Vineyard Notes

JULY 24, 2012

Inside this issue:

Crop Estimation in 2012

Hans Walter-Peterson, Finger Lakes Grape Program
Dr. Jodi Cresap-Gee, Lake Erie Regional Grape Program

Estimating a crop every year is often a real challenge for grape growers no matter where they farm, but here in the East our variable weather conditions and their impacts on vines, clusters and berries make the challenge that much more – uh, challenging.

In many cases, crop estimation is used to determine how much, if any, fruit should be removed from the vines in order to reach a real or perceived quality target. So it is no wonder that we will see more growers trying to estimate their crops in cool years or seasons with an unusually heavy crop when ripening can be a challenge.

However, neither of those conditions really exists in 2012 in the Finger Lakes or the Lake Erie region. Many blocks with Concord, Niagara, Baco, Chardonnay and other early varieties got hit with frost damage to varying degrees this spring, reducing potential yields. In addition, we are experiencing another warmer than average growing season with bloom occurring 2-3 weeks ahead of time, which means we should have ample growing season to ripen an above average crop (for those who have one).

So why should growers bother estimating their crop this year?

Two reasons come to mind: facilitating good communication with current buyers, and determining the need to find new buyers if necessary. And for crop insurance purposes, if need be (OK, three reasons to do crop estimation). Buyers will want to know as soon as possible if there will be enough fruit to fill their needs come harvest, or if they need to go out and find more. Growers who can provide that kind of information to wineries and processors earlier in the season can potentially benefit from an improved reputation and relationship with buyers, making them a more highly desired supplier of fruit. Or at the other end of the spectrum, growers will want to know if they need to go out and find more buyers for their crop if it is larger than what they have committed to buyers so far.

Adjusting crop size. To maintain balanced vines, one must attempt to maintain the appropriate leaf area to fruit weight ratio, which, according to Dr. Terry Bates with the LERGP, is 15 cm^2 of exposed leaf area/gram of fresh fruit.

- Does this ratio apply to wine grapes? Of course – wine grapes need to be balanced to attain the quality desired by the winemaker.

- Does this ratio apply to processing grapes? Yes! While the goals of growing processing grapes (maximum tonnage) differs from that

Crop Estimation in 2012 (cont.)

of wine grapes (maximum quality), vines are healthiest and most consistently productive when they are balanced.

How can a vineyard manager work toward this goal? Using strategies such as pruning, fruit thinning, shoot thinning, and combinations of these techniques will all alter the crop size, which will affect crop quality. Of course, this assumes good insect, disease, weed, and nutrient management programs are in place.

In wine grape production, the goal is often to reach an optimal balance of sugar, acidity, color, etc. in specific varieties. Although the definition of "ripe" is changing with new research, for simplicity's sake, we will focus on °Brix. To ripen a wine grape crop to about 21° Brix, the crop weight MUST NOT exceed the leaf area, or vines will struggle to ripen the crop, and wine quality will be compromised, not to mention that vines with excessive crop loads tend to over-winter very poorly.

- *Strategies to manage crop load and canopy in wine grapes:*
    - Pruning
    - Shoot thinning
    - Leaf pulling
    - Crop estimation and thinning
    - Vigor management
    - Soil/nutrition management

In processing grape production, the goal is often to reach a specific level of °Brix at maximum yield. To ripen a crop to about 15-18 Brix, the crop weight MUST NOT exceed the leaf area, or vines will struggle to ripen the crop, and juice quality will be compromised, not to mention that vines with excessive crop loads tend to over-winter very poorly.

- *Strategies to manage crop load and canopy in juice grapes:*
    - Pruning
    - Shoot thinning
    - Crop estimation and thinning
    - Vigor management
    - Soil/nutrition management

Notice any similarities? Keep in mind that many of the management practices in wine and processing grape production are very similar, with the main difference being scale of production. Crop estimation – in either production system – requires historical data from previous years and average cluster weights when berries are at approximately 40 -50% of their final berry weight. This is at 30 days post bloom in Concord production and at about 1200 growing degree days (50°F base) for hybrid and vinifera grapes.

As we all know, the growing season got off to an early start in March. Both the Finger Lakes and Lake Erie regions reached 1200 growing degree days (GDDs) earlier than we usually do in the season, if you include the GDDs that we accumulated in March. While it isn't unusual for us to accumulate a few GDDs in March, this year was obviously different as it was warm enough to begin vine growth (news flash - grapevines don't pay attention to the calendar). Therefore, it makes sense that we would include those early GDDs this year if using this method to estimate crop yields. As we have discussed and demonstrated a number of times over the past several years,

Return to top

Crop Estimation in 2012 (cont.)

we have a pretty good handle on how to do crop estimates in Concord. Based on work by Terry Bates, Bob Pool and others, we know that Concord berries are at about 50% of their final berry weight at 30 days after bloom, which happens to generally coincide with about 1200 GDDs here in New York. Estimates can be done later in the year, all the way until veraison, as long as adjustments are made to the factor to convert current berry weight to final berry weight. While the numbers might be a bit different, you can probably use the same technique and information to get a pretty good estimate of a Niagara or Catawba crop as well.

Crop Estimation in Concord

Many growers have different techniques for estimating crop load, but the essential tool that Concord growers need to have on hand is Terry Bates' crop estimation table (at the end of this article). At 30 days post bloom, a grower may **mechanically** pick 1% of his or her vineyard, record the weight, and multiply by 2 to get a rough estimate of crop. Now, at 30 days post bloom, the berry curve indicates that the berries are 40% of their total weight, so, again, it's easy to underestimate the actual crop. Another method is to clean pick 1/100th of an acre, weigh it, and calculate the final yield estimate. For example, in a vineyard with 9-ft row spacing, 1/100th of an acre would be 48.4ft, or roughly 2 post-lengths. If you have uneven fruit set through a vineyard, hand pick from several post-lengths and average the numbers prior to reading the table. There is a short video on the LERGP website showing how to use this technique.

