Veraison to Harvest

Statewide Vineyard Crop Development Update #2

Cornell University Cooperative Extension

September 14, 2007

Around New York…

Statewide - *Tim Martinson*

As harvest of early varieties swings into full gear, significant rainfall across NY in the past week (>1 inches in many areas) brought growers and winemakers welcome relief from droughty conditions.

Berry samples collected this past Monday (9/10; see Fruit Maturation Report starting on p.4) showed significant increases in berry weight and sugars, and large drops in titratable acidity (TA) and malic acid from our previous samples two weeks ago (8/27). Gains in ripening from the 90º F temperatures a week ago were moderated somewhat by drought stress in some areas, resulting in reduced gas exchange and photosynthesis (See Concord summary on p. 2).

Berry weight increased by 10-20%, but still remains 10-20% lower than last year at this time (See Cab Franc, Riesling, Lemberger and Concord numbers for '06 averages).

Brix (soluble solids) increased by 4-6 points overall, with TA dropping by 4-6 g/L in the two weeks since the last sample. TA on Riesling, Cabernet Franc, and Lemberger are 2-6 g/L lower than last year at this time.

Note the impact of cluster shading (and canopy management treatments) on Traminette and Marechal Foch numbers, where shaded/no leaf removal brix were lower and TA was higher than exposed/leaf removal and shoot positioning treatments. TA was also higher on the 'exposed' Noiret treatment.

Harvest of Marechal Foch blocks and some of the Chardonnay blocks included in this report will start next week.

The *Sampling Focus* article on p. 3 describes Terry Bates' research plots in Fredonia, from which the Lake Erie samples reported in this newsletter are collected.

Finger Lakes-*Hans Walter Peterson*

Harvest activity has picked up in the Finger Lakes region this week. National Grape Cooperative opened for Niagara harvest on Tuesday, September 11. Early red hybrids such as Baco Noir, GR7 and Marechal Foch also are being harvested. While Brix numbers appear to be in good shape, acidity has been down in some of these earlier varieties, particularly Elvira and Niagara. It will be interesting to see if this trend continues in other varieties as the harvest season progresses. The first significant rainfall in almost 3 weeks came on Sunday and continued through part of Tuesday morning, with total amounts around 1.25-1.5" recorded at most NEWA stations in the region. Fruit still looks clean and of good quality at this point. Growers should be scouting for new downy mildew and *Botrytis* infections this week, and into next, as more periods of rain are forecast over the next week.

Long Island - *Alice Wise*

Continued sunny, warm weather was punctuated by a much needed 0.9" of rain on Sept. 11. The rainfall perked up thirsty vines but did not precipitate cluster rot even in susceptible varieties. The fall ripening season has been beautiful thus far with harvest of Pinot Noir for still wine beginning this week. Bird pressure has been low to moderate, wildlife pressure has been variable. Deer have become very interested in vineyards in the last 10 days.

Lake Erie and Niagara Escarpment- *Tim Weigle*

A $50,000 rain is the way one vineyard owner described the impact on their operation as a much needed general rain event was felt across the Lake Erie Region and Niagara Escarpment over the past weekend. Weather instruments at the Fredonia Vineyard lab recorded 2.22 inches of rain over the weekend while the Lockport (Ransomville) instrument in Niagara County recorded 1.55 inches. While both areas are still well below the average rainfall amounts

for the growing season, the rain couldn't have come at a better time. Vines on shallow or droughty soils are showing signs of water stress through various nutritional deficiency symptoms and loss of leaves. Area juice processors started harvest operations for Niagara grapes earlier in the week and some of the early wine varieties such as Marechal Foch are also being harvested. Early season 'green' Concords and Elvira have been harvested. Late season infections of powdery and downy mildew can be found on the leaves of many varieties and grape berry moth damage is showing an increase along with male grape berry moth pheromone trap catches.

Hudson Valley - *Steve McKay* and Steve Hoying

A warmer than usual fall has advanced harvest dates in the Hudson Valley so far, with many vineyards already having picked early white hybrids. Chardonnay and Pinot Noir were picked for sparkling wine last weekend, more than two weeks earlier than last year. Some Pinot Gris and Gewurtztraminer will be harvested this coming week. The TA has been lower than normal this year for many varieties grown in the Hudson Valley. Cold nights have brought excellent color to the grapes with later reds such as Cabernet Franc, Sangiovese, Cabernet Sauvignon, and Merlot on track to mature early. Bird damage varies by vineyard according to the crop protection practices being used. Finally, powdery mildew is appearing on leaves in many vineyards.

