

VERAISON TO HARVEST

Statewide Vineyard Crop Development Update #7



Cornell University
Cooperative Extension

October 23, 2009

Edited by Tim Martinson and Chris Gerling

Around New York...

Statewide (*Tim Martinson*)

Much fruit has been harvested this past week, as reflected by all the 'H' for harvested notes in this week's Fruit Maturation report (pp.4-6). Notably, over half of the Riesling blocks were harvested before we sampled October 19. In the remaining blocks, acids did drop a bit - and the numbers look very similar to '08 at this time. There is very little *botrytis*, and this year's fruit has come in clean. All Cabernet Franc samples were still collected, and very little movement in brix or TA came through in our samples. Much will be harvested in the coming week, as some vineyards have lost their leaves. Long Island Merlot samples didn't show much movement, either - but in the maritime climate they can expect a few more weeks of ripening time before frost hits.



Long Island: Chardonnay on October 9 (at harvest) at the Variety/Clonal evaluation block at the Long Island Horticultural Research and Extension Center in Riverhead. Note bird feeding injury, in spite of early application of bird netting.

Photo by Alice Wise

This week Chris and Hans (p. 2) try to answer your questions about partially frosted canopies and prospects for further 'hang time'. (See also Chris's article in *Veraison to Harvest* # 5 on Managing Acidity in the Winery). Cornell faculty, staff, and graduate students rely on cooperating vineyards and wineries to complete research and demonstration projects. We just harvested a major one (p.3) at White Springs vineyard, which showed some interesting fruit differences. YAN (p. 7) samples still show a lot of variability.

Long Island (*Alice Wise and Libby Tarleton*)

After a short spell of cooler weather, this past week was typical for October – sunny and in the 60's. Many growers took the opportunity to let fruit hang and benefit from the good weather. A few Chardonnay blocks are still out (late even by LI standards) but with excellent fruit integrity and healthy canopies, growers are expecting flavors to intensify and acids to soften. Though any benefits will likely be modest, these nuances in management are critical to push quality as much as possible.

Peconic Bay Vineyard's vineyard manager Charlie Hargrave was elated over his Riesling on October 9th. The fruit was strikingly clean and flavors balanced nicely with acids, coming in at 20.5 brix and 3.10 pH. Hargrave went on to say that this was possibly the best Riesling that he has grown, a weighty statement from a manager that annually provides his winery with beautiful ripe fruit. Reds trickled into wineries this week with varieties such as Malbec and indications that Merlot harvest may begin soon, though some blocks will clearly hang another 2-3 weeks. With all of the challenges in the vineyard this season behind them, vineyards managers are starting to exhale as their efforts to bring in a quality crop have in the most part succeeded.

Lake Erie (*Jodi Creasap Gee*)

More cold temperatures over the weekend and at the beginning of the week turned leaves brown in most vineyards across the region. For National Grape Cooperative, the Concord harvest paused briefly last week for processing late Niagaras, but the harvesting crews in the region are still moving through the Concords. In fact, this past week, the pace has picked up, and more trailers are waiting to be weighed and emptied. Most of the wine grapes at this point look just OK – leaves are green and the fruit is hanging well, although dehydration is becoming more apparent in some blocks. I have noticed more powdery mildew infections on rachises, which often simply fall from the vines with only the slightest pressure. Berry weights are dropping on most varieties, with a subsequent

increase in Brix, but the acids are staying fairly high. This is to be expected with the weather we have had this year, so we recommend getting the fruit in as soon as possible – as long as wineries are not making a late harvest or ice wine – and deal with the juice in the winery.

Hudson Valley (Steve McKay & Steve Hoying)

A welcome warming trend arrived this week, thus helping to boost sugars in the late red varieties still hanging. Freezing nighttime temperatures caused variable damage to canopies, but mainly on tender leaves. Mature leaves have remained and in many cases still provide sufficient canopies to continue ripening unharvested grapes. All grapes at the Highland Lab were harvested this week. Yields were outstanding on these three year old vines. A couple of panels were mistakenly not thinned, and they provided an excellent illustration showing how delayed ripening and poor fruit quality result from a lack of proper canopy management during the growing season. Canopies are still intact and healthy in these vines, and most varieties have canes hardening well, except 'Sauvignon Blanc'. A number of growers are still waiting for maturity gains before they harvest 'Cabernet Franc'.

