LERGP Crop Update

August 11, 2016

Lake Erie Regional Grape Program

Important dates:

See the flyers for more information on the following events:

August 31, 2016- Cornell Vegetable Program Field Day at CLEREL

September 1, 2016- Cover Crop Conference at CLEREL- Register today!

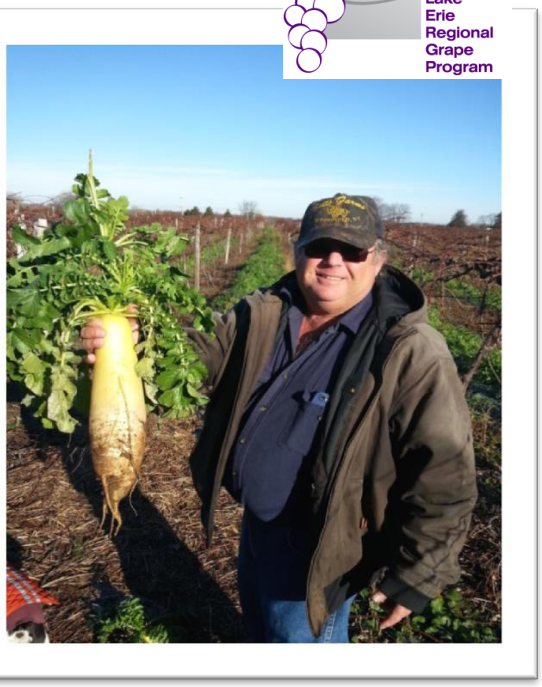
Building Strong and Vibrant New York Communities

Diversity and Inclusion are a part of Cornell University's heritage. We are a recognized employer and educator valuing AA/EEO, Protected Veterans, and Individuals with Disabilities.

Cover Crop Workshop and Field Day

Lake Erie Regional Grape Program

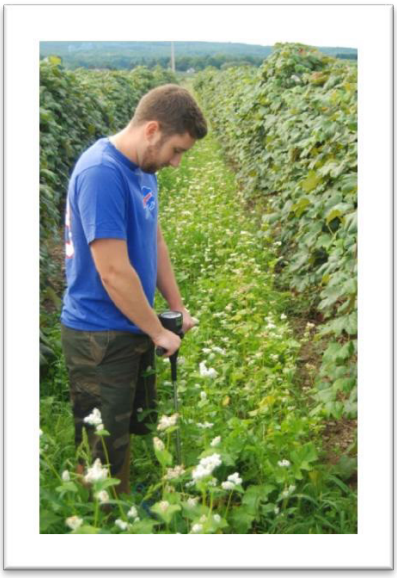
September 1, 2016 @ CLEREL
9:00am-4:00pm
6592 West Main Rd.
Portland, NY 14769



Join the Lake Erie Regional Grape Program for a full day of education surrounding cover crops in Concord vineyards.

- Current research
- Leading scientists in cover crop research
- Tour demonstration plots
- Hear local growers sharing their experience

Fee: $ 10; includes morning refreshments and lunch



Register by August 25, 2016 at the LERGP web-site Registration or call Kate at 716-792-2800, e-mail: kjr45@cornell.edu

NY farm viability INSTITUTE

Cover Crop Workshop- Luke Haggerty

It is inevitable that portions of our area landscape change. However, some Concord vineyards have existed here for over one hundred years. As a perennial crop, there are limited changes to the layout of our grape vineyards. An intense regiment of management practices calls for various farm equipment to be driven up and down the grape rows multiple times a year. Over time, this has led to a range of soil health problems. To combat these problems, area grape growers are turning to cover crops to improve the soil in their vineyards.

As the use in cover crops grows in popularity, many growers turn to the Lake Erie Regional Grape Program (LERGP) for recommendations on what to plant. Recognizing the need for research-based cover crop recommendations, LERGP applied for, and was awarded, a grant from the New York Farm Viability Institute. The funding has been used to measure how different cover crop mixes affect soil health and to sponsor a conference to educate interested grape growers.

Although the concept of cover crops in vineyards is not new, the idea of planting multiple species in a mix geared towards a targeted outcome is. To address the many questions fielded from growers, LERGP is hosting a "Cover Cropping in Concord Vineyards" conference on Thursday, September 1st. Conference participants will have the opportunity to learn about cover crops in a classroom setting and have the opportunity to see test plots in the field located at the Cornell Lake Erie Research and Extension Laboratory (CLEREL) in Portland, NY.

The September 1st conference starts at 9 AM and will run until 4 PM. The CLEREL meeting facilities, 6592 West Main Road, Portland, NY 14769, will be used for the classroom portion of the program. Registration is $10 to cover refreshments and lunch. To register for the conference, please contact Kate at (716) 792-2800 or visit the Lake Erie Regional Grape Program website at http://lergp.cce.cornell.edu.

The Lake Erie Regional Grape Program is a cooperative effort between Cornell and Penn State Universities; the participating Cornell Cooperative Extension Associations of Chautauqua, Erie, Niagara and Cattaraugus Counties in New York and Erie County in Pennsylvania; and participating industry partners National Grape Cooperative (Welch's), Constellation Brands and Walkers Fruit Basket. The LERGP extension team provides research-based educational programming for commercial grape growers throughout the year at venues across the Lake Erie grape belt. For more information on LERGP, call 716-792-2800 or visit our website at http://lergp.cce.cornell.edu/

Business Management

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

Harvest Operations:
Decreasing Expenses and Increase Net Revenue

While it seems like it just stopped snowing, we are again at the tail end of financial and production decision making for the 2016 harvest. In areas with later wild grape bloom, some berry moth insecticides are still being applied. Even in those areas, most of the decision making is complete and finishing the task is all that remains. Some cover crops are in. Due to dry weather, most cover crops are on hold. Otherwise, most financial decisions have been made for the crop year.

Really, immediate decision-making requires only the development of an efficient harvest and labor staffing plan. As growers continue to try to do more with less, I thought I'd take a look at one of the important differences in harvest operation. It appears that the large majority of growers have upgraded their harvesters to eliminate the use of a bin attendant. Despite that, labor size for harvest operations still varies considerably. Growers report using a combination of 3 to 5 tractor-drivers and a harvest operator to complete harvest.

Gross cost of paid labor, assuming all laborers are paid, therefore varies between $60 per hour and $91 per hour. Tractors, including tow motors and harvesters, also vary between 3 and 5. These operations also have increased tractor hours and fuel use per day. Marginal depreciation fuel use, repair and maintenance will vary between will vary between $62 per hour and $80 per hour. Total cost will vary between $122 and $171 per hour.

Gross revenue of harvest involves considerably more complex variables. As typical harvest revenue relates to yield, harvest speed is not always an indication of gross revenue. Harvest speed varies between 1.65 and 2.31 acres per hour. A higher crew size, particularly in a non-bulk operation can contribute to higher harvest rates. The other variable, of course, is yield. A small harvest crew is always better when yield falls below 5 tons per acre. A larger crew does not increase the ability of the operation to increase gross revenue per hour. Obviously in that scenario, net revenue is lower.

Net revenue for a harvest operation varies between $39 and $500 per hour. Average is just under $200 per hour. On average, it is more profitable for a grower to use a smaller harvest crew. It decreases the risk of loss in the event of a small crop. It is also almost always the optimal method, from a net revenue standpoint, when yield is below seven tons per acre.

The average grape harvester in the region harvests 100 acres of grapes. This clearly shows an effort to minimize costs or growing the harvest operation are the best methods of increasing net revenue. The typical grape harvester will need to cover less than 4 acres of grapes per day.