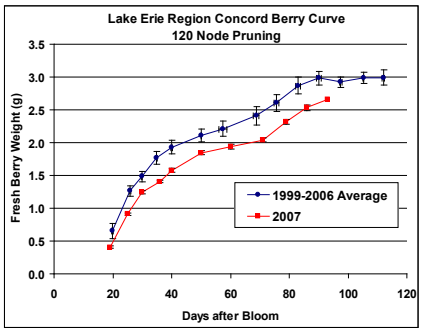
Pinot Gris in the Finger Lakes, September 12

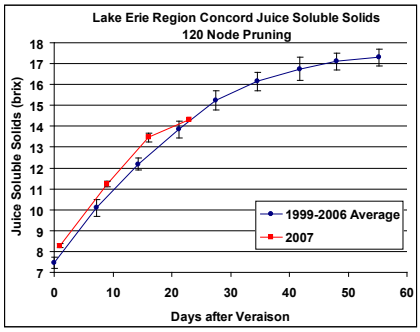
Concord Ripening Profile at Fredonia - September 11

Terry Bates, Cornell Vineyard Laboratory

Concord berry weight and juice soluble solids (JSS) were collected on 9/11/2007 at the new Portland Laboratory. Berry weight continued to increase last week supported by the 1.5-2.0 inches of rainfall over the weekend. Berry weight jumped from 2.53g to 2.65 g on average over the week, a 4.7% increase. However, berry weight remains approximately 10-12% below average. Concord fruit typically reaches maximum fresh berry weight between 90-100 days after bloom; therefore, the berry curve should start to flatten in the upcoming weeks.

Although JSS continued to increase overall, the rate of accumulation was lower than average for the third week after veraison. Normally, JSS accumulation at this time averages 0.23 brix/day (2007 average was 0.125 brix/day). I collected soil moisture and leaf gas exchange measurements last week (before the rain) and photosynthesis rates were down 25-75% depending on vineyard water relations. In exceptionally dry vineyards, JSS accumulation rates were as low as 0.08 brix/day. In vineyards with better water relations and higher photosynthesis rates, JSS accumulation rates were higher at 0.20 brix/day (not much lower than average). Therefore, the last week's slowdown probably had more to do with the effect of water stress on leaf gas exchange and less to do with the effect of weekend rain on increasing berry weight and diluting brix – although both had an impact.





Sampling Focus: Fredonia Rootstock and Soil pH Experiment

Tim Martinson

Several of the fruit chemistry sample results reported in this newsletter are from research projects in different parts of New York. This week I'll report on samples collected from **Dr. Terry Bates's** project at Fredonia entitled Improving wine grape production in acid soils with rootstocks and soil management.

This project focuses on rootstocks and lime applications to improve vine performance. The rationale for this project starts with the acid vineyard soils in Western NY. While the deep gravelly loams in the Lake Erie grape belt have excellent drainage, native soil pH in the region ranges from about 4.0 to 5.5 - adequate for acid-tolerant Labrusca varieties, but less than optimal for *V. vinifera* and hybrids. Historically, soil pH-related nutrient deficiencies may have limited productivity and cold hardiness of some hybrid and vinifera vineyards in the region.

Liming soils to raise the pH is an obvious and effective fix for this problem, but there are some further complications: Lime, even when incorporated preplant, can only influence soil pH - at least initially - in the top 6-12 inches of soil. But these deep soils support root development down 6 feet or more, so the root system might make it down into the more acid subsoil, negating the benefits of liming the top layer.

Enter the rootstocks. Rootstocks, like grape varieties, vary in their growth habits. C3309 tends to grow straight down, while Riparia Gloire tends to grow horizontally, staying close to the surface. Thus more of the root mass of Gloire would tend to be in the limed zone than that of the C3309, which would end up in the 'low pH' soil below the surface layer. Gravesac is a newer rootstock, developed for acid tolerance. Add to that the 'own-rooted' option, and you have the four 'rootstock treatments' in the experiment.

