Finger Lakes Vineyard Update

Hans will be traveling out of the country for the next couple of weeks. He will return to the office on Monday, August 25. If you need assistance in the meantime, please contact Mike Colizzi at mac252@cornell.edu or 315-536-5134.

In The Vineyard

Mike Colizzi

Well it feels like summer is starting to slip away the harvesters are getting serviced and bins are being washed out. It wont be long now and the early varieties will start to come in. We will be starting Veraison to Harvest samples on August 25th so look for the first summary to be sent out on the 29th.

Grape berry moth sprays should be applied soon in vineyards that are above the 15% damage threshold. Most places have reached 1620 DD earlier this week. The window to apply contact insecticides is 1620-1710 DD. As most of you know these berry moth stings can lead to botrytis issues later in the fall. So treating problem areas now will pay off later especially in a wet year like this. There have been some reports of serious hail damage around the Finger Lakes. Parts of the southern Finger Lakes were hit very hard last Tuesday.

Figure 1: Hail damaged Riesling

Links To

Upcoming Events

Tailgate Meeting Dr. Frank's Vinfera Wine Cellars *August 19, 2014*

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It seems as though most vineyards I have been in that had downy problems earlier this summer have them somewhat under control now. Berries are resistant to new infections at this point so now it is just a matter of keeping the canopy clean to help ripen the fruit. I had not seen much powdery mildew around until last week. I was in one vineyard in particular that had a powdery mildew problem mainly on the fruit. The worst infections were in Chardonnay and Riesling however several other varieties had infection as well.

Figure 2: Powdery Mildew

As many varieties reach veraison bird nets are starting to go on, or be lowered whichever the case may be. We just completed netting many of our red varieties at the teaching vineyard including some over the row nets for Marquette, Jupiter, and Marquis that are on an umbrella trellis. Good thing there is only three rows like that. I have seen birds starting to flock up the past couple weeks and some blocks have been damaged already. Most early red hybrid varieties are well into veraison, as well as Pinot Noir, Lemberger, Chardonnay, Cayuga White, and many table grape varieties.

Figure 3: Marquette on 8/6/14

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Understanding and Managing Sour Rot

Wayne Wilcox, *Plant Pathology, Cornell University, NY State Agric. Expt. Sta., Geneva*

SOUR ROT is often used as an imprecise catch-all term to describe the "snork" that takes over injured clusters near harvest when the weather becomes wet. Unfortunately, this means that different people (and fungicide labels) can use this same name to refer to a general condition that has different causes. For the rest of this discussion, I'll be referring to what I call "true" sour rot--a syndrome that involves pre-harvest cluster decay accompanied by the smell of vinegar (hence the name, duh).

Winemakers often refer to and measure the cause of this vinegar smell (acetic acid) as volatile acidity (VA). Dr. Wendy McFadden-Smith at OMAFRA on Ontario's Niagara peninsula, who has been in the forefront of sour rot research for more than 5 years now, has shown that the measure of VA in grapes harvested from different vineyards is strongly associated with the pre-harvest level of sour rot in them. It's generally accepted that the vinegar is produced by certain acetic acid-forming bacteria (species of *Acetobacter* and *Gluconobacter*), and that wounds (birds, rain cracking, berry moth, compression in tight bunches, powdery mildew, etc.) are necessary to get the whole process started. Sometimes these bacterial infections are accompanied or followed by infections by several wild "bad" yeasts, which can produce ethyl acetate (smells like nail polish remover or varnish). There appears to be a progression of steps involved in this whole process, which probably begins with the production of ethanol by "good" yeasts as the injured berries start leaking grape juice (ethanol is the substrate that the abovementioned bacteria convert to acetic acid, and we've found a lot of *Saccharomyces* yeasts associated with sour-rotted berries in the field), but a lot of the details are still rather murky. However, we know a lot more than we did a few years ago.

