Trying Something New: Finger Lakes and Lake Erie Grape Programs Developing Joint Newsletter

A few months ago, staff from the Lake Erie and Finger Lakes Grape Programs went to a professional development retreat with other regional ag extension staff from around the state. One of the things that we heard about there was how the two vegetable programs in the state had come together to produce a single newsletter that was developed by staff from both programs. At the following break, the grape programs’ staff discussed doing something similar for our programs, and we decided it would be worth trying.

So welcome to our first issue of this new “shared” newsletter for both the Lake Erie and Finger Lakes. We hope that by combining our efforts into one newsletter that we can provide growers in both regions with a more comprehensive and informative, and therefore more valuable, resource. Many of the topics that we discuss in our newsletters are important to growers regardless of their specific location, so it seemed to make sense to try this approach. Putting our efforts into one newsletter will allow each of us to focus more strongly on a particular topic in each issue, rather than trying to cover a number of issues all at once.

Our intention is not to dilute the information provided to growers in each area. Each program will continue to produce weekly e-mail updates with information relevant to their specific regions, and will develop their own extension programming tailored to their clientele. Both programs saw this as a way to be more efficient and to provide a better resource to the industry at the same time.

This new arrangement is not written in stone, but we wanted to give it a shot and see if it would work. We will probably be trying some different things with the design and layout of the newsletter, but the focus will continue to be providing timely and relevant content. Please feel free to give us your comments and feedback about this new approach to the newsletter. The only way we can know if this new approach is successful is if we hear from you.
Introduction. What have we had so far in 2011? Rain, rain, and more rain. The ground is saturated, and growers really were only able to get into the vineyard near the end of May. What does this mean for the rest of the 2011 growing season? Well, this year is so far providing excellent motive for crop estimation (and possibly crop thinning) across the belt. Let’s face it, last year was a great season; it was warm, we had just the right amount of rain, and the lighter-than-average crop of Concords easily ripened. These factors, with the addition of high bud survival over the winter, combine to create the potential for a large 2011 crop. In fact, we already see the high crop potential, with most shoots carrying 3 clusters (Figure 1).

Every year we discuss crop estimation as a management strategy to make decisions on how best to manage your crop. Crop thinning may not necessarily be the answer for many vineyard blocks; perhaps your pest management program will need to be modified to ensure that your fruit remains clean through the end of the season. How will you know if you do not at least estimate the crop at 30 days after bloom?

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 15cm² exposed leaf area/g 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 outcome of growing processing grapes (maximum tonnage) differs from that of wine grapes (generally lower tonnages), 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 optimal insect, disease, weed, and nutrient management programs are in place.

• Let’s talk wine grapes. In wine grape production, the goal is often to reach an optimal level of °Brix in specific varieties, although the definition of “ripe” is changing with new research, but 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 (Figure 2)
• Leaf pulling
• Crop estimation and thinning
• Vigor management
• Soil/nutrition management

Let’s talk processing grapes. In processing grape production, the goal is often to reach a specific level of °Brix at maximum yield and optimal color. 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 (Figure 3)
- 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 vinifera grapes. Note in Figure 4 that Concord, hybrid, and vinifera grapes all differ in berry development over time, so timing of estimation of these varieties will vary.

Studies are underway at CLEREL and in the Finger Lakes to develop berry curves for some vinifera and hybrid varieties to enable crop estimation in wine grapes. Records of Concord berry development at the Fredonia Lab have been maintained for the past 10 years, which is why we already have a guideline for estimating crop size in this important variety.

**Crop Estimation and Thinning Guidelines for Concord**

**Who?** YOU, the grower, or your favorite vineyard manager.

**What?** Crop Estimation and Thinning – Regardless of *Vitis* species and cultivars, crop estimation and thinning are important in vineyard management. For Conords, the goal is to ripen as large a crop as possible to a specific °Brix, while for wine grapes, the goal is to attain specific parameters – such as °Brix, pH, flavor profiles, etc. – that can often be met by crop thinning.
**When?**  
30 days post bloom up to veraison.

Keep in mind, though, that the sooner crop thinning is done, the sooner carbohydrates are redirected from fruit to wood to ensure ripe periderm for optimal overwintering abilities. According to Dr. Bates, at 30 days post bloom, the weight of the berries is roughly 40%-50% of their final weight. However, crop estimation and thinning can be done up to veraison, but keep in mind that for every 10 days that go by, the berries grow closer to their final weights. Use Terry’s Crop Estimation Table to estimate your crop levels at 30, 40, 50+ days post bloom. But, bear in mind that it is easy to underestimate your crop! For example, the general practice among growers who estimate at 30 days post bloom is to assume the fruit is at 50% of its final weight; however, it is more than likely only at about 40% of its final weight, which means the final weights will be larger.

**Where?**  
Your vineyard blocks, of course.

Estimating your crop throughout your vineyards is important, as different blocks will likely have differing cropping levels, especially if there are any spots that have smaller or larger vines than the rest of the vineyards.

**Why?**  
Vine balance – so your fruit will ripen appropriately (regardless if you are growing Concord or other wine grapes). What do growers require by the end of the year in their vineyards? Typically, to ensure a sustainable production of fruit, a grower needs to have 1) a fully ripened crop (to whatever standards are required for processing) and 2) mature wood to ensure survival through the winter. These goals are why vine balance is so important, whether you’re growing Concord for juice processing, or Noiret for wine production.

**Why Not?**

Complaints about mechanical crop thinning:

“Thinning really bangs up the vines and can shut them down too early in the season.”

“With prices being what they are, we can’t afford not to gamble a bit to get high tonnages.”

Regarding Point 1: If mechanically thinning your crop results in trashed vines, stop the harvester! Adjust the harvester to a level appropriate for the vineyard. Unfortunately, with all the different types of harvesters and rods (bow rods tend to be gentler), there is no set formula for thinning in each individual vineyard. This process takes experience and patience to determine the proper rates for your vineyards.