Finger Lakes (Hans Walter-Peterson)

Warmer temperatures and a break from the rain helped to make harvest a bit more of a pleasant experience this week. Many vineyards were picking Riesling this week, and the general consensus from winemakers continues to be positive regarding the quality of the fruit coming in. Sugar content remains lower than average in general, with acids higher than usual as well. Depending on how much malic acid is remaining in the fruit, acidity may still fall a little further even in vineyards that are losing their leaves due to freezing temperatures or disease, but significant reductions (>10-15%) don't seem likely at this point.

Overall tonnage seems to be average to slightly below average, based on comments from growers, with the primary culprit being poor set in some vineyards and varieties. Concord yields are running about average in vineyards on the Keuka bluff, but are still hovering in the 15 degrees Brix range for the most part. Fruit remains clean for the most part, but the warm days this week appear to have kicked some last minute *botrytis* infections into gear, so sorting fruit may need to become a consideration in some situations.

PROSPECTS FOR FURTHER FRUIT DEVELOPMENT

*Chris Gerling and Hans Walter-Peterson
Statewide Enology Extension Program
Finger Lakes Grape Program*

"All the leaves are brown, and the sky is gray..."

-lyrics by The Mamas and The Papas

"...but the winemaker heard the numbers and doesn't want to see me yet."

-New York Vineyard Manager

This week we have reached an uneasy truce with Mother Nature. The next step is to figure out where we stand and what happens now. The topic that seems to be on most people's lips is the status of the fruit that remains on the vine and what we might be able to expect from it in the future.

Earlier this week, Justine Vanden Heuvel, Hans Walter-Peterson, Tim Martinson, Anna Katharine Mansfield and I were out (hand-harvesting a vineyard trial) discussing leaves and grapes, and since Hans made it out of there first, he set out to get some answers to the following questions:

- 1.) If some leaves are damaged but some are green, are the green ones still functioning?
- 2.) If there are no green leaves remaining, is anything beneficial happening?

Here's what Hans found out (*adapted from October 20 Finger Lakes Vineyard Update*):

Scenario #1 (some leaves killed or dropped, some green leaves still present): I asked Alan Lakso this question this morning. He told me that he went out to measure photosynthesis rates on green leaves last week and found that they were still active. This makes sense physiologically – as long as there is green chlorophyll to intercept sunlight and there is adequate water and nutrient availability, photosynthesis can occur. However, even if the leaves were still active, I would not count on significant accumulations of sugar in the berries at this point. If your vineyard foliage is still completely green, you can understandably expect significantly more.

Scenario #2- (no green leaves remaining): Consensus opinion holds that the berries may still be respiring on the vine, and part of internal respiration is the consumption of malic acid (independent of leaves). Malic acid,

RESEARCH FOCUS: RIESLING HARVEST AT WHITE SPRINGS VINEYARDS

Tim Martinson



Is it better to have fewer, larger clusters or more and smaller clusters? We know that light exposure to clusters is important – so is it important to do fruiting-zone leaf removal early or is there a broad window of time in which it can be accomplished? We know that good fruit exposure reduces disease pressure, but which practices reduce it most? And how does all this influence wine flavors?

These questions are ones that interest researcher **Justine Vanden Heuvel**, whose program is systematically addressing how canopy management practices influence wine quality, flavors – and profitability for growers and wineries.

A large experiment in a six year-old Riesling vineyard at **White Springs Vineyards** near Geneva is bringing together 12 different combinations of shoot thinning, cluster thinning, and leaf removal (2 timings) to answer these questions.