Allowing significant downtime for repairs, a large two shift harvest crew should approach 800 – 1,000 acres of grapes harvested per machine, per year. These large crews, with reasonably effective management, should easily be able to do the work of nearly 10 typical harvesters. A smaller crew would be able to harvest about 70% to 80% of the typical large crew.

For the few growers trying to harvest more than 500 acres with a single harvester, it may make more sense to increase labor in heavy crop years to avoid purchasing a second harvester or reducing the size of the custom harvest business.

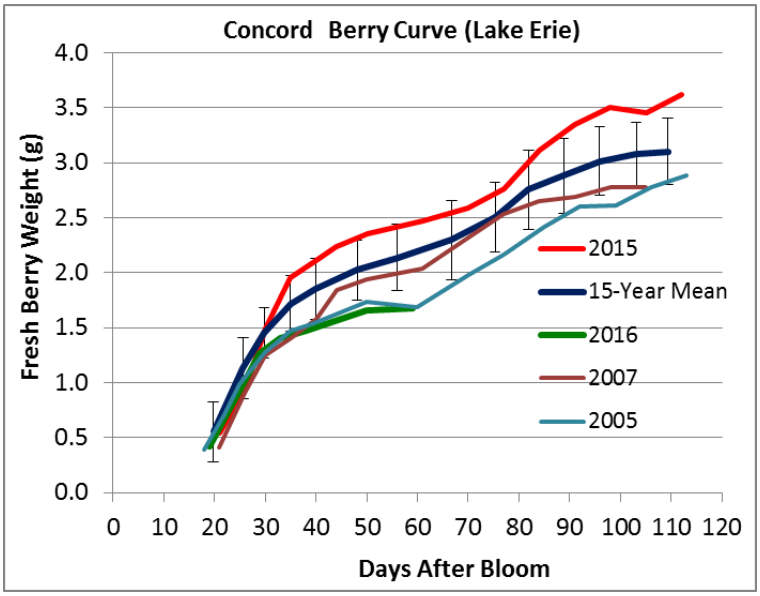
Cultural Practices

Luke Haggerty,Viticulture Extension Associate, Lake Erie Regional Grape Program

Continued Drought Stress, Berry Curve, Projected Veraison, and Precipitation Levels

Showers in the early morning of August 10th and more rain in the forecast for the weekend have helped break the dry cycle. Keep the moisture coming! Over the past week we found vineyard blocks with severe water stress symptoms. The picture to the right was taken this week where a five acre section of the vineyard block was showing symptoms of severe water stress. The berries are shriveling; leaves are showing deficiencies and starting to senesce, and berry size is small. In this week's crop update we have added two past articles from statewide viticulturist, Tim Martinson, that relate to vine water stress.

We are still finding many vineyard blocks where the vines are able to pull up adequate moisture; these sites are doing well considering the conditions. On the flip side, small vines and blocks with shallow roots have not been able to pull up the moisture they need causing them to shut down early in order to conserve moisture.

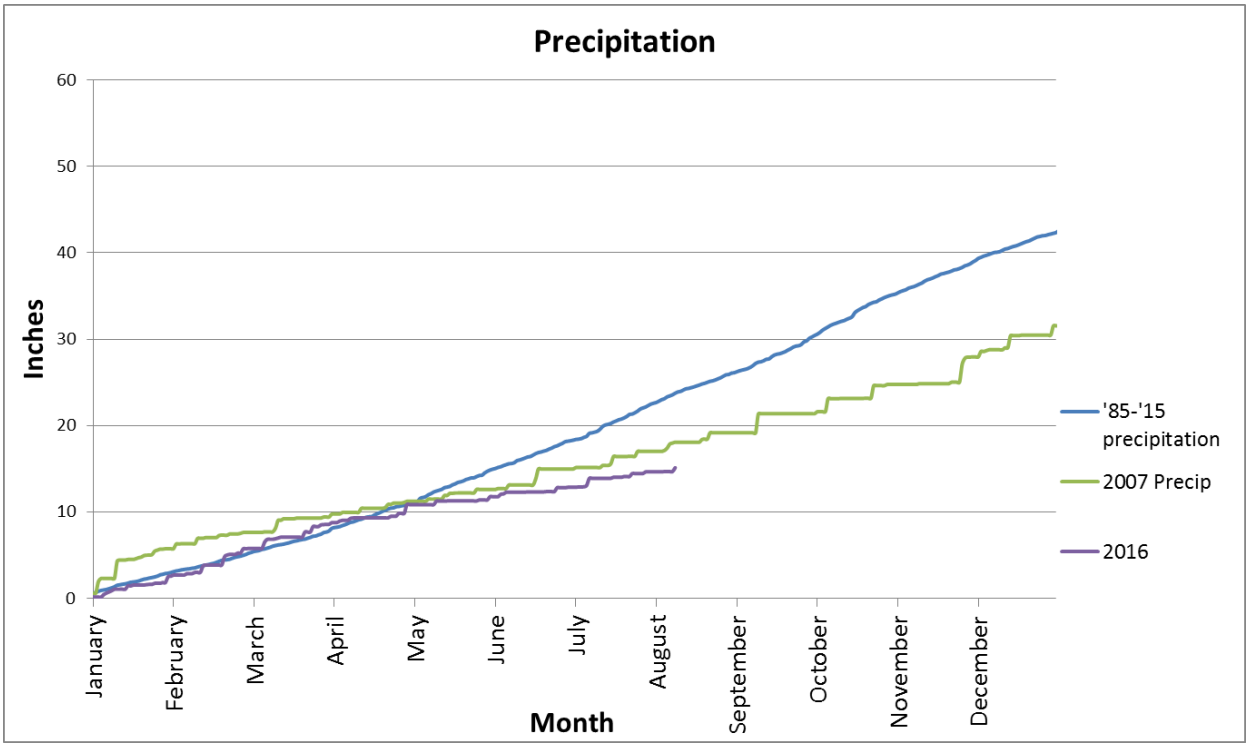


Following the berry curve we can see that the berry weight has plateaued signaling the berries are in lag phase. At this point, the berry curve is tracking very close to 2005 where the growing season was also hot and dry. However, in 2005 there were two hurricanes that brought large amounts of moisture to the area, but it shows, that with the right conditions, there is still plenty of time to increase berry size... to a respectable weight.