Regarding Point 2: With prices being what they are and with the standards being raised every year for °Brix, can you afford to make the gamble that you’ll not ripen your fruit to the appropriate level? You might be left scrambling to find someone outside of this region to take your fruit – then can you afford the shipping costs? Estimating your crop will provide you the odds you need to decide, based on your vineyard history, whether your site can ripen the estimated tonnage on the vines.

**How?** See Dr. Terry Bates’ Crop Estimation Table at the end of this article. Many growers have different techniques for estimating crop load. At 30 days post bloom...
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 48.4 ft, 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.

Any way you do it, it’s simply important to do it every year at roughly the same time so you have the information for your records, and every piece of consistent information you have from your vineyards will enable you to improve management in your vineyards.

**How much should you thin?** 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 (*See Terry’s article “Concord Crop Adjustment: Theory, Research, and Practice”*) for graphs.

**Where are we now?** As of early June in 2011 – and after a wet and cool April and May – we are a few days ahead of average. The average bloom date for this region is June 15, and as of June 3, boom in wild grape has been reported as just beginning. Generally, Concord bloom is about 7 to 10 days after bloom in wild grapes – depending on the location of the vineyards in relation to the wild grapes, of course. Wild grapes that are blooming in North East, PA, will not likely do much to predict bloom in Concords on Silver Creek, NY. Regardless, we seem to be back on track for an average season, provided the weather continues to cooperate through harvest.

**How to read the crop estimation table:**

- Weigh fruit clean-picked from 1/100th of an acre. Find this number in the left-hand column of the table.
- Locate the approximate number of days after bloom in the shaded bar at the top of the table.
- Follow where 1) and 2) meet, and that is your final tonnage. You’ll note that the numbers at the tops of the columns indicate the percent of final berry weight at the different days post bloom.
Collecting berry weight information from their own individual vining blocks for the year's overripe and underripe berries. Select individual clusters and the values shown are calculated from the average of the cluster weight. This table gives the relationship between the percent of season and final berry weight on an acre.

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

<table>
<thead>
<tr>
<th>Time of Season</th>
<th>20DBAB</th>
<th>30DBAB</th>
<th>40DBAB</th>
<th>50DBAB</th>
</tr>
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<tbody>
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<td>100</td>
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</tbody>
</table>

% of Final Berry Weight

Pounds of Fruit

<table>
<thead>
<tr>
<th>Time of Season</th>
<th>20DBAB</th>
<th>30DBAB</th>
<th>40DBAB</th>
<th>50DBAB</th>
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<td>100</td>
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</tbody>
</table>

This table is used to estimate the final berry weight on an acre. The values shown are calculated from the average of the cluster weight. The table gives the relationship between the percent of season and final berry weight on an acre. A grower has a tool now for spotting and developing those varieties that give the best results in the early stages of the season. The grower has a tool now for spotting and developing those varieties that give the best results in the early stages of the season.
What’s New in NEWA in 2011?

Tim Weigle

The Network for Environment and Weather Applications, or NEWA, has always been a valuable source of information in developing and implementing a vineyard IPM strategy. However, if you haven’t used NEWA lately, you will find some significant improvements and additions to the insect and disease models thanks to grants obtained by Juliet Carroll, Fruit IPM Coordinator, NYS IPM Program as well as entomologists Greg Loeb (Cornell), Mike Saunders and Jodi Timer (Penn State) and LERGP Extension Staff Andy Muza and Tim Weigle, NYS IPM.

Juliet Carroll and Wayne Wilcox revamped the grape disease model pages to include statements that provide the user some background information to use with the results of the disease models to assist in making better-informed decisions for vineyard disease management programs (Figure 1). The grape disease models page provides information on Grape Disease Infection Events for the current date, the previous two days, as well as a forecast for the next five days, where applicable. There is also the option of choosing the phenological stage of the vineyard in question, which then dictates the disease management information provided on the page (Figure 2). And, if you want to know what infection periods have occurred in the vineyard to help in making the decision of shortening or extending spray intervals, a Grape Infection Events Log is also available at the bottom of the page (Figure 3).

A new method of timing Grape Berry Moth management is currently being tested in grower vineyards and through the NEWA website. The model currently uses wild grape bloom as the biofix (start date) to begin collecting degree-days (DD). Mike Saunders’ lab at Penn State determined that it takes 810 DD for a grape berry moth to complete one generation at a base temperature of 47.14F. Accessing the model, either through the links for pest forecasts from a station page or through the Pest Forecasts drop down menu at the top of a NEWA page will present a page as shown in Figure 4. Degree-day accumulations are presented for the current day, the previous two days and are forecasted for the next 5 days.

While there is a good representation of weather stations for vineyards across the Finger Lakes and in Niagara County there has been a noticeable lack of stations in the lower Lake Erie grape belt. A Northeast Region IPM grant received by Saunders and Loeb and a Kaplan grant received by Weigle resulted in 7 weather stations being added to NEWA in 2011. Two units will be added in Erie County, PA, 4 in Chautauqua County, NY and 1 in Cattaraugus County, NY. This should significantly increase the availability of weather and pest information for grape growers.

