

# Vineyard Notes



MAY 2013

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## *Shoot Thinning: Good for the vines, but good for the wines?*

*Hans Walter-Peterson, Viticulture Extension Specialist, Finger Lakes Grape Program*

In an ideal vineyard, a grower could simply prune the vines during the dormant season and know that they were perfectly balanced. During the growing season, the right number of shoots would emerge uniformly only in the places that you wanted them to be, with the proper number of clusters to balance that growth, while getting just the right amount of light exposure and air movement around the fruit to prevent disease and develop good color, balanced acidity, and great flavors.

Unfortunately, those vineyards are virtually non-existent in our area, so growers need to use various tools and techniques to manipulate the vineyard canopy and the amount of crop in order to achieve the quantity and quality of crop that they need, while also maintaining healthy vines. One of those tools is shoot thinning, whereby excess shoots or shoots growing in the wrong places are removed from the vine.

In situations where there is excessive shoot growth, shoot thinning can be beneficial for several reasons, including:

- Improving bud fruitfulness by reducing shading in the interior of the canopy;
- Reducing disease pressure;
- Improving fruit exposure to sunlight, which can impact color and flavor development (possibly); and
- It is a relatively fast and inexpensive way

(whether by hand or machine) to make adjustments to the canopy structure to bring it closer to “balance.”

### *Reduces Shading, Improving Bud Fruitfulness*

If a large number of shoots are growing in a particular region of the vine, such as the head region (see photo), it creates a situation where many of the leaves and developing buds next to them, which will produce the following year's crop, receive very little sunlight. The lack of sun exposure

on those developing buds reduces the amount of tissue that can develop into clusters (called ‘cluster primordia’)

within the buds, and thereby reducing the potential crop for the following year. Without intervention, this can lead to a bit of a vicious cycle as the reduced crop on the vines results in more vegetative growth, which can cause more canopy shading, and so on. Removing excess shoots can help to improve sun exposure on these buds, which will promote cluster formation for the following season.

### *Reduces Disease Pressure*

Not only does shoot thinning allow better sunlight penetration into the canopy, it also helps to improve air movement around the leaves and clusters, which helps to dry the canopy faster and make it less of an attractive landing



## *Shoot Thinning: Good for the vines, but good for the wines (cont.)*

for new disease infections to establish and spread. In a trial conducted in a Vignoles vineyard in 2011, vines that had been shoot thinned on both mid-wire and top wire training systems had lower levels of botrytis and other associated bunch rots. If you recall, we had a lot more rain at the end of the season that year than we typically do, and significant botrytis infections were the norm. Shoot thinning allowed the fruit to dry out better in between those rain events, which reduced the amount of botrytis in those clusters, as well as the amount of sorting that was required to

*Vignoles clusters from mid-wire (VSP)-trained vines with no thinning (top) and shoot thinning (bottom).*



Source: "Vignoles Harvest: Shoot Thinning, Training System and Botrytis" by Tim Martinson.

<http://www.fruit.cornell.edu/shared/pdfs/Vignoles.pdf>

remove the overly rotted clusters at the winery.

### *Influence color and flavor development(?)*

We know that the amount of sun exposure that clusters receive can have an impact on color in red varieties, as well as the development of flavor and aroma compounds in aromatic varieties like 'Traminette.' Justine Vanden Heuvel from Cornell, along with Gavin Sacks, Tim Martinson and others, has looked at the impact of canopy management practices like shoot and cluster thinning and leaf pulling in hybrid varieties like Corot noir and Marechal Foch, as well as in Riesling. While each of these studies found that shoot thinning by itself could have an impact on the canopy architecture and cropload balance, its impact on fruit chemistry and sensory characteristics of the final wines was inconsistent. In her work with Corot noir, for example, Justine found that cluster thinning had more of an influence on the fruitiness of the final wines than did shoot thinning.

### *Relatively fast and inexpensive practice*

When it is done early in the growing season, shoot thinning can be accomplished relatively quickly and inexpensively once a person gains some experience with the practice. In a trial looking at the impact of shoot thinning and harvest timing in Marechal Foch, Tim Martinson calculated that the practice would take about 1.6 hours/acre, depending on the vine density of the vineyard.

