Cornell Cooperative Extension
Finger Lakes Grape Program

August 24th, 2021

Finger Lakes Vineyard Update

In the Vineyard

This will be the final weekly 'Vineyard Update' newsletter for the 2021 season, as this week we will be sending out the first of the weekly 'Veraison to Harvest' project newsletters. As in past years, these newsletters will be published at the end of each week (usually Fridays) during the harvest season, with brief updates from each growing region around the state and ripening data for a number of cultivars from those areas. You can check out issues from past years at the Veraison to Harvest project homepage. - Hans

In This Issue:

In the Vineyard

Concord clusters in a Seneca Lake vineyard starting veraison

Harvest is now underway in the Finger Lakes, with both Bully Hill and E & J Gallo opening up for early loads, primarily of Aurore and a couple of other early hybrids. Most vinifera blocks I've been in are now in some phase of veraison, including Riesling which is still very green but with berries starting to soften up. Concord berries are starting to turn color as well this week. The Lake Erie team called veraison last Thursday, August 20, but I think most places in the Finger Lakes are probably still a day or two away from it.

In case you hadn't noticed, most of the Finger Lakes got a lot of rain last week. We recorded over 5" at the Teaching Vineyard over the past 7 days, and I know plenty of other areas did as well. The exception was up in Wayne County, where weather stations only recorded about 1" of rain, give or take. Even when it hasn't been raining, the humidity has been pretty high. Taken together, it's no great surprise that we're seeing some splitting in earlier ripening cultivars, especially Cayuga White.

'Regent' cluster in the Teaching & Demonstration Vineyard

IPM

The recent conditions of rainfall and high humidity are likely culprits in the amount of berry splitting that we're seeing in recent days. Cayuga White seems to be affected the worst so far based some observations in vineyards and calls from growers, but I have also seen it happening in Aurore, Baco, Marquette, Vignoles, and Pinot noir to various degrees as well. Riesling berries are just starting to soften, so they have been less likely to split up to this point, but similar conditions later on could cause more splitting in that variety as well.

Along with the splitting, we're also seeing more fruit flies starting to appear in these areas as well. After 2018, we are all painfully aware of the strong association between fruit flies and sour rot, so growers are understandably anxious about their appearance. But recall that sour rot requires both fruit flies *and* the microbial complex of yeast and bacteria in order to develop, and those microbes require certain conditions in the berry in order to proliferate. Several different studies have found that sour rot symptoms don't really get going until the fruit reaches about 14-15° Brix, but fruit flies can still feed and lay their eggs in fruit that is less than that level of ripeness. It may be splitting hairs a bit, but just because there are fruit flies present does not necessarily mean that sour rot is running amok, or is about to.

Photo 1. Baco noir with sour rot development (left).
Photo 2. Cayuga White with splitting berries (right)

In the case of a few of these early cultivars though, sour rot is certainly getting started. Greg Loeb noted that Vignoles in one of the research blocks at Geneva is starting to display sour rot symptoms with clusters testing around 13-14 Brix. Sour rot could also be found (and smelled) in a block of Baco noir (see photo) on Seneca Lake yesterday. I collected small cluster samples from a few cultivars yesterday (five clusters for each) to see if they were at or near Brix levels where sour rot could develop.

Cultivar	° Brix
Aurore	11.8
Baco noir	15.7
Chardonnay	14.7
Cayuga White	14.3

In each location where I sampled, I could find berries that had splits or some kind of wound on them, but for the most part, only the Baco had the very distinct smell of sour rot, along with the typical berry symptoms. The Aurore block had plenty of splitting going on, and a fair bit of sour rot developing, despite the low Brix reading in my sample (my suspicion is that the clusters with rot had higher Brix than my sample did, which contained relatively clean and intact clusters). The same was true in the Cayuga White – lots of split berries with some turning brown (Photo 2), but no real development of sour rot to any extent. The Chardonnay block had a bit of splitting, but not too much so far. As I mentioned, these results are from cluster samples, so there are certainly berries, especially in the Chardonnay and Cayuga clusters, that are above 15 Brix in those samples, so it is entirely possible that sour rot is starting to get established in those berries (like in one or two of the berries in the Cayuga photo might be).

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IPM (continued from page 2)

Katie Gold has provided a fairly brief review of the state of knowledge on sour rot so far, which follows this article (thank you Katie!). Be sure to pay special attention to the conditions that help to promote the development of the disease as they will be important to understand as we move into September and October, and to the recent research that is being done to see if we can avoid making weekly sprays to manage the disease like has been done so far. Results from trials in both Missouri and New York seem to indicate that this might be the case. If so, that would be helpful from the standpoint of reducing the amount of chemical inputs applied to the fruit and therefore reducing costs to growers, as well as sustaining the usefulness of our insecticides.