The best way to find out what NEWA has to offer is to get on the web site and explore. The NEWA home page is located at [http://newa.cornell.edu](http://newa.cornell.edu) If you have any questions on NEWA or would like to discuss how to use the information from NEWA in your vineyard operation please contact Tim Weigle at [thw4@cornell.edu](mailto:thw4@cornell.edu) or 716.792.2800 x203

(see figures 1-4 on following pages)
### Disease Management

<table>
<thead>
<tr>
<th>Disease</th>
<th>Disease Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phomopsis</td>
<td>At this time, protect against rachis infections and prevent infections that move from berry stems into the fruit later in the season. Monitor infection events and maintain fungicide protection on susceptible varieties, in hedged vineyards, or locations with a history of Phomopsis.</td>
</tr>
<tr>
<td>Powdery Mildew</td>
<td>A lot of powdery mildew the previous year = More primary inoculum to cause infections this spring. The model logs potential primary infection events. <strong>CAUTION:</strong> Prolonged cloud cover (lack of sunshine), high RH (&gt;60%) and warm (63-86F) weather significantly increases the risk of powdery mildew infections. Do not delay sprays beyond the 10 inch shoot growth stage for highly susceptible <em>V. vinifera</em> and hybrid varieties. Do not delay sprays beyond the immediate prebloom stage on Concord and other moderately to slightly susceptible varieties. Fruit is extremely susceptible to powdery mildew from immediate prebloom through fruit set. This is the most critical period to protect from fruit infections. Management programs should be at their peak, emphasizing the use of effective fungicides, full rates, appropriate spray intervals, and superior spray coverage.</td>
</tr>
<tr>
<td>Black Rot</td>
<td>Do not delay black rot sprays beyond this stage. The immediate prebloom through early postbloom periods are critical for management of black rot. Keep track of infections events and maintain fungicide protection accordingly. Conords can become infected up to 6 weeks after the last cap has fallen, and <em>V. vinifera</em> varieties up through 7 weeks postbloom.</td>
</tr>
</tbody>
</table>

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**Grape Disease Infection Events for Portland**

<table>
<thead>
<tr>
<th>Disease</th>
<th>Past</th>
<th>Past</th>
<th>Current</th>
<th>Grape Disease 5 Day Forecast</th>
<th>Forecast Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phomopsis</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Powdery Mildew</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Black Rot</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Grape Disease Infection Events for Portland**

- **Phomopsis:** Calculates when weather conditions may allow spores to infect susceptible tissue.
- **Powdery Mildew:** Runs from bud break until early bloom; calculates when weather conditions may allow overwintered primary spores (asexual spores) to infect susceptible tissue.
- **Black Rot:** Calculates when weather conditions may allow spores to infect susceptible tissue.

**Phenological stage:** Immediate pre-bloom

*Choose the phenology stage for the grape variety of interest to display management messages. Concord grape phenology is estimated by the minimum historical records for this variety.*
### Grape Infection Events Log

When calculating combined wetting periods we use the following rules: 1) an infection event must start with precipitation, 2) successive wetting periods are combined into a single infection event until a dry period of over 24 hours or a wetting period with no precipitation is encountered.

<table>
<thead>
<tr>
<th>Starting Date/Time</th>
<th>Ending Date/Time</th>
<th>Hours LW</th>
<th>Avg Temp</th>
<th>Total Rain</th>
<th>Phomopsis</th>
<th>Black Rot</th>
<th>Combined Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jun 11 9:01</td>
<td>Jun 12 10:00</td>
<td>8</td>
<td>64.4</td>
<td>0.43</td>
<td>Infection</td>
<td>Infection</td>
<td>Yes</td>
</tr>
<tr>
<td>May 25 21:01</td>
<td>May 28 10:00</td>
<td>46</td>
<td>58.0</td>
<td>2.05</td>
<td>Infection</td>
<td>Infection</td>
<td>Yes</td>
</tr>
<tr>
<td>May 23 11:01</td>
<td>May 24 4:00</td>
<td>9</td>
<td>64.6</td>
<td>1.41</td>
<td>Infection</td>
<td>Infection</td>
<td>Yes</td>
</tr>
<tr>
<td>May 18 19:01</td>
<td>May 19 13:00</td>
<td>14</td>
<td>54.6</td>
<td>0.43</td>
<td>Infection</td>
<td>Infection</td>
<td>Yes</td>
</tr>
<tr>
<td>May 14 5:01</td>
<td>May 16 14:00</td>
<td>51</td>
<td>50.2</td>
<td>2.26</td>
<td>Infection</td>
<td>Infection</td>
<td>Yes</td>
</tr>
<tr>
<td>May 11 1:01</td>
<td>May 4 9:00</td>
<td>48</td>
<td>46.1</td>
<td>1.39</td>
<td>No infect; temp&lt;50</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>May 11 1:01</td>
<td>May 4 9:00</td>
<td>48</td>
<td>46.1</td>
<td>1.39</td>
<td>Infection</td>
<td>No infect; temp&lt;50</td>
<td>Yes</td>
</tr>
<tr>
<td>Apr 22 18:01</td>
<td>Apr 29 12:00</td>
<td>50</td>
<td>49.1</td>
<td>3.61</td>
<td>Infection</td>
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<td>Yes</td>
</tr>
<tr>
<td>Apr 16 0:01</td>
<td>Apr 17 3:00</td>
<td>25</td>
<td>49.3</td>
<td>4.09</td>
<td>Infection</td>
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<td>Yes</td>
</tr>
<tr>
<td>Apr 11 8:01</td>
<td>Apr 11 18:00</td>
<td>6</td>
<td>64.8</td>
<td>0.25</td>
<td>Infection</td>
<td>No infect</td>
<td>Yes</td>
</tr>
<tr>
<td>Apr 3 17:01</td>
<td>Apr 5 8:00</td>
<td>35</td>
<td>47.7</td>
<td>1.85</td>
<td>Infection</td>
<td>No infect; temp&lt;50</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Download Time: 6/14/2011 11:00

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### Grape Berry Moth Results for Portland

**Wild Grape Bloom** 6/4/2011

Wild Grape Bloom data above is estimated based on degree day accumulations or your input. Enter the actual data for blocks of interest and the model will calculate the results more accurately.