There are also mechanized options for shoot thinning on larger acreages as well. The model produced by OXBO Corporation is probably the best known, and has been demonstrated in the Finger Lakes and Lake Erie regions in previous years. This system uses a set of soft rubber "fingers" to remove the shoots (see photo). The number of fingers, rotation speed and tractor speed can all be varied to adjust the number of shoots that are removed.

## Shoot Thinning: Good for the vines, but good for the wines (cont.)



It is generally recommended that shoot thinning be done when shoots are between 6-12" long. As shoots elongate past that point, the base of the shoot starts to lignify which makes it more difficult to remove the shoots cleanly. In general, try to target about 4-5 shoots per foot of canopy in VSP-trained vinifera varieties. Hybrid varieties that are trained on high-wire systems can have somewhat higher numbers depending on variety, while native varieties like Concord can have as many as 15 shoots per foot of row in highly productive vineyards.

Shoot thinning removes both reproductive and vegetative growth from the vine, but usually results in an overall reduction of both yield and cropload (yield to pruning weight ratio) (Sun et al. 2012), and therefore is most beneficial in situations where vines are overcropped. If vines already have a low yield to pruning weight ratio (i.e., are undercropped), it's much less likely that thinning will have any significant impact on fruit quality. However, the other benefits mentioned here – reducing shading and crowding which can improve bud fruitfulness and reduce disease pressure – might be significant enough on their own to potentially justify the practice. The only way to know for sure is to try some thinning in a couple of rows and see if any resulting benefits can offset the cost of extra labor and reduced yield.

### Resources:

Martinson, T. *Vignoles Harvest: Shoot Thinning, Training System and Botrytis.*

<http://www.fruit.cornell.edu/shared/pdfs/Vignoles.pdf>

Martinson, T. and J. Vanden Heuvel. *Shoot Density and Canopy Management For Hybrids.*

<http://www.fruit.cornell.edu/grape/pdfs/Canopy%20Management%20for%20Hybrids%20-2007.pdf>

Sun, Q., G. Sacks, S. Lerch, J. Vanden Heuvel. 2011. *Impact of Shoot Thinning and Harvest Date on Yield Components, Fruit Composition, and Wine Quality of Marechal Foch.* American Journal of Enology and Viticulture 62:32-41.

Sun, Q., G. Sacks, S. Lerch, J. Vanden Heuvel. 2012. *Impact of Shoot and Cluster Thinning on Yield, Fruit Composition and Wine Quality of Corot Noir.* American Journal of Enology and Viticulture 63:49-56.

Perez, J. and W. M. Kliewer. 1990. *Effect of Shading on Bud Necrosis and Bud Fruitfulness of Thompson Seedless Grapevines.* American Journal of Enology and Viticulture 41:168-175.

# A Cash Flow Budget Following A Frost

Kevin Martin, Business Management Educator, Lake Erie Regional Grape Program

## Unusual Challenges For Mature Businesses

Businesses can be challenged by a lack of cash flow for various reasons. New businesses, regardless of competitive advantage and profit margins can be challenged by cash flow. Most Lake Erie vineyard operations do not typically face issues relating to cash flow. The businesses tend to be mature ones, conservatively investing capital and usually not growing.

Frost and freeze damage in 2012 impacted grower revenues significantly. For some growers, revenue may still be up. For many growers revenue has fallen precipitously. Management strategies may change slightly if growers will be using a line of credit to plug the hole in their cash flow. Before decisions like that are made, taking a look at your cash flow picture is the place to start.

It is important to look at your individual financial situation and not rely on the advice of other growers. The collective knowledge of the industry can be overwhelmingly helpful. In this situation, however, individual variables dramatically change the cash flow picture from operation to operation.

## Revenue

Figure one illustrates the cash flow variability that can occur when yields and acreage are equal. All of these hypothetical growers have 100 acres of Concord grapes that yielded 300 tons in 2012. Even when processor payments are relatively equal, the structure of the payment can change cash flow budgeting.

