magnified and was made by a canary.

- **Acetic Acid and Rot.** The acetic acid measurements made a little more sense. First, there were only really measurable amounts in a couple of samples, which is a very good thing and quite impressive given the challenges of the year. If I were to sum up the acetic detection in one word, it would be "Vignoles," which probably isn't a huge shock to anybody. The only vinifera sample that had meaningful acetic acid was harvested a couple of weeks early given the variety, suggesting that others noticed the same thing we did.

The Charts. There are a lot of numbers that come with these reports, so for this week I decided to just choose a couple of snapshots. The first two figures are from week four, somewhat mid-way through the season. Figure one is all of the Cabernet Franc samples in V to H. There are Cab Francs in every V to H region so it seemed like a good cultivar to choose. The variety with the most representation in any region is Finger Lakes Riesling, so figure two is a look at all of them on that date. Finally, figure three is a time course of three samples that were still in the field on week nine, giving us the maximum data points. Table one (p. 5)

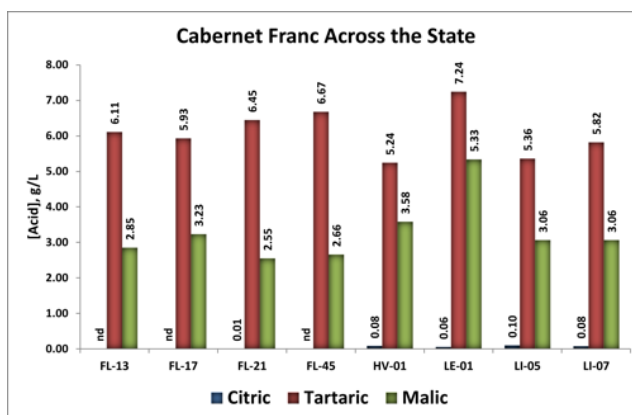


Figure 1. Comparison of Cabernet Franc samples from across New York state, week 4

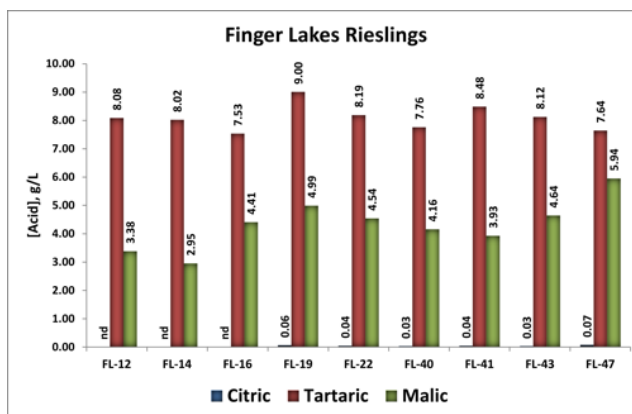


Figure 2. Rieslings from the Finger Lakes, week 4

is the brix, pH and TA from week four compared with the sum of malic and tartaric acids as well as each individually. This comparison provides a good segue to the next issue.

Comparing OAs to TA. It would be nice to think you could add up the individual organic acids and have the sum be pretty similar to the TA. As you can see from just the tartaric and malic, you can't do that. Just like pH and TA are distinct measurements, the organic acid profile is something else again. There are a number of reasons for this, starting with the fact that we're talking about different acids. The HPLC quantifies each acid on its own molar terms. When we report TA, we report it "as tartaric," which means we pretend all the acid is tartaric. It's kind of like having 5 American dollars, 3 Euros and 3 Swiss Francs and saying you have 11 dollars.

Of course, if it were only a matter of applying exchange rates or conversion, things would be (relatively) simple. Grapes also contain potassium and sodium cations that are partially titrating the juice before the "real" titration is performed. Going back to financial terms, think of a checking account where some out-of-state checks have just been deposited but haven't cleared. The TA is the available balance and the organic acid profile is the total balance.

