Lake Erie Regional Grape Program

Vineyard Notes-February 2018

The Lake Erie Regional Grape Program

PENNSTATE

Cornell University
Cooperative Extension

Building Strong and Vibrant New York Communities

2018 LERGP Winter Grape Grower Conference

Wednesday, March 14, 2018
SUNY Fredonia Williams Center

Come enjoy a full day of programming, morning refreshments and a catered lunch, all for only $50.00

Come spend the day with fellow growers, members of the LERGP Program and other speakers learning about new mechanized vineyard management, crop load estimation, WPS Regulations, vine nutrition, and IPM, to name a few subjects.

Call Katie at 716-792-2800 ext 201 with Questions.
You can register on-line at the LERGP Web-site

https://lergp.cce.cornell.edu/event.php?id=335

2018 Lake Erie Regional Grape Program Growers' Conference Agenda

7:00 AM Registration and Tradeshow open

7:50 AM Welcome

8:00 - 9:00 AM Ensuring Crop Load Balance
Terry Bates, LERGP, Cornell University

9:00 – 9:30 AM Climate Influences on Concord Grape Phenology, Berry Weight and Berry Composition
Golnaz Badr, LERGP, Cornell University

9:30 – 10:00 AM Change Your Name, Make More Money.
Kevin Martin, LERGP, Penn State University

10:00 – 10:30 AM Break

10:30 – 11:00 AM Update on Changes in the Worker Protection Standard Regulations
Michael Nierenberg, NYS Department of Environmental Conservation

11:00 – 11:30 AM Technology Adoption and Outreach – The Efficient Vineyard Project
Tim Weigle, NYS IPM Program/LERGP, Cornell University

11:30 – Noon Why Were My Leaves Black?
Andy Muza, LERGP, Penn State University

Noon- 1:30 PM Lunch and Visit Tradeshow

Breakout sessions held from 1:30 – 2:30 PM and 2:45 to 3:45 PM

Breakout Session 1 Integrated Pest Management

1:30 – 2:00 PM 1:30 – 2:00 PM Disease Management Update
Bryan Hed, LERGP, Penn State University

2:00 – 2:30 PM Respirator Fit Training and Other Requirements of WPS for Vineyard Owners
Anna Meyerhoff, New York Center for Agricultural Medicine and Health

2:30 – 2:45 PM Break

2:45 – 3:15 PM Overview of Grape Insect Pests
Jody Timer, Penn State University

3:15 – 3:45 PM NEWA – Where We Are and Where We Are Heading
Dan Olmstead, NYS IPM Program, Cornell University

Breakout Session 2 Variable Rate Management/Efficient Vineyard

1:30 – 2:30 PM Topic and Speaker(s) to be determined

2:45 – 3:45 PM Topic and Speaker(s) to be determined

3:45 PM Adjourn

LAKE ERIE REGIONAL GRAPE PROGRAM

2018 GRAPE GROWERS' CONFERENCE REGISTRATION FORM

SUNY Fredonia Williams Center

Wednesday, March 14, 2018

Deadline for registration is Friday, March 2, 2018.

Name (1st attendee) _____ **$**_____

Farm Name _____

Address, City, State, Zip Code _____

_____

Phone_____ **E-mail**_____

Are you enrolled in Lake Erie Regional Grape Program (LERGP)? **Yes**_____**No**_____

REGISTRATION FEES	
LERGP Member 1st attendee	$ 50.00
Additional attendee on same farm	$ 40.00
Non- member	$100.00

Additional Attendees:

	$
	$
	$
	$
	$

*Please add a **$25.00 late fee** for each reservation made after March 2, 2018

TOTAL $_____

Please make check payable to **LERGP (Lake Erie Regional Grape Program)** and mail to: (*US funds only*)

Kate Robinson
LERGP
6592 W Main Rd
Portland NY 14769

Name _____NY DEC/PA PDA NUMBER_____

Name _____ NY DEC/PA PDA NUMBER_____

Name _____ NY DEC/PA PDA NUMBER_____

Date Ck. Rec'd	**Amount**

Call Kate at 716-792-2800 ext 201 with any questions.

Business Management

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

Crafting A Buy Sell Agreement

A buy sell agreement is part of a succession plan. These agreements may involve two or more current owners. They may also include a party that will have a future interest or an increasing ownership interest as time goes on. Such an agreement is necessary to reduce the uncertainties that arise when building a business with more than one owner. The financial, mental or physical capabilities of any business partner may evolve over the course of the business. Unanticipated events may be brought on by outside individuals that develop an interest in the assets of one business partner. Suffice to say even with a high degree of trust, even with familial partner, a buy sell agreement is highly recommended to increase the sustainability of the business.