High and Low pH. The four varieties of grapes, grafted to 4 rootstocks, are planted within larger blocks of soil with and without pH adjusted with lime. Soil pH in the two unlimed blocks range from 4.5 - 5.0, while the limed blocks were adjusted to 5.5-6.0 - a bit lower than the target of 6.0-6.5.

Our samples. For our pre-harvest samples, we are collecting berries across the different rootstocks in both the 'high pH' and 'low pH' portions. Our Fredonia samples from Cabernet Sauvignon, Riesling, Noiret, and Traminette in the 'Fruit Maturation Report' are so labeled.

The experiment is tracking vine performance and nutritional effects of the different treatments. This year, wines are being made from some of the treatments, and differences in wine quality will be compared.

Pictures. This experiment shows dramatic differences in vine performance among the different pH and rootstock treatments.

A. **'Saurschaden'** is a German term for 'low pH' malady, that is the collection of nutrient deficiencies (including Mg and P) that occur due to restrictions in nutrient availability (and Aluminum toxicity) resulting from low pH. Cabernet Sauvignon (shown below) and Riesling exhibited these symptoms in the low pH blocks.

*Continued on **page 3***

Fruit Maturation Report

Samples reported here were collected on **Monday, September 10** No fruit samples were collected this week, due to the Labor Day holiday. The next samples will be collected on **Monday, September 17**. Where appropriate, sample data from 2006, averaged over all sites (mostly Finger Lakes), is included. Fruit maturation data from 2006 is posted at:

August 29: http://www.nysaes.cornell.edu/fst/faculty/henick/pdf/Ripening_Progress_06.pdf

September 5: http://www.nysaes.cornell.edu/fst/faculty/henick/pdf/Ripening%20Progress%2006R2.pdf

September 12: http://www.nysaes.cornell.edu/fst/faculty/henick/pdf/Ripening%20Progress%2006R3B.pdf

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	FL-CF-7	Cayuga Lake W	1.36	16.8	3.04	12.2	6.4	4.5	0.06
Finger Lakes	09/10/07	FL-CF-8	Seneca Lake E	1.42	16.8	3.00	11.0	5.9	4.0	0.02
Finger Lakes	09/10/07	FL-CF-9	Seneca Lake E	1.48	15.9	2.95	11.4	6.3	3.7	0.07
Finger Lakes	09/10/07	FL-CF-10	Seneca Lake W	1.05	16.5	2.92	12.1	5.5	4.8	0.09
Finger Lakes	09/10/07	FL-CF-11	Seneca Lake W	1.30	15.5	3.00	11.4	6.5	3.7	0.08
Finger Lakes	09/10/07	FL-CF-12	Seneca Lake W	1.00	15.4	3.22	9.0	5.7	2.7	0.00
Hudson Valley	09/10/07	HV-CF-2	E of Hudson River	1.64	15.7	3.07	12.8	6.0	5.8	0.00
Hudson Valley	09/10/07	HV-CF-3	W of Hudson River	1.28	17.2	3.14	11.5	5.8	4.9	0.02
Lake Erie	09/10/07	LE-CF-9	Fredonia Vin Lab	na	18.8	3.11	10.1	5.4	3.7	0.06
Long Island	09/10/07	LI-CF-4**	Aquebogue LI	1.60	17.6	3.23	10.8	4.3	5.8	0.00
Long Island	09/10/07	LI-CF-7?**	Aquebogue LI	1.65	19.0	3.11	11.7	5.5	5.1	0.09
Average	**9/10/07**			**1.38**	**16.8**	**3.07**	**11.3**	**5.8**	**4.4**	**0.04**
8/27 Ave	8/27/07			1.11	11.7	2.73	23.6	8.6	11.4	0.1
'06 Average	**912/06**	**FL**	**Finger Lakes**	1.64	15.5	3.02	14.2	5.0	7.4	0.10