**Accumulated degree days (base 47.14°F) wild grape bloom through 6/14/2011: 201 (0 days missing)**

<table>
<thead>
<tr>
<th>Base Temp</th>
<th>Past</th>
<th>Past</th>
<th>Current</th>
<th>5-Day Forecast</th>
<th>Forecast Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.14°F - QBM</td>
<td>Jun 12</td>
<td>Jun 13</td>
<td>Jun 14</td>
<td>Jun 15</td>
<td>Jun 16</td>
</tr>
<tr>
<td>184</td>
<td>196</td>
<td>207</td>
<td>233</td>
<td>243</td>
<td>262</td>
</tr>
</tbody>
</table>

**Past Status**

First generation of grape berry moth larvae are hatching and beginning feeding. Grape berry moth will not be at significant population levels in vineyards classified as being at low, intermediate, or high risk using the Risk Assessment protocol.

**Past Management**

Research has shown that this insecticide timing for the first generation provides little, if any, additional control of grape berry moth in vineyards classified as being at low, intermediate, or high risk for grape berry moth damage. However, an insecticide timed with the immediate post-bloom fungicide application can be used in vineyards experiencing significant crop loss from grape berry moth on a yearly basis.
Degree Days  
*Juliet Carroll, Fruit IPM Coordinator, NYS IPM Program*

(Editors note: While not specifically targeted to a grape audience, the following article does a great job explaining the collection, calculation, and use of Degree Days by NEWA. If you have a question on degree days this article should have an answer for you.)

Several inquiries regarding degree days have surfaced as NEWA newa.cornell.edu use has increased. Degree days (DD) are, essentially, a mathematical way to calculate the accumulation of heating units over time. (Cooling units, i.e. chilling hours, can also be calculated, though this is not currently programmed into NEWA.) A brief description of DD’s is available from the University of Illinois at http://ipm.illinois.edu/degree-days/calculation.html.

Keep in mind…

- NEWA serves many agricultural and horticultural commodities.
- There are several formulas that can be used to calculate degree days.
- Max and Min temperatures are collected during a ‘defined’ 24-hour period.

Degree Days (DD) calculated in NEWA at http://newa.cornell.edu/index.php?page=degree-days and their application to plant and pest phenology models.

<table>
<thead>
<tr>
<th>Base temperature</th>
<th>Use(s)</th>
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<tr>
<td>4C</td>
<td>cabbage maggot</td>
</tr>
<tr>
<td>32F</td>
<td>apple scab</td>
</tr>
<tr>
<td>40F</td>
<td>onion maggot</td>
</tr>
<tr>
<td>43F</td>
<td>obliquebanded leafroller, spotted tentiform leafminer</td>
</tr>
<tr>
<td>45F</td>
<td>oriental fruit moth</td>
</tr>
<tr>
<td>47.14F</td>
<td>grape berry moth</td>
</tr>
<tr>
<td>48F</td>
<td>alfalfa weevil</td>
</tr>
<tr>
<td>50F</td>
<td>growing degree days (GDD), codling moth, plum curculio, apple maggot, San Jose scale</td>
</tr>
<tr>
<td>55F</td>
<td>fire blight shoot blight symptom development</td>
</tr>
<tr>
<td>86/50F</td>
<td>European corn borer (86F high cutoff, 50F base temperature)</td>
</tr>
</tbody>
</table>
Temp data for the location of interest, generating a DD value (using Baskerville-Emin calculations, see below), and then comparing that total against a lookup table of DD ranges and corresponding text messages that are used to populate the Pest Status, Pest Development, and Pest Management boxes on the screen.

There are several formulas that can be used to calculate degree days – In NEWA, historically, the simple Max-Min formula is what has been used for DD calculations. This formula can readily be calculated by hand and was also included in many of the Cornell Pest Management Guidelines. The Baskerville-Emin (BE) formula uses a sine wave algorithm and results in more precise DD calculations. This formula was implemented in NEWA in ~2006.

We chose to place the simple DD formula choices at the top of the drop down selection list on the NEWA Degree Day Data webpage http://newa.cornell.edu/index.php?page=degree-days to reduce confusion among our long-time NEWA users. Those choices that use the BE DD formula are noted as “BE” in the name.

Currently, in all the NEWA apple disease and apple insect phenology models that utilize DD accumulations, the BE formula is being used. Drs. Cox and Agnello have chosen to use BE DD’s because of their higher precision. Furthermore, BE DD’s have been used in the entomology field observations in Geneva, NY, for the past 15 years or more.

If you are comparing the Scaffolds “Upcoming Pest Events” tabulated DD’s to what is tabulated for Geneva in NEWA, make sure you compare these to the BE DD’s to get the best match. “Best match” because, having used two calculators to crunch an involved equation and come up with two answers that don’t exactly match, it is true that software programs can differ slightly in the way they handle rounding of decimal places, etc. which can create some slop in the mathematical answer.

Max and Min temperatures are collected during a ‘defined’ 24-hour period - Another area that introduces variability in DD accumulations is how the 24-hour period is defined. For some, the 24-hour day begins at midnight, for some it ends at midnight. That is, in some systems midnight is 0:00, in some it is 24:00. In NEWA, midnight marks the beginning of the day and is tabulated as 0:00 in the Hourly Data pages. NEWA’s 24-hour period runs from 12:00 AM (= 0:00) until 11:59 PM.

Data is collected for NEWA’s database at the top of the hour. Therefore, some NEWA weather stations may miss the true Max and Min temperature for a given day, because it might have occurred at 2:16 PM. Another source of variability! NEWA’s new weather stations with the IP100 ethernet interface, described at http://newa.cornell.edu/index.php?page=get-weather-station, will be programmed to collect the true daily Max and Min values.

Enter daylight savings time when, essentially, an hour is lost and then gained in the annual time continuum. NEWA will soon begin utilizing the same methodology as the National Weather Service (NWS) for dealing with this 23-hour-long day and 25-hour-long day during the year.

The NWS has Weather Observer sites reporting daily Max and Min temperatures. These sites collect data, once per day, at specified times which can affect DD value calculations. Consider the time when you look at the values from your Max-Min thermometer and then clear them. If you look at these first thing in the morning and invariably at 5:00 AM, then you are collecting a true 24-hour Max and Min temperature for the period 6:00 AM until 5:00 AM the following day. If you collect this data in the afternoon, the 24-hour period range would be different. Over time, climatologists have found that “afternoon” observations typically accumulate more DD’s than “morning” ones.