The challenge with doing yield estimates in vineyards with more than a small amount of frost-injury (>20% perhaps) is the different stages of development of the berries on primary and secondary clusters. The berry weight curve that is the basis of the crop estimation technique assumes that the clusters are from primary shoots. We have no data on how berries from secondary clusters develop during the growing season, so this adds a whole other layer of potential error in any crop estimate in these areas.

So do you need to thin your crop? For almost all bulk variety growers this year, the answer will probably be 'no'. But how do you know if you don't check? You should know the historical cropping levels in your vineyard, and that is a good start for how much crop you should remove from the vines. For example, a balanced block that ripens an average of 8 tons/acre could easily be thinned to that yield annually, depending on the growing degree days. If we are three growing degree days ahead of average at thinning time, one more ton could be ripened in that vineyard. Terry notes that this "'3 days to ripen one ton' rule comes from a Concord pruning experiment where vines with a range of crop levels were harvested based on juice soluble solids," not on a single date. Additionally, it is important to note that as crop level increases in Concord vineyards, the juice soluble solids (°Brix) decreases.

Crop Estimation in Hybrid and Vinifera Varieties

For most other grape varieties, there is a bit more of a challenge to this inexact science. Unlike Concord, we still don't have berry development curves for other major New York varieties based on multiple years of data, although the Finger Lakes and Lake Erie Grape Programs are currently working on a project with to do so. In the meantime, however, there are a couple other ways that growers can estimate their crop.

Historical Cluster Weights - Cluster weights are primarily influenced by the number of berries on each cluster and how much each of those berries weighs. Each of these factors can vary depending on the growing season, resulting in fluctuating cluster weights each year. Some growers have collected cluster weights at harvest over multiple years and calculated an average weight for different varieties, and sometimes different clones within varieties. If you have this data, the calculation is fairly straightforward: *Yield = (# of bearing vines/acre) x (clusters/vine) x (final cluster weight in lbs.) / 2000*

"Many growers have different techniques for estimating crop load, but the essential tool that Concord growers need to have on hand is Terry Bates' crop estimation table (at the end of this article)."

Return to top

Crop Estimation in 2012 (cont.)

The obvious challenge with this method is that most growers don't collect cluster weight data. The following are some estimates of final cluster weight (in pounds) for a few varieties that are grown in the Finger Lakes, based on data from Ohio and Michigan*:

*Data from "Crop Estimation of Grapes", by Imed Dami & Paolo Sabatini (2011). http://ohioline.osu.edu/hyg-fact/1000/pdf/1434.pdf

Chardonnay: 0.23	Traminette: 0.24
Riesling: 0.18	Vidal: 0.34
Cabernet Franc: 0.23	Seyval: 0.43
Lemberger: 0.30	Niagara: 0.35

Using Growing Degree Days - This model is similar in some ways to that used for estimating crop in Concord, in that it assumes that final berry weight is approximately 50% of its final value at a certain point in the growing season, defined by a particular number of growing degree days. In the Finger Lakes, we have most often focused on the 1200 GDD threshold as the point where berries are 50% of their final weight. But as you can guess, this is likely somewhat dependent on variety. Dami and Sabatini (2011) suggest that 50% final berry weight generally falls around the following number of GDDs for these varieties (see Table 2).

According to this data, with some exceptions, many varieties on this list generally hit 50% final berry weight around 1200 GDDs.

To use this method, you need to do what we call "destructive sampling," meaning you need to harvest some clusters - I would suggest at least 40-50 clusters from 25-30 vines - and weigh them in order to determine an average cluster weight. Once you have the average cluster weight, double that number (assuming you're close to the number of GDDs cited above) and that is your estimated final cluster weight. Then use the formula up above to calculate your crop estimate.

Berry growth continues beyond 1200 GDDs obviously, so estimates that are taken after this point will need to adjust the factor used to multiply the current cluster weight to calculate the estimated final weight. One factor to consider is that at around 40 days after bloom (give or take depending on variety) berry growth enters the lag phase of development, when changes in berry weight slow down before resuming at or just after veraison. Growers who are estimating from now through the beginning of veraison may want to try using a factor of 1.7 or 1.8 when multiplying the current cluster weight, instead of doubling that number.

Remember that crop estimation is not an exact science. Things can happen towards the end of the year that can result in some significant differences from your earlier estimate, e.g., changes in berry size due to weather, insect or disease problems, etc., along with the simple fact that it is an estimate. If you manage to be within 15% or so of your original estimate come harvest time, especially in the first few years of trying this, consider yourself successful.

Sources:

Dami, I. and P. Sabatini. 2011. "Crop Estimation of Grapes". Fact Sheet HYG-1434-11, Ohio State University. http://ohioline.osu.edu/hyg-fact/1000/pdf/1434.pdf

This publication has some useful worksheets that walk growers through the process of collecting the necessary information and making the calculations to estimate their crop. The publication can be found at http://ohioline.osu.edu/hyg-fact/1000/pdf/1434.pdf. Growers who are unable to access the worksheet online can contact the FLGP or LERGP offices for a printed copy.

Bates, T. "Concord Crop Adjustment: Theory, Research and Practice." Accessed at http://lergp.cce.cornell.edu/Bates/pdf/Crop_Adjustment.pdf.

Return to top

Crop Estimation in 2012 (cont.)