Finally, there are also some acids we don't quantify with HPLC and some other substances that are titratable with sodium hydroxide but are not what we usually consider to be acids. For a financial comparison in this case, please refer to the federal budget or a Florida mortgage agreement circa 2007. As I said already, the bottom line: they don't add up.

What Does it All Mean? There are some basic implications for tartaric/ malic acid ratios that I have written about previously, mostly relating to pH. A sample with proportionally more malic acid than tartaric will likely have a higher pH than one with more tartaric, assuming roughly equal sums of tartaric plus malic. If the pH is higher than the acid ratio might suggest, there may be more potassium or other cations present. We are currently upgrading equipment to allow for better potassium measurement. In the greater scheme of things, we don't know what this data means yet.

Veraison to Harvest is really a window into our lab at this time of year. I would compare where we are with this data to where you are with your wines. We've put something in the tank and now it's going to be a few months (or years) before we really know what we have, only instead of fining trials there will be statistical regression. And we can make a deal right now- if you have an outstanding wine or we find a really cool relationship, let's keep in touch.

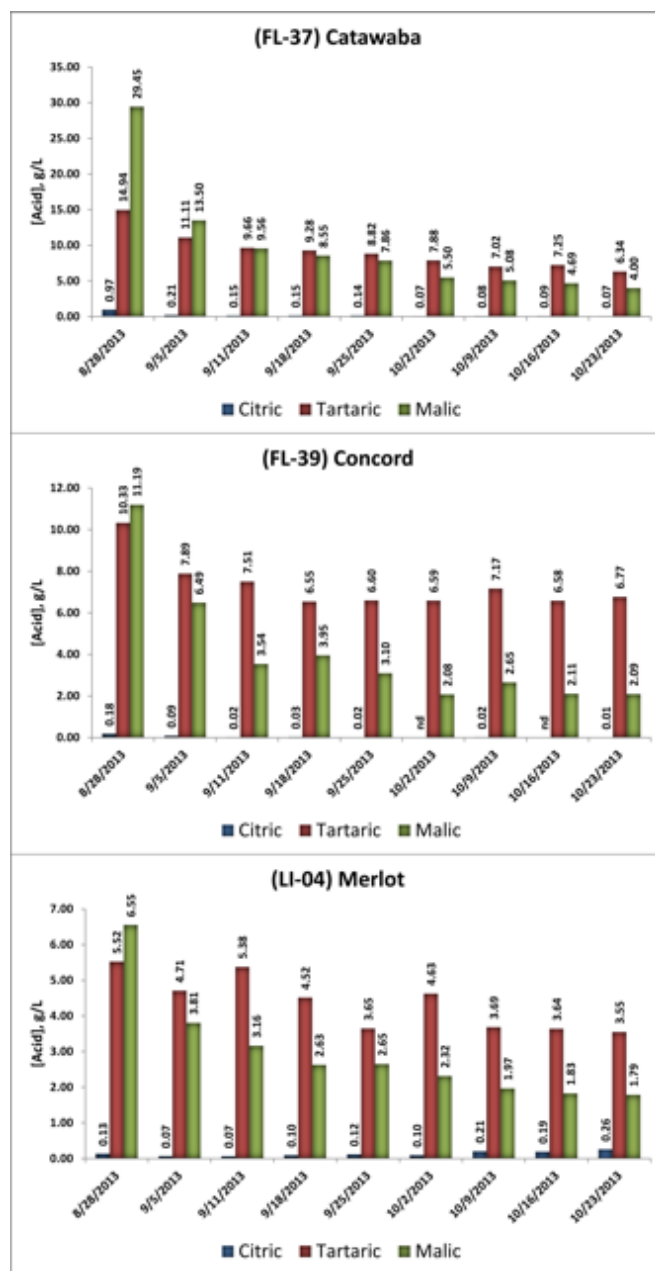


Figure 3. *Catawba*, *Concord* and *Merlot* throughout the 2013 *Veraison to Harvest* season. Note that in the malic acid (green) decreases as grapes ripen while the tartaric acid (red) levels are more stable over time.