The bottom line - when comparing DD data, keep in mind the sources of variability in DD accumulations. And don't sweat the discrepancies you find too much; like they say, you can measure it with a micrometer, but what's the sense if you have to cut it out with a hatchet? Nothing is better than looking outside and seeing if you have green tip or counting the insects in your traps. We certainly don't expect an adult codling moth to pop out on the dot at 489 DD43 from Jan 1, or plum curculio to stop immigrating into the orchard at 308 DD50 from petal fall; there are simply too many sources of variability (e.g., in whose data one is using, how it was collected, in how representative a site, and at what point in time, etc.) to make this level of tracking practical.

NEWA provides theoretical predictions and forecasts. The theoretical models predicting pest development or disease risk use the weather data collected (or forecasted) from the weather station location. These results should not be substituted for actual observations of plant growth stage, pest presence, and disease occurrence determined through scouting or insect pheromone traps.
The economics behind controlling weeds is a little like maintaining the roof on your house. An old roof looks a lot like a vineyard with less than adequate weed control, a little ugly. The economic costs associated with that ugly vineyard or roof are relatively minimal, at least for a while. There isn’t a real problem until your roof starts to leak. At that point the costs are overwhelming and getting your house back into shape may quickly involve more than replacing shingles. Before you know it, you’re replacing sheathing, insulation and drywall.

Good weed control has the ability to increase vine size and berry size in dry years, compared to vineyards lacking control. In a year with without water stress, these benefits are not realized. In vineyards with extremely poor control weeds disrupt airflow and spray coverage, thus increasing disease pressure. If you do not stay ahead of the weeds, they’ll outcompete your vines. Grass under the trellis evolves into poison ivy and trees that require a much more intensive approach. Much like a house with an aging roof, the benefits are somewhat marginal until it becomes an overwhelming problem. In the wrong year, that can happen very quickly.

Weeds are never a small problem
Economically speaking, weeds are never a small problem. Usually less than ideal weed control does not produce discernable economic harm. That is, until it quickly becomes obvious that potential crop is adversely and hugely impacted. Nearly perfect vines can fall under 2.5lbs pruning weights in a single year. That reduces future potential crop by a ton or $270 per acre. Repairing that vine size will require above average herbicide management costs offsetting any operating costs you saved. While you’ll end up paying for the chemicals one way or another, you’ll never get that potential crop back.

Economics of row middles
Weed control in row middles is a little bit easier to manage than under the trellis. If things get a little too tall, you might have to mow a little slower, or a burn-down won’t be as effective as you like. A burn-down would almost always be advisable during dry conditions. Mowing does not generally conserve any water to lower vine stress. A burn-down may also be advisable in years with considerable rainfall because increased weed vigor might require an extra mowing. For those with duel tank weed sprayers a row middle burn down costs between $11 and $13 per acre applied, or between $7.33 and $8.66. For those without a dual tank sprayer, a burn down costs approximately $8 and $9 more than mowing. If you do not have a dual tank sprayer, a burn down makes sense only if it prevents a mowing or prevents vines from becoming water stressed. Economically, with a duel-tank sprayer, depending on the timing of your weed control, the burn down can replace mowing as a less expensive option. If you’re considering using a burn-down method regularly a 40 acre farm would save approximately $3,600 assuming ten applications over the next ten years.

Under the trellis
The costs of materials vary widely. It doesn’t get much cheaper than roundup, aim and an adjuvant, which costs approximately $14 per applied acre. It also doesn’t get much more expensive than Chateau, Gramoxone, Aim, and an adjuvant, which costs $29 per acre. Of course, when comparing these with control programs and others, effectiveness relates directly to the economic value of the chemical costs. However, the best weed control program will be in a constant state of fluctuation. It may not be ideal for cash flow but there are times when you’ll need to spend more on chemicals to do an equal job, only to return to less expensive chemicals as your timing and target species change. This complicates the expense side of a cost benefit analysis.

Round-up, Aim, and an Adjuvant are going to manage many suckers and species of grasses adequately. Even if you throw in a Gramoxone in during the summer, this would still be less expensive than two applications of the Chateau/Gramoxone cocktail. If this or some other less expensive chemical mix tempts you, it will only work for so long. As your weed species change, you’ll likely need to switch to a different chemistry and start using pre-emergent herbicides.

Most growers cannot reliably apply pre-emergent herbicides alone. On a commercial scale it is very challenging to make applications early enough so that weeds have not yet emerged and late enough so that season long control is attainable. Economically it is advantageous to manage pre-emergent applications to target particular species of weeds and/or to save a
trip through the vineyard.

**Fall Application of Round up**

Fall applications have recently emerged as a trend. This low-cost application, generally around $25 per applied acre. I have not heard any reports that this type of application saves a trip in the spring, but it certainly cleans up vineyards in the spring. This type of strategy may be a good way to catch up if perennials are starting to get ahead of you. Economically speaking, since it does not save a trip, it should be reserved for catch-up and improved spring timing. It should not be an annual strategy. You probably do not require this advice, as fall weed control will be limited by weather conditions. If you attempt this strategy on heavy clay soil you may be successful 30% of the time, which is perfectly reasonable.

**Inefficiency in Management Style**

When it comes to vineyard management some growers tend to drift toward high investment and intensive spray programs, while others play loose with the Concord, knowing full well how hearty it can be. When it comes to weed control, economic efficiency is usually somewhere in the middle. Of course ninety five percent bare ground is not a long-term effective strategy for commercial concord production. With low labor costs and the right technology, it can be done but it is more efficient to set the bar lower.