The Riesling block at White Springs Vineyards, managed by long-time winemaker **Derek Wilber**, is unique. It is a high density planting, with 3 ft vine spacing, and 7 vines per post length. Vineyard practices are top-notch, and vine size is unusually uniform. In other words, its an excellent place to do research.

Results. Our crew harvested 96 post lengths on 672 vines (about 1/3 acre at a planting density of 1800 vines/acre). We counted every cluster.

The thinning (either shoot or cluster, or both) made a huge difference in how many clusters were present - and on cluster size. Thinned vines had fewer, and larger clusters. Unthinned ones had smaller, more numerous clusters (see photos).

In practical terms: In different treatments, I harvested from 250 to 450 clusters per 7-vine panel, which works out to 35 - 65 clusters per vine. Where there were more clusters, they weighed less and had smaller berries. My guess is that clusters in the ‘unthinned’ treatments weighed about 60% of what the clusters in the ‘thinned’ treatments weighed. (We harvested into plastic grocery bags. Depending on the treatment, I could fit 60 or 100 clusters in each bag.) Taking cluster number and weight into consideration, I’m guessing there may be a 10-12% yield difference among plots. I’d expect that wines made from these grapes will be quite different.

Justine Vanden Heuvel, however, predicts that the early shoot thinning and the extra light exposure it affords the clusters will have an even greater effect on wine flavors than the thinning treatments. She expects that the effects will be particularly pronounced in this cloudy, cool growing season - in other words, that early leaf removal will have a greater effect than in sunny years.

There was no practical difference in disease severity. We found almost no *Botrytis* or evidence of earlier powdery or downy mildew damage to clusters.



This experiment is one of around 25 separate vineyard trials taking place in commercial vineyards in the Finger Lakes with at least 15 cooperating growers this year. Our thanks to Derek and the White Springs crew for their cooperation!



Harvest at White Springs. Technician **Steve Lerch** and **Jack Reich** weigh fruit with a field scale and record crop weight. Wines will be made in duplicate from six of the treatments. (Top) Typical variation in cluster size among different treatments.



This project was funded by a grant from the Northeast Sustainable Agriculture Research and Extension (SARE) Program.

Photo by Tim Martinson

FRUIT MATURATION REPORT - 10/19/09

Samples reported here were collected on **Monday, October 19 2009**. Where appropriate, sample data from 2008, averaged over all sites is included. Tables from 2008 are archived at www.grapesandwine.cals.cornell.edu/extension/vtohp.php

Cabernet Franc

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	W Seneca Lake	H	H	H	H
		E Seneca Lake	1.54	19.6	3.09	13.4
		Cayuga Lake	1.52	19.6	3.17	11.7
Hudson Valley	10/19	HV Lab	1.25	18.6	3.28	12.6
	Lake Erie	10/19	Fredonia	1.35	18.8	3.24
Long Island	10/19	S Side North Fork	1.33	20.7	3.46	10.3
		N Side North Fork	1.35	20.7	3.40	10.7
Average	10/19		1.39	19.7	3.27	11.9
<i>Prev Sample</i>	<i>10/12</i>		<i>1.49</i>	<i>19.8</i>	<i>3.24</i>	<i>11.6</i>
<i>'08 Average</i>	<i>10/20/08</i>		<i>1.75</i>	<i>21.1</i>	<i>3.36</i>	<i>8.7</i>

Catawba

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	Cayuga Lake	2.75	16.6	3.35	3.8
Average			2.75	16.6	3.35	3.8
<i>Prev Sample</i>	<i>10/12</i>		<i>2.81</i>	<i>16.5</i>	<i>3.29</i>	<i>4.7</i>

Chancellor

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Lake Erie	10/19	No Shoot/Cluster thin	H	H	H	H
		Mechanical Shoot thin	H	H	H	H
		Mechanical Cluster Thin	H	H	H	H
<i>Final Sample</i>	<i>10/05</i>	<i>(Final-Harvested)</i>	<i>1.77</i>	<i>17.7</i>	<i>3.34</i>	<i>10.9</i>