Acknowledgement

Dr. David Manns is the HPLC whisperer and performed the analyses for all of the *Veraison to Harvest* samples. We are extremely grateful for his skill and cooperation.

Table 1. Brix, pH and TA along with tartaric/ malic sum, tartaric and malic acids from week 4.

Code	Variety	Description	Brix	pH	TA (g/l)	Sum of Tart/ Malic (g/l)	Tartaric (g/l)	Malic (g/l)
FL-13	Cabernet Franc	E. Seneca	19.4	3.01	7.75	8.96	6.11	2.85
FL-17	Cabernet Franc	W. Seneca	18.5	3.03	8.13	9.16	5.93	3.23
FL-21	Cabernet Franc	Cayuga	17.9	3.08	7.58	9.00	6.45	2.55
FL-45	Cabernet Franc	W. Seneca	17.9	3.08	7.88	9.33	6.67	2.66
HV-01	Cabernet Franc	HV-01	18.8	3.31	8.19	8.82	5.24	3.58
LE-01	Cabernet Franc	LE-01	15.0	3.21	9.4	12.57	7.24	5.33
LI-05	Cabernet Franc	LI-05	18.0	3.38	7.04	8.42	5.36	3.06
LI-07	Cabernet Franc	LI-07	20.0	3.26	7.34	8.88	5.82	3.06
FL-37	Catawaba	Keuka	13.4	2.77	16.67	17.83	9.28	8.55
FL-39	Concord	Keuka	14.2	3.05	9.16	10.50	6.55	3.95
LI-04	Merlot	LI-04	20.1	3.51	5.73	7.15	4.52	2.63
FL-12	Riesling	E. Seneca	16.8	2.89	9.88	11.47	8.08	3.38
FL-14	Riesling	E. Seneca	17.7	2.86	9.47	10.97	8.02	2.95
FL-16	Riesling	W. Seneca	17.1	2.91	10.21	11.94	7.53	4.41
FL-19	Riesling	E. Seneca	16.7	2.93	10.78	13.99	9.00	4.99
FL-22	Riesling	CL 90 Cayuga	16.0	2.93	11.76	12.72	8.19	4.54
FL-40	Riesling	Keuka	16.6	2.86	11.09	11.91	7.76	4.16
FL-41	Riesling	W. Seneca	18.0	2.9	10.21	12.41	8.48	3.93
FL-43	Riesling	W. Seneca	17.0	2.89	11.17	12.76	8.12	4.64
FL-47	Riesling	W. Canandaigua	14.9	2.98	12.37	13.58	7.64	5.94

Last Harvest at the Station. Justine Vanden Heuvel's Noiret training trial was harvested this week - the last block to be harvested at the Station.

Photo by Tim Martinson



FRUIT MATURATION REPORT - 10/25/2013

Samples reported here were collected on **Monday, October 21**. Where appropriate, sample data from 2012, averaged over all sites is included. Tables from 2012 are archived at <http://grapesandwine.cals.cornell.edu/cals/grapesandwine/veraison-to-harvest/2012.cfm>.

We are again reporting berry weight, brix, titratable acidity and pH, and yeast assimilable nitrogen (YAN), as part of a joint project with Anna Katharine Mansfield and Lailiang Cheng. Graduate student Mark Nisbit is running the YAN assays as part of his Ph D project, and other students from the Enology lab are running samples. - TEM

Cabernet Franc

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/21/2013	E. Seneca	1.75	23.4	3.30	6.7	59
Finger Lakes	10/21/2013	HARVEST					
Finger Lakes	10/21/2013	Cayuga Lake	1.78	20.9	3.36	6.3	97
Finger Lakes	10/21/2013	HARVEST					
Hudson Valley	10/14/2013	HARVEST					
Lake Erie	10/21/2013	HARVEST					
Long Island	10/21/2013	HARVEST					
Long Island	10/14/2013	HARVEST					
Final Sample	10/21/2013		1.76	22.2	3.33	6.5	78
Prev Sample	10/14/2013		1.62	21.3	3.36	6.2	95
'12 at Harvest	10/16/2012		1.66	20.7	3.40	6.5	71

