

# VERAISON TO HARVEST

## Statewide Vineyard Crop Development Update #1



Cornell University  
Cooperative Extension

August 30, 2013

Edited by Tim Martinson and Chris Gerling

## Welcome to Veraison to Harvest



Welcome to our seventh season of *Veraison to Harvest*, a joint project of the Lake Erie, Finger Lakes, Hudson Valley, and Long Island grape extension programs and the statewide viticulture and enology extension programs. Our goal is to provide New York grape growers and winemakers with current information about fruit ripening, harvest information across NY and harvest-related management tips – for both the vineyard and winery. Each Monday through the end of harvest we collect fruit samples from four regions and post maturity indicators (brix, pH, TA, and YAN) in a convenient table. In addition, we post a weekly update from each region, and additional articles and photos from ongoing projects.

Thanks again to the New York Wine and Grape Foundation and Cornell's Federal Formula Funds Grant Program for providing funding to support this newsletter. We could not do it without their support.

- Tim Martinson and Chris Gerling, Co-editors

## Around New York...

### Statewide (Tim Martinson)

[Last year](#) at this time, many vineyards were already near harvest, and the 2012 harvest ended at the end of September – an unprecedented event. This year, we see a return to more average maturity levels more comparable to [this time in 2011](#). Brix levels (see fruit maturation table, p 5-7) are running 3-6° brix behind 2012, while titratable acidity is 4-5 g/l higher than last year. With abundant moisture in most places, canopies have been large, and the crop is moderate to large – most regions having avoided the spring frost-associated bud injury that reduced crop last year. We suspect that, for cultivars that are susceptible to *botrytis* bunch rot, there are likely to be a lot of latent *botrytis* infections in clusters that could blossom if rainfall continues through the ripening season.

### Long Island (Alice Wise and Libby Tarleton)

This season has been full of ups and downs in terms of weather that will keep any weather forecaster guessing. After a dry May (2.36 in of rain), wet June (9.92 in of rain) then an equally dry July (3.07 in of rain), August seems to be finishing up dry which is



**August 27, Geneva, NY.** Ample moisture has fueled canopy growth this growing season. But spreading the vine's growth potential into a greater number of shoots can control individual shoots' growth rate - and when they stop growing. Shown here is Alan Lakso's Cabernet franc block trained to single curtain VSP (left) and double-curtain Lyre (right). Most of the shoots in the VSP are still actively growing (see inset at left), while most of the shoots in the divided Lyre canopy have stopped growing (inset at right). Pruning weights in the two rows are the same - but channelled into the split canopy (2x as many shoots) instead of a single canopy.

Photo by Tim Martinson

great compared to our last few seasons this time of year (remember Irene in 2011 that brought August rainfall up to 10 inches). Growing degree days are behind the last couple of years with August 25th of this year at 2405. Compared to last year on this date we were at 2673 and in 2011 at 2558. By the looks of it harvest is a little ways off. Reds are still finishing up véraison but whites are through. Fruit set looks good although there are some sporadic problems with Merlot. This could be because of the rain we received in June during bloom. We have a few early varieties at the research vineyard that we will need to keep an eye on including Marquette and Auxerrois.

This growing season most major diseases have been kept under control. Downy mildew infections, particularly on foliage, have become more prevalent over the past few weeks which is typical in a season like this. There have been several observations of *botrytis* infections appearing prior to véraison, particularly in Chardonnay. This may mean higher levels of *botrytis* infection, particularly in the tight-clustered varieties of Chardonnay and Pinot Noir. We are doing quite a bit of work this season in the industry and at the research vineyard on sour rot and the conditions that

favor it. Hopefully after this season we will have some more information on this particularly problematic cluster rot.

As with every season bird pressure has commenced and all vineyards either have netting on or are finishing up. We are seeing more side netting being utilized as well as other strategies such as “spacers” made out of metal or wood that push a set of catch wires out at the fruiting zone to keep the net off the fruit. Whatever the case, growers are working hard to preserve their crop from all critters.

### **Lake Erie (Luke Haggerty)**

As projected, last year’s frost resulted in a very heavy crop load for the Lake Erie Region. Crop estimations for most juice grape growers were higher than expected with some reports in the high teens (tons/acre) for both Concord and Niagara. The main concern with high crop loads is whether or not the fruit will ripen. Starting in mid-July, many growers started up their harvesters and began crop thinning. It was estimated that 30% of the region’s Concord acres were thinned.