You can also follow this link to the slides from a presentation that Katie gave in August, 2020, about late season bunch rots, including sour rot.

We have had two years in a row (2019 and 2020) with very little rot pressure, but right now it doesn't feel seem like we're heading to a third one. However, if we return to conditions like those we had back in June (warm and dry), things will be looking better again. Fingers crossed…

Sour Rot

Katie Gold, Cornell AgriTech

Sour rot is caused by a four-way interaction amongst naturally occurring microbes (acetic acid bacteria + yeasts), *Drosophila* flies, and fruit wounding and is of growing concern to NY grape production. Under the right conditions, sour rot can cause major economic damage to wine grapes in NY and elsewhere, especially negatively impacting high value cultivars, as occurred in 2018. In bad years like 2018, sour rot disease can present a significant challenge to producing high quality grapes for wine production in all regions of NY where grapes are grown. The characteristic visual symptom of sour rot is a tan to occasionally reddish discoloration of the rotting berries, which eventually lose their integrity and begin to decompose. Sour rot can be distinguished from Botrytis bunch rot by the lack of moldy growth on and between berries. Whereas various molds, including botrytis, are often found on sour-rotted clusters, these organisms are not necessary for sour rot to develop. One additional group of organisms characteristically associated with sour-rotted clusters, which are highly visible and appear to be an important if not essential component of the disease, are Drosophila "fruit flies" or "vinegar flies." Sour rot is called sour rot for a reason, and earns its name from the pungent vinegar smell the rotting clusters give off. Often times you can smell sour rot in the vineyard before you see it.

Sour rot, K. Gold, Cornell University

Pioneering research by Megan Hall, Wayne Wilcox, and Greg Loeb unveiled the unique, multitrophic nature of this peculiar rot. In order to get sour rot, you need a wounded grape, a yeast to ferment the sugars and generate ethanol, acetic acid bacteria to convert that ethanol into in vinegar, and fruit flies. Yeasts and acetic acid bacteria occur naturally on and in grapes, healthy or otherwise, and there is in fact no meaningful difference between the microbiome of healthy berries and sour-rotted, meaning that the culprits are naturally occurring. It appears as though these endemic microbes only turn antagonistic and develop into sour rot when the berry is both wounded and exposed to fruit flies. Wounds are important for sour rot development as they expose a sugary carbon food source for nearby yeast and bacteria causing them to increase in abundance, create an aerobic environment ideal for converting ethanol to acetic acid, and release volatiles that attract the flies. Wounds can be caused by a number of agents (and is the subject of ongoing collaborative research between myself, Greg Loeb, and his new PhD student, Rekha Bhandari), but most frequently by the grape itself. Riesling, Pinot Noir, Sauvignon Blanc, Chardonnay, and Vignoles are especially at risk for developing sour rot

because of their tight cluster architecture. As the clusters grow, wounds are formed as the berries rub up against each other and expand. Loose clustered varieties are thus less prone to sour rot.

The final component of sour rot are fruit flies. It's clear that they are necessary for disease development, but their exact role, be it enzyme secretion or something else, is not yet known. Recent findings by the Hall lab at Missouri showed that larval fruit flies can cause sour rot at the same rate as adult fruit flies on wounded and inoculated grapes, but they have not yet elucidated the mechanism as to *why.* Stay tuned.

Now considering management, the most important things to keep in mind is that 1) disease is initiated once rains occur after berries reach approximately 15° Brix and 2) warm temperatures (significant periods of time in the upper 60's and above) are much more problematic than cooler temperatures (credit owed to Wendy McFadden-Smith for both discoveries). Warm nights should definitely trigger alarm bells for sour rot scouting. Disease develops rapidly between 68-77°F and needs at minimum 60°F and rain conditions to get started (in *vinifera* vineyards at least). Therefore, lots of rain can mean lots of disease, as we saw in 2018, and very little rain can mean very little disease, as we saw in 2020. Leaf thinning and good canopy management will keep things from getting worse than they would otherwise. And most importantly, vineyard scouting at critical times of year. It's much easier to keep things down to a dull roar if you address a disease outbreak as soon as you see it (BEFORE you smell it) rather than waiting for it to explode.

Sour rot, arrows point to fruit flies. M. Hall, E&J Gallo, Cornell University at time of photograph.