To my mind, two of the more important things that Wendy and her group have determined insofar as understanding the development of sour rot are: (1) Berries of Pinot noir and Riesling (the primary cultivars they've worked with) do not become worrisomely susceptible to infection until they mature to a point of about 15°Brix (minor levels of infection developed from inoculations at 13° Brix, nothing at 10°); and (2) The disease develops rapidly and severely at temperatures between 68 and 77°F; much more moderately at 59 to 68°F; and just barely chugs along at temperatures in the 50's. These data probably make sense to Finger Lakes Pinot Noir growers who remember last September—very warm and wet after Labor Day as clusters of this cultivar were nearing harvest and rapidly building sugars, with nasty sour rot ensuing soon thereafter.

The Ontario contingent has also done a nice job of documenting that sour rot doesn't get started in the vineyards until rain occurs after berries have reached 15°Brix and temperatures are at least in the 60's. Rain probably plays a few roles in disease development, but two of the more important are that it moves the causal bacteria around and into open wounds, plus it can help cause the injuries necessary for infection to occur in the first place (e.g., cracking that results as berries swell rapidly and/or become excessively compacted in tight clusters).

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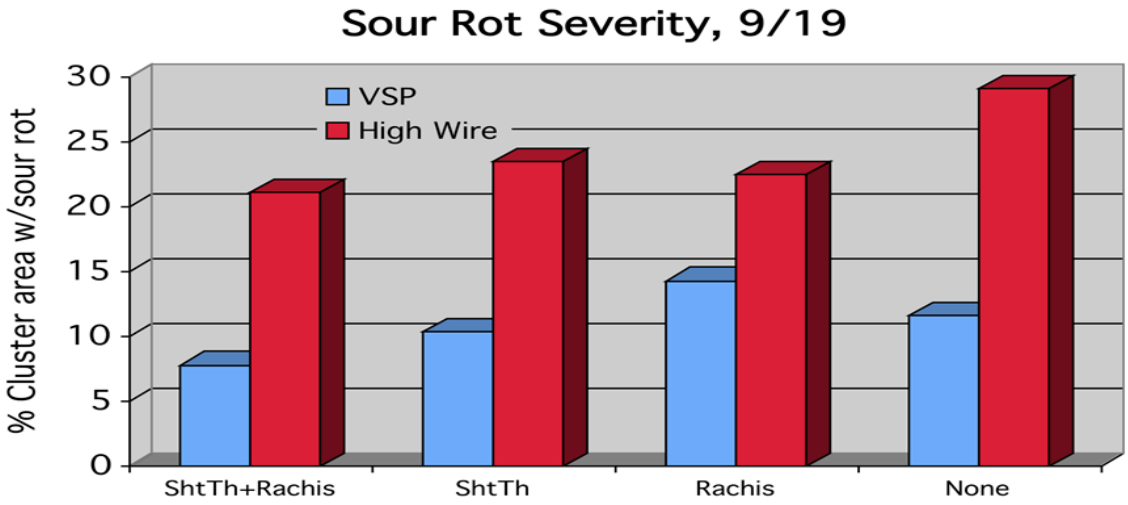
Another piece of the puzzle is the potential (apparent?) role of fruit flies (*Drosophila* spp.). Clusters with sour rot are typically swarmed with these insects. A prominent line of thinking over the years has been that they are opportunists coming to feed on a convenient food source; indeed, they are attracted to the smell of acetic acid. However, a study from Portugal published in 2012, while far from conclusive, suggests that these insects may actually play a direct role in the initiation and/or spread of the disease. Which caught our interest, see below.

Thus, in terms of managing sour rot, it seems that the likely strategies are: (1) Provide a berry microclimate in the canopy less conducive to pathogen growth; (2) Minimize berry injuries; (3) Minimize pathogen populations; and (4) Control the fruit flies if they are, indeed, a factor.