We had a slightly early than average bloom and veraison date, however with the lack of high temperatures we have slightly lower than average accumulated GDD. Lack of rain has not been a problem for the region this year. Here at the Portland, NY site we have received over 14” of rain since June 1. The wet conditions have contributed to black rot, downy mildew, and extensive weed pressure.

Concord veraison occurred on or close to August 19th which is four days earlier than average for the region. Normally this would project harvest at the end of September, but with the heavy crop load harvest may be later. We are all hopping the forecast calls for “sunshine and heat” for the month of September.



*Constellation opened the 2013 harvest on Tuesday, August 27. Aurore grapes, like these on Keuka Lake, are usually the first variety picked each year.*

### **Finger Lakes (Hans Walter-Peterson).**

Harvest got underway in the Finger Lakes this week. Some table grapes and a few very early blocks were probably picked last week, but the season got going in earnest on Tuesday, August 27, when Constellation opened up for Aurore harvest. Processors who purchase Aurore will be starting to harvest it in the next few days as well.

Other early varieties like Baco, Geneva Red and Foch will start coming off in the next week or so, but blocks with larger crops that are taking longer to ripen may be left to hang a bit longer. Crops in most native and hybrid blocks look to be above average this year. In some cases this is due to higher numbers of clusters per vine, while in others – like Concord and Niagara – the large crops are the result of above average fruit set, with high number of berries per cluster in many cases despite less than ideal weather during bloom for these varieties.

Some growers have mechanically thinned their Concord crop this year in order to reduce the stress on the vines and to give them a better chance of ripening the remaining fruit, while others decided to “roll the dice” and try to ripen their full crops, which may prove challenging in a season that is just about average in terms of heat accumulation and vine development. At this point, we anticipate Concord harvest to start sometime in the latter half of September (depending on the processor), and potentially lasting as long the end of October. Of course, only time will tell.

Crops in vinifera blocks look to be more of a mixed bag so far. Earlier varieties like Chardonnay, the Pinots, and Lemberger are through veraison at this point. Riesling and Bordeaux reds are just about finished going through veraison, although heavier Cabernet Franc blocks still have more pink/red berries than purple ones right now. Many blocks of Chardonnay and Pinot gris look to have higher than normal crops this year. Tight clusters abound in these varieties, which raises concerns about bunch rot development. Wet weather during the bloom period led to the establishment of early botrytis infections in some varieties in certain locations. If the weather during harvest stays fairly dry, these infections won’t result in too many problems during harvest. If we get a more normal rainfall amount during the pre-harvest period, it might become necessary for some more aggressive sorting to take place both in the vineyard and at the crush pad.

The season continues to track pretty close to average as far as heat accumulation goes, and the current longer-term forecasts seem to be calling for average temperatures overall over the next several weeks. The rain that we received on Monday (about 0.7” at our vineyard in Dresden) was the first we received in two weeks. Most growers would be happy if that kind of pattern continued for the next couple of months.

Photo by Hans Walter-Peterson

## Hudson Valley (Steve Hoying)

The Hudson Valley is nearing harvest with early varieties such as Foch and Leon Millot approaching maturity typical of an average season. This is a full 10 days later than 2012. Brix levels reflect typical development with Pinot noir and gris, Chardonnay, and Lemberger near 18.0. Some harvest will likely begin just after the Labor Day weekend.

This has been a more typical season than the past few years but still has held enough challenges for all. The organic producers have had a particularly difficult time with black rot and mildew which has reduced their crops significantly. Chardonnay appears generally to have had a lighter set than normal across this region, perhaps caused by winter damage although winter temperature recorded at our monitoring stations stayed above the critical mark. All other varieties appear to have an excellent crop.

Dry conditions in May helped with early disease control. The rain returned in June with consistent moisture throughout July and very heavy rains in August playing havoc with mildew control. Some blocks experienced explosive development of Downy mildew. And those not on top of their control programs are still fighting the mildews. Home owner calls requesting information on grape disease problems have been constant recently. On the flip side rains came at just the right time to prevent water stress to local vineyards and berry size and quality appears excellent. There has been little cracking so far.