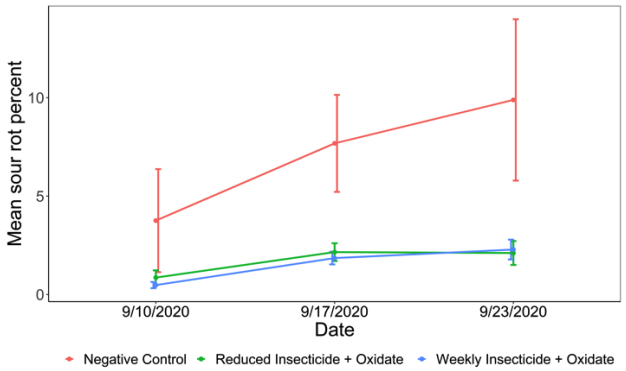
In terms of chemical management, the current best practice recommendation is to use a combination of insecticide and anti-microbial (Oxidate 2.0) weekly through harvest once you start seeing the flies but before you smell the rot, starting around approximately 12-13 Brix but depending on the weather conditions that season. If you wait until you smell the rot to start spraying, your weekly sprays will only keep disease at the level at which it first appeared. Spraying weekly will NOT get you more control than 1-2 combo sprays *if and only if* you wait to start spraying until you see symptoms. The downside to the recommended weekly spray program this is that it is costly and has led to the development of resistant fruit fly populations. If you choose to follow this route, ROTATE YOUR INSECTICIDES!! Spraying the same active ingredient weekly is a surefire way to build yourself a super-resistant population of fruit flies that will be a nightmare to control. This has already been documented in the Finger Lakes by Jeff Scott, Greg Loeb, and Hans Walter-Peterson. Avoid building resistant populations by rotating your active ingredients! Emerging research on spray timing by Megan Hall, Greg Loeb, and myself is helping to refine the current best practice recommendation, and will be discussed in the next section.

Recent Research

Refining Spray Timing.

Recent research from the Loeb and Scott entomology labs at Cornell University have documented wide-spread levels of resistance in NY populations of *Drosophila melanogaster* to three out of the four major classes of insecticides (pyrethroids, organophosphates, neonicotinoids) labeled for use against *Drosophila* in grapes. That is not to say that these materials are not providing some protection under field conditions, but there is a serious risk for control failures and it behooves the industry to apply insecticides only when necessary. In 2020, Greg Loeb and I decided to explore whether weekly combination pesticide applications (insecticides targeting *Drosophila* and surface sterilant targeting microorganisms) are truly necessary to achieve adequate control. To address this, we conducted a timing experiment in a research block of Vignoles (highly susceptible to sour rot) located at Cornell AgriTech with the following treatments:

1) Untreated
2) Weekly applications of insecticide plus Oxidate 2.0 starting at about 15 Brix (industry standard)
3) Two applications of insecticide + Oxidate 2.0; one at around 15 Brix, and near harvest (around 21 Brix).



Graph showing sour rot prevalence by percent in three test populations.

We evaluated the efficacy of the treatments by 1) monitoring abundance of Drosophila on clear sticky cards, 2) rearing adult flies from a subset of fruit collected near harvest, and 3) assessing incidence and severity of sour rot on several dates approaching harvest. We found greater numbers of Drosophila species on sticky cards and from rearing flies from berries between control plots (no sprays) and the other two treatments but no differences between weekly sprays (4 sprays) and 2 sprays (15 Brix and near harvest). Similarly, no difference was observed in sour rot severity between the weekly and start and near harvest treatments but both treatments had reduced sour rot compared to control.

These preliminary results show there's reason to believe two pesticide applications may be as just as effective at controlling sour rot as four. This would great news in terms of reducing selection pressure for insecticide resistance in our fruit fly populations, but will need to be evaluated across seasons with variable environmental conditions before we change our best practice recommendation. As an important caveat, environmental conditions during the late season in 2020 were not conducive to sour rot development (though we did see disease develop in the pathology vineyards), and this is only one year of data. We are planning to repeat an expanded version of this timing experiment in the 2021 season to better define the minimum number and timing of pesticides to provide good control.

Lorsban (chlorpyrifos) Banned in NY

I can't recall ever hearing a grape grower talk about using Lorsban on grapes but I wanted to be sure that this was out there just in case.

The New York State DEC has adopted changes to the state pesticide registration regulations prohibiting chlorpyrifos in New York State effective July 31, 2021. Notice of the regulation adoption was published in the State Register July 21, 2021. Additional supporting documents for the regulation change can be found at the DEC's website.

This ban went into effect on July 31. The NYS DEC also cancelled the registrations of most chlorpyrifos products on December 31, 2020 and then cancelled the remaining products on July 31, 2021. As for any remaining grower inventory after July 31, the NYS DEC issued an enforcement discretion that will allow possession, transport, storage or handling of open or closed containers of these products for purposes of shipment out of state or for proper disposal and will allow preparation for disposal of these products until February 1, 2022 or until the Enforcement Discretion for Distribution of Unregistered Products Containing Chlorpyrifos is rescinded by the Department.