Last summer, we (graduate student Megan Hall, entomologist Greg Loeb and his technician Steve Hessler, along with yours truly and technician Dave Combs) began a multi-year project to better understand sour rot and how we might be able to better manage it. One year's worth of results is just that and we might find something very different this year. But as sour rot season starts approaching, here's what we found, for what it's worth, along with some other associated information and thoughts about control options:

Canopy microclimate. I'll trot out data presented before from a trial conducted with other Cornell colleagues in a commercial Vignoles vineyard in the very wet fall of 2011. There were two different training systems and three canopy management systems involving shoot thinning and removal of old clusters stems or rachids (to lower Botrytis inoculum). The data and figure captions speak for themselves.



- Effect of training system was greater than that of canopy manipulation: across all four treatments, average of 11.0% cluster area w/sour rot for VSP, 22.2% for Top Wire.
- Effects of training system and canopy manipulation were additive: best treatment = Shoot Thin + Rachis Removal/VSP (7.8%), worst treatment = Check/Top Wire (29.1%)

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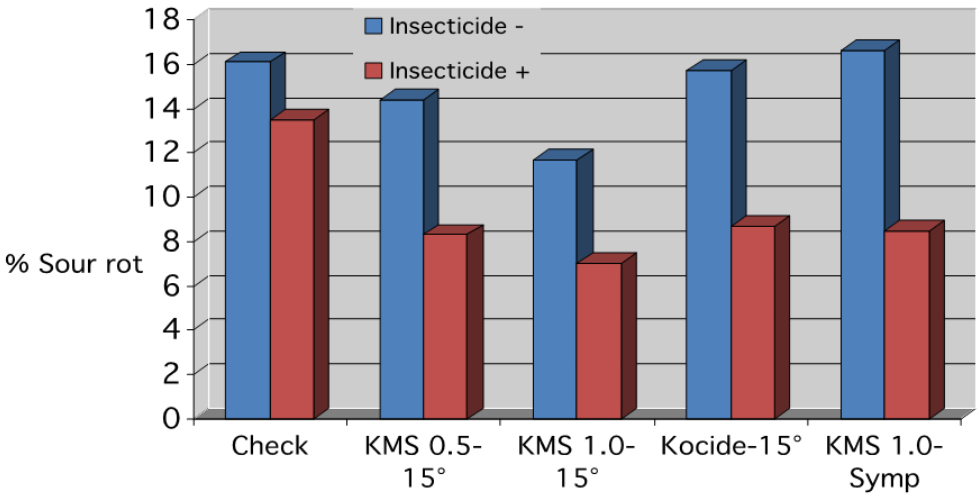
Minimize injury. Beyond the obvious (do what you can to reduce damage from birds, berry moth, powdery mildew, etc.), loosening clusters is likely to reduce mechanical injuries due to compaction, and will also go a long way toward reducing Botrytis development as well. In fact, I'd consider loosening clusters to be the holy grail for managing the late-season bunch rots that we deal with in this part of the world; unfortunately, finding a good technique for doing so has been almost as elusive a goal. Various treatments that some have found to be effective include giberellic acid (a registered use), the growth regulator prohexidione-calcium (not registered), and prebloom leaf removal. Even the legal options have their risks and are not for the faint of heart, and need to be left for another discussion. Calcium sprays to "toughen" the grape skins haven't reduced sour rot development when tried by tried by Wendy et al., nor have Raingard or calcium chloride applied as anti-cracking treatments.

Minimize the pathogen population. A number of antimicrobial sprays tried in Ontario did not have any effect on sour rot development: Serenade, Pristine, vermicompost, potassium bicarbonate (e.g., Milstop, Armicarb). But what did reduce sour rot was potassium metabisulfite ("KMS", in shorthand), applied weekly at a rate of either 0.5 or 1.0% (4 or 8 lb per 100 gallons of water, respectively). It must be noted that whereas KMS is used widely in wineries both to sanitize equipment and as an additive to musts and wines to kill wild microorganisms and prevent oxidation, it is NOT registered for spraying onto vines to control diseases, either in the US or Canada. Also, it is nasty stuff if you get it in your eyes or breathe in the dust.

Control fruit flies. Although some growers have tried this approach, I'm not aware of any experimental data evaluating its efficacy prior to our trial last year.