Chardonnay

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	W Seneca Shoot Thin	H	H	H	H
		W Seneca Noshoot thin	H	H	H	H
		Cayuga Lake	H	H	H	H
Hudson Valley	10/19	HV Lab	1.76	21.0	3.52	10.0
		Long Island	North Hudson Valley	1.47	20.5	3.51
		S Side North Fork	H	H	H	H
Average	10/19		1.62	20.8	3.52	8.8
<i>Prev Sample</i>	<i>10/12</i>		<i>1.75</i>	<i>19.6</i>	<i>3.42</i>	<i>8.6</i>
<i>Final '08</i>	<i>10/1/08</i>		<i>1.56</i>	<i>20.2</i>	<i>3.23</i>	<i>8.9</i>

Concord

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	Keuka Lake	H	H	H	H
<i>Final Sample</i>	<i>10/12</i>		<i>3.29</i>	<i>15.6</i>	<i>3.37</i>	<i>6.0</i>
<i>'08 Average</i>	<i>10/13/08</i>		<i>3.69</i>	<i>17.4</i>	<i>3.38</i>	<i>5.7</i>

Corot Noir

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	Shoot thin/Leaf Removal	H	H	H	H
		No Shoot Thin/No Leaf Rem	H	H	H	H
<i>Final Sample</i>	<i>10/12</i>		<i>2.17</i>	<i>15.9</i>	<i>3.32</i>	<i>7.9</i>
<i>'08 Average</i>	<i>10/20/08</i>		<i>2.33</i>	<i>18.3</i>	<i>3.45</i>	<i>6.6</i>

Gewürztraminer

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
<i>Final Sample</i>	<i>10/05</i>		<i>1.61</i>	<i>20.4</i>	<i>3.80</i>	<i>6.7</i>

Marechal Foch

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
<i>Final Sample</i>	<i>10/05</i>		<i>1.09</i>	<i>23.2</i>	<i>3.52</i>	<i>8.3</i>
<i>'08 Average</i>	<i>9/22/08</i>	<i>(FINAL-HARVESTED)</i>	<i>1.02</i>	<i>24.1</i>	<i>3.18</i>	<i>12.8</i>

Leon Millot

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
<i>Final Sample</i>	<i>9/21</i>		<i>0.90</i>	<i>22.3</i>	<i>3.12</i>	<i>15.4</i>

Merlot

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Hudson Valley	10/19	HV Lab	H	H	H	H
Long Island	10/19	S Side North Fork	1.82	20.7	3.57	9.5
		N Side North Fork	1.77	19.4	3.46	10.9
Average	10/19		1.80	20.1	3.52	10.2
<i>Prev Sample</i>	<i>10/12</i>		<i>1.93</i>	<i>19.4</i>	<i>3.48</i>	<i>8.9</i>
<i>Final'08</i>	<i>10/13/08</i>		<i>1.67</i>	<i>22.1</i>	<i>3.53</i>	<i>6.9</i>

Noiret

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	W Seneca Shoot Thin	H	H	H	H
		W. Seneca. Noshoot.thin	H	H	H	H
Hudson Valley	10/19	HV Lab	1.67	19.5	3.48	7.4
		W. Hudson Valley	H	H	H	H
Lake Erie	10/19	Sheridan-no treatment	1.88	16.1	3.19	13.2
		Sheridan-crown gall	1.64	16.8	3.21	12.8
Average	10/19		1.73	17.5	3.29	11.1
<i>Prev Sample</i>	<i>10/12</i>		<i>1.97</i>	<i>17.1</i>	<i>3.25</i>	<i>10.5</i>
<i>'08 Average</i>	<i>10/20/08</i>		<i>1.74</i>	<i>18.6</i>	<i>3.17</i>	<i>11.1</i>