Dr. Terry Bates: Crop Estimation and Thinning Table: 7/16/2003

	Time of Season														
	20DAB			25DAB		30DAB		40DAB	50DAB		Veraison				Harvest
	% of Final Berry Weight														
Pounds of Fruit Removed in 1/100th of an Acre	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**	**65**	**70**	**75**	**80**	**90**	**100**
10	2.5	2.0	1.7	1.4	1.3	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.6	0.6	0.5
20	5.0	4.0	3.3	2.9	2.5	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.3	1.1	1.0
30	7.5	6.0	5.0	4.3	3.8	3.3	3.0	2.7	2.5	2.3	2.1	2.0	1.9	1.7	1.5
40	10.0	8.0	6.7	5.7	5.0	4.4	4.0	3.6	3.3	3.1	2.9	2.7	2.5	2.2	2.0
50	12.5	10.0	8.3	7.1	6.3	5.6	5.0	4.5	4.2	3.8	3.6	3.3	3.1	2.8	2.5
60	15.0	12.0	10.0	8.6	7.5	6.7	6.0	5.5	5.0	4.6	4.3	4.0	3.8	3.3	3.0
70	17.5	14.0	11.7	10.0	8.8	7.8	7.0	6.4	5.8	5.4	5.0	4.7	4.4	3.9	3.5
80	20.0	16.0	13.3	11.4	10.0	8.9	8.0	7.3	6.7	6.2	5.7	5.3	5.0	4.4	4.0
90	22.5	18.0	15.0	12.9	11.3	10.0	9.0	8.2	7.5	6.9	6.4	6.0	5.6	5.0	4.5
100	25.0	20.0	16.7	14.3	12.5	11.1	10.0	9.1	8.3	7.7	7.1	6.7	6.3	5.6	5.0
110	27.5	22.0	18.3	15.7	13.8	12.2	11.0	10.0	9.2	8.5	7.9	7.3	6.9	6.1	5.5
120	30.0	24.0	20.0	17.1	15.0	13.3	12.0	10.9	10.0	9.2	8.6	8.0	7.5	6.7	6.0
130	32.5	26.0	21.7	18.6	16.3	14.4	13.0	11.8	10.8	10.0	9.3	8.7	8.1	7.2	6.5
140	35.0	28.0	23.3	20.0	17.5	15.6	14.0	12.7	11.7	10.8	10.0	9.3	8.8	7.8	7.0
150	37.5	30.0	25.0	21.4	18.8	16.7	15.0	13.6	12.5	11.5	10.7	10.0	9.4	8.3	7.5
160	40.0	32.0	26.7	22.9	20.0	17.8	16.0	14.5	13.3	12.3	11.4	10.7	10.0	8.9	8.0
170	42.5	34.0	28.3	24.3	21.3	18.9	17.0	15.5	14.2	13.1	12.1	11.3	10.6	9.4	8.5
180	45.0	36.0	30.0	25.7	22.5	20.0	18.0	16.4	15.0	13.8	12.9	12.0	11.3	10.0	9.0
190	47.5	38.0	31.7	27.1	23.8	21.1	19.0	17.3	15.8	14.6	13.6	12.7	11.9	10.6	9.5
200	50.0	40.0	33.3	28.6	25.0	22.2	20.0	18.2	16.7	15.4	14.3	13.3	12.5	11.1	10.0

Row Spacing determines length of 1/100th of an acre
10.0 feet row spacing = 43.5 feet = 1/100th of an acre
9.5 feet = 45.9 feet = 1/100th of an acre
9.0 feet = 48.4 feet = 1/100th of an acre
8.5 feet = 51.2 feet = 1/100th of an acre
8.0 feet = 54.45 feet = 1/100th of an acre
7.5 feet = 58.1 feet = 1/100th of an acre

Calculation
43, 560 square feet per acre
Divide by row spacing and then
divide by 100 to get 1/100th of an acre

Example:
A grower has 9 foot row spacing and clean picks 48.4 feet at 25 days after bloom. The fruit weighs 80 pounds and the grower estimates that the berries are between 35% and 40% of final berry weight. According to the table, the crop estimate is between 10.0 and 11.4 tons per acre.

Disclaimer:
This table gives the relationship between time of season and % final berry weight on an average year. Year to year variability in weather related berry growth adds error to this table. Information on current year berry growth can be obtained from the Fredonia Vineyard Lab (or) it is strongly suggested that individual growers start collecting berry weight information from their own individual vineyard blocks.

Return to top

Grape Berry Moth Management in a Challenging Year

Tim Weigle

The 2012 growing season is proving to be a challenge for growers in determining the need for grape berry moth management due to a number of reasons; 1) the spring freezes created a hodgepodge of tonnage between, and within, vineyard blocks – especially in the Lake Erie region and 2) the mild winter and extremely early, warm and dry season have combined to provide excellent conditions for grape berry moth development.

What does this mean to a grower? We always stress the need to manage your vineyards on a block by block basis. This is more important than ever in 2012 as you will need to get into each block (and even areas of blocks where GBM has been a problem) to determine if there is a crop present to justify an insecticide application against GBM. Knowing that grapes are a perennial crop it makes sense to try to control grape berry moth this year even in vineyards where the crop size is not there. This will help to reduce the overwintering population of grape berry moth that you will have to deal with next year. For all practical purposes it is difficult to recommend a spray on vineyards that you do not intend to pick. For those vineyards keep two things in mind; First, get into the vineyard and complete crop estimation in a number of areas – splitting them between areas with major freeze damage and areas with less damage. This will give you the information you need to actually determine if you have more crop potential than your eyes are telling you. Second, if you skip sprays in areas where GBM management should be accomplished in 2012, plan on using those savings on GBM management in 2013 (if necessary) as not dealing with the problem this year can lead to larger problems for next year.

In an early year such as this you can throw the calendar based sprays of the Grape Berry Moth Risk Assessment protocol out the window. In its place is the new Grape Berry Moth Phenology-based Degree Day (DD) model that can be found on the NEWA website. This model is based on research conducted by Mike Saunders lab at Penn State which found that it takes 810 DD's (base temp 47.14 F) for the grape berry moth to complete its lifecycle from egg to larvae to pupa to egg-laying adult. Calculation of degree days starts on the date of wild grape bloom.