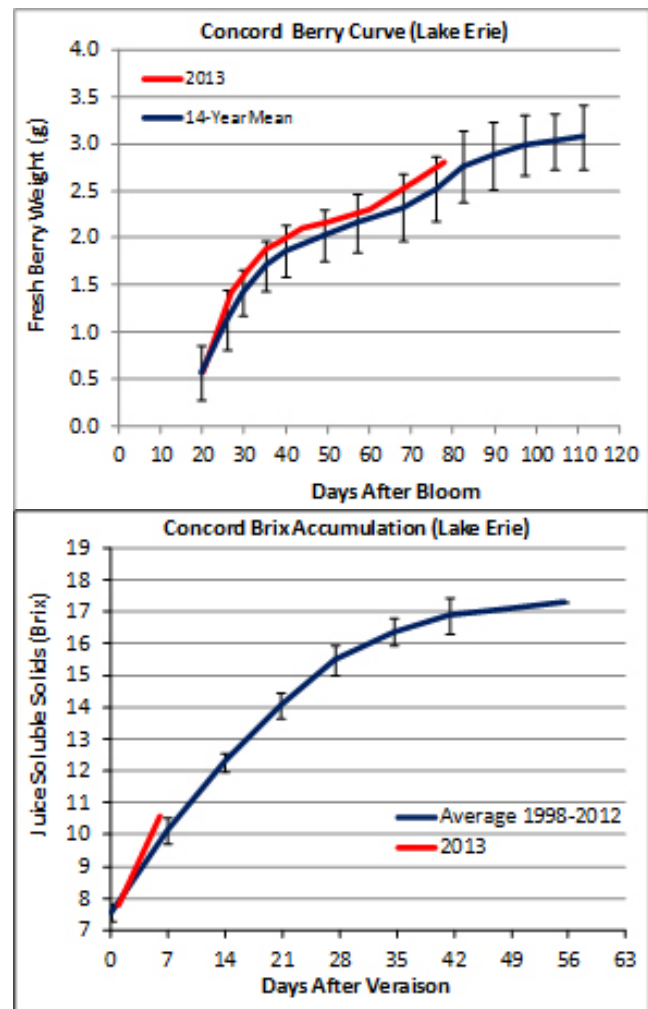
Bird damage again appears to be a major issue and damage has been heavy across the region primarily caused by the smaller species such as chipping sparrows. However, as in past years turkeys have found the early varieties and have devastated the Dornfelder at the Hudson Valley Lab disregarding bird nets! Those who have protected vineyards with netting have been rewarded handsomely. Those who have not, will likely end up with botrytis and the sour rot complex and expensive fruit sorting to achieve the quality wine needed these days to compete.

The new invasive species, Spotted Wing Drosophila (SWD) and Brown Marmorated Stinkbug, continue to be of concern in the Hudson Valley. Preliminary test by Peter Jentsch and Tim Lampasona show that SWD confined to grapes will oviposit and larvae hatch and develop. As expected, there appears to be a direct correlation to Brix with eggs deposited on fruit with the highest Brix when given a choice. These fruit were intact with no obvious wounds and were still on the rachis. In these tests Pinot noir, Pinot gris, Leon Millot, all supported egg laying and larval development.

## 2013 LAKE ERIE CONCORD UPDATE

Terry Bates

The story of the 2013 Concord season in the Lake Erie region, so far, has been the high bud fruitfulness and large crop size as a result from the 2012 freeze damage and low crop size. Otherwise, the 2013 bloom date, veraison date, and seasonal GDD accumulation have been close to the long term average. Above average precipitation during berry cell division phase also led to higher than average berry weight which only added to the high crop potential. Sunny and dry weather the first week post-veraison has given a good jump-start to the juice soluble solids accumulation. Given the 2013 veraison date and crop size, we expect to see 16 °Brix in healthy and high producing Concord vineyards around 35 days after veraison.



Concord berry weight (top, red line) and brix (bottom) compared to long term average for standard concord vines at the CLEREL laboratory in Portland, NY.

## LATE SEASON SULFUR SPRAYS

*Alice Wise*

*Note: This article is reprinted from the August 15 Long Island Fruit & Vegetable Update - TM*

Keeping the canopy free from powdery and downy mildew is absolutely critical to maintaining a photosynthetically active canopy. A healthy canopy is necessary to properly ripen fruit and to allow vines to accumulate carbohydrates that help them overwinter.

From a winemaking standpoint, one of the primary concerns about late season sprays is that potential residues may inhibit fermentation. Some winemakers consider this an issue, especially with sulfur, others discount it. Some enologists demand a particular interval (ranging from weeks to months) between the last sulfur spray and harvest.