Based off of the phenology data, veraison occurs 69 days after bloom +/- three days. This year we call bloom June 12th and that puts veraison projections to fall on August 20th. Right now

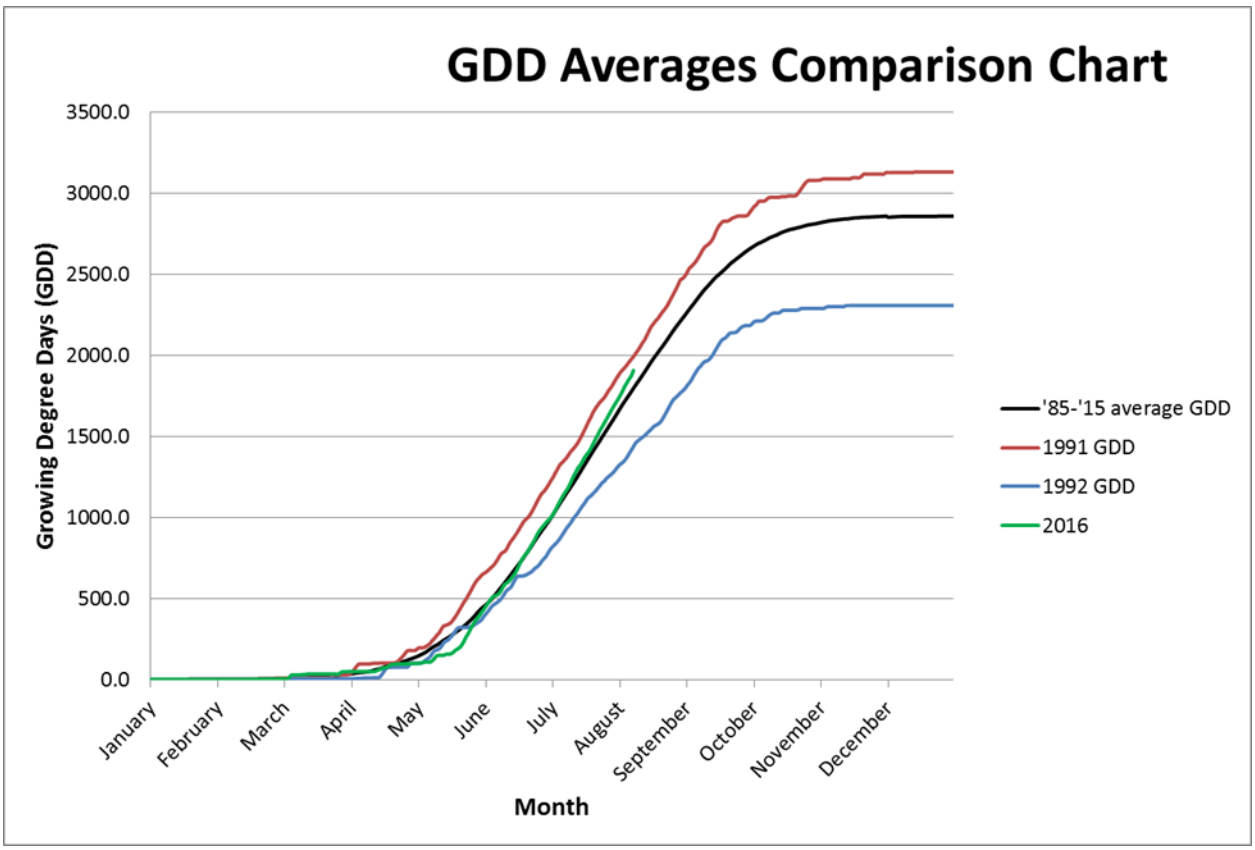
there is an assumption that veraison may occur early this year because of the vine stress from the hot and dry conditions. However, 2005 and 2007 were both hot and dry and veraison occurred 69 days after bloom.

Currently, here at CLEREL, we are **8.5 inches below average**. However, depending on your location this amount may change. I have included two columns in the NEWA table on the next page to include weekly precipitation and accumulated precipitation totals from May to present (Aug 10). Niagara County is noticeably drier than the immediate belt with areas only receiving 3.5 inches in the past three months.



Lake Erie Grape Region NEWA Weather Data						
Location	Past week Precip	Precip July total	Precip June total	Precip May total	May-8/10 total	Total March GDD
North East Lab, PA	0.8	2.68	1.92	2.13	**7.53**	1808
Harborcreek, PA	1.6	2.04	1.74	1.68	**8.72**	1772
North East Escarpment	1.83	2.81	2.37	1.52	**8.53**	1654
Ripley	0.92	1.20	3.86	1.50	**7.48**	1797
Portland CLEREL	0.43	1.63	1.44	1.48	**4.98**	1753
Portland Escarpment	0.85	1.43	1.24	1.56	**5.08**	1830
Dunkirk	1.29	1.52	2.16	1.13	**6.10**	1661
Silver Creek	0.57	2.20	NA	1.78		1695
Sheridan	1.14	1.83	2.23	1.85	**7.05**	1769
Versailles	0.92	2.35	1.47	1.72	**6.45**	1655
Appleton North	0	1.18	1.41	0.71	**3.30**	1582
Somerset	0.02	4.76	1.53	0.94	**7.25**	1712
Ransomville	0.01	1.45	0.93	0.92	**3.31**	1841

Note: All Weather data reported as of 8/10/2016 NA=Sensor Malfunction. Precip in inches.



Lack of Irrigation in 2002 Reduced Riesling Crop in 2003

Timothy E. Martinson
Finger Lakes Grape Program

Lailiang Cheng, Alan Lakso, Thomas Henick-Kling and Terry Acree
Depts. Horticulture – Ithaca, Horticultural Sciences- Geneva, and Food Science and Technology, Geneva.

Irrigation has not been traditionally used in Finger Lakes vineyards. But increasingly frequent dry periods during late July and early August are leading us to re-examine the role that water stress before and during veraison plays in influencing quality and yield.

ATA project. Over the past three growing seasons, we have conducted a project to look at how irrigation and nitrogen fertilization influence vine physiology, fruit quality, and wine sensory characteristics in a Riesling vineyard. A major goal was to relate water and nitrogen status of the vines to the appearance of 'atypical aging' (ATA) flavors in wines. Wines with ATA have less varietal character, and off flavors described as 'furniture varnish', 'floor polish', 'waxy', and 'damp dishrag'. The ATA malady is associated with dry production years, and is thought to have something to do with the lack of nitrogen uptake, due to water stress and drought. This experiment tested that idea through direct comparison of wines made from irrigated or non-irrigated vineyards, with or without the application of supplemental foliar or soil-applied nitrogen. The management idea was that growers could reduce or delay the appearance of the ATA symptoms through irrigation or by foliar applications of urea in the weeks before and after veraison.

Today, I'm going to focus strictly on how irrigation affected yield and maturity over the three years of the experiment. We were fortunate (for experimental purposes) to have two very dry years, followed by a wet year in which we applied no irrigation – and essentially treated the 'irrigated' and 'non-irrigated' vineyards the same way. This offered the opportunity to document the 'carryover' effect of the very dry 2002 growing season. The bottom line is that **following two years of drought, the 2003 crop was reduced by up to 50% in the unirrigated blocks compared to the irrigated plots.** This occurred because the severe drought of 2002 brought on water stress that reduced photosynthesis from mid-July through mid-September. As a consequence, ripening was delayed, and pruning weight was reduced by about half compared to irrigated vines that had leaf function throughout the drought.

Drought stress and photosynthesis. Vines depend on water supply to maintain leaf temperature in an optimum range. They do this through evapotranspiration – i.e. cooling by evaporation of water from the leaf surface. When water supply is inadequate, the **stomates,** minute pores through which gas exchange occurs, close, and vine respiration shuts down. This reduces the rate of photosynthesis, because vines can't take in C02 from the atmosphere, or respirre. So water stress can shut down photosynthesis and raise leaf temperature during the day, resulting in tissue damage. When this occurs in July and August (around veraison), both growth and berry development (including sugar accumulation) suffer. Our data from 2001-2003 illustrate this well:

1. Weather in 2001-2003. Rainfall was significantly below average in 2001 and 2002, and irrigation was applied weekly to the irrigated plots from late July through early September. In 2003, Rainfall was at least average in all months of the growing season, and was 2 inches above average in May and August .