Pinot Noir

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	E Seneca Lake	H	H	H	H
Hudson Valley	10/19	HV Lab	H	H	H	H
		Mid Valley	H	H	H	H
Final Sample	10/12		1.59	21.0	3.39	11.1
<i>Final '08</i>	<i>10/06/08</i>	<i>(final sample)</i>	<i>1.26</i>	<i>22.8</i>	<i>3.37</i>	<i>9.3</i>

Riesling

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	W Seneca-Shoot thin/Leaf Rem	H	H	H	H
		W Seneca-No Shoot Thin/No Leaf Rem	H	H	H	H
		E Seneca (1)	1.79	19.3	2.96	16.6
		E Seneca -shoot thin (2)	1.75	19.0	3.02	14.9
		E Seneca - no shoot thin (2)	1.74	17.7	2.97	15.5
Hudson Valley	10/19	Cayuga Lake	H	H	H	H
Hudson Valley		North Hudson Valley	2.04	17.2	3.32	10.2
		HV Lab	1.82	18.9	3.32	11.1
Lake Erie	10/19	Fredonia -No Thin/No leaf rem	H	H	H	H
		Fredonia - No leaf rem/late hedge	H	H	H	H
		Fredonia-Leaf rem/early hedge	H	H	H	H
		Fredonia-No leaf rem/early hedge	H	H	H	H
Average			1.83	18.4	3.12	13.7
<i>Prev Sample</i>	<i>10/12</i>		<i>1.71</i>	<i>18.5</i>	<i>3.07</i>	<i>15.0</i>
<i>'08 Average</i>	<i>10/20/08</i>		<i>1.60</i>	<i>19.3</i>	<i>2.96</i>	<i>13.6</i>

Sauvignon Blanc

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Long Island	10/19	S Side North Fork	1.82	21.1	3.18	12.7
<i>Final Sample</i>	10/19		1.82	21.1	3.18	12.7
<i>Final '08</i>	<i>9/22/08</i>	<i>(FINAL -HARVESTED)</i>	<i>1.77</i>	<i>20.1</i>	<i>3.03</i>	<i>10.8</i>

Seyval Blanc

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Long Island	10/19	S Side North Fork	1.69	21.2	3.22	13.9
<i>Prev Sample</i>	<i>10/05</i>		<i>1.98</i>	<i>19.0</i>	<i>3.42</i>	<i>7.2</i>
<i>Final '08</i>	<i>9/22/08</i>	<i>(Final '08 sample)</i>	<i>2.16</i>	<i>21.5</i>	<i>3.04</i>	<i>9.0</i>

Traminette

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	Shoot Thin	H	H	H	H
		No Shoot Thin	H	H	H	H
Hudson Valley	10/19	HV Lab	1.88	23.2	3.26	12.2
		W Hudson Valley	1.49	18.7	3.30	11.6
Lake Erie	10/19	No Shoot Thin (1)	2.05	17.3	3.14	12.9
		Shoot Thin (1)	2.06	17.7	3.18	12.6
		No Shoot thin (2)	1.94	16.9	3.14	16.1
		Shoot Thin (2)	1.92	16.7	3.13	16.2
Average			1.89	18.4	3.19	12.6
<i>Prev Sample</i>	<i>10/12</i>		<i>1.95</i>	<i>18.1</i>	<i>3.10</i>	<i>13.1</i>
<i>Final '08</i>	<i>10/13/08</i>		<i>1.77</i>	<i>20.7</i>	<i>3.07</i>	<i>11.5</i>

Vignoles

Region	Harvest Date	Description	Berry Wt. (g)	% Brix	pH	TA (g/L)
Finger Lakes	10/19	Shoot thin	H	H	H	H
		No shoot thin	H	H	H	H
<i>Final Sample</i>	<i>10/12</i>		<i>1.47</i>	<i>20.4</i>	<i>3.13</i>	<i>14.7</i>
<i>Prev Sample</i>	<i>10/05</i>		<i>1.63</i>	<i>18.2</i>	<i>3.17</i>	<i>15.0</i>

YEAST ASSIMILABLE NITROGEN- 10/19/09

Chris Gerling

Yeast Available Nitrogen (YAN) represents the sum of Ammonia (amm) and Free Amino Nitrogen (FAN) on the accompanying table. Nitrogen levels play a large role in yeast nutrition during fermentation and deficiencies can lead to stressed and/or sluggish fermentations and potential off-aromas. Furthermore, compounds with implications for human health are also related to the amount and types of nitrogen compounds contained in must and wine. The generally agreed upon minimum YAN for a successful fermentation is in the range of 150 mg/L, while the optimum levels are considered to be at least 200 mg/L and often higher.