However, most vineyards on LI have reached the point in the season where fruit is no longer susceptible to new PM infections. Consequently, regardless of materials being used, most growers have turned off the nozzles in the cluster zone (easy to do with VSP training that facilitates a well-defined cluster zone) and are focusing on keeping the canopy clean.

Nevertheless, sulfur applications in the vineyard are often demonized by winemakers. Excessive S may be converted to H<sub>2</sub>S by yeasts, resulting in stinky wines and/or sluggish fermentations.

Because of industry concerns, this is an area of research addressed a couple of years ago by Cornell researchers Drs. Gavin Sacks, Wayne Wilcox and Misha Kwasniewski. The team developed a new, simple method for measuring S residues on grapes, and then applied the approach to field trials.

Based on 2009-2011 data from the Finger Lakes, it ap-

pears that 5 lbs/acre sprays of both Microthiol and wettable sulfur within **4 weeks of harvest** can result in sulfur residues on harvested grapes sufficient to result in increased levels of H<sub>2</sub>S production, particularly in red wines (see below).

The reason for writing “increased levels” is that all fermentations will produce some amount of H<sub>2</sub>S as part of basic yeast metabolism, even in the absence of elemental S. Six weeks is a gray area, and eight weeks seems to be safe.

However, these precise cut-off times likely vary with site, year, canopy characteristics, type of sprayer/nozzles, pressure and so on. Note also that in their research protocol, the cluster zone nozzles were not turned off. The LI practice of turning off nozzles in the cluster zone at veraison should help to mitigate potential sulfur residues. However, measuring sulfur residues on your grapes is the only sure way to know. Interested winegrowers should contact Gavin Sacks (gls9@cornell.edu) for information on making S-measurements on grapes.

Sulfur residues are primarily a concern with skin-fermented wines. For standard white winemaking conditions, if the must is well clarified (<100 NTU), over 95% of sulfur residues will be removed. So, if you have concerns, make sure your juice is well clarified! However, with reds, skin contact is important so the concern is real.

A number of factors – rainfall, wind, temperature, sunlight – may be important in determining the degree of sulfur residue. There may be seasonal differences in these factors, i.e., one may carry more weight one season vs another.

*Alice Wise is Senior Resource Educator with Cornell Cooperative Extension Association of Suffolk County, based at the Long Island Horticultural Research and Extension Center.*

*Thanks to Gavin Sacks, Wayne Wilcox and Misha Kwasniewski, Cornell University.*

## LUKE HAGGERTY JOINS THE LAKE ERIE REGIONAL GRAPE PROGRAM

*Tim Martinson*



We welcome Luke Haggerty, Extension Viticulturist with the Lake Erie Regional Grape Program to New York. Luke just completed his Master’s degree in the Applied Plant Sciences Graduate Program at the University of Minnesota, and joined the Lake Erie extension team in mid-July. Luke’s graduate project was to track phenology and ripening (fruit chemistry) of the UM cold-hardy grape cultivars as influenced by growing degree-days over three growing seasons. Sounds a lot like what we do for *Veraison to Harvest*. Luke will be the Lake Erie Region correspondent for *Veraison to Harvest*.

## FRUIT MATURATION REPORT - 8/30/2012

Samples reported here were collected on **Monday, August 25** Where appropriate, sample data from 2012, averaged over all sites is included. Tables from 2011 are archived at <http://grapesandwine.cals.cornell.edu/cals/grapesandwine/veraison-to-harvest/2011.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	8/28/2013	E. Seneca	1.05	15.1	2.77	15.8	21
Finger Lakes	8/28/2013	W. Seneca	1.11	12.4	2.70	18.9	52
Finger Lakes	8/28/2013	Cayuga	1.16	13.0	2.76	18.5	106
Finger Lakes	8/28/2013	W. Seneca	1.30	13.4	2.77	17.0	76
Hudson Valley	8/28/2013	HVL	1.08	10.4	2.84	16.1	102
Lake Erie	8/28/2013	Portland	1.16	11.1	2.80	22.1	227
Long Island	8/28/2013	North Fork	1.77	14.6	2.97	13.7	91
Long Island	8/28/2013	North Fork	1.26	15.3	2.92	14.2	59
<b>Average</b>			<b>1.24</b>	<b>13.2</b>	<b>2.82</b>	<b>17.0</b>	<b>92</b>
<i>Prev Sample</i>							
<i>'12 Average</i>	8/29/12		1.48	15.6	3.01	12.9	88