More information can be found at: https://www.dec.ny.gov/chemical/122311.html.

The NYS DEC also notes that, in addition to pursuing re-distribution of these products out of state or proper disposal, growers may also explore participation in a CleanSweep NY collection event. A collection event is planned for October 12 through 14 in DEC's Region 4. Check the CleanSweep NY website, email info@cleansweepny.org or call 518-225-8146 for details. DEC is also pursuing potential collections in other locations.

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.

Eastern Viticulture & Enology Forum

Grower & Winemaker Town Hall

Tuesday, September 7, 2021 3:00 – 5:00 PM

Via Zoom

Registration Link: https://cornell.zoom.us/meeting/register/tJcqf-mrrzspEteQCPUCoz5gb3sNH_tw_gVT

See the announcement in this weeks' Vineyard Update or on our website. Questions can be submitted before the meeting using this link. Deadline for questions is August 31.

Respirator Fit Testing Clinics

September 23, 2021 (Thursday)

September 24, 2021 (Friday)

CCE Ontario County, 480 North Main St, Canandaigua, NY 14424

The New York Center for Agricultural Medicine and Health (NYCAMH) and HealthWorks is pleased to provide respirator fist testing clinics in the Finger Lakes region. All attendees must wear a mask or face covering while attending the clinic.

During the clinics NYCAMH will provide medical evaluations; respirator fit tests; and WPS compliant trainings on how to properly inspect, put on, take off, fit, seal check, use, clean, maintain, and store respirators. If a worker wears more than one style of respirator, including filtering facepieces, they must be fit tested for each one. Please keep in mind while determining who will come to the clinic that a clean-shaven face is a necessity for masks to be effective and for fit testing to be possible.

Clinic appointments are **one hour long** and **groups of 4 workers** can be seen at a time. Medical evaluations, fit tests, and trainings are available in both **English and Spanish**. If you are unable to attend the clinic in your area you may schedule an appointment at another clinic location.

To schedule an appointment, please call the NYCAMH office at 607-547-7014 #7 or email fittest@bassett.org between **August 2 and September 30**, Monday – Friday, 8:00am – 4:30pm. Ask to speak with the farm respirator clinic scheduler. When scheduling an appointment please have the following information available:

- Total number of people attending from your farm
- Name of each person being scheduled
- Language spoken by each attendee
- Make and model of each respirator to be tested

2021 GDD & Precipitation

FLX Teaching & Demonstration Vineyard – Dresden, NY					
Date	**Hi Temp (F)**	**Lo Temp (F)**	**Rain (inches)**	**Daily GDDs**	**Total GDDs**
8/17/21	82.8	68.2	1.66	25.5	2055.2
8/18/21	75.7	70.7	2.79	23.2	2078.4
8/19/21	80.8	70.3	0.62	25.6	2103.9
8/20/21	84.7	66.9	0.00	25.8	2129.7
8/21/21	80.6	70.7	0.13	25.7	2155.4
8/22/21	85.1	68.5	0.00	26.8	2182.2
8/23/21	83.8	73.2	0.00	28.5	2210.7
Weekly Total			**5.20”**	**181.0**	
Season Total			**19.55”**	**2210.7**	

GDDs as of August 23rd, 2020: 2190.4

Rainfall as of August 23rd, 2020: 11.42”

Seasonal Comparisons (at Geneva)

Growing Degree Days

	2021 GDD [1]	Long-term Avg GDD [2]	Cumulative days ahead (+)/behind (-) [3]
April	72.0	62.7	+2
May	256.6	254.6	+1
June	608.9	481.5	+7
July	599.7	646.4	+5
August	513.5	593.2	+9
September		358.7	
October		109.9	
TOTAL	2050.6	2507.1	

[1] Accumulated GDDs for each month.

[2] The long-term average (1973-2019) GDD accumulation for that month.

[3] Numbers at the end of each month represent where this year’s GDD accumulation stands relative to the long-term average. The most recent number represents the current status

Precipitation

	2021 Rain [4]	Long-term Avg Rain [5]	Monthly deviation from avg [6]
April	2.34”	2.83”	-0.49”
May	1.86”	3.12”	-1.26”
June	2.23”	3.55”	-1.32”
July	4.95”	3.43”	+1.52”
August	3.96”	3.20”	
September		3.49”	
October		3.40”	
TOTAL	15.34”	23.02”	

[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 at http://flgp.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!

Cornell Cooperative Extension
Finger Lakes Grape Program

The Finger Lakes Grape Program is a partnership between Cornell University and the Cornell Cooperative Extension Associations in Ontario, Seneca, Schuyler, Steuben, Wayne and Yates Counties.

Hans Walter-Peterson—Team Leader
Donald Caldwell—Viticulture Technician

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