Region	Harvest Date	Variety	Description	Ammonium mg/L	FAN mg/L	Y A N mg/L
Finger Lakes	10/19	Cabernet Franc	E Seneca Lake	12	32	44
	10/19	Cabernet Franc	Cayuga Lake	4	35	39
	10/19	Catawba	Cayuga Lake	25	48	73
	10/19	Riesling	E Seneca shoot thin	100	58	158
	10/19	Riesling	E Seneca no shoot thin	95	73	168
	10/19	Riesling	E Seneca Lake	88	55	143
Hudson Valley	10/19	Cabernet Franc	HV Lab	51	113	164
	10/19	Chardonnay	HV Lab	147	278	425
	10/19	Chardonnay	N HudsonValley	100	288	388
	10/19	Noiret	HV Lab	62	212	274
	10/19	Noiret	W Hudson Valley	33	142	175
	10/19	Riesling	N HudsonValley	98	87	185
	10/19	Riesling	HV Lab	74	92	166
	10/19	Traminette	HV Lab	25	305	330
	10/19	Traminette	W Hudson Valley	11	101	112
Lake Erie	10/19	Noiret	Sheridan -normal	32	115	147
	10/19	Noiret	Sheridan -crown gall	37	118	155
	10/19	Traminette	No shoot thin	10	108	118
	10/19	Traminette	Shoot thin	12	60	72
Long Island	10/19	Merlot		38	104	142
	10/19	Sauvignon blanc	S side N Fork	100	141	241

Continued from Page 2

as most of you know, tends to occur in the second highest concentrations in grapes after tartaric acid. As in scenario one, no one believes that we're talking about large drops or even necessarily statistically meaningful ones. The largest effect is most likely due to water. In dry conditions the berries will begin dehydrating on the vine, while in wetter conditions there may be some absorption and dilution.

The catch, which I'm sure you've already spotted, is that we want sugar up and acid down. Dehydration will give us sugar increases but also increases in acid, while dilution will lower the acid but also the sugar. Flavor compounds probably also fall into the category of being affected by water (and not really by anything else the vine is doing at this point), so dehydration would most likely benefit them to some extent.

Finally, we could ask whether leaving fruit is actually causing harm. After all, we may not have space in the cellar, or we may not have access to harvest crews and equipment, or we've come this far and may just feel better with the idea that there is still hope for improvement from some natural force out in the vineyard. It goes without saying that the usual risks- weather, rot, and animals- are still very much in play. If disease is not an issue, and you have control over deer, birds and roving researchers, you could imagine that in the best case you've got a sort of open-air storage. The idea to keep in mind is that the odds are against dramatic maturation, however, and the risks will outweigh the benefits in most cases. As we've learned in the early rounds, Mother Nature rarely fights fair.



This newsletter was made possible through a grant from the New York Wine and Grape Foundation's Total Quality Focus program.

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

Copyright 2009 © Cornell University



Cornell University
Cooperative Extension

The information, including any advice or recommendations, contained herein is based upon the research and experience of Cornell Cooperative Extension personnel. While this information constitutes the best judgement/opinion of such personnel at the time issued, neither Cornell Cooperative Extension nor any representative thereof makes any representation or warranty, express or implied, of any particular result or application of such information, or regarding any product. Users of any product are encouraged to read and follow product-labeling instructions and check with the manufacturer or supplier for updated information. Nothing contained in this information should be interpreted as an endorsement expressed or implied of any particular product.