The amount of crop insurance carried also has

## 2013 Total Cash Revenue By Date

Grower	May-2013	Sep-2013
1	50,000	86,000
2	47,400	92,400
3	91,500	91,500
4	141,000	177,000
5	126,400	171,400
6	201,500	201,500

Figure 1

a significant impact on cash flow. Growers 3 through 6 all have crop insurance. The impact on cash flow varies from a few thousand dollars to an excess of one hundred thousand dollars. Even last year a majority of growers would not have had a meaningful claim if their insurance was a CAT(astrophic) policy.

## Production Expenditures

Expenses can also vary considerably, though should not vary as significantly as revenue. The biggest variability should be in mechanization of crop load. Through May, expenses have likely been realized for pruning, trellis maintenance, and renewals. One should target \$120 for minimally pruned vineyards.

Figure 2 shows the expenses realized through May 1<sup>st</sup>. Another total, for sake of comparison, is provided to show expenses just prior to harvest. Costs may vary somewhat more for smaller growers. The realization of certain cash expenses should have a relatively low probability. For example, mechanized thinning of hand-pruned vineyards may be done strategically but is not typically a whole farm practice. It may be more likely that a smaller grower would have his entire farm done, rather than just a portion in an area of extreme risk for berry moth.

For many growers that only have farm cash expenses, the current crop is adequate to cover those expenses by payments realized from the ½ crop in 2012. An extreme example, growers with no crop and CAT insurance would be able to cover 75% of cash expenses. A crop loan, of approximately \$15,000 would be nec-

## 2013 Total Cash Expense By Date

Management	May-2013	Sep-2013
Minimally pruned	11,500	57,500
Mechanized hand follow-up	19,500	56,500
Hired hand pruned	31,800	64,800

Figure 2



## *A Cash Flow Budget Following A Frost (cont.)*

essary. If that grower were a cooperative member, a line of credit would be recommended. Revenue after May is forecasted and more or less could be required.

### **Leveraged and Salary Expenditures**

For growers that have leveraged their investment or draw a salary, the cash flow budget is much more challenging. Many business owners vary salary draw considerably, in particular when a household has two incomes.

If a salary is required, even a modest one of forty thousand requires a 60% increase in expenditures. Drawing that salary would either require a moderately high level of crop insurance or credit. It is a perfectly acceptable business practice to draw a salary. However, if it is something you require, it is another reason to think of crop insurance as a mandatory expense.

Even a highly leveraged grower of one hundred acres probably does not have more than five hundred thousand in debt. Interest payments for the year should total between twenty and thirty thousand. Principle payments may be adjusted, depending on the lender. Total loan expenses should not exceed \$35,000 on this type of farm. This kind of leveraging allows a younger grower to enter the business. The cash flow budget reveals the additional risk realized with higher debt levels. Again, this is a reason to consider high levels of crop insurance. Without it, the typical grower would have to increase debt (if possible) to make it through the year.

### **Accrued Expenditures**

Expenses considered thus far have been limited to expenses related to the 2013 crop, beginning in November. Accrued expenses from prior crop years could significantly impact cash flow budgets.

Payments for the 2012 harvest may fall into this period. For the examples above most growers larger than 100 acres do have a harvester. If not, an additional \$13,000 – \$15,000 for the 2012 crop may push certain farms toward obtaining or expanding a line of credit.

Farmers are in a unique position of paying most taxes, federal income taxes, on an annual basis. This accrued expense may include profits from 2010 – 2012 crop years. This expense has the potential to vary widely and can be significant for larger growers. With monthly or quarterly payments reduced until the next harvest a conservative approach to capital investment may have increased tax liability in 2012. While that bill may hurt, it means the business is coming into 2013 with more resources.

### **Other cash flow variations**

While a great number of variables can slightly change cash flow, the previously considered capture most variation. Of an important note, of course is the baseline. The purpose of a cash flow budget is not to determine profitability. It does not determine the long-term sustainability of your operation. It is merely a forecast illustrating the ability of a business to make required purchases at particular points in time. This is why poor businesses may go a long time without a cash flow problem and excellent businesses struggle with cash flow right out of the gate. The greatest single determinate of future success is the amount of wealth you were born into. The amount of cash on hand prior to 2012 crop year payments will influence the outcome of 2013 crop year cash flow budgeting more than anything else.