** Two samples labeled LI-CF-4

Riesling

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	Cl. 239-a	Cayuga Lake W	1.23	16.3	2.90	12.3	7.3	3.6	0.04
Finger Lakes	09/10/07	Cl. 90-a	Cayuga Lake W	1.02	15.5	2.89	12.8	7.4	4.1	0.00
Finger Lakes	09/10/07	Cl 90 -b	Seneca Lake E	1.37	17.7	2.91	12.8	7.0	4.3	0.05
Finger Lakes	09/10/07	Cl. 239-b	Seneca Lake E	1.20	16.7	2.93	13.7	6.8	5.4	0.02
Finger Lakes	09/10/07	Cl-239-c	Seneca Lake E	1.22	16.4	2.91	12.4	6.9	4.0	0.03
Finger Lakes	09/10/07	Cl-90-c	Seneca Lake E	1.47	15.8	2.86	13.7	7.2	4.9	0.00
Hudson Valley	09/10/07	HV-R-4	E of Hudson River	1.64	18.4	2.98	14.0	6.8	5.7	0.07
Lake Erie	09/10/07	High pH	Fredonia Vin Lab	1.41	16.4	2.89	12.1	7.0	3.8	0.00
Lake Erie	09/10/07	Low pH	Fredonia Vin Lab	1.37	16.4	2.90	12.3	7.0	4.1	0.00
Long Island	09/10/07	LI-R-3	Aquebogue LI	1.49	16.5	3.08	13.8	6.5	6.2	0.00
Long Island	09/10/07	LI-R-6	Aquebogue LI	1.63	17.3	2.98	14.1	6.8	5.7	0.00
Average	**9/10/07**			**1.37**	**16.7**	**2.93**	**13.1**	**7.0**	**4.7**	**0.02**
8/27 Ave				1.14	12.4	2.73	23.4	9.3	11.0	0.07
06 Average	9/12/07		Finger Lakes	1.60	15.0	2.86	18.8	7.5	8.8	0.06

Lemberger

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	FL-LEM-13	Seneca Lake W	1.73	17.7	2.98	11.7	6.3	4.0	0.07
Finger Lakes	09/10/07	FL-LEM-14	Seneca Lake W	1.60	18.6	2.92	10.4	6.5	2.3	0.18
Average	**09/10/07**			**1.67**	**18.2**	**2.95**	**11.1**	**6.4**	**3.2**	**0.13**
8/27 Average	**8/27/07**			**1.50**	**14.9**	**2.79**	**16.8**	**7.8**	**6.7**	**0.12**
06 Average	9/12/07			1.93	16.7	3.01	12.7	5.7	5.3	0.05

Merlot

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Hudson Valley	09/10/07	HV-M-4	Eof Hudson River	1.46	17.7	3.23	10.5	5.5	4.5	0.04
Long Island	09/10/07	LI-M-5	Aquebogue LI	1.82	19.1	3.20	9.6	4.9	3.9	0.05
Long Island	09/10/07	LI-M-1	Cutchogue LI	1.59	20.2	3.43	7.9	4.1	3.9	0.09
Long Island	09/10/07	LI-M-2	Cutchogue LI	1.67	18.7	3.22	9.4	5.2	3.5	0.13
Long Island	09/10/07	LI-M-8	LIHRC Riverhead	1.84	21.0	3.28	9.9	5.0	4.2	0.18
Average	09/10/07			1.68	19.3	3.27	9.5	4.9	4.0	0.10
8/27 Ave	8/27/07			1.55	14.2	2.89	16.3	6.7	7.6	0.06

Chardonnay

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Hudson Valley	09/10/07	HV-C-3	W of Hudson River	1.49	20.3	3.19	10.0	5.0	4.3	0.06
Hudson Valley	09/10/07	HV-C-2	E of Hudson River	1.54	18.8	3.09	11.3	5.2	5.0	0.10
Long Island	09/10/07	LI-CH-9	LIHRC Riverhead	1.73	20.4	3.27	10.7	4.9	5.4	0.09
Average	**09/10/07**			**1.59**	**19.8**	**3.18**	**10.7**	**5.0**	**4.9**	**0.08**
8/27 Ave	08/27/07			1.35	14.8	2.94	15.4	6.3	7.3	0.07

Cabernet Sauvignon

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Lake Erie	09/10/07	High pH	Fredonia Vin Lab	1.26	18.7	3.02	13.8	6.7	5.9	0.03
Lake Erie	09/10/07	Low pH	Fredonia Vin Lab	1.26	18.5	3.04	14.3	6.9	6.2	0.01
Average	09/10/07			1.26	18.6	3.03	14.1	6.8	6.1	0.02
8/27 Ave	08/27/07			1.07	15.6	2.75	22.0	8.6	10.5	0.02