Setting the bar too low leads you vulnerable to weather conditions. I am sure we can agree, weather conditions already have enough say in your bottom line. Weed control is most efficient when weed pressure is not impacting vine size or berry size and when escapes are not requiring intensive spot treatments (poison ivy, locust trees). Recovery from these three variables is expensive and savings in operating expenses cannot justify crop losses.

**Solution to Complex Financial Analysis**

On the cost side, consider the bigger picture when pricing herbicide chemical costs. Consider not just the required number of passes but the ability to potentially lower chemical costs in later years. Track all of your costs, chemical costs in particular. A long-term average will give you a better idea if your weed management program is efficient.

Set targets and adjust them as chemical prices change. There is no reason to switch only to roundup because chemicals are getting more expensive, so adjust your targets. In the meantime try to manage under the trellis for less than $25 in chemical costs annually per applied acre. Certain years may require much higher costs but if you keep your average below $25 you’re operating relatively efficiently.

Manage row middle costs separately. When managing row middles offset any mowing costs if trips are saved. Mowing vineyards should cost $12 - $14 per acre. Also keep in mind that a burn down is far superior to mowing in dry years. Costs may be a little higher in extremely dry and wet years and should be lowest in years that do not have extreme weather. Keep row middle management under $30 per acre of grapes or $20 per acre of row middles.

**Reducing Trips**

Growers determined long ago that reducing trips through the vineyard is a simple but effective way to reduce costs, to a point. Commercial concord vineyards have almost entirely switched to no till programs, and many have started mixing in pre-emergent applications and using duel tank sprayers to limit trips through the vineyard.

The next step is reducing the cost of vineyard trips. Mowing, for instance generally costs more per acre than weed spray. We have two multi-row weed sprayers in the region and I expect more will follow. Those early adopters of multi-row canopy sprayers quickly realized the tractor with the weed sprayer was getting more hours than their multi-row sprayer. As this equipment gets commercialized if costs come down it may be an appropriate investment for 100-acre farmers. As it currently stands growers with more than 200 acres should definitely consider this investment. Your depreciation costs, per acre, may triple. With a large enough farm those costs are easily offset by the 50% reduction in labor, tractor hours and timing of
Medium-sized growers (40 – 75) acres should start considering duel tank sprayers. At 40 acres the investment will probably not return an ROR to justify interest costs (6%). However, it should be a worthwhile investment as compared to cash productivity (3% or less). That means if you have some cash you would like to invest, treasuries, CDs and Ginney Maes are historically cheap. So cheap, in fact, that a duel tank upgrade to your weed sprayer may be a decent investment.

Concords will outcompete weeds, with your help

Much like your roof, I cannot promise you that a full tear off will save you money this year. In fact, I fully expect the opposite scenario. Diligence and constant variable investments will allow you to efficiently manage your weeds and avoid any of the disaster like scenarios that happen when problems go ignored.

Postemergence Chemical Weed Control Options
Hans Walter-Peterson, Finger Lakes Grape Program

(Adapted from “Postemergence Weed Control in Vineyards” by Alice Wise and Andy Senesac, Long Island Fruit and Vegetable Update, April 14, 2011)

An increasing number of growers in the Finger Lakes are moving away from the use of preemergence herbicides in favor of postemergent strategies for weed control in their vineyards. In many cases, this means applying two, three or more postemergent herbicide sprays during the growing season, but a number of growers have also incorporated mechanical weed control into their programs as well.

The decision to employ just a postemergent weed control strategy should not be taken lightly. Over a growing season, it tends to be more labor intensive and thus more expensive than the use of preemergence herbicides. A postemergence program places a high amount of importance on addressing emerging weeds early in their development, when they are less than 6” tall. In some cases, other vineyard tasks end up taking precedence over later season herbicide sprays, allowing weeds to grow tall enough that they become difficult to control later in the season. Consequently, this strategy is better suited to smaller vineyards with the ability to keep up with the work necessary to take care of weeds early in their development.

There are two types of postemergence herbicides: those that burn back the aboveground portion but typically do not kill the root and those that are absorbed and are translocated through the plant, killing the root as well. A well-established stand of weeds, particularly some of the grasses, may require more than one application to achieve sufficient control.

The following are descriptions of several herbicides that can be considered for use in a postemergence-only program. At this point in the season, the use of any type of contact or systemic herbicide requires extra precautions to make sure they do not impact the fruit or canopy of the vines. Using shielded sprayers or air-induction nozzles that produce large droplets which are less prone to drift can help in this regard. Some of the labels for these materials specifically prohibit contact with green tissue on the target plant.

**Glyphosate** (Roundup and several other trade names) is a non-selective systemic herbicide, which means that the spray must not contact green grapevine tissue. If that were to occur, the active ingredient may be translocated throughout the plant. This is particularly devastating to young grapevines. Note that uptake is enhanced after bloom, and thus particular care must be taken in the bloom to late season sprays. Shielded sprayers are fairly effective at preventing contact. Typically about 30 gallons of water/acre are used in application of these products, except for CDAs (controlled droplet applicators like the Enviromist), which typically apply 5 -10 GPA. With repeated use over time, certain weed species may develop resistance to this material. Thus relying exclusively on glyphosate over the long term is not advised.

**Aim** (carfentrazone) is a postemergence contact herbicide. Aim controls several annual broadleaf weed species (actively growing weeds up to 4” tall) but it does not control grasses or sedges. Aim is also an effective suckering agent. Aim is used at a maximum use rate of 2.0 fl.oz. /acre, and a maximum of 7.9 fl.oz. per season in a minimum of 10 GPA. In trials conducted by weed scientist Rick Dunst (formerly
of the CU Portland Vineyard Lab) on Concord and DeChaunac, Aim was more effective than Gramoxone in burning off sucker growth, and a tank mix of the two was more effective than either applied alone. Aim applied alone or in a tank mix with Gramoxone or preemergence herbicides should provide effective burn down of suckers. Use a non-ionic surfactant (NIS) or crop oil concentrate (COC) as per label recommendations.