The largest variability that cannot be assessed across the industry, only on individual farms, is the amount of cash on hand prior to the beginning of 2012 crop payments and 2013 crop expenses. If one had a crop loan larger than the value of the crop, it is entirely possible a farm entered the 2013 crop year with negative cash.

### **Outlook**

As discouraging and dramatic as the loss in 2012 was, most growers remain fairly optimistic in 2013. For the majority of growers, equity losses have slowed in recent years and many have equity to tap if they need to. As shown above, some growers will not find that necessary. This cash flow budget does articulate the

## *A Cash Flow Budget Following A Frost (cont.)*

challenges facing younger growers. With nearly half of all growers eligible to collect SSI survivors insurance, leveraging and required salary distributions are the exception more than the rule. Younger growers are much more likely to

require a salary, as well as, being leveraged. Those growers, if they have not had a chance to build equity, face the greatest risk.

## *Did You Know That Nitrogen Is the Most Used Nutrient In Grapevines?*

*Mike Colizzi, Viticulture Community Educator , Finger Lakes Grape Program*

Buds are pushing and shoots are elongating this can only mean one thing the growing season is here. Whether you are ready for it or not, it is time to put the snowplow away and get the glycol out of the sprayer. This can be a very hectic time of the year in vineyards, and there are a lot of important decisions that need to be made. Did you know that Nitrogen is the most used nutrient in grapevines? It can also be one of the hardest to manage. Understanding the role of nitrogen in grapevine growth and development will help you increase quality, yields and efficiency.

Nitrogen is used as the foundation for many plant components including amino acids, nucleic acids, proteins and pigments. Since nitrogen is crucial to the vines growth and development you need to know if the vine is taking up enough. The best way to test for nitrogen is with a bloom time petiole test. Bloom petiole samples are taken from leaves opposite the basal or mid cluster. These petiole tests are also a great time to assess the vines micronutrient status. Adjustments for micronutrients can then be made during the summer through foliar applications.

Uniformly light green leaves, short internode length, reduced crop load, and small leaves are all symptoms of a nitrogen deficiency. These however are also symptoms associated with drought, insect damage, and over cropping. It is very important to properly identify

a problem. Applying nitrogen when it is not needed can do more harm than just wasting money. Excessive nitrogen coupled with an adequate amount of soil moisture can produce can produce extremely vigorous vines with long shoots, many laterals, and poor wood maturation. Excess vegetation can decrease airflow thus increasing the disease potential. Try to avoid applying nitrogen immediate before or during bloom since this can decrease fruit set by shifting a vines focus to vegetative growth. A decrease in yield can also be associated with excessive nitrogen application when the canopy shades buds the buds for next year and decreases fruitfulness.



*Figure 1 A nitrogen deficient canopy. Photo courtesy of the Ontario Ministry of Agriculture Food & Rural Affairs*

## Did You Know That Nitrogen Is the Most Used Nutrient In Grapevines?

You may be wondering where all the nitrogen you applied last year went. Most of the nitrogen loss in a vineyard can be attributed to the harvesting of fruit. Grape berries contain 0.18% nitrogen; this means that a five-ton crop will remove around 18 pounds of nitrogen per acre. If winter pruning's are removed from the vineyard an additional 0.25% of nitrogen is lost. That being said if you never put additional nitrogen down the soil reserves will soon be depleted.

It is a good practice to have adequate amounts of nitrogen in the soil at all times rather than

allowing them to deplete and trying to catch up. Typically a maintenance rate of nitrogen is between twenty and thirty pounds of actual N per acre. Heavy rates can be as high as eighty pounds per acre. It is advised to use a fifty-fifty split application if you need a high rate or are on soils prone to leaching. The best timing for nitrogen application is the six weeks immediately following bloom. Dehilling or under vine cultivation after an application can help to incorporate the fertilizer and limit the potential for volatilization.

## Using NEWA Resources in a Vineyard IPM Strategy

Tim Weigle, Lake Erie Regional Grape Program

NEWA, the Network for Environment and Weather Applications, is a free, web-based information system (<http://newa.cornell.edu/>) that provides grape growers, processor reps and consultants the information that they need to implement research-based practices into their vineyard IPM strategy. One of the basic principles behind NEWA is that the value of weather data is greater when it can be shared. NEWA creates a central site for growers to access weather and pest information from instruments in, and near, vineyards.