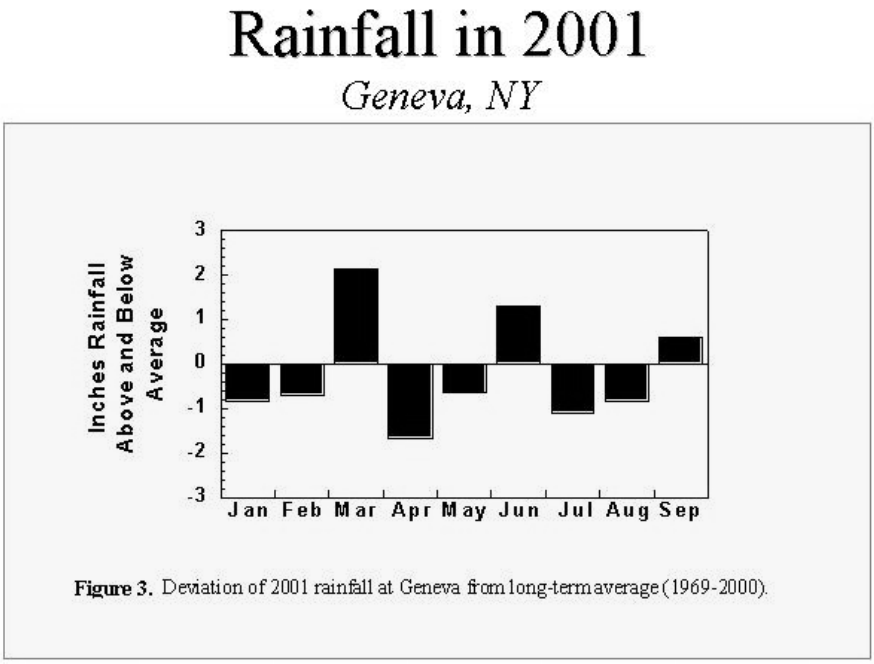
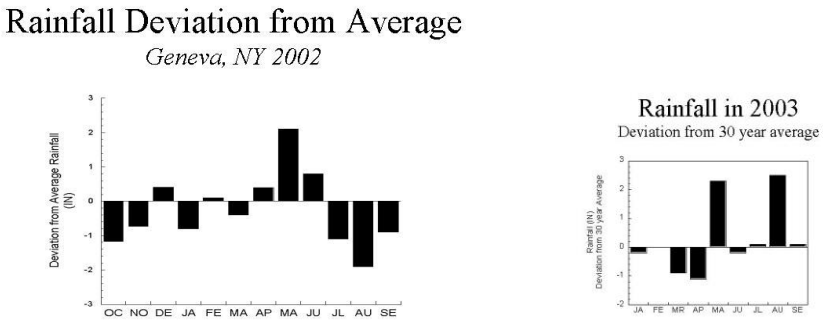


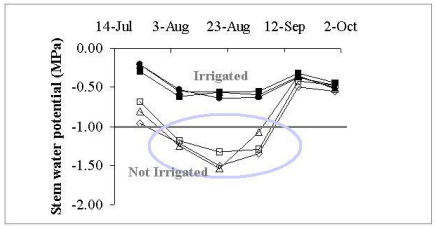
Figure 3. Deviation of 2001 rainfall at Geneva from long-term average (1969-2000).



2. Stem water potential and leaf photosynthesis in 2002. In all three years, we measured water status of the leaves (leaf water potential, left) and leaf photosymthesis (right). In 2002, stem water potential dropped below –1 for about 6 to 8 weeks (left). –1 is about the threshold at which leaf stomates are fully shut during the day. As a result, direct measurements of leaf photosynthesis (right) were *very low* in comparison with irrigated vines. Water stress in 2002 shut down photosynthesis for seven weeks during the hottest months of the growing season. The data is from 2002, but we saw similar trends in 2001.

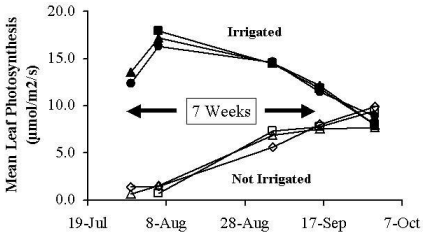
Stem Water Potential

Riesling Irrigation and N trial 2002



Leaf Photosynthesis

Riesling Irrigation and N trial 2002



3. Yield and Quality in 2001. There was no difference in yield in 2001, however irrigation increased berry weight by 0.1 gram, and clusters were heavier in the irrigated treatment (left). Brix (right) was 2 degrees higher in the irrigated plots. In other words: Irrigation increased berry size and brix simultaneously.

Yield Components At Harvest

Riesling Irrigation and N trial 2001

Treatments Irrig	N	Yield (lb/vine)		Berry Wt (g)	Berry# (#/cluster)		Cluster Wt (g)	Cluster # (#/vine)
No	0	10.6		1.58	55.7		87.7	54.5
	Foliar N	10.6	1.6	1.57	58.6	88	91.5	52.8
	Soil N	9.6		1.62	52.9		84.4	50.1
Yes	0	10.0		1.73	58.8		99.8	45.1
	Foliar N	8.3	1.7	1.74	54.9	98	95.2	38.7
	Soil N	11.5		1.75	56.5		98.2	53.1
Significance								
Irrigation		ns		P<0.01	ns		P<0.001	ns
N		ns		ns	ns		ns	ns

P values indicate the significance level. ns: non-significant.

Juice Analysis 2001

Soluble Solids and Yeast Available Nitrogen

Treatments Irrig	Nitrogen	Brix (%)	Yeast available N (mg/L)
No	0	20.3	180.9
	Foliar N	20.0	→ 277.1
	Soil N	20.2	168.9
Yes	0	22.8	→ 244.7
	Foliar N	22.1	→ 329.2
	Soil N	22.7	244.8
Significance			
Irrigation		P<0.0001	P<0.001
N		ns	P<0.001

P values indicate the significance level. ns: non-significant.

Riesling Irrigation and N trial 2001

4. Yield and Quality in 2002. In 2002, we saw similar trends, but more exaggerated than in 2001. Irrigation increased brix by 3 degrees, and berry size by 0.3 g (30%). Cluster number in both plots was similar. Irrigated vines had larger berries with higher sugar content. However, a side effect (below) was that the irrigated fruit had higher levels of fruit rots than unirrigated fruit. We think this may be related to the sunburning we saw in Riesling vineyards in September 2002.

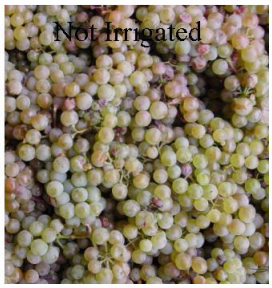
Yield Components at Harvest

Riesling Irrigation and N Trial 2002

Treatments Irrigation	N	Brix (%)		Yield (kg/vine)		Berry Wt (g)	Berry# (#/cluster)		Cluster Wt (g)	Cluster # (#/vine)
No	0	18.9		5.04		1.31	58.1		76.3	65.9
	Foliar N	18.5	**18.5**	5.42	**1.3**	1.36	56.5	**76**	77.0	70.1
	Soil N	18.4		5.78		1.33	56.5		74.9	76.5
Yes	0	21.7		5.57		1.82	42.8		77.9	72.1
	Foliar N	21.2	**21.5**	5.91	**1.7**	1.74	43.2	**76**	75.4	78.6
	Soil N	21.6		5.13		1.70	43.7		73.3	70.1
Significance (P)										
Irrigation		0.0001		ns		0.0001	0.0001		ns	ns
N		ns		ns		ns	ns		ns	ns

P VALUES INDICATE THE SIGNIFICANCE LEVEL. NS: NON-SIGNIFICANT.