**Paraquat** is a non-selective contact herbicide. There appears to be just one formulation registered for grapes in NY - Gramoxone Inteon (2 lbs./gal a.i.). Use 2.5 to 4.0 pts/acre in a minimum of 10 gallons of water per acre. Use of a NIS or COC is recommended. Note that Gramoxone Max is no longer labeled in NY and existing supplies cannot be used. Paraquat materials must not contact green grapevine tissue (unless being used to control suckers). Short distance translocation through grapevine shoots is possible, though less likely. The contacted tissue, however, will be killed. Gramoxone is a restricted-use chemical, meaning only licensed applicators may use this product.

**Poast (sethoxydim)** is a selective postemergence herbicide that will control annual grasses very well up to 12 inches tall. Sethoxydim is labeled for use in nonbearing AND bearing vineyards (50 days PHI). Best success is usually obtained with early intervention on annual grasses not more than 6” tall. Weeds that are drought-stressed are much more difficult to control. A crop oil concentrate (1% v/v) is usually added for optimal control. Broadleaf weeds and nutsedge are not controlled by sethoxydim.

**Rely 280 (glufosinate-ammonium)** is primarily a non-selective contact herbicide. It is labeled for use in both non-bearing and bearing vineyards, and also has a 2(ee) label for use to burn suckers less than 12” long. Apply 48-82 fluid ounces of product per acre in a minimum of 15 gallons per acre. The product label contains information on the rate to use, depending on weed height and weed species that are present. Under the 2(ee) recommendation for grapevine sucker control, two applications approximately 4 weeks apart at 56 fluid ounces are recommended when suckers are less than 12” long. Do not apply more than 246 fluid ounces product per acre per year.

**Scythe** is a postemergence herbicidal soap (pelargonic acid) that ruptures the cells within green tissue. The initial effect on weeds is seen rapidly (within minutes), but the ultimate level of control may not be known for several days. As with the other products, green grapevine tissue should not be contacted. For effective control with Scythe, grasses should be very small (<3”) and broadleaves should also be small. Do not expect to apply Scythe to a dense, well-established carpet of weeds and get adequate weed control. For best results, use 60 GPA of water. Consequently, it will not perform well when used with low volume CDA sprayers. The label suggests combining Scythe with other postemergence materials such as glyphosate for quicker burndown results. No additional surfactants are necessary for Scythe.

**Acetic acid (Weed Pharm)** and clove oil products have been tested in vineyards with varying success. Matran EC, a clove oil product, is OMRI approved and does not have an EPA number as the company feels it qualifies as a minimum risk product. These materials are best applied to weeds <6” with volumes of water sufficient to thoroughly cover plant surfaces (>30 gpa). There may be control of top growth but they are not translocated so that weeds will regrow. The need for relatively high rates/frequent reapplication makes these types of materials a more expensive option. Their best use might be in combination with other weed control techniques such as cultivation and under trellis mowing. Also, be clear on the registration status of such products; make sure agriculture is a stated use on the label. Recently, Weed Pharm was OMRI approved and recently approved in NY for food crop use. Be aware that there is DANGER precaution on the label because of applicator safety concerns.
Proper mechanical weed control is all about timing. As is the case with chemical weed control, it is much easier and more effective to cultivate weeds when they are three inches high rather than when they are 3 feet high. Mechanical weed management can be relied on as your only method for weed control or in combination with a chemical program. Rotating between chemical and mechanical methods will help to ensure you don’t burn out herbicides. However, it can be a time-consuming and more expensive practice that requires attention throughout the growing season. For grafted vines, the process of unhilling in the spring tends to work well as an early mechanical weed control. A few of the more commonly-used systems include those from Braun, Weed Badger, and Green Hoe.

*Braun* offers several different cultivators, all of which are hydraulically operated and feature a trip arm to guide them in and out of the vines. There are a couple of attachments for these units, which can be used for hill-up and take down as well as suckering. The unit features hydraulic lift and tilt to accommodate steep vineyard slopes. The Braun uses a flat blade that slices along just under the soil surface cutting the roots of the weeds. On the back of the blade are lifter tines, which help to expose the roots to air and sunlight preventing the roots taking hold again.

*Weed Badger* has many mechanical weed control options. All of these machines use a rotating disc with metal cultivator tines to disrupt and rip out the weeds. Some of these units are sensor-controlled while others rely on the operator to guide them in-between the vines. Weed Badger’s tractor-mounted units have external hydraulic tanks and pumps, which means they can be used on tractors from 25-90 horsepower. They also have a tilting head feature, but it is not hydraulically controlled like the Braun is. Attachments for this unit include a broom, rake, sweeper/tiller, disk, spade, and mower. One limiting factor of the rotating head is that tall or vine-like weeds or can become entangled in the tines – another reason why it is important to cultivate while the weeds are young.

*Green Hoe* provides a couple of cultivator options for their Hyd-Row-Hoe platform, which includes a rotary cultivator, tooth cultivator, and an undercut blade. The tooth cultivator can be outfitted with an automatic sensing attachment. There are also other attachments for this unit that include a disc mower, a vine auger, and a graft cleaning brush.

**New Extension Enologist in Pennsylvania**

*Andy Muza-Penn State Cooperative Extension*

To support the state’s growing winemaking industry, Penn State Extension has hired Denise Gardner, a sensory scientist for Vinquiry Enartis in Windsor, Calif., to become the new extension enologist for Pennsylvania, effective May 2.

With guidance from a wine industry advisory committee, Gardner will develop applied enology research and educational programs aimed at commercial winemakers and their employees. She will conduct on-site evaluations of winemaking operations, recommend improvements and keep winemakers apprised of the latest science regarding wine production methods, winery economics and business practices.

In the Lake Erie Region, Denise is eager to begin working closely with her extension enology colleagues at Cornell and Ohio State, the LERGP Extension Team and wine industry personnel to provide research-based educational programs for the region.