The GBM model can be found by accessing the NEWA website http://newa.cornell.edu, choosing a weather station near you (by clicking a station location on the map or choosing it from the pull down menu), and clicking the link for grape berry moth model in the Stations Pest Forecasts box. You will be taken to the Grape Berry Moth Model Results page for that particular station where you can put in the date of wild grape bloom in your area. If you did not notice wild grape bloom the model will provide a date for you using temperature information for the station and historical Concord bloom data from the Lake Erie region.

As you can see by the figure above, the model provides daily and accumulated degree day information for the past two days, the current day, as well as forecasting this information 5 days out using National Weather Service forecasts. On July 11, 2012, when this article was written, you can see that at Portland (CLEREL) we are currently at 1106 DD which puts us out of the most effective time to manage second generation. According to the forecast we will be picking up about 30 DD each day for the next 5 days putting us at 1254 DD on Monday, July 16. Scouting for the GBM to determine if there is a need to spray for the third generation can take place starting at 1470 DD.

So when is the next time to spray for grape berry moth. I do not know, but you can get a good handle on it by accessing the model on the NEWA website or by accessing the info in the weekly electronic updates from the Lake Erie and Finger Lakes grape programs.

Return to top

Crop Load Management:

Kevin Martin

A Delayed Approach Can Increase Return On Investment

In a previous newsletter article we discussed an assessment of primary bud damage due to 2012 frost events. That assessment was completed across the nine sites selected as the best candidates to establish a representative sample of weather variation based on elevation and location.

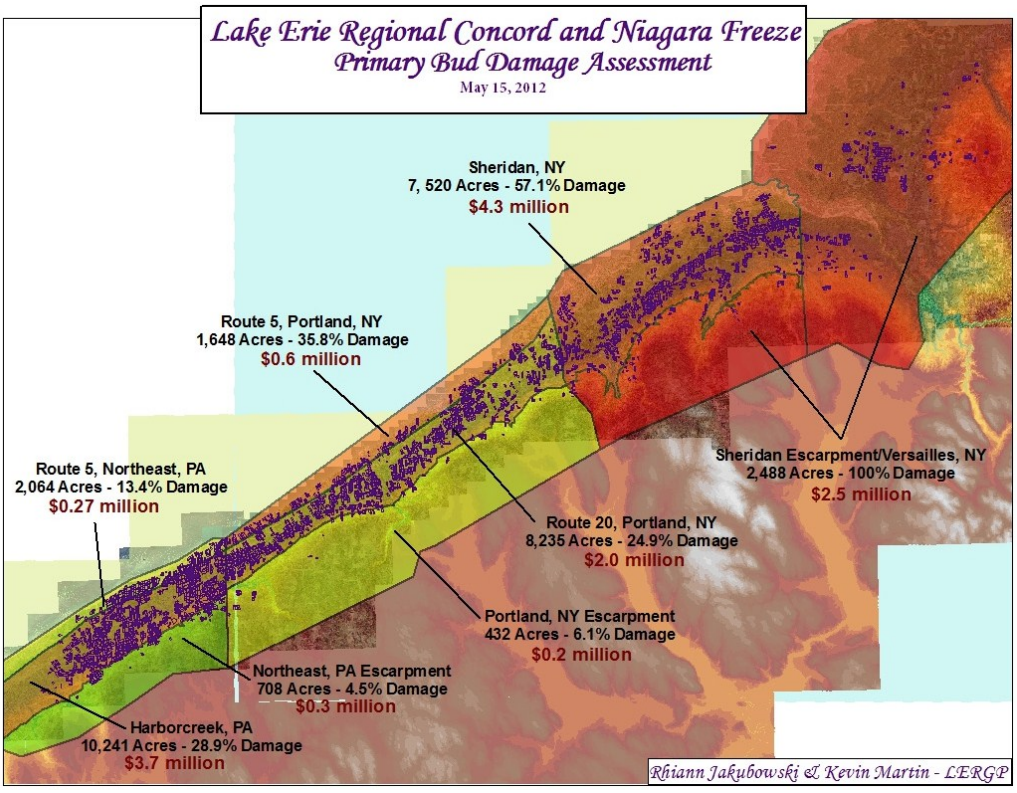
Frost damage tends to be more location specific and variable than accumulated GDD and fruit maturation. However, LERGP, has done its best with these nine sites and GIS mapping to paint the most informative picture of damage that we possible can. Now that we are beyond 30 days post bloom, a self-assessment of your own vineyards would be far more accurate. All sites were pruned to approximately 120 nodes.

We observed significant primary damage in early May, damage that was significant across seven of the nine sites. Moderately higher damage was observed on those two sites but in parts of the vineyard away from test plots. For more information see Primary Bud Damage Figure 1. These escarpment sites represent only 1,100 acres, with most of the acreage confined to lower lying areas.

Since this assessment the cluster and berry counts have provided additional information that primary bud damage would not show. With great focus placed on the size of the crop this year, a lot of hands chipped in gathering this data. Without Tim Weigle organizing the data collection and filling the van with team members gathering data the economic impact would be a shot in the dark.