Fruit Quality - 2002



5. Pruning Weights after 2002. Irrigated vines had twice the grown pruning weight at the end of 2002 as the unirrigated vines. Again, this was a consequence of the irrigated vines' ability to keep on photosynthesizing during the dry weather, when other vines shut down.

Pruning Weights 2002-2003

Treatments Irrigation	N	Pruning Wt (lb)
No	0	0.87
	Foliar N	1.17
	Soil N	1.10
Yes	0	1.89
	Foliar N	1.80
	Soil N	1.76
Significance (P)		
Irrigation		<0.001
N		ns

6. Yield and Quality in 2003. All plots had adequate soil moisture in 2003. Therefore any effects on yield were the result of carryover effects from the 2002 drought. Brix levels were higher in the 'unirrigated' blocks, but this was because they were carrying much less crop. Berry weight was also similar. However, yields in the 'unirrigated' blocks averaged 12 lb/vine in comparison with the 23 lb per vine in the 'irrigated' plots. Clusters were the same size in both

blocks, so the difference in yield was because of the different number of clusters – again the 'unirrigated' vines had about half the number of clusters as the irrigated vines.

Yield 2003

Table 3. Effects of irrigation and nitrogen applications on Riesling yield and Brix (2003)

Treatments Irrigation	N	Brix (%)		Yield (lb/vine)		Berry Wt (g)		Berry# (#/cluster)	Cluster Wt (g)		Cluster # (#/vine)
No	0	18.5		10.8		1.86		67.4	125.7		38.0
	Foliar N	18.3	**18.5**	14.4	**12.5**	1.87	**1.9**	68.9	128.6	**43.7**	50.0
	Soil N	19.0		12.5		2.04		63.4	129.1		43.2
Yes	0	17.4		26.1		1.92		66.4	127.4		92.4
	Foliar N	17.6	**17.5**	21.8	**23.3**	1.95	**1.9**	61.2	118.9	**84.7**	82.8
	Soil N	17.4		21.9		1.90		64.7	123.0		79.7
Significance (P)											
Irrigation		0.010		0.0001		ns		ns	ns		0.0001
N		ns		ns		ns		ns	ns		ns

Summary. During two drought years, water stress sharply reduced photosynthesis during July and August, and into September in 2002. Vines without irrigation had smaller berries with lower sugar content than irrigated vines in those years. Following a 7 week period of reduced photosynthesis in 2002, irrigation doubled the pruning weights as compared with unirrigated vines. This resulted in a large carryover effect in 2003. In an environment in which there was adequate water supply for all vines, the 'unirrigated' vines had half as many grape clusters, and produced half as many pounds per vine.

The difference in this case was at least 2 tons per acre for 2003, for a 'loss' of about $2800 in gross income per acre (at $1400/ton for Riesling). Add to that the cost in quality from having less ripe grapes during the two drought years, and the overall economic effect of not irrigating during a severe drought adds up to several thousand dollars. If you have a site with shallow, droughty soils of limited water holding capacity, losses of this magnitude would be more than enough to pay for installing an irrigation system in one year.

Acknowledgements:

Funding for this research was provided by New York Wine & Grape Foundation and USDA Viticulture Consortium. We thank Tom & Libby Prejean and Jim Zimar for their collaboration and cooperation on this project.

Measuring Vine Water Status at two Finger Lakes Vineyards

Tim Martinson, Justine Vanden Heuvel, Ming-Ye Chou, Raquel Kallas and Alan Lakso

While signs of mild to moderate water stress are visible in most Finger Lakes vineyards, growers generally don't have the means to measure it. Justine Vanden Heuvel's students, however have been measuring water status of vines in research plots in a couple of vineyards in the Finger Lakes, where Justine and her students are studying the effect of under-the-trellis cover crops on vine growth, water status, and yield/quality.

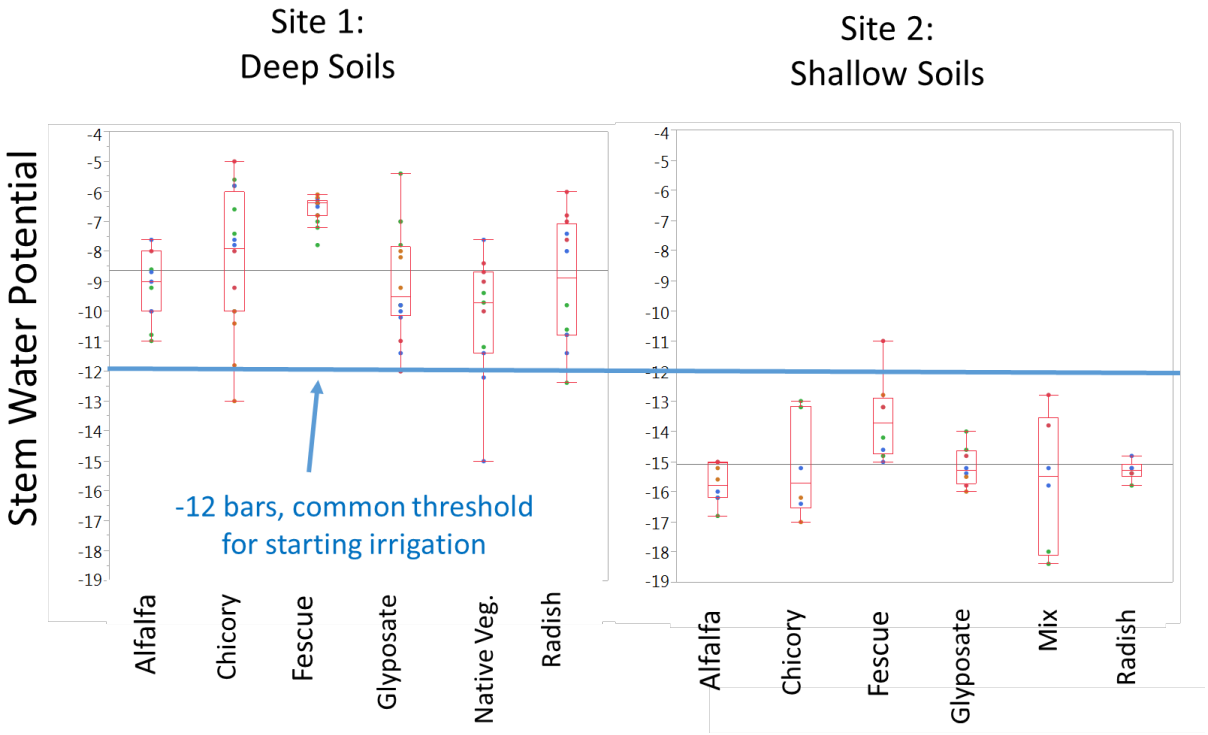
Stem water potential is a measure of how much pressure is required to push water out of a leaf. As the soil dries and water in the xylem (water conducting vessels) is under more tension, it takes more pressure to force water out of an excised leaf – like sucking a thick milkshake out of a straw instead of water. It's measured with a device called a pressure bomb (see The Pressure Chamber (the Bomb) for an explanation).

Stem water potential becomes more negative the more water-stressed the vines are. As a general rule of thumb, at higher than -10 bars, vines suffer little water stress. At -16 bars or lower, vines are suffering severe water stress (Keller 2010, Chapter 7.2), Growers practicing regulated deficit irrigation in California will start their first irrigation when SWP reaches about -12 bars (see Prichard 2015 for a discussion of regulated deficit irrigation in California).