NEWA provides both weather and pest model information from weather instruments that are located in, or near, vineyards across New York with concentrations of instruments in the Lake Erie (12 instruments) and Finger Lakes (16) grape growing regions of New York and Erie County Pennsylvania.

Table 1. NEWA Stations in the Lake Erie and Finger Lakes Grape Growing Regions

Lake Erie	Finger Lakes
Versailles	Barrington
Sheridan	Branchport
Silver Creek	Cornell Orchards
Portland Escarpment	Dundee
Portland	Fayette
Portland Route 5	Geneva (Bejo)
Ripley	Geneva
North East Escarpment, PA	Lansing
Harborcreek, PA	Lodi (Lamoreaux)
North East Lab, PA	Lodi (Shalestone)
Ransomville	Lodi (Standing Stone)
Lockport	Ovid
	Romulus
	Varick
	Watkins Glen
	Watkins Glen (Lakewood)

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## Using NEWA Resources in a Vineyard (cont.)

Dorothy from the *Wizard of OZ* once said, “There is no place like home”. The same can be true for the weather instrument where you are getting your weather and pest model information. However, if you do not have a weather instrument in your vineyard, as listed in Table 1, if you are in the Lake Erie or Finger Lakes region, there is a good chance you are near a station or situated between two or more stations that will give you a general idea of the weather and pest conditions that could be occurring in your vineyard. If you are unsure whether a station near you is located near a vineyard or a field of vegetables, you can access the station’s home page to get the latitude, longitude and elevation of the station as well as a Google map with the station’s location. Weather data is also collected from airports, so this type of information can be extremely useful to determine how well the weather data fits your local growing conditions. If the Google map indicates that the weather instrument is set up next to a taxiway or runway, it is reasonable to assume that the mass of asphalt or concrete may have an impact on high and low temperatures that are recorded. You can access a specific station’s page from the NEWA home page by using either the “Station Pages” drop down menu in the blue tool bar near the top of the page or by clicking on a map marker using the interactive map.

The station page provides you with a wealth of information that can be used in implementing a vineyard IPM strategy. The Pest Forecasts provide infection events information on Phomopsis, powdery mildew and black rot, as well as information on what disease management strategies are important at the current growth stage. This page also provides access to a grape infection events log and a leaf wetness log, both of which keep a running score of what has occurred so far in the season. The grape disease model information is customizable for each site, or variety, as you have the option of selecting the phenological stage of the grape you would like the disease model to provide

information for. Infection periods for Downy mildew are determined separately using DMCast and are found using the link “Grapevine Downy Mildew” in the Pest Forecast box on the Station’s Page. The one insect model that NEWA runs for grapes is the new Phenology Based Degree-Day model, which will start collecting degree days when the wild grapes come into bloom.

The station page also provides access to weather information that includes the Daily Summary, Hourly Data and Growing Degree Days (using a number of base temperatures). The daily summary is useful in charting how much rainfall occurred each day, a period of days or for the month while the hourly reports give you a better handle on how hard it rained. Growing degree days have been shown to be useful in comparing how one year is stacking up compared to others. If you have collected phenological information over the years such as bud break, bloom, Veraison and harvest or scouting reports for first siting of pests, you can compare growing seasons using the archived weather information found on NEWA. Archived weather information can be accessed from the NEWA home page using the Weather Data drop down menu. Daily summaries, hourly data and growing degree day information has been archived for a station from the time that it was set up.

NEWA has teamed up with the National Weather Service to provide weather forecasts and local radar images as well as linking the pest models with the 5-day weather forecast to provide a future look to help plan in advance. Combining the weather and pest model resources available on NEWA can help you better time pest management applications and determine which materials would be best to use in the current growing conditions. As an example, the rule of thumb is that you will lose one-half of the protection from a pesticide with each 1-inch of rain. However, with fungicides, the need to reapply protection against a particular pest will be affected by 1) the



## *Using NEWA Resources in a Vineyard (cont.)*

amount of inoculum or pest population present, 2) the phenological stage and susceptibility of the variety, 3) the type of material used in the last application, 4) the number of rain events that have occurred since the last application, 5) the timeframe in which the rain fell (half an inch over a day or 1-inch in an hour), 6) the severity of the infection periods that have occurred since the last application and 7) the weather forecast between now and when the next application is planned.