### Catawba

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Keuka	1.70	7.4	2.44	41.7	112
<i>Prev Sample</i>							
<i>'12 Sample</i>	8/29/12	Keuka	1.91	12.2	2.63	26.3	413

### Cayuga White

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Keuka	2.41	13.3	2.79	17.2	168
Finger Lakes	8/28/2013	Cayuga	2.54	16.7	2.91	13.1	180
<b>Average</b>	<b>8/28/2013</b>		<b>2.47</b>	<b>15.0</b>	<b>2.85</b>	<b>15.1</b>	<b>174</b>
<i>Prev Sample</i>							
<i>'11 Average</i>	8/29/2012		2.54	16.6	3.04	10.4	177

### Chardonnay

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Cayuga	1.13	14.0	2.87	15.7	158
Finger Lakes	8/28/2013	W. Seneca	1.39	14.4	2.96	14.2	116
Finger Lakes	8/28/2013	W. Seneca	1.32	13.0	2.91	13.4	112
Long Island	8/28/2013	North fork	1.47	16.8	3.19	11.3	279
<b>Average</b>	<b>8/28/2013</b>		<b>1.33</b>	<b>14.6</b>	<b>2.98</b>	<b>13.6</b>	<b>166</b>
<i>Prev. Sample</i>							
<i>'12 Average</i>	8/29/12		1.42	17.6	3.21	10.7	223

### Concord

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Keuka	2.28	10.1	2.69	21.0	106
Finger Lakes	8/28/2013	W. Canandaigua	2.63	10.6	2.67	20.5	95
Lake Erie	8/28/2013	Portland lab	2.87	10.1	2.83	21.5	328
<b>Average</b>	<b>8/28/2013</b>		<b>2.60</b>	<b>10.3</b>	<b>2.73</b>	<b>21.0</b>	<b>176</b>
<i>Prev Sample</i>							
<i>'12 Sample</i>	8/29/12		2.89	14.1	3.10	10.5	206

## Lemberger

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Keuka	1.67	16.7	2.85	12.4	45
<i>Prev Sample</i>							
'12 Sample	8/29/12	Keuka	1.67	20.8	3.04	8.3	43

## Malbec

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Long Island	8/28/2013	North Fork	2.12	13.8	2.93	21.1	209
<i>Prev Sample</i>							
'12 Sample	8/29/12	North Fork S	2.22	14.0	3.08	18.3	242

## Merlot

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Hudson Valley	8/28/2013	HV Lab	1.13	11.4	2.97	14.0	137
Long Island	8/28/2013	North Fork	1.79	14.9	3.14	10.6	119
Long Island	8/28/2013	North Fork	1.59	16.2	3.12	10.5	120
<b>Average</b>	<b>8/28/2013</b>		<b>1.50</b>	<b>14.2</b>	<b>3.08</b>	<b>11.7</b>	<b>125</b>
<i>'12 Average</i>	<i>8/29/2012</i>		<i>1.72</i>	<i>16.0</i>	<i>3.28</i>	<i>9.4</i>	<i>120</i>

## Niagara

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Lake Erie	8/28/2013	Portland	3.56	11.2	2.88	17.1	272
<i>Prev Sample</i>							
'12 Sample	8/29/12	Portland	3.64	15.3	3.16	8.9	243

## Noiret

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Hudson Valley	8/28/2013	HVL	1.20	11.6	2.99	14.2	284
Lake Erie	8/28/2013	Fredonia	1.81	12.2	2.82	22.4	316
<b>Average</b>	<b>8/28/2013</b>		<b>1.51</b>	<b>11.9</b>	<b>2.91</b>	<b>18.3</b>	<b>300</b>
<i>Prev Sample</i>							
'12 Sample	8/29/12		2.17	16.7	3.14	11.9	231

## Pinot Noir

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	E. Seneca	1.17	17.6	3.00	10.2	114
<i>Prev Sample</i>							
'12 Sample	8/29/12		1.37	18.3	3.31	9.4	175