Stem water potential (SWP) was measured at two sites last week under different cover crop treatments. Site 1 has deep, gravelly loam soils (Howard) with high water holding capacity. Site 2 has shallower soils (Lordstown) with low water holding capacity. Note that the average SWP at site 1 across the floor treatments was around -9 bars, while the average SWP at Site 2 was around -15 bars. While there were some apparent differences due to the cover crop treatment, the ranges overlapped and differences were modest compared to the 'site effect'.

Soil water holding capacity and drought stress: These figures illustrate the huge differences in drought stress that vines are experiencing depending on the water holding capacity of different soils, which varies with soil texture and soil depth. Silty-loams hold about 3 in of water per foot of soil; Loamy sands about 1.2 inches/foot. At this time of the year, it's estimated that mature vines use somewhere around ¾ to 1 acre-inch of water per week. The Howard soils at Site 1 range from 3-6 ft deep, while the soils at Site 2 are estimated to be 2-3 ft deep and very gravelly. Thus, the Riesling vines at Site 1 are experiencing only mild water stress, while the Noiret vines at Site 2 are experiencing moderate to severe water stress. At both sites, the Fescue treatment seems to have resulted in less water stress than the other treatments, but the soil characteristics played the dominant role in the vines' water status at these sites this year.

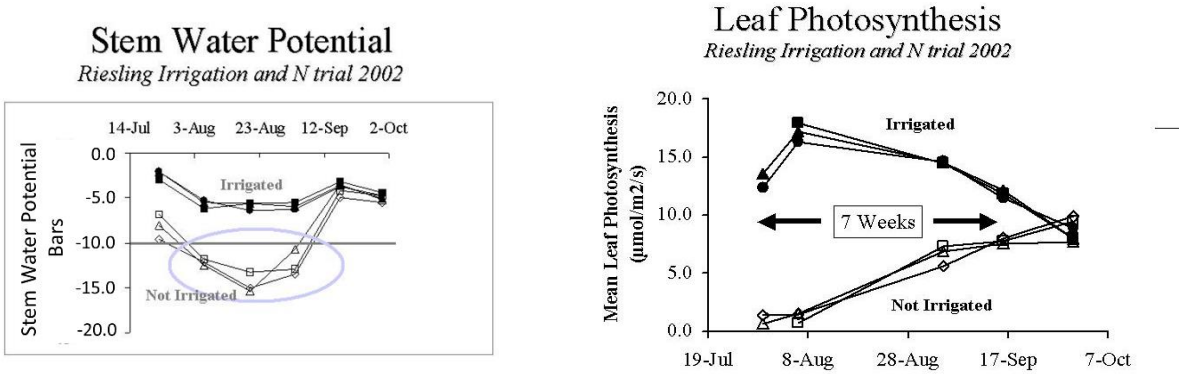
Figure 1. Stem water potential measured August 4 and 5 at two sites in the Finger Lakes with different under-the row cover crops.



Note: These are 'box plots' that show the range of individual readings. The boxes encompass the middle 50% of the values, and the 'tails' represent 100% of the range.

2001-2003 Irrigation Study. In 2001-2003, we did a study with irrigated and non-irrigated Riesling at a vineyard block adjacent to 'Site 2'. 2002 was a drought year, and Alan Lakso measured stem water potential and photosynthesis from late July through early October. Note (Figure 2, left) that the SWP hovered around -5 to -8 bars in the irrigate plots, but reached -12 to -15 bars in the unirrigated plots. Mid-day photosynthesis (Figure 2, right) was also low in the non-irrigated plots, and never reached the same levels as the irrigated plots until the final sample in late September. At harvest, the unirrigated vines averaged about 18 °brix soluble solids - 4°brix lower than the 22 °brix in the irrigated vines at harvest.

Figure 2: Stem water potential and mid-day photosynthesis at a Riesling vineyard adjacent to 'Site 2' in 2002.



Bottom line: Stem water readings a Site 2 on August 4 mirror the measurements from our 2002 study on August 20th in 2001. If the drought continues, we could see similar impacts – reduced carbon assimilation and photosynthesis, and delayed soluble solids accumulation. In contrast, Site 1 is suffering only modest water stress, and should see little effect if rainfall returns and soil moisture is replenished.

References:

Pritchard, T. 2015. Winegrape Irrigation Scheduling Using Deficit Irrigation Techniques. http://ucanr.edu/sites/ce_san_joaquin/files/35706.pdf

Keller, M. 2010. The Science of Grapevines. Chapter 7.2

IPM

Tim Weigle, NYSIPM, Cornell University, LERGP Team Leader

Location, Location, Location.

The Degree Day Phenology model on NEWA shows that the management strategies needed at this time for grape berry moth in the Lake Erie Region can vary widely due to vineyard location and timing of wild grape bloom used by the model. The table shows results for the GBM model found on NEWA for August 10 and is followed by the Pest Status, and Pest Management messages that accompany the model results for the various degree days. As you can see, stations across the grape belt are reporting anywhere from the need for scouting to determine the need for an insecticide for the 3rd generation of GBM all the way to it is too late to spray for the 3rd generation as the larvae are all now safely inside the berries.

As always, check the NEWA website often and use the date of wild grape bloom that you recorded for your location. This will provide you with the most accurate information to assist with your management decisions.

NEWA Location	Wild grape bloom date*	DD Total on August 10
Versailles	May 30	1666
Dunkirk Airport	June 3	1620
Sheridan	May 31	1734
Silver Creek	June 3	1629
Portland Escarp.	May 31	1721
Portland	June 1	1688
Ripley	May 31	1739
North East Escarp	June 2	**1565**
Harborcreek	May 31	1726
North East Lab	June 2	1708
Erie Airport	May 30	1852
Ransomville	June 1	1748
Somerset	June 3	1644
North Appleton	June 10	1454
* Estimated date provided by NEWA website		

Below 1620 DD

Pest Status – Second generation larvae are protected within berries and completing their development.

Pest Management – The most effective time for treatment of second generation grape berry moth is over. Prepare to scout all vineyard blocks for grape berry moth damage when DD accumulation reaches 1470-1620 DD. During scouting, determine if the number of damaged clusters from previous generation exceeds the treatment threshold of 15%. If above threshold, control measures should be applied starting at 1620 DD.

At 1620 DD

Pest Status – Females are active and egg-laying is at its peak.

Pest Management – Control measures should be timed to coincide with 1620 DD in high risk vineyards. For materials that must be ingested, e.g. Intrepid (PA only), Altacor, it is important to get insecticides on as close to 1620 DD as possible.

1640 – 1699 DD

Pest Status – Egg-laying continues

Pest Management – For materials that are contact insecticides, e.g. pyrethroids and carbamates, apply between 1621-1710 DD in vineyards where scouting found more than 15% damaged clusters. Low risk vineyards rarely require this treatment.

1700 DD and later

Pest Status – Third generation larvae are protected within berries and completing their development.

Pest Management – The most effective time for treatment of second generation grape berry moth is over. With the exception of extremely warm years, egg-laying is reduced and most pupae enter diapause (overwintering stage) after 1700 DD.