2013 trial results. We looked at a combination of insecticide and antimicrobial sprays. Alternate rows in a 'Vignoles' vineyard were sprayed with the insecticide Delegate (weekly, beginning at 15° Brix), with the remaining rows receiving no insecticide. Then, within these insecticide-plus or –minus rows, we applied various antimicrobial treatments, also on a weekly schedule: (i) 0.5% KMS, beginning at 15° Brix; (ii) 1.0% KMS, beginning at 15° Brix; (iii) Kocide at 2 lb/A (registered!), beginning at 15° Brix; (iv) 1.0% KMS, beginning at first appearance of disease symptoms; (v) none (check). The results are presented to the right.



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Bottom line: Antimicrobials without insecticide provided an average of 9% control (vs. check); antimicrobials with insecticide provided an average of 50% control (vs. check); and insecticide without antimicrobials provided 15% control.

A few comments:

- As noted, these are data from a single experiment. I'll feel more confident if we're able to repeat the results this year. However, both our results and those from Ontario indicate that some antimicrobial sprays can reduce sour rot. Because bacteria are a huge part of the complex and we haven't seen any consistent association with "filamentous" (non-yeast) fungi, I wouldn't expect fungicides to provide much benefit in our region or those with similar climates, other than reducing the number of certain injury sites (e.g., pre-harvest Botrytis infections). In warmer climates (California, Texas, South Australia), species of the *Aspergillus* fungus often are associated with sour rot, but what causal role they may or may not play is not that clear.
- We have other reasons to believe that fruit flies are important players in this disease complex. (It should be noted that whereas the spotted wing Drosophila is getting a lot of attention and may be a component in the mix, the "garden variety" species—*D. melanogaster*, which has always been around—seems to be the primary player from what we can tell so far). Now the question is what to do about them.
- This trial was designed as a "proof of concept"—we nuked the hell out some vines in order to see whether insecticide plus antimicrobial sprays can have an effect. Once we're convinced that they can, we'll start working on finding out how much less we can spray to get the same result.
- KMS is not a legal treatment and Kocide has potential copper residue issues that, although legal, might cause problems with fermentation in the winery. This year we'll also be trying Oxidate, which is expensive but legal and without potential fermentation issues. Wendy did not get benefit from it in her earlier trials, but some Finger Lakes growers tried this product last year as a "rescue" treatment and felt that it helped (of course, such observations are seldom based on comparisons with an unsprayed check row or rows). We'll also be using Mustang Max as our insecticide, as Greg thinks it will have more residual efficacy. (Note that it is labeled for use on grapes with a 1-day PHI, although fruit flies are not a listed target pest). Stay tuned.
- We're looking at a lot of other issues regarding the various microbes involved, the mechanistic role of fruit flies in this whole process, their interactions, and when these different components appear and/or start multiplying to high levels in the vineyard. We hope to have some interesting and useful information to report as the project continues.

What does this all mean for 2014? Sour rot occurs sporadically and the "state of the art" with respect to understanding and controlling it is still pretty sketchy. Individual growers will approach managing it differently depending on their own individual perceived risk and philosophy for addressing it. For now, I'd keep these concepts in mind: Disease can be initiated once rains occur after berries reach approximately 15° Brix; warm temperatures (extended periods in the upper 60's and above) are much more problematic than

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cooler temperatures; good canopy management will keep things from getting worse than they would otherwise; it's much easier to keep things down to a dull roar if you address a disease outbreak early than if you wait until things start blowing up in your face. Just how to do this is the $64,000 question (and that term was coined in 1950's currency!).

Knowing what we do at this point, if it was me and I had a few thousand dollars per acre of crop threatening to go south in a hurry, I'd put something on to help control the fruit flies and responsible microbes. If it was consistently warm and wet and I'd had a problem in that block before, I might start at 15° Brix before seeing symptoms and back off if the weather turned more favorable and/or disease development stayed in check. Otherwise, I'd probably keep a very close eye on my vineyards and the weather, and be ready to jump in if I saw the disease starting and the weather looked conducive for its spread. Here's to hoping that we get plenty of disease pressure in our test plots so that we can find out more about it, but that it stays away from commercial blocks this year.