Catawba

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/21/2013	Keuka	2.36	18.1	3.03	9.7	135
Prev Sample	10/14/2013	Keuka	2.33	18.1	3.00	11.1	60
'12 at Harvest	10/1/12	Keuka	2.24	19.5	3.02	9.0	77

Cayuga White

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	9/23/2013	Keuka	HARVEST				
Finger Lakes	9/23/2013	Cayuga	HARVEST				
Final sample	9/23/2013	HARVEST	2.98	16.6	2.98	11.4	219
'12 at Harvest	9/5/2012	HARVEST	2.52	18.8	3.18	8.7	284

Chardonnay

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/7/2013	Cayuga	HARVEST				
Finger Lakes	9/30/2013	W. Seneca	HARVEST				
Finger Lakes	10/7/2013	W. Seneca	HARVEST				
Long Island	10/7/2013	LI-03	HARVEST				
Final Sample	9/30/2013		1.61	20.4	3.35	7.4	135
'12 at Harvest	9/17/2012	HARVEST	1.48	20.7	3.60	6.1	245

Concord

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/21/2013	Keuka	2.89	16.9	3.30	7.4	213
Finger Lakes	10/21/2013	W. Canandaigua					
Lake Erie	10/14/2013	HARVEST					
Final sample	10/21/2013	Keuka	2.89	16.9	3.30	7.4	213
Prev Sample	10/14/2013		3.05	17.2	3.33	6.7	207
'12 at Harvest	10/8/2012	Keuka	3.09	17.5	3.40	6.6	242

Lemberger

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/21/2013	HARVEST					
Final Sample	10/14/2013	Keuka	1.84	23.3	3.21	5.8	93
'12 at Harvest	9/24/2012	HARVEST 2012	1.79	23.6	3.20	7.2	40

Malbec

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Long Island	10/21/2013	LI-06	1.95	22.6	3.82	6.7	168
Prev Sample	10/14/2013	LI-06	2.43	22.7	3.68	6.1	176
'12 at Harvest	10/16/2012	North Fork S	1.95	21.6	3.55	8.5	186

Merlot

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Hudson Valley	10/14/2013	HARVEST					
Long Island	10/21/2013	LI-04	1.85	23.1	3.85	4.8	102
Long Island	10/14/2013	HARVEST					
Final Sample	10/21/2013	LI-04	1.85	23.1	3.85	4.8	102
Prev. Sample	10/14/2013		1.88	22.4	3.79	4.2	104
'12 at Harvest	10/16/2012	North Fork (4)	1.99	20.7	3.63	5.7	119

Niagara

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Lake Erie		HARVEST					
Final Sample	9/23/2013	Portland	4.01	14.8	3.28	6.8	335
'12 at Harvest	9/5/2012	HARVEST 2012	3.84	16.6	3.26	7.2	205

Noiret

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Hudson Valley	10/21/2013	HARVEST					
Lake Erie	10/14/2013	HARVEST					
Final Sample	10/14/2013	HVL	1.56	18.2	3.51	7.0	271
'12 at Harvest	10/1/2012		1.61	19.2	3.45	6.9	208

Pinot Noir

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	9/30/2013	HARVEST					
Final Sample	9/23/2013	E. Seneca	1.58	20.6	3.13	8.0	94
'12at Harvest	9/10/2012	HARVEST 2012	1.46	20.9	3.52	6.4	222



Changing Focus: These photos from two adjacent rows of Wayne Wilcox's Chardonnay fungicide trial block illustrate effect of 'lack of disease management'. In the foreground (left) is the unsprayed 'control'. With focus shifted to adjacent row (right) you can see intact, unharvested Chardonnay clusters (and leaves) on a 'sprayed' row. Photos were taken on October 22, well past optimal harvest date for Chardonnay.