These agreements may serve to limit the transfer of ownership. Ever see someone help their child purchase a car, only to see them sell it and pocket the cash? Limiting the transfer of ownership prevents this. To begin with, a sale or transfer of interest must require notice. While unusual with many businesses, in agriculture 120 days of notice is recommended.

The agreement might also require owners are offered a right of first refusal. Finally, the agreement can set the terms of the sale. One way to further restrict business transfers is to set the price and value of the business at the onset of agreement. It can also be set by formula. Without a set price or formula to determine price disputes about the quality of business valuations.

A buy sell agreement can also force a buyout. If partners are interested, retirement, disability, and death are all events that can trigger a forced buyout. In the event of a forced buyout, the remaining owners are required to purchase the business. These forced buyouts do create some risk that partners will become overleveraged by purchasing the business unexpectedly.

It is normal to decrease that risk by creating favorable terms for the buyer. These favorable terms would include payments rather than a lump sum transaction. If tax policy requires interest be charged, it would typically be the minimum allowable rate. If business partners are young, life and disability insurance can assist with the transaction.

One note of caution, the risk of disability, retirement and death are quite high as an individual approaches 65 years old. There should be a realistic plan in place that allows the junior generation to make minimum payments without undermining the integrity of business operations.

On the other hand, a buy sell agreement may also allow partners to force another partner into a sale. This may sound unfair, but under limited circumstances it may be in the interests of the business to agree to these restrictions. Assets are often transferred to a spouse after death or divorce. In those circumstances the spouse may be forced to sell.

Sales may also be forced for more serious reasons. Business partners may declare personal bankruptcy, commit a felony, or commit a crime against the business. A crime against the business or civil action involving gross negligence may also impact the formula for the valuation of the buyout. Disputes between owners can and often do come up, such disputes should not impact valuation. More serious disputes that involve crimes, malfeasance or gross negligence may be considered by owners to be egregious enough to impact the valuation of the company in a sale. An act of gross negligence, for instance, is conscious and voluntary.

In addition to when a sale takes place, the agreement also provides one or more methods of calculating value of the sale. The most common method is to hire an independent appraiser. If the appraisal results in a disagreement, more appraisers are hired to solve the dispute. Often, the valuation becomes a vote by multiple appraisers. Allowing this method in smaller businesses is a mistake. The costs of 3-5 appraisals outweigh the benefit. This is not all that different than the method a court would order to resolve a dispute. The goal of these agreements is to resolve fights before they start, not allow or encourage expensive disputes.

One alternative might be a single binding appraisal followed by arbitration. For a vineyard operation it might be 4x gross earnings. For most businesses a formula that is linked to earnings makes the most sense. For vineyards, an average taken across multiple years would be required to make this type of formula equitable. If the vineyard operation is a result of a new purchase it might be the initial purchase price times an inflation factor. This would work if the primary assets of the company were land.

Once the business has a value the agreement defines how selling owners, their heirs or creditors are paid. When owners force another owner to sell, the terms of payments are typically monthly with minimal interest. If the sale is optional or a result of death¸ payment terms are variable. They depend on the resources of owners and the circumstances of the surviving spouse. When a lump sum cash payment is possible, perhaps through a life insurance policy, the agreement generally elects for such a method.

A buy sell agreement might be part of a larger management or partnership agreement. It may also just be referenced by such an operating agreement. While many farms and vineyards operate as sole proprietorships an operation that is a joint ownership is much more likely to survive multiple generations and remain sustainable through the succession process. Traditionally farms were passed from father to son. Operating agreements and buy sell agreements are some of the tools that may allow owners to feel comfortable and secure working in tandem with non-family partners. For more information, contact the author or check out our video blogs at lergp.com

Viticulture

Jacqueline Dresser, Viticulture Extension Support Specialist, LERGP

Cycles of Grapevine Winter Dormancy and Cold Hardiness

Jacqueline Dresser, Viticulture Extension Support Specialist

Weather events are not just news for the weather channel anymore; 2017 news cycles were riddled with headlines about droughts, earthquakes, wildfires, mudslides, hurricanes, tornados, floods, heat waves and cold snaps. As winter temperatures fluctuate drastically in the Lake Erie region, grape growers may be wondering how temperature impacts dormancy of grapevines and cold hardiness.

Figure 1 Taken From: Discover France Magazine

Research at Cornell and elsewhere has built on foundational knowledge of the physiological and environmental forces that influence cold acclimation and grapevine dormancy. If you suspect that buds or other vine tissues have been injured this winter, there are methods of scouting for winter injury in the vineyard and ways to adapt pruning strategies to minimize the effect on this season's crop.