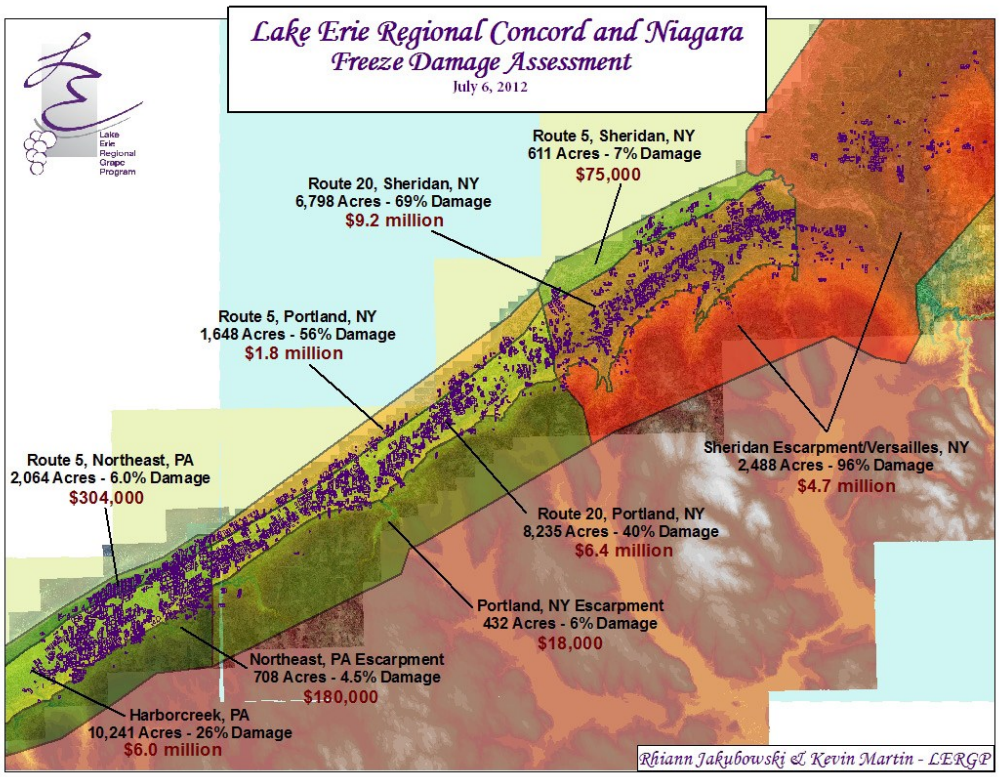
The first thing to take away from the crop size data is that where unscathed primaries are observable and measureable, fruitfulness was up this year. The economic damage of this frost event is noticeably higher, in large part because we had more to lose than originally estimated. Total damage is significantly higher than originally estimated.

Taking a look at the new map, which includes crop estimates reveals some other trends. The data shows some of the negative observations growers, field reps and extension have been



Return to top

Crop Load Management (cont.)



making. Beyond primary bud loss there was primary and secondary bud damage that would also reduce crop. This damage was most significant in the Sheridan and Perrysburg area, away from the lake. Poorly performing secondary and remaining primaries most severely affected Route 5 in Portland. Primary bud mortality at that location did not indicate nearly the amount of damage now observed.

On the Pennsylvania side of things, probably due to the later frost events being less severe, secondary bud performance is highly localized. In certain sites it appears that they're performing very well and have created an opportunity for crop levels much higher than I would have anticipated. Obviously the damage is severe, so what do we do about it? Nothing, of course, can be done to restore crop already gone. The question, what can be done, is best answered in the modification of practices in the future.

To manage for extremes, it can make sense to delay crop size reduction as long as possible. Dormant season pruning was historically the only crop size reduction tool. Growers and researchers have long-since been experimenting with ways to delay crop size reduction. Shoot thinning, shoot positioning and crop thinning are all tools commercially used to safely increase bud numbers above 150. The method requires a different approach. Passes through the vineyard tend to increase for purposes of crop reduction and disease control. There is the potential, however, for average yields to increase because of higher yields following a frost.

The improvement in frost year performance may justify the cost of additional management. The more likely a frost, the more likely a grower will increase profitability with this strategy. The most promising element of this method is the ability to adopt it as a continuum. Bud numbers so high that crop thinning becomes an annual event is probably not the most efficient method. Managing bud numbers so that crop-thinning requirements are reduced to a level. A target of 50% - 75% of all years is much more practical. New technology can help justify these high thresholds as shoot thinning and crop thinning machines create the potential to reduce the cost of late crop size management.

This approach can also be practical for growers less than fifty acres. Shoot thinning and shoot positioning machines are fairly simple. A home brewed system with ability to adjust shoots could easily delay 20% of crop size reduction until shoots had pushed. Such a

Return to top

Crop Load Management (cont.)

system would be an affordable DIY project for the savvy grower, even with a farm size between 15 and 50 acres.

Dedicated fruit thinning heads, as well as, machine pruners can quickly pay for themselves for growers at sixty acres in size. These growers probably do not have harvesters and having the ability to fruit thin greatly increases potential crop load.

The idea that by managing crop levels for more extreme weather patterns appears to have paid dividends in vineyards that did not experience significant secondary bud mortality. These vineyards could represent 30% of the regional acreage. Much of this acreage is located in areas that are least likely to experience frost events. Other vineyards that postpone crop size reduction saw their secondary and event tertiary buds sustain so much damage that even with 150+ nodes, some blocks may not get harvested.

Sheridan Route 5, Harborcreek Route 20 and Route 20 Portland all have crop size estimated above 4 ton per acre. Those types of conditions create an environment where increasing bud numbers can have a positive impact on the economic value of the crop. Other sites with less damage, or nearly 100% damage would not necessarily have seen any economically significant potential from higher bud numbers.

Our experience tracking frost and yield to try and come up with an estimate of risk is limited to fifty years worth of data. We know that in marginal sites 80 – 120 buds is not sustainable unless prices exceed $300 per ton. We also know that because of the frequency of disaster crop insurance is not, by itself, does not adequately manage risk at these sites. Converting to mechanized pruning and reducing crop size later, along with crop insurance substantially reduces risk.

We do know that bud break has been trending earlier in the season at a rate faster than bloom. This indicates that early spring has gotten warmer but temperatures remain more volatile than late spring bud swell. I would expect, given these environmental conditions, the zone of marginal sites could expand.

