Crop Update September 19, 2019

Cornell University Cooperative Extension

Lake Erie Regional Grape Program

PennState Extension

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In this Crop Update:

- **Efficient Harvest- Kevin Martin**
- **Do You Have Fruit Flies?- Tim Weigle**
- **Understanding the Berry Curve and Collecting Your own Data - Jennifer Russo**
- **Weather and Disease Update - Bryan Hed**

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The Lake Erie Regional Grape Program is a Cornell Cooperative Extension partnership between Cornell University and the Cornell Cooperative Extensions in Chautauqua, Erie and Niagara county NY and in Erie County PA.

Business Management

Kevin Martin, Penn State University, LERGP, Business Management Educator

Efficient Harvest

Operating efficiently throughout harvest requires balance. Circumstances of "balance" differ, depending on the operation and yields. A few principals guide the approach most growers take, but when those issues are in conflict, balance becomes challenging. Remaining flexible and changing your operation based on yields allows for the economical harvest of lower yielding vineyards. It also allows one to remain competitive when custom harvesting by the acre.

Equipment

In many years the goal of the operator is to keep the harvester in motion, to maximize the number of acres that can be harvested with a single machine. Success allows for the justification of additional acreage, decreased labor costs and a narrower harvest window.

While some costs are entirely reasonable, at times keeping a harvester in motion can get very expensive. Equipment innovation, preventative maintenance, and equipment replacement all differ across operations. Equipment innovations, such as de-MOG units, bulk hauling, and modern harvesters have added additional capacity while reducing labor costs. The size of your operation dictates exactly how important innovation is. Of course, for many, additional capacity provides very little value. While for others, without this kind of innovation, less acreage or more harvesters would be required. A MOG makes sense when harvesting between 120 and 150 acres. A MOG's payback period is short because it replaces labor costs

Adoption of bulk harvesting is a more complex discussion. As processors become able to receive bulk, adoption will ramp up. Opinions differ behind the business advantages of bulk. For a grower that can switch 300 acres of harvest to bulk, there is no doubt the return on investment will be better than most capital investments a grower can make. The average grower harvests just 100 acres of grapes, so what about him? I've written in detail about the factors that influence the return on investment here so I'll just provide a quick update here. Labor costs will be significantly higher in NY in 2020. Be sure not to over-invest in unnecessary equipment. Gondolas and bulk harvesting speed up harvest and even plant turn-around times. Just because you have 4 trailers worth of boxes does not mean a grower needs to buy 8 bulk hoppers. Two larger gondolas can be more than adequate, especially for smaller growers, when three trailers made sense.

Newer harvesters can harvest more tons per hour. We've seen widespread adoption above 200 acres. The payback period on this would be the longest.

Labor

In harvest operations the use of labor varies greatly. Harvest operations can efficiently complete 50 tons per day with as few as three people. Most operations harvesting 100 – 125 tons per day use at least four individuals at a time. Others use as many as eight. This is where the amount and type of

equipment are balanced by downtime and labor size. One advantage of a smaller workforce is that downtime is considerably less expensive.

Remaining flexible is particularly important. Small crop sizes allow for considerably more downtime. The efficiency of loading and hauling is far less important and justifies far less labor when there are simply fewer loads to be hauled. A typical grower might haul as many as 125 loads in a year. 20 minutes of tying down and an additional 30 minutes of delay in loading translates to an additional 3.5 hours per day. In a poor year, that same harvester may only haul 32 loads. The same inefficiencies in loading and tying down account for only 1.2 hours per day over a shorter season.

While the mindset of the custom harvester is to harvest as many tons as quickly as possible, some accommodation for small crops should be made. Reducing the labor costs balanced with some reasonable delay makes a lot of sense. Gross savings should be as high as $200 per day, per employee. Fewer employees will cause harvest to stop more frequently. Reasonable delays in loading and tying down should cost less than $50. This reduces acreage cost by nearly $10. When charging by the acre most growers are on the cusp of breaking even. This change in harvest style should push the more efficient growers right to the line of breaking even.

Pre-harvest samples

As of last week we've seen Concord brix vary from 10.75 – 15.2. Variability on one farm has been as much as 3 brix. Knowing and understanding where brix variability now, by block, will result in significant efficiency in scheduling and staging equipment come harvest time. A great time to take these samples is while you are repairing (unfortunately) trellis from our last wind storm.

IPM

Tim Weigle, NYSIPM, Cornell University, LERGP Team Leader

Do You Have Fruit Flies That Won't Die?

As you may have heard, fruit flies have been linked to the occurrence and spread of sour rot in a vineyard. If you have seen an increase in sour rot over the years, despite making insecticide applications to control fruit flies around harvest, I would like to hear from you. Greg Loeb, Cornell, is leading a project that is looking at potential resistance of fruit flies to different insecticides labeled against them.