Spider mites and dry and hot weather
Greg Loeb, Cornell Entomology
August 9, 2016

August is often the time we see the emergence of spider mite problems in vineyards and this summer it is particularly important to scout for them because we often see more mite problems under dry conditions. There are several contributing factors but temperatures are usually above average when its dry and these higher temperatures lead to more rapid mite development and more generations and potentially higher populations. Also, beneficial mites often are not able to keep up with the population growth of spider mites with hot temperatures. Perhaps an even more important factor is that with drought conditions the vines will shut their stomates during part of the day to help conserve water and this has the result of increasing leaf temperatures due to lack of transpiration and evaporative cooling. Also, the vine stops adding new leaves earlier in the season in drought conditions and this has the effect of concentrating mites on less leaf material.

There are good reasons to scout your vineyard for spider mites and/or spider mite damage. I reviewed mites in my spring update, but briefly, there are two species of spider mites that attack grapes in the Eastern US, two-spotted spider mite (TSSM) and European red mite (ERM), but ERM typically is the more common. It is important to know the difference between the two species since some miticides are more effective against one than the other. As the name indicates, ERM is reddish in color and lays red eggs. Adult female TSSM tend to have large black spots on the top of the abdomen but this is a pretty variable. TSSM eggs are clear to opaque. TSSM tends to stay on the bottom side of leaves and produces obvious webbing while ERM can be found on either side of the leaf and does not produce much webbing. Both species have the capacity to go through a number of generations during the season. Because of their small size, it is often difficult to know if you have mites. Foliar symptoms (bronzing of leaves) are one clue, although if you have wide spread, obvious symptoms then economic damage may already be occurring. The working threshold for spider mites (TSSM and ERM combined) in our area is 7 to 10 mites per leaf, although this will vary depending on health of the vineyard, crop load, value of the grape, etc. The impact of mite feeding on grapes includes reduced photosynthesis, delayed accumulation of sugars thereby delaying harvest date, and the potential of reduced yield the following season. I suggest sampling at least 50 mid-shoot leaves from both the edge and the interior (25 leaves each) of a vineyard block, examining both sides of the leaf. A hand

Adult European red mite on bottom side of grape leaf

Two spotted spider mite adult. Photo: Jack Clark, UC Davis

lens will be necessary to see the mites for most people. Even with a hand lens, it is challenging to count the mites. Thus, we recommend estimating the proportion of leaves infested with one or more mites and use something like 50% infested as a treatment threshold. A leaf is considered infested if it has one or more spider mites. Remember to keep rough track of which species is most common.

There are several chemical options available for mite control in New York and Pennsylvania: Vendex [fenbutatin-oxide], Agri-Mek and several generics [abamectin], Nexter [pyridaben] (not on Long Island), Acramite [bifenazate], JMS Stylet Oil [aliphatic petroleum distillate], Zeal Miticide1 [etoxazole], Onager or Savey [hexythiazox], Danitol [fenpropathrin], Portal [fenproximate] and the newly labeled miticide called Nealta [cyflumetofen]. Read labels carefully. JMS Stylet Oil is not compatible with a number of other products including Captan, Vendex, and sulfur. Also, although Stylet Oil can help with mite problems, it is not likely to provide complete control in problem vineyards. Nexter is very effective against ERM but higher rates should be used for TSSM. Agri-Mek currently has TSSM on the label but not ERM, although in apples both species are on the label. Acramite includes both TSSM and ERM, although it calls for higher rates for ERM. The new label for Zeal miticide 1 includes both ERM and TSSM in NY whereas the old label only had TSSM. You need a 2(ee) recommendation, which is readily available, for use against ERM with older material. Since Zeal miticide 1 affects eggs and immatures, it is advised to apply before populations reach damaging levels to give the material time to work. Similar advice can be applied to Onager, Savey and Portal. Danitol and Brigade (two-spotted only) are broad-spectrum insecticides that also have fairly good miticidal activity. Pyrethroids are hard on beneficial mites, however.

Spider mites are often thought of as a secondary pest. In other words, something must happen in the vineyard that disrupts their natural control by predators, particularly predatory mites, before their populations can increase to damaging levels. Since Danitol and Brigade have miticidal activity they would not be expected to flare spider mites in the short term. However, in the past, spider mites have been quick to develop resistance to frequent use of pyrethoids. This may or may not happen but it is worth keeping in mind. One of the first things to watch out for is initial good suppression of mites followed by a resurgence indicating the spider mites recovered more quickly than the predatory mites. The other miticides (Vendex, Onager, Savey, Zeal, Acramite, Nealta, and Nexter) are generally pretty easy on natural enemies, although at high rates Nexter can negatively affect predatory mites. Overall, paying attention to conserving predatory mites can pay economic dividends since miticides are quite expensive.

In summary, given how dry things are its worth getting out in the vineyard and scouting for mites and mite damage. While you are out there, also scout for grape berry moth and leafhoppers. As of today (August 9, 2016) we are at about 1600 DD using the grape berry moth phenology model (in Geneva, NY) at the NEWA web site (http://newa.cornell.edu/), so its about the right timing for the third flight of grape berry moth. As we get closer to harvest, you also will want to be cognizant of multicolored Asian beetle in clusters and Drosophila fruit flies (see my spring review for more information). If you have questions, send me an email (gme1@cornell.edu) or give me a call (315-787-2345).

In the Vineyards, PA

Andy Muza, County Extension Educator, Penn State, LERGP

Andy is on vacation this week.

North East, PA Update

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

Weather: The latest storm system dumped several inches of much needed rainfall in Erie this morning, and was a lifesaver in parts of North East PA as well. NEWA recorded 1.79" for the North East Escarpment, and at least 1.33" (maybe more?) at Harborcreek. At my house in Lawrence Park, my rain gauge captured nearly 3". At our North East site by the lake, we recorded about 0.8"; not too shabby, but we could have used more. Unfortunately, rainfall amounts quickly diminished after that and most sites in the New York grape belt received quite a bit less as the system moved eastward. This was the first rainfall we recorded in August. There is more rain in the forecast over the next several days, let's hope it materializes. Growing degree day accumulations since April 1 are at 1766 and above average temperatures will persist for the next several days.

As for diseases, the need to keep leaves clean of powdery mildew and fully functional for as long as possible is dependent on crop load and variety: heavier crops will require more functional leaf area to ripen and of course this is more critical for Concord that will need to reach higher sugars than Niagara. Hopefully, adequate rainfall that occurred in some areas, may alleviate stressed canopies as we are seeing symptoms of drought related nutrient deficiency.

For wine grape growers of bunch rot susceptible varieties, a spray at veraison to control Botrytis is recommended, especially if the weather turns wet. Good fruit set in many vineyards of these rot susceptible varieties has resulted in excessively compact clusters (Pinot Gris, Vignoles) some of which are already showing damage from berries being pushed off their stems. In some cases, whole branches of the cluster are ripped off, or cluster rachises split up the middle, as berries have no room to expand in these tight clusters. Berry damage during ripening opens the way for Botrytis and sour rot development that is difficult at best to try and spray your way out of.

The IPM Climate & Weather Conference – August 15, 2016 at Albany CCE, Voorheesville, NY

Climate, Weather, Data: Protecting Our Crops and Landscapes will be held August 15, 2016 at the Albany County Cornell Cooperative Extension Office, 24 Martin Rd., Voorheesville, NY 12186. Because space is limited, pre-register on the Registration page. **Pre-registration closes on August 10**. The Climate, Weather, Data portal has maps, an agenda and registration details. If you have questions, call Amanda Grace at arw245@cornell.edu or 315-787-2208. The program will run from 9:00-4:15 and costs $45 – which includes lunch, breaks and materials. **Yes, get DEC credits, too!**

With all the talk about climate change you might be wondering how it will affect food production, pests, and even landscapes—and what you can do about it. This is definitely a year when weather changes have affected our crops – from the Valentine's Day massacre winter freeze to plant life gasping for water. Come and learn how gathering information on weather and climate can help growers, gardeners and landscapers plan for changes. Find details on The Climate and Weather Conference webpage.