Support for the Extension Enology position, which will be based in the Department of Food Science at Penn State’s University Park campus, is provided by the Pennsylvania Winery Association, the state Wine Marketing Research Board and Penn State’s College of Agricultural Sciences.

Dennis Calvin, director of Penn State Extension, said Gardner’s hiring demonstrates Extension’s commitment to support a growing, dynamic wine grape industry. “The number of licensed wineries in Pennsylvania has risen from fewer than 30 to nearly 170 in the last three decades,” he said.

“We’re pleased to partner with the industry to help provide the programs that grape growers and winemakers need to remain profitable.”

Pennsylvania ranks seventh among states in wine production, bottling more than 1.2 million gallons an-
nually. The state also ranks as the nation’s fifth largest producer of wine grapes, with about 2,000 acres yielding as much as 16,000 tons of grapes. According to a recent study, the wine industry has an annual economic impact of $870 million on the state’s economy, including $180 million in tourism-related activity.

As sensory scientist for Vinquiry Inc., Gardner studied the sensory effects of wine products and ingredients such as yeasts and enzymes on red and white wines. She also consulted with winemakers on enological problems and winemaking techniques, prepared and taught sensory-related seminars, and conducted laboratory analysis of juice and wine. Her previous experience included work in retail wine-tasting rooms and vineyard maintenance.

Gardner earned her bachelor’s degree from Penn State in food science with a minor in horticulture (small fruits emphasis) and her master’s degree from Virginia Tech in food science and technology with an emphasis in enology and flavor chemistry. She is a member of the American Society of Enology and Viticulture and the American Wine Society.

**What Are They Doing?**

*Tim Weigle*

There is nothing like a good story, and I should probably wait for a while until some good ones get going but, curiosity can kill the cat and I would hate to see that happen.

By now, many of you have driven by CLEREL, or heard from somebody who has, and were surprised by the 16 - 17 foot poles erected just in back of the laboratory. Over the past three years, there has been a dramatic increase in the number of requests about information on growing hops. The more I looked into it, the more interested I became. When grape growers started to ask questions about hops production it became obvious that there was a lack of research-based Hops IPM information for the Northeastern United States, as well as, any type of demonstration planting in the Lake Erie region.

I have been fortunate enough to have received grant funding from the Northeast Center for Risk Management Education - Trade Adjustment Assistance for work on diversification for the New York and Pennsylvania grape industry, as well as, a grant from the Northeast Region Grape IPM Program to develop and implement a Hops IPM Working Group. I am also fortunate enough to work at CLEREL where they are open to trying new ideas that have potential to help members of the Lake Erie Grape Industry.

The poles you will see planted in back of the lab are part of a hops research/demonstration vineyard. Part of the planting is a variety trial where we can track varietal susceptibility to the various hops disease and insect pests that growers will have to deal with. The remainder of the planting will be used in research projects developed by the Northeast IPM Working Group. While hops production is still relatively new in its resurgence in the Northeast, there are a number of grape growers across New York and Erie County, PA who have expressed interest.

This type of project fits into the mission of CLEREL and the Lake Erie Regional Grape Program to lead in the development and dissemination of innovative, research-based information providing the New York and Lake Erie Region Grape Industries with integrated tools to maximize efficiency, profitability and opportunities for diversification.

If you are interested in learning more about hops production you can give me a call or you can get in touch with Steve Miller, the newly hired Hop Extension Educator located in Madison County, NY. Steve’s email is szm6@cornell.edu

And as always, if you are interested in discussing Vineyard IPM Strategies or any of the research and demonstration projects we have going in grapes, I would enjoy speaking with you.

*See photos on next page for hops vineyard preparation*
LERGP Announces a Mechanization Workshop for Grape Growers

The Lake Erie Regional Grape Program or LERGP will hold a Mechanization Workshop for grape growers in the Lake Erie region of New York and Pennsylvania. This workshop will provide an opportunity for growers to discuss mechanization options and discover mechanization research. There will also be displays and demonstrations of shoot thinning, shoot positioning, crop estimation, crop thinning, and mechanical pruning. The event will be held July 21st 2011 at the Lake Erie Research and Extension Laboratory in Portland, NY from 10:00AM until 3:30PM. Lunch will be provided to participants, free to members of LERGP and $10 for non-members. Pre-registration is mandatory and the deadline for registering is July 14th. Contact Kate Robinson at (716) 792-2800 ext. 201 to register or for more information.

The view from our backyard- All the posts are set and ready for the hops to begin their climb.
Lake Erie Regional Grape Program’s
Mechanization Workshop

Thursday July 21st, 2011
Lake Erie Research and Extension Lab
Portland, NY
10:00AM-3:30PM

Considering mechanizing your production practices?
Join us for a discussion and demonstration of current research in
and economics of vineyard mechanization.

Displays and Demonstrations of:
Shoot Thinning
Shoot Positioner
Crop Thinning
Mechanical Pruning
Crop Estimation

Lunch will be provided to participants: Free for members, $10 for non-members.

Pre-registration is required. Call Kate Robinson at (716)792-2800 ext. 201 to
register today!
Deadline for registration is July 14th.
Don’t miss out on this great opportunity!
UPCOMING EVENTS

Field Symptoms of Virus Infection and Management Options
Wednesday, July 20  4:30 - 6:00 PM
Glenora Farms (NOT the winery)
340 Dundee-Glenora Road
Dundee, NY

LERGP Mechanization Demonstration Day
July 21, 2011  10:00am - 3:30pm
CLEREL - 6592 West Main Road, Portland, NY
Information available on the previous page. Pre-registration for this event is required by Thursday, July 14. Contact Kate Robinson at (716) 792-2800 x201 if you plan on attending.

Farm Business Management Grower Meeting
With Kevin Martin, Farm Business Management Specialist, Lake Erie Grape Program
Tuesday, July 26  4:30 - 6:00 PM
Jordan Hall, Geneva Experiment Station (tentative)

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