There are a few important factors that may limit the ability of growers to adopt these practices. First, the size of the farm helps justify these investments. However, the cost of the equipment will vary based on the available capital the farm has and the ability of the grower to build, modify or maintain equipment. While the cost of money is at a record low, for many growers this year would be a terrible time to make large investments in equipment. To lower the cost of adoption, this should be part of a long-term plan. If your opinion of your site is evolving because of changing environmental conditions, adoption can be a long-term plan.

If the immediate success of the operation requires the adoption of something new and this methodology appears to be a good fit, capital expenses can be avoided in the short-term. Growers are operating machine pruners for hire at affordable rates. Dealers are also offering hourly leases of machine pruners.

Keep in mind that this is only half of the plan. Leaving up bud numbers that create the possibility of 12-18 ton crops require a commitment to reduce crop later on. That plan needs to be in place before the pruning happens. If you don't have a harvester or a fruit thinner, make sure you get access to one. If hiring the thinning done, get a written contract. Getting machinery ready in the summer for another grower is a hassle. The possibility of contractual damages provides good motivation to get the harvester ready, even if it is for someone else.

Clearly, the frost damage this year was a result more dramatic than the earlier spring trend. The crop became susceptible to frost weeks earlier than average, not days. So early that significant damage was almost certain. In a year like this we can show that managing your crop load for extremes would be an effective tool for some. It also shows the limitations of the tool. With nearly 100% primary and secondary loss it some vineyards the crop is lost no matter how many buds are left. Where there is significant primary damage, or inconsistent primary damage this type of crop load management can reduce the number of years crop is below four ton. In doing so, it can make crop insurance a more effective tool in marginal sites. Otherwise freeze and frost events can erode the long-term yield average that makes crop insurance work.

"The idea that by managing crop levels for more extreme weather patterns appears to have paid dividends in vineyards that did not experience significant secondary bud mortality."

Return to top

Brown Marmorated Stink Bug

Andy Muza
LERGP Extension Team/Penn State Extension
Erie county, PA

A potential problem for the Lake Erie and Finger Lakes Regions
Andy Muza - LERGP Extension Team/Penn State Extension – Erie County, PA

Halyomorpha halys (Stål), commonly known as the brown marmorated stink bug (BMSB), is a relatively new, introduced insect pest from Asia, which has caused economic losses in the eastern, U.S. in various fruit, vegetable an agronomic crops over the last few years. In 2010 more than 37 million dollars in losses were reported in the tree fruit industry in the Mid-Atlantic Region.

This non-native stink bug has been officially recorded in at least 33 states and is probably present but not yet reported in others. High populations exist in Maryland, Virginia, New Jersey, Delaware, West Virginia and portions of Pennsylvania. A native pest in China, Japan, Korea and Taiwan this insect was initially collected in the United States in Allentown, PA in 1998. In New York BMSB was first detected in 2008. It is suspected to have entered the country in commercial cargo from Asia.

Hosts – BMSB is reported to feed on as many as 300 host plants such as: fruit crops (e.g., apples, peaches, grapes, raspberries); vegetables (e.g., sweet corn, peppers, tomatoes, snap beans); agronomic crops (e.g., soybeans, field corn); ornamental crops ; and on numerous tree species.

Life Cycle and Description – The BMSB has 3 life stages - egg, nymph and adult (images of various life stages are at http://www.pestthreats.umd.edu/content/documents/BMSBBulletin1_10-2010_00) .

Eggs – are spherical, white-pale green in color, and laid in masses of about 25 – 30. These are usually deposited on the undersides of leaves. Eggs hatch in 3-5 days.

Nymphs – progress through 5 instars (nymphal developmental stages) before becoming adults. Each instar varies in size and appearance but all lack fully developed wings. Development through each instar takes about 1 week depending on temperatures (images of nymphs at http://www.hgic.umd.edu/content/documents/BrownMarmoratedStinkbugImages.Leskey.pdf).

Adults – the adult is about 1/2 inch in length and shield -shaped, like other stink bug species. Coloration of the head and back of the insect is brown - gray with numerous small bluish dimples (seen with hand lens) which gives this insect a mottled appearance. However, characteristics that distinguish the BMSB from other stink bugs or similar appearing insects occur on the antennae, pronotum (shoulder area behind the head) , and abdomen . Antennae – a pattern of alternating dark and white bands on the last 2 segments, Pronotum – margins of pronotum smooth not toothed or spiny, Abdomen – extends beyond the wings with alternating bands of white and black triangular shaped markings around the edges (image of distinguishing characteristics at http://fieldcropnews.com/2011/08/is-this-brown-marmorated-stink-bug/ , images of similar looking insects at http://pmtp.wsu.edu/downloads/bmsbIDsheet.pdf and http://www.ipm.iastate.edu/ipm/hortnews/2011/3-9/bmsbpictures.html).

In the fall adults congregate in protected sites to overwinter. Due to this behavior BMSB has become a nuisance pest for homeowners by using houses as overwintering sites. In the spring adults begin emerging over an extended period to feed and mate. About 2 weeks after emergence females begin laying eggs. Females lay up to 250 - 400 eggs during their life.

In the Lake Erie and Finger Lake Regions BMSB

Return to top

Brown Marmorated Stink Bug (cont.)

is suspected to have only 1 generation/year. However, in southeastern, PA, especially in a hot year such as this, up to 2 generations are possible.