If you have a vineyard with a history of sour rot despite multiple insecticide applications against fruit fly populations, we would like to hear from you. Participation in the project is extremely simple. All you need to do is contact us, show us where the vineyard is, and then we collect samples of the fruit flies present in that vineyard block.

If you are interested in the project please send me an email at thw4@cornell.edu or give me a call at 716.792.2800 x203. We are looking for 3 vineyards in the Lake Erie region to participate.
For more information on controlling fruit flies and sour rot, check out the articles by Hans Walter-Peterson and Greg Loeb in our last newsletter.

Viticulture

Jennifer Russo, Viticulture Extension Specialist, LERGP

Understanding the Berry Curve and Collecting Your Own Data

At the Cornell Lake Erie Research and Extension Laboratory we have been tracking Concord grape phenology over the past 21 years. Phenology is defined as the study of cyclic and seasonal natural phenomena, especially in relation to climate and plant and animal life. Basically for our purposes, it is the timing of grape development.

The work at CLEREL and previously at the Fredonia Lab, has developed a historical average that is very useful when comparing berry weight and sugar accumulations from year to year to strengthen your management practices. Sustainable production of grapes is increasingly tied to a clear and accurate knowledge of vineyard conditions, the variation in your vineyard, and recording your own history of berry development. Getting a handle on all of that will greatly improve your management practices and allow you to farm more efficiently, and hopefully lead to more profitability.

The point of all of this, is that I am trying to encourage you to keep records of your berry growth. Most of you are already doing this in your heads but writing it down in a dedicated space from year to year will allow you to see trends over the years and strengthen your decisions. Collecting final cluster weights at harvest is an important step that easily gets forgotten in the organized chaos of harvest, however it is crucial to better understand your own vineyard.

So let's do a brief overview of berry development to help better understand the graphs that we supply throughout the growing season. There are three phases that create the 'S'-shaped curved line (called double sigmoid) that you see when berry development is charted on a graph. Below is the updated Concord Berry Curve (Lake Erie) by Dr. Terry Bates that clearly shows the curved lines and is labeled with all three stages (not to be confused with three Stooges, just checking to see if you are still with me).

Stage I is after bloom and fruit set, and is when rapid cell division occurs. Simply put, the berries are growing quickly and that is why the curve has a steep increase, or inclines on the graph. During this phase, the seeds are soft and green, and berries resemble hard green marbles, that accumulate mainly organic acids (tartrate and malate), but no sugar.

Stage II, often called the "lag-phase", is when the berry growth slows down a bit and the seeds start to protect themselves by changing color and hardening to ensure that they get their genes (genetic material found in the seeds) into the next generation. All the plant wants to do is survive and dropping seeds is how it does so; it's all about procreation. During this phase, on our graph you will notice that the line sort of levels off to the eye, and there is a 'lag' in the curves incline. The end of this phase is signaled by veraison.

Stage III, or the ripening stage, is when the cells that divided during Stage I rapidly expand. This is where you see the second incline on the curved line. We are in Stage III now and nearing the end of it; the sugars are rapidly accumulating and berries are soft. Just shy of getting too 'sciencey' (I geek out over scientific things), this is when sugars (mainly glucose and fructose) go up and acids and other pigments (e.g., chlorophyll) go down. The berry's sweetness and aromas at this time attract species to eat the fruit and drop the seeds onto the ground, effectively dispersing the vine's genetic

material. For the Concord industry, we are 91 days after bloom today nearing the end of Stage lll and entering another ‘lag’ on the growth curve, signaling harvest season.

Okay, so now what? Why did we go through all of this? With a little extra effort, you can have your own personal berry curve for each of your vineyards. The CLEREL Concord Berry Curve is a great reference point, but knowing what your personal berry curve is will allow you track vineyard performance, see trends, and possibly diagnose shortcomings and address them in a timely manner.