Scouting and knowledge of your vineyard operation will provide you with the answer to the

first three factors. NEWA can provide you with the answers to the next four. Armed with this information you can make a better informed decision on the need to shorten the spray interval or, in the event of dry weather, extend it a bit. NEWA even provides a link to the New York and Pennsylvania Pest Management Guidelines for Grapes if you have a question about which materials are available for use.

If you would like help in implementing NEWA into your vineyard IPM strategy, please get in touch with me at [thw4@cornell.edu](mailto:thw4@cornell.edu) or (716) 792-2800 x203

## *Looking for Some Diversity? Look into Hops.*

*Tim Weigle, Lake Erie Regional Grape Program*

New York State used to be the leading producer of hops for the United States. Downy mildew, hop aphid and, finally, prohibition brought a virtual end to hops production in New York State. The repeal of prohibition saw the hops industry expand in the Pacific Northwest where the majority of hops continue to be produced today.

However, with a combination of the buy local movement and a marked increase in the number of microbreweries cropping up across the northeast, there has been a renewed interest in the production of hops in New York and the Northeastern United States. Why would hops be of interest to grape growers? Grape growers will have much of the equipment needed for the field work in hops and many of the pests associated with hops would be familiar to grape growers as well. And, while there would be an increase in the amount of hand work required in the spring of the year, harvest of most varieties would be completed prior to the start

of all but the earliest grape varieties.

A hops conference featuring growers from Pennsylvania, Maryland and New York, brewers from local breweries, and extension hops specialist Steve Miller and NYS IPM extension specialist Tim Weigle will be held at CLEREL on June 15, 2013 starting at 8:00 AM and running until 4:00 PM. A complete agenda can be found at:

<http://lergp.cce.cornell.edu/event.php?id=64>

# Upcoming Events

## Vineyard Tailgate Meetings

*Tuesday, May 28 2013 5:00 – 6:30 PM*  
*Hicks Farm*  
*5301 Seneca Point Road*  
*Canandaigua, NY 14424*

These are a series of informal meetings held with growers in different locations around the Finger Lakes during the growing season. Meetings are held every other Tuesday afternoon, starting at 5:00 PM and usually ending around 6:30 PM. During the day of each meeting, Mike and I visit a few growers and vineyards near the meeting location to get a sense of what has been happening in the area, and give us some ideas about some potential topics for the meeting later that day. There will also be ample time to discuss any questions or issues that others want to bring up as well. There is no need to register ahead of time – just show up when you can, and leave when you have to.

There will be 0.75 pesticide recertification credits available for each meeting. As with other events where credits are available, you need to be present at the beginning of the meeting to sign the meeting roster – make sure to have your card with you - and stay until the end to receive your certificate.

Here is the schedule for the rest of our Tailgate meetings this season:

Date	Address
June 11	Hosmer Vineyards 6999 Route 89, Ovid NY 14521
June 25	Dr. Konstantin Frank's Wine Cellars 9749 Middle Road, Hammondsport NY 14840
July 9	Hermann J. Wiemer Winery 3962 State Route 14, Dundee NY 14837
July 23	Vine Country Farms (Roy & Gordon Taft) 8531 County Rd 79, Prattsburgh NY 14873
August 6	Atwater Vineyards 5055 Route 414, Hector NY 14841
August 20	Goose Watch Winery 5480 Route 89, Romulus NY 14541

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## Introductory Spanish Workshop:

### Focusing on Agriculture & Viticulture Language

*Session 1: May 6 & 8, 2013*

*Session 2: May 20 & 22, 2013*

*6:30 – 8:00 PM*

*Damiani Wine Cellars*  
*4704 NY Route 414, Burdett NY*

This will be an introduction for farmers, grape growers, and anyone interested in crossing linguistic barriers to improve quality, productivity, approachability and human connection.

Registration cost is \$25 for each of the two sessions. To register, contact Rachel Orlyk at [rachel.orlyk@gmail.com](mailto:rachel.orlyk@gmail.com) or 347-409-2559.



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### FINGER LAKES VINEYARD NOTES

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