Upcoming Events

Don't forget to check out the calendar on our website (http://flgp.cce.cornell.edu/events.php) for more information about these and other events relevant to the Finger Lakes grape industry.

FLGP Tailgate Meeting

Tuesday, August 19 5:00 – 6:30 PM

Dr. Frank's Vinifera Wine Cellars

Beattle Hill Road, Hector, NY (click here for map)

Our final Tailgate Meeting of the season will be held on Tuesday, August 19th at 5:00 PM at Dr. Frank's Seneca Lake vineyard in Hector.

These meetings are held every other week at various grape farms around the Finger Lakes, and are intended to be informal, small-group meetings where FLGP staff and growers can ask questions and discuss issues about vineyard management, IPM strategies or other topics appropriate for that point in the growing season. Growers are eligible to receive 0.75 pesticide recertification credits at each meeting this year.

NY FIRST

New York First gives priority and advantage to local companies in upstate New York and throughout the State of New York. As a committed partner in economic development, we buy goods and services available in the region and the State from local vendors. If you represent a New York business, and would like more information on becoming a preferred vedor or you just want to learn more about the proposed Lago Resort and Casino, please attend our informational meeting.

Informational Meeting

Thursday, August 14, 2014
7:00pm
Holiday Inn
2468 State Route 414
Waterloo, NY 13165

Contact:
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NEW YORK FIRST

2014 GDD Accumulation

2014 GDD & Precipitation

FL Teaching & Demonstration Vineyard – Dresden, NY					
Date	Hi Temp	Lo Temp	Rain (inches)	Daily GDDs	Total GDDs
8/6/2014	75.1	60	0.01	17.55	1,709.30
8/7/2014	74.9	56.6	0	15.75	1,725.05
8/8/2014	74.8	55.5	0	15.15	1,740.20
8/9/2014	79.1	55.1	0	17.10	1,757.30
8/10/2014	82.4	57.9	0	20.15	1,777.45
8/11/2014	81.2	62.2	0	21.70	1,799.15
8/12/2014	72.1	63.6	0.43	17.85	1,817.00
Weekly Total			**.44”**	**125.05**	
Season Total			**19.68”**	**1810.10**	

GDDs as of August 12, 2013: 1768.9

Rainfall as of August 12, 2013: 15.66”

Seasonal Comparisons (at Geneva)

Growing Degree Days

	2014 GDD [1]	Long-term Avg GDD [2]	Cumulative days ahead (+)/behind (-) [3]
April	52.1	65.6	-3
May	298.3	247.3	+3
June	516.9	480.6	+4
July	573.3	642.3	+1
August	220.8	590.3	-1
September		347.5	
October		104.6	

[1] Accumulated GDDs for the month.

[2] The long-term average (1973-2013) GDD accumulation for that month, or up to the most recent records in the current month.

[3] Numbers at the end of each month represent where this year’s GDD accumulation stands relative to the long-term average. For example, at the end of April 2014, we were 3 days behind average accumulation. The most recent number represents the current status.

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2014 GDD Accumulation

Precipitation

	2014 Rain [4]	Long-term	Monthly deviation from avg [6]
April	2.90”	2.90”	0.00”
May	3.64”	3.11”	+0.53”
June	3.23”	3.60”	-0.37”
July	7.81”	3.31”	+4.50”
August	1.01”	3.18”	
September		3.69”	
October		3.26”	

[4] Monthly rainfall totals up to current date

[5] Long-term average rainfall for the month (total)

[6] Monthly deviation from average (calculated at the end of the month)

Additional Information

Become a fan of the Finger Lakes Grape Program on Facebook, or follow us on Twitter (@cceflgp) as well as YouTube. Also check out our website, "The Grape Lakes – Viticulture in the Finger Lakes" at http://flg.cce.cornell.edu.

Got some grapes to sell? Looking to buy some equipment or bulk wine? List your ad on the NY Grape & Wine Classifieds website today!

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