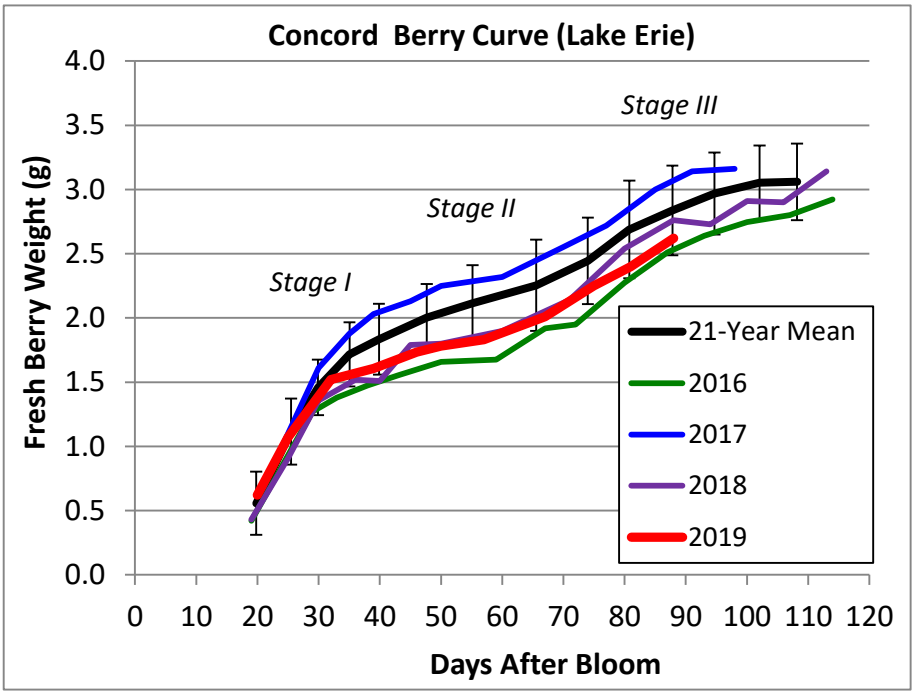
At this point in the season, the yield component to record is cluster weights. Maintaining records of cluster weights from year to year with help improve crop estimation. It is the component of yield that varies the most from year to year. Wet weather during bloom could cause poor set and may lead to low cluster weight. A dry summer tends to reduce berry size and thus may decrease average cluster weight. A raining end of Stage lll could increase berry size and dilute sugars. So having this data recorded is a key part of any yield prediction program. The ideal way to collect cluster weights is to take them from the vine that you used for cluster counts at the beginning of the season, but any data is better than no data. If time only allows you to grab from bins, then by all means collect away. Average cluster weight is obtained by sampling at least 100 clusters throughout the vineyard; weigh the total and divide by the number of clusters sampled.

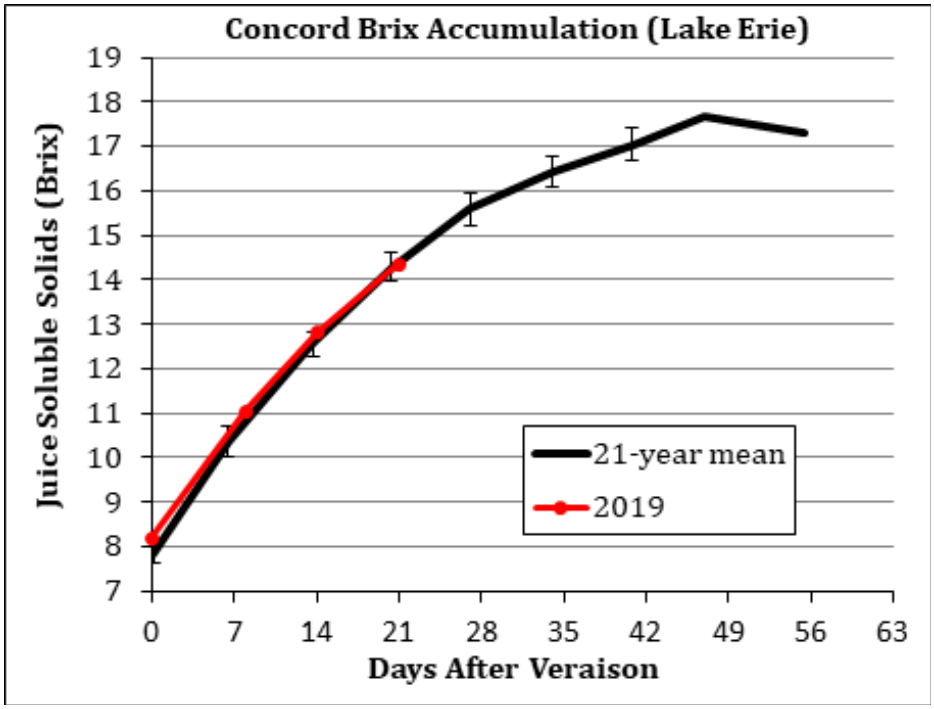
Do not get discouraged if first attempts at crop estimation are inaccurate, because the more experience and data acquired, the more accurate the estimates will become. The Grower/vineyard manager knows that the vineyard is not uniform. Variation within the blocks can be categorized as “high-,” “moderate-,” or “low-” producing. If you have data-driven maps through our Free Loaner Sensor program, or from your own sensors, use them to select a few vines that are characteristic of these zones for your data collection. The data recorded from these management zones can serve as the basis for long-term understanding of that zone/vine relationship and the usefulness of this vineyard data grows as the information collected grows over years. Remember that no person can have better knowledge about the vineyard or greater incentive to achieve maximal sustainable production than you.