We are honored that Richard Ball, the Commissioner of the New York State (NYS) Department of Agriculture and Markets, will kick off the conference with opening remarks. A wide variety of speakers from NYS and the Northeast will provide background information on the current state of knowledge on climate change and changes in our weather patterns, and how collecting climate and weather data can help us predict and manage pests. Open discussion sessions are included so you can ask your own questions. Join us to learn and discuss!

Agenda below or access it on the Climate and Weather Conference webpage!

Climate, Weather, Data: Protecting Our Crops and Landscapes

The 2nd Annual IPM Conference – August 15, 2016 at Albany CCE, Voorheesville NY
Organized and hosted by the New York State Integrated Pest Management Program (NYS IPM)
Supported in part with funding from Cornell Cooperative Extension.

8:30-9:00 Pick up registration materials. Sign up for DEC credits.

Welcome

9:00-9:15 Introduction - Elizabeth Lamb, Ornamentals IPM Coordinator, NYS IPM
Welcome - Richard Ball, NYS Commissioner of Agriculture

Collecting weather data and predicting pests

9:20-9:40 *The New York State Mesonet* - Jerry Brotzge, Program Manager, NYS Mesonet

9:45-10:05 *The Suffolk County Network & how we use it* - Becky Wiseman and Laurie McBride, Agricultural Stewardship Program, Suffolk County Cornell Cooperative Extension

10:05-10:15 Break

10:15-10:35 *Exploiting the vagaries of weather with open access tools on the Network for Environment and Weather Apps (NEWA)* - Julie Carroll, Leader NEWA, NYS IPM

10:40-11:00 *Weather forecasting and modeling for diversified vegetable growers* - Katie Campbell-Nelson, Vegetable Extension Educator, UMass Extension

11:05-11:25 *Ag-Radar: A low cost system to integrate weather into farm management decisions* - Glen Koehler, Associate Scientist IPM, UMaine Cooperative Extension

11:30-12:00 ***Discussion, with the speaker panel***

12:00-12:45 *Lunch*

Climate change and its impact on pests

12:45-1:05 *Climate Change: Challenges and opportunities for all of us* - Mike Hoffmann, Executive Director, Cornell Institute for Climate Change and Agriculture (CICCA)

1:10-1:30 *Climate change and pests: A Northeastern IPM Center Signature Program* - Steve Young, Director, Northeastern IPM Center

1:35-1:55 *USDA Northeast Climate Hub* - David Hollinger, Director, USDA Northeast Regional Climate Hub

1:55-2:05 *Break*

2:05-2:25 *Cornell's Climate Smart Farming Program: Training, decision tools and extension support for farmers* - Allison Chatrchyan, Director, CICCA

2:30-2:50 *Arthropod-borne diseases and climate in New York* - Bryon Backenson, NYS Dept of Health, Bureau of Communicable Disease Control

2:55-3:15 *Cornell Plantations' Climate Change Garden* - Elizabeth Lamb

3:20-3:50 ***Discussion, with the speaker panel***

3:55-4:15 Evaluation and wrap up - Elizabeth Lamb

4:15 Adjourn. Safe travels!

Climate, Weather, Data:
Protecting Our Crops and Landscapes

Save the Date!

When: August 15, 2016, 9:00 – 4:15
Where: Cornell Cooperative Extension Albany County, Voorheesville, NY

With all the talk about climate change you might be wondering how it will affect food production, pests, and even landscapes - and what you can do about it. The Second Annual NYS Integrated Pest Management conference can help!

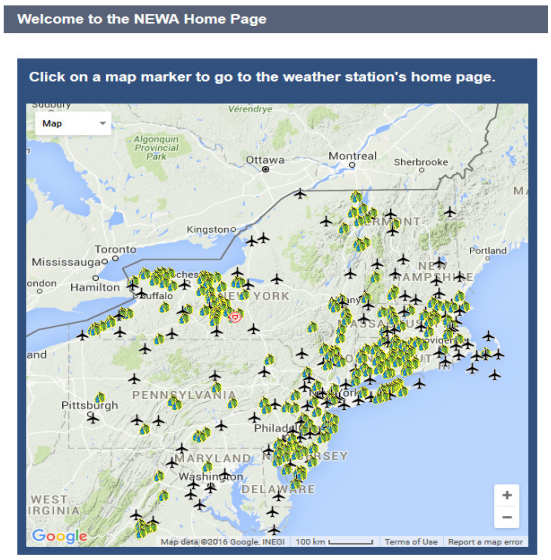
A wide variety of speakers from NYS and the Northeast will provide information on the current state of knowledge on climate change, changes in our weather patterns, and how collecting climate and weather data can help us predict and manage pests. Join us to learn and discuss!

$45 includes materials, lunch, and breaks.

The draft agenda, registration information, and map can be found at:
tinyurl.com/hq8tbm2

If you have questions, please contact Amanda Grace at arw245@cornell.edu or 315-787-2208.

New York State Integrated Pest Management Program



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2016 eNEWA Grape Project Subscription Sign-Up

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Dunkirk	**Finger Lakes Region**	**Lodi (Shalestone)**
Erie	**Aurora**	**Lodi (Standing Stone)**
Harborcreek	**Branchport**	**Penn Yan**
North East Escarpment	**Dresden (FLGP/FLCC)**	**Romulus (B. wood Grove)**
North East Lab	**Dundee (Weimer)**	**Romulus (Thirsty Owl)**
Portland	**Fayette 3 Brothers**	**Varick (Swedish Hill)**
Portland Escarpment	**Geneva**	**Watkins Glen**
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Jared Mosier
Phone: (301) 512-3977
jsmosier1@gmail.com

7653 Dutton Rd.
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LERGP Website Links of Interest:

Check out our new Facebook page!!

Cornell Lake Erie Research & Extension Laboratory Facebook page
https://www.facebook.com/Cornell-Lake-Erie-Research-and-Extension-Laboratory-678754995584587/?fref=ts

Table for: Insecticides for use in NY and PA:
http://lergp.cce.cornell.edu/submission.php?id=69&crumb=ipm|ipm

Crop Estimation and Thinning Table:
http://nygpadmin.cce.cornell.edu/pdf/submission/pdf65_pdf.pdf

Appellation Cornell Newsletter Index:
http://grapesandwine.cals.cornell.edu/cals/grapesandwine/appellation-cc

Veraison to Harvest newsletters:
http://grapesandwine.cals.cornell.edu/cals/grapesandwine/veraison-to-harvest/index.cfm

Go to http://lergp.cce.cornell.edu/ for a detailed calendar of events, registration, membership, and to view past and current Crop Updates and Newsletters.

Lake Erie Regional Grape Program Team Members:
Andy Muza, (ajm4@psu.edu)Extension Educator, Erie County, PA Extension, 814.825.0900
Tim Weigle,(thw4@cornell.edu) Grape IPM Extension Associate, NYSIPM, 716.792.2800 ext. 203
Kevin Martin, (kmm52@psu.edu) Business Management Educator, 716. 792.2800 ext. 205
Luke Haggerty, (llh85@cornell.edu) Grape Cultural Practices, 716.792.2800 ext. 204

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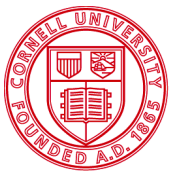

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