Current status and concerns about BMSB in the Lake Erie and Finger Lakes Regions – Only 3 brown marmorated stink bugs have been collected in Erie County, PA since 2010. At this point, there have been no confirmed reports of BMSB feeding on grapes in either the Lake Erie or Finger Lakes Regions. However, high populations of these stink bugs have occurred in vineyards in Maryland, Virginia and southeastern, PA. BMSB nymphs and adults feed in clusters and puncture berries with their piercing-sucking mouthparts. Unless population levels are high, direct feeding on berries may not cause economic losses on juice and wine varieties. However, concerns exist about feeding sites increasing the susceptibility of berries to secondary pathogens. Another potential problem is tainting of juice/wine due to crushing of BMSB with harvested grapes during processing. BMSB emit a disagreeable odor when crushed or disturbed which results in offensive aromas in grape juice. Research by Joe Fiola (Viticulture and Small Fruit Specialist, University of Maryland) showed that between 5-10 BMSB/25 lb lug of Vidal grapes and 10-20/25 lb lug of Cabernet Sauvignon grapes resulted in detectable aromas in juice. However, after fermentation, neither wine had any noticeable sensory taint.

Research and Management – Extensive research is being conducted on the management of BMSB throughout the eastern, U.S. To see research and extension priorities and other information concerning this pest check the Brown Marmorated Stink Bug IPM Working Group web site at http://www.northeastipm.org/index.cfm/working-groups/bmsb-working-group/

Greg Krawczyk (Entomology Dept. - Penn State) has conducted numerous insecticide bioassays to determine the efficacy of various products against BMSB. A variety of insecticides have been effective including pyrethroids and several neonicotinoids (bioassay results are at http://extension.psu.edu/fruit-times/news/2012/management-options-against-brown-marmorated-stink-bug-in-pennsylvania-fruit-orchards-2012-perspective).

The 2012 New York and Pennsylvania Pest Management Guidelines for Grapes currently lists three products, Danitol 2.4 EC, Leverage 360 and Baythroid XL as insecticides which are labeled for use in both Pennsylvania and New York for BMSB management. Since this pest is highly mobile and can easily move among various host plants continual scouting of vineyard blocks is extremely important. If a pesticide application is warranted then be sure to check preharvest intervals before use.

"Extensive research is being conducted on the management of BMSB throughout the eastern, U.S."

Currently, Jody Timer (Lake Erie Regional Grape Research & Extension Center, North East, PA) and Mike Saunders (Entomology Dept. - Penn State) are maintaining a colony of BMSB for research purposes. An artificial diet has been developed which will make rearing this insect more efficient. In addition, both a feeding study on Concord grapes and a trial to determine the level of BMSB required for perceptible aromas in pasteurized Concord juice are to be conducted this season. However, additional research is needed to fully ascertain the extent of problems that BMSB may pose for the juice and wine industries.

Reporting – This pest is being monitored in the Lake Erie and Finger Lakes Regions in New York by Greg Loeb (Entomology Dept. - Cornell), and Tim Weigle (LERGP Extension Team/NYS IPM Program). In Erie County, PA monitoring is being conducted by Saunders, Timer and Muza.
It is important that we have the cooperation of grape growers in tracking the buildup of this pest in both regions.

Return to top

Brown Marmorated Stink Bug (cont.)

Therefore, report any suspected BMSB sightings to the Lake Erie Regional Grape Program (716-792-2800) or the Finger Lakes Program (315-536-5134).

Sources

Brown Marmorated Stink Bug Fact Sheet – Penn State University http://ento.psu.edu/extension/factsheets/pdf/BrownMarmoratedStinkBug.pdf

Brown Marmorated Stink Bug – Exotic Pest Threats, UMD Entomology Bulletin, 2010 http://www.pestthreats.umd.edu/content/documents/BMSBBulletin1_10-2010_000.pdf

Brown Marmorated Stink Bug Images - http://www.hgic.umd.edu/content/documents/BrownMarmoratedStinkbugImages.Leskey.pdf

Field Crop News – Is this Brown Marmorated Stink Bug, August 16, 2011 http://fieldcropnews.com/2011/08/is-this-brown-marmorated-stink-bug/

Pest Alert: Brown Marmorated Stink Bug – Washington State University Extension http://pmtp.wsu.edu/downloads/bmsbIDsheet.pdf

Horticulture and Home Pest News - Stink Bugs and Similar-Appearing Insects in Iowa http://www.ipm.iastate.edu/ipm/hortnews/2011/3-9/bmsbpictures.html

Brown Marmorated Stink Bug (BMSB) Part 2 – Management in the Vineyard http://www.grapesandfruit.umd.edu/TimelyVit2/TimelyVitBMSB2rev.pdf

Brown Marmorated Stink Bug (BMSB) Part 3 – Fruit Damage and Juice/Wine Taint http://www.grapesandfruit.umd.edu/TimelyVit2/TimelyVitBMSB3.pdf

Brown Marmorated Stink Bug IPM Working Group http://www.northeastipm.org/index.cfm/working-groups/bmsb-working-group/

Management Options for Brown Marmorated Stink Bug in Pennsylvania Fruit Orchards – 2012 Perspective http://extension.psu.edu/fruit-times/news/2012/management-options-against-brown-marmorated-stink-bug-in-pennsylvania-fruit-orchards-2012-perspective

Brown Marmorated Stink Bug Fact Sheet – Ohio State University http://ohioline.osu.edu/hyg-fact/pdf/FS_3824_08.pdf

Brown Marmorated Stink Bug – Northeastern IPM Center http://www.nifa.usda.gov/nea/pest/pdfs/stink_bug_pest_alert.pdf

Finger Lakes Teaching & Demonstration Vineyard Making Progress

Mike Colizzi
Finger Lakes Grape Program

Cornell Cooperative Extension's (CCE) Finger Lakes Grape Program (FLGP) and Finger Lakes Community College (FLCC) are in the process of establishing a teaching and demonstration vineyard at Anthony Road Wine Company. The 2.5 acre vineyard will serve as a site where CCE's Finger Lakes Grape Program can conduct applied research projects and demonstrations for current and prospective grape growers in the Finger Lakes region and beyond. Students from FLCC's Viticulture and Wine Technology program will have the opportunity to participate in some of this research. They will also provide most of the vineyard labor, such as pruning, shoot thinning and harvesting, and learn how characteristics of grapes translate into winemaking.