## Riesling

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	E. Seneca	1.21	14.2	2.77	16.8	52
Finger Lakes	8/28/2013	E. Seneca	1.22	14.4	2.71	18.1	43
Finger Lakes	8/28/2013	W. Seneca	0.89	12.5	2.72	19.8	51
Finger Lakes	8/28/2013	E. Seneca	1.11	12.9	2.77	17.6	139
Finger Lakes	8/28/2013	CL 90 Cayuga	1.06	12.1	2.77	18.8	141
Finger Lakes	8/28/2013	Keuka	1.09	12.7	2.73	19.1	112
Finger Lakes	8/28/2013	W. Seneca	1.17	13.5	2.76	19.8	158
Finger Lakes	8/28/2013	W. Seneca	1.07	12.7	2.75	20.1	132
Finger Lakes	8/28/2013	W. Canandaigua	1.30	10.3	2.78	22.6	219
Hudson Valley	8/28/2013	HVL	1.11	8.3	2.91	17.1	184
Lake Erie	8/28/2013	Fredonia	1.34	12.4	2.85	16.7	186
Long Island	8/28/2013	North Fork	1.16	14.2	2.93	15.4	164
<b>Average</b>	<b>8/28/2013</b>		<b>1.14</b>	<b>12.5</b>	<b>2.79</b>	<b>18.5</b>	<b>132</b>
<i>Prev Sample</i>							
'12 Sample	8/29/12	Average	1.33	16.2	2.88	13.9	105

## Sauvignon Blanc

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Long Island	8/28/2013	North Fork	1.19	18.6	3.04	12.1	173
<i>Prev Sample</i>							
'12 Sample	8/29/12	North Fork N	1.54	18.5	3.24	11.4	135

## Seyval Blanc

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Cayuga	1.52	17.2	2.98	10.7	109
<i>Prev Sample</i>							
'12 Sample	8/29/12		1.56	17.5	3.22	8.8	231

## Traminette

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	Keuka	1.56	13.5	2.71	20.0	98
Hudson Valley	8/28/2013	HVL	1.22	10.7	2.88	15.0	47
Lake Erie	8/28/2013	Fredonia	1.62	12.2	2.82	19.1	119
<b>Average</b>	<b>8/28/2013</b>		<b>1.47</b>	<b>12.1</b>	<b>2.80</b>	<b>18.1</b>	<b>88</b>
<i>Prev Sample</i>							
'12 Sample	8/29/12	Average	1.51	16.3	2.93	13.0	63

## Vignoles

Region	Harvest Date	Description	Ber. Wt. g.	% Brix	pH	TA g/L	YAN (ppm)
Finger Lakes	8/28/2013	VSP Keuka	1.62	16.9	2.84	19.7	188
Finger Lakes	8/28/2013	W. Seneca	1.66	17.4	2.89	17.4	180
<b>Average</b>	<b>8/28/2013</b>		<b>1.64</b>	<b>17.2</b>	<b>2.87</b>	<b>18.5</b>	<b>184</b>
<i>Prev Sample</i>							
'12 Sample	8/29/2012		1.44	21.6	2.99	13.6	171



# FRUIT SAMPLES FOR THE NORTHERN GRAPES PROJECT

*Chrislyn Particka and Tim Martinson*

As part of the USDA-Specialty Crops Research Initiative *Northern Grapes Project*, We have training trials (Marquette and Frontenac) and crop load studies (Frontenac and La Crescent) underway at Coyote Moon Vineyards, near Clayton, NY. We are sampling this fruit every monday (complete set in our trials every 2 weeks plus a single set on 'off weeks'.

Note the high brix (15-20 in the 8/26 samples) but also the high titratable acidity, (18 to 30 g/l). Acids are 10 g/l higher than last year at this time.

Variety	Date	Training	Berry wt (g)	pH	Brix	TA
Frontenac	8/26/2013	High	1.07	2.87	16.3	21.5
	8/26/2013	Low	1.10	2.88	15.6	22.3
	8/26/2013	Umbrella	1.10	2.86	15.8	23.2
LaCrescent	8/19/2013	-	0.83	2.74	17.4	29.2
	8/26/2013	-	0.96	2.82	20.7	18.6
Marquette	8/19/2013	High	0.93	2.73	16.3	29.0
	8/19/2013	Low	0.98	2.76	18.0	28.6
	8/19/2013	Umbrella	1.05	2.74	16.4	29.8
	8/26/2013	-	1.05	2.88	18.8	18.1



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**Veraison to Harvest** is a joint publication of:

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*Hudson Valley Regional Fruit Program*



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