Here’s to a beginning, or continuation, of your vineyard records and understanding the berry curve and best wishes for a great harvest!

The following is Dr. Terry Bates **2019 Lake Erie Concord Update:**
9/18/2019

Concord juice soluble solids continued to climb last week at a predictable rate in the CLEREL phenology block averaging 14.4 °Brix on 9/16. Fresh berry weigh also continued the post-veraison climb at 2.62 grams but still lags behind the 2018 fresh berry weight. The Lake Erie region is experiencing sunny and dry conditions this week with light showers expected next week. Concord crop development should keep pace with the long term mean.


Concord Berry Curve (Lake Erie)
Fresh Berry Weight (g)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
Stage I
Stage II
Stage III
21-Year Mean
2016
2017
2018
2019
0 10 20 30 40 50 60 70 80 90 100 110 120
Days After Bloom


Concord Brix Accumulation (Lake Erie)
Juice Soluble Solids (Brix)
19
18
17
16
15
14
13
12
11
10
9
8
7
21-year mean
2019
0 7 14 21 28 35 42 49 56 63
Days After Veraison

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PA Update

Bryan Hed, Research Technologist, Lake Erie Grape Research and Extension Center

Weather: At our location by the lake, our monthly total rainfall stands at 1.83 inches. Our growing degree day total for the month of September is currently at 300, and we have accumulated 2434 gdds from April 1. For the short-term forecast, above average temperatures and dry conditions will prevail through the weekend.

Diseases: Though it has been dry over the past 3 days, a wetting period over September 11-15 may have caused a resurgence of downy mildew in some vineyards. We are seeing tiny bits of downy mildew in our Niagara, but not enough to generate the need to spray with just a few days to harvest, and a dry forecast. After harvest next week, you can resort to mancozeb products for downy mildew on your Niagara, if the need arises, in order to ensure good cane ripening, especially if vines have been pushed hard to maximize production. Late season copper and lime can also be used.

On wine grapes, copper/lime or Captan might be good choices for late season downy control from a resistance management perspective, but these materials can have a negative impact on fermentation (for example, copper kills yeast just like any other fungus). However the negative impact will depend on the amount of residue present at harvest (which depends on the number of previous sprays, when the last spray was applied, the amount of rainfall since the last spray…many factors), and there is some information to the effect that captan residues degrade under the acidic conditions present during wine-making, potentially posing less of a problem than high copper residues. As for phosphorus acid products (for downy), resistance management dictates that you make no more than 3 applications per season.

And finally, for powdery mildew, late season applications of Nutrol or harvestmore may be your only options, even for vinifera. Sulfur is also an option but research at Cornell several years ago indicated that late season sulfur applications, especially to reds (which are fermented on the residue laden skins), can leave high enough sulfur residues so as to have adverse effects on the wine. For young, non-bearing vinifera, sulfur provides good control of powdery mildew until leaf fall, ensuring maximum cane maturation and winter cold hardiness.

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NY, 2019

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- **Nov. 20, 2018:** Sales Closing, Policy Change, Cancellation, Termination Date
- **Nov. 20, 2019:** End of Insurance Period
- **Jan. 15, 2019:** Acreage / Production Report Date

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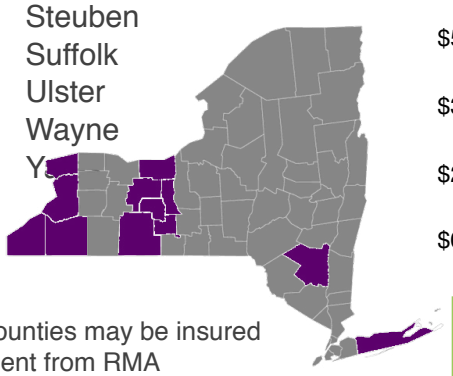
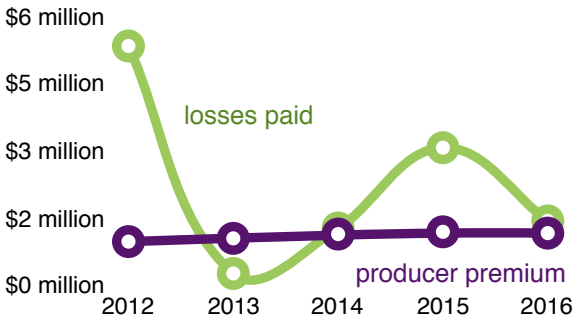


Grapes in other counties may be insured by written agreement from RMA

NYS Grape Crop Insurance



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