The vineyard was planted on May 31st and posts were set the following week. Fruiting wires have been installed so the vines could be staked for training. Recently, we have been working on getting our drip irrigation system up and running, which we are hoping to have completed by July 13th. After that we will need to start tying the vines to the stakes in order to keep them growing straight. We also need to finish running our foliage wires and get our new weather station mounted and working.

The vineyard contains fourteen different varieties: Catawba, Cayuga White, Riesling, Cabernet Franc, Chardonnay, Lemberger, Gruner Veltliner, Zweigelt, Marquis, Jupiter (both Marquis and Jupiter are seedless table grapes), Vidal, NY81.0315.17 (a Cayuga White x Riesling

cross from Bruce Reisch's breeding program), Corot Noir, and Marquette. We also chose to plant some varieties on a couple of different rootstocks to look at differences in growth and other characteristics. We plan to also experiment with different types of trellis designs. We want this vineyard to showcase what is out there as much as possible in 2.5 acres. If you're ever interested in checking out the new vineyard, please feel free to give either Hans or Mike with the FLGP a call, and we'll be happy to show it to you.

This project has been funded by a grant from the Genessee Valley Regional Market Authority. We thank them for their support of this new and valuable resource.

Return to top

Upcoming Events

You can also check out our Calendar on the FLGP website for information about upcoming events.

Grower Tailgate Meeting

Tuesday, August 7th 5:00 – 6:30 PM

Hosted by: Tina and Eric Hazlitt

Sawmill Creek Vineyard

5587 State Rte 414

Hector, NY

Mike and Hans will bring some timely topics and information to discuss at the meeting, but there will also be time to talk about whatever else is on growers' minds. Hope to see you there!

Tile Drainage Field Day

Friday, August 10 9:00 AM - 2:00 PM

Registration begins at 8:30 AM

Lilyea Farms, 1320 Pre-Emption Road,

Penn Yan NY.

Have you ever wondered how to get rid of the wet spots on your farm? Are there locations in fields that you avoid planting every year? Cornell University Cooperative Extension and Yates County Soil & Water Conservation District are planning a Tile Drainage Field Day August 10 from 9 am to 2 pm. Registration begins at 8:30. The field day takes place at Lilyea Farms, 1320 Pre-Emption Rd, Penn Yan.

The event will provide an overview that is applicable for all crops. Highlights of the day will include Carol MacNeil, Cornell Vegetable Program, covering the soil health benefits of tile (subsurface) drainage. Tom Eskildsen with Yates County Soil & Water Conservation district will talk about installation, proper depth and placement. Economics of both traditional and tile plow installation will be covered by John Hanchar, NWNY Dairy, Livestock & Field Crops Team. After lunch will be equipment demonstrations.

Lunch will be provided, but please register to reserve yours by calling Cornell Cooperative Extension at 315.536.5123 by August 6. Please bring your own chair! The event is sponsored by Himrod Farm Supply and Hudson Pipes & Pumps.

Return to top

Upcoming Events (cont.)



From Vine to Bottle: Making Decisions about Canopy Management

Taste the wines, we'll talk about the vines.

August 9, 2012
4:00-6:00
(Includes wine tasting)
4:00 wine tasting at:
Food Science Laboratory, 630 West North Street NYSAES, Geneva NY
CLEREL Laboratory, Rte 20 Portland, NY
5:00 Webinar
(Open to growers/winemakers from all regions, link will be sent out to those who register)

Canopy management practices (shoot positioning, cluster zone leaf removal, shoot and cluster thinning, hedging) can dramatically improve fruit composition, spray penetration and disease control – but they also cost money, often involve manual labor, and can reduce yield. The payoff for wineries and growers can be increased wine quality and marketability. The challenge is balancing costs and benefits in a competitive wine market.

At this meeting and webinar, Justine Vanden Heuvel, Todd Schmit, and Tim Martinson will discuss the connection between vineyard practices, wine quality, and consumer 'willingness to pay'. We will draw upon four years of canopy management research and grower demonstrations on Riesling and hybrids. We invite you to:

4:00 – 5:00 Tasting: Experimental wines (Riesling and hybrid) from canopy management experiments (Geneva and Portland Lab only)
5:00 – 6:00 Webinar: Lessons learned from five years of canopy management studies.

- *How canopy management practices impact fruit composition and wine sensory characteristics.* **Justine Vanden Heuvel,** Dept. Horticulture
- *Estimated costs of shoot and cluster thinning.* **Tim Martinson** Dept. Horticulture
- *Economics and consumer 'willingness to pay'.* **Todd Schmit,** Charles H Dyson School of Applied Economics and Management

Registration is free, but required. Please register by completing form at: https://cornell.qualtrics.com/SE/?SID=SV_3DlmxFdXVxWVu4c

These research and outreach projects funded by the Northeast Sustainable Agriculture Research and Education Program and the New York Farm Viability Institute

Return to top


Stimplex
CROP BIOSTIMULANT
Yield:
Quality:
Uniformity:
Your Checklist for Better Grapes.
To learn more use the QR code below or call
OMRI

Notes:

Cornell University
Cooperative Extension
Finger Lakes Grape Program

finger lakes
grape program

Newsletter No.3

July 2012

FINGER LAKES VINEYARD NOTES

Is published by
Cornell Cooperative Extension
Finger lakes Grape Program
Ontario, Schuyler, Seneca, Steuben and Yates Counties
County Office Building , 417 Liberty Street, Penn Yan, NY 14527

Comments may be directed to

Hans Walter– Peterson

Viticulture Extension Educator
Finger Lakes Grape Program
315.536.5134
hcw5@cornell.edu

Cornell Cooperative Extension

Finger Lakes Grape Program

417 Liberty Street

Penn Yan, NY 14527