Riesling

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/14/2013	HARVESTED					
Finger Lakes	10/21/2013	HARVESTED					
Finger Lakes	10/21/2013	HARVESTED					
Finger Lakes	10/21/2013	E. Seneca	1.61	16.6	3.11	9.0	98
Finger Lakes	10/14/2013	HARVESTED					
Finger Lakes	10/14/2013	HARVESTED					
Finger Lakes	10/14/2013	HARVESTED					
Finger Lakes	10/21/2013	HARVESTED					
Finger Lakes	10/21/2013	W. Canandaigua	1.72	17.9	3.19	9.6	237
Hudson Valley	10/14/2013	HARVESTED					
Lake Erie	10/14/2013	HARVESTED					
Long Island	10/7/2013	HARVESTED					
Final Sample	10/21/2013		1.67	17.3	3.15	9.3	167
Prev Sample	10/14/2013		1.59	17.8	3.17	8.0	141
'12 at Harvest	10/1/2012		1.47	19.6	3.10	7.1	59

Sauvignon Blanc

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Long Island	9/16/2013	HARVESTED					
Final Sample	9/9/2013	HARVESTED	1.23	22.1	3.23	8.1	141
'12 at Harvest	9/10/2012	HARVESTED	1.70	20.2	3.40	7.5	141

Seyval Blanc

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	9/16/2013	Harvested					
Final Sample	9/9/2013	HARVESTED	1.77	19.9	3.22	6.4	126
'12 at Harvest	9/10/2012	HARVESTED	1.71	19.4	3.39	6.3	194

Traminette

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	10/21/2013	Keuka	1.81	23.5	3.23	3.9	148
Hudson Valley	9/30/2013	HARVEST					
Lake Erie	10/7/2013	HARVEST					
Final Sample	10/21/2013	Keuka	1.81	23.5	3.23	3.9	148
Prev Sample	10/14/2013	Keuka	1.94	23.2	3.01	9.2	121
'12 at Harvest	10/1/2012		1.80	21.8	3.18	7.2	109

Vignoles

Region	Harvest Date	Description	Ber. Wt. g.	°Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	9/23/2013	VSP Keuka	HARVEST				
Finger Lakes	9/30/2013	W. Seneca	HARVEST				
Final Sample	9/30/2013	W. Seneca	1.67	23.9	3.16	12.9	179
'12 at Harvest	9/10/2012	HARVESTED	1.32	24.5	3.27	8.8	163

GROUNDBREAKING FOR FINGER LAKES COMMUNITY COLLEGE VITICULTURE CENTER AT THE STATION

Tim Martinson

Groundbreaking ceremonies were held on October 25th for the new Finger Lakes Community College's (FLCC) Viticulture Center, to be built at the Cornell [Agriculture and Food Technology Park](#) on the New York State Agricultural Experiment Station campus in Geneva.

The building will house FLCC's [Viticulture and Wine Technology](#) Program, a two-year associate degree program to train students interested in entering the vineyard and winery workforce in the Finger Lakes.

State Senator Mike Nozzolio and Assembly Minority Leader Brian Kolb helped secure \$3.5 M in funding to build the center, which will open in Fall 2014. Nozzolio, Kolb, FLCC president Barbara Risser, and NYSAES director Tom Burr, as well as other State, Ontario County, and City of Geneva officials spoke at the ceremony, which also cited a greenhouse renovation project underway at the Station.

Photos (Clockwise): Viticulture Center; Senator Mike Nozzolio, FLCC President Barbara Risser, and Assemblyman Brian Kolb; Experiment Station Director Tom Burr.

Photos by [Finger Lakes Daily News](#)



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Finger Lakes Grape Program

Lake Erie Regional Grape Program

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