Noiret

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	Exp. Clus	Keuka Lake W	1.61	16.6	3.17	11.6	6.1	4.9	0.00
Finger Lakes	09/10/07	Shad. Clus	Keuka Lake W	1.70	16.4	3.13	13.7	6.7	6.5	0.00
Hudson Valley	09/10/07	HV-N-3	W of Hudson River	1.59	18.3	3.10	10.3	5.5	4.0	0.01
Lake Erie	09/10/07	High pH	Fredonia Vin Lab	1.70	18.0	2.99	11.4	5.9	4.2	0.00
Lake Erie	09/10/07	Low pH	Fredonia Vin Lab	1.60	18.4	3.01	10.6	5.5	3.7	0.09
Average	**09/10/07**			**1.64**	**17.5**	**3.08**	**11.5**	**5.9**	**4.7**	**0.02**
8/27 Ave				1.44	14.6	2.87	17.9	7.6	8.1	0.01

Traminette

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	Shade Clus	Keuka Lake W	1.68	14.9	2.85	15.7	6.8	6.7	0.09
Finger Lakes	09/10/07	Expos Clus	Keuka Lake W	1.77	16.4	2.83	14.5	7.1	5.3	0.12
Hudson Valley	09/10/07	HV-T-1	W of Hudson River	na	19.6	3.01	10.9	5.8	3.8	0.17
Lake Erie	09/10/07	LE-T-High-1	Fredonia Vin Lab	1.56	18.6	2.90	9.5	5.1	2.9	0.06
Lake Erie	09/10/07	LE-T-Low-2	Fredonia Vin Lab	1.66	18.5	2.93	9.9	5.1	2.9	0.09
Average	**09/10/07**			**1.67**	**17.60**	**2.90**	**12.10**	**5.98**	**4.32**	**0.11**
8/27 Ave.	08/27/07			1.34	11.5	2.67	23.8	8.9	11.2	0.15

Marachel Foch

Location	Collection	Sample ID	Location	Berry Wt g	% Brix	pH	g/L TA	g/L Tartaric Acid	g/L Malic Acid	g/L Acetic Acid
Finger Lakes	09/10/07	Lf Removal	Seneca Lake W	1.18	23.3	3.30	11.1	5.1	4.7	0.11
Finger Lakes	09/10/07	N Lf Remov	Seneca Lake W	0.80	22.2	3.24	10.7	5.3	3.9	0.11
Average	09/10/07			0.99	22.8	3.27	10.9	5.2	4.3	0.11
8/27 Ave				0.94	18.2	3.04	14.0	5.8	6.3	0.09

Continued from ***Page 3***

B. Vine size. This photo (below), taken at the border between limed and unlimed Riesling, shows the dramatic difference in vine size and canopy fill associated with different soil pH. Limed area is to the left in this photo. In general, grafted hybrids Noiret and Traminette in this experiment have excess vigor, while own-rooted hybrids have moderate canopy size. Vigor in grafted *vinifera* (in high pH blocks) is moderate.

C. Own-rooted Vinifera. Own-rooted Cabernet Sauvignon, shown in this photo (below), are much smaller than grafted vines - undoubtedly due to feeding by grape phylloxera. This is a cautionary example for those contemplating layering or planting own-rooted vinifera.

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Veraison to Harvest is a joint publication of:

Cornell Enology Extension Program

Statewide Viticulture Extension Program

Long Island Grape Program

Finger Lakes Grape Program

Lake Erie Regional Grape Program

Hudson Valley Regional Fruit Program

Because the Vineyard Laboratory will be moving to new facilities in Portland, NY, this experiment, planted in 2003, is slated to be removed after the 2008 Growing season. I'd recommend a visit to Fredonia to see this with your own eyes before that happens. The Lake Erie Extension Team and Terry plan on hosting some field day events there next growing season. Its well worth a look.

Information collected here will be invaluable to the Lake Erie industry and other areas with acid soils for many years to come. Expect a lot of detailed, practical information in future articles about this trial.