Preparing for dormancy

When the heavy load of grapes is taken from the shoulders of grapevines, they begin their preparation for a hibernation of sorts, to protect themselves from the ruthless chill of winter. The once vibrant leaves senesce and fall to the vineyard floor, pliable green shoots become rigid and woody, the flow of fluids through vascular tissues ceases and sensitive areas are either dehydrated or filled with the vine's version of anti-freeze. Two phenomena are experienced from the cellular to the whole plant level, cold acclimation and dormancy. These terms are often used nebulously in the literature but do have distinct definitions.

Dormancy is achieved when meristematic cell division pauses and metabolism and respiration slow[8]. As with any process in biological systems, the transitions into and out of dormancy are multifaceted and dependent on genetic, environmental and management factors. Cold acclimation is a dynamic process triggered by changes in temperature leading to the development and loss of cold hardiness (Figure 2)[2].

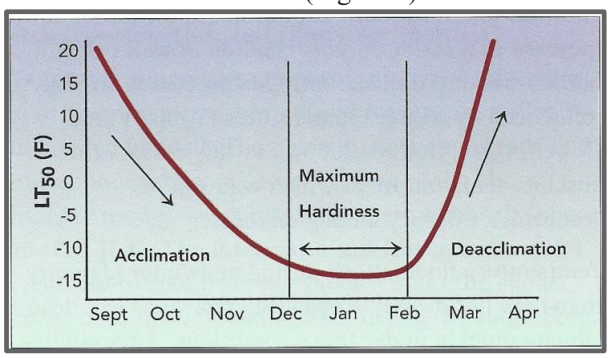

Figure 2 Cold acclimation of grapevine buds. From Zabadal et al. 2007.

Anatomy of dormancy and cold acclimation

Cells are differentiated within grapevines according to their location and function and behave differently in their acclimation to cold. In vascular tissues of grapevines, xylem cells are responsible for moving water, containing dissolved minerals and nutrients, to the meristematic cells in the vine, from root tips to leaf tips, that are dividing and expanding throughout the season. The function of cells in phloem tissues is to move organic materials formed during photosynthesis from the leaves and into tissues in the rest of the plant[9]. Cells in both the xylem and phloem tissues are susceptible to damage from intracellular freezing, when water inside the cells expands and ruptures their cell walls.

As vine tissues are acclimating to cold, the inter-cellular channels that carry materials through the phloem tissue are gradually plugged with callus and the cells that make up the xylem channels are dehydrated. These defense mechanisms halt the transportation of sugars, carbohydrates, proteins and other materials in the vine[3]. So, before the acclimation process begins, it is crucial that enough reserves of energy are being stored in the appropriate tissues so they are there to fuel spring growth until the photosynthetic engine in the leaves takes over. Crop load, nutrition, disease or pest damage, water status or state of dormancy may all affect the amount of carbohydrates available for storage and the level of cold hardiness that can be achieved[11].

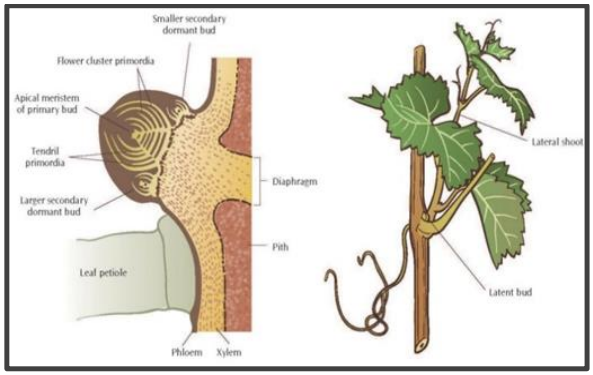

Figure 3 Latent bud. Taken from Lodi Growers

Cold hardiness is especially important in latent buds (Figure 3), who protect themselves by supercooling, or releasing water from the intracellular space into the cell wall, where it can freeze safely away from essential organelles[1]. The level of cold hardiness in buds can be measured by differential thermal analysis (DTA) which logs spikes in thermal energy released when tissues freeze. The high-temperature exotherm (HTE) is observed when the water in the cell wall freezes and is not considered lethal. The low-temperature exotherm (LTE), however, signals death of the primary bud as the intracellular water freezes[6]. The LTE is indicative of the level of cold hardiness in a bud, and changes throughout the winter in response to environmental factors. Models to predict bud hardiness have been developed for some *V. vinifera* and *V. labrusca* varieties[2]. Overall, bud hardiness depends on the same factors affecting tissue, organ or whole plant hardiness[11].

Two stages of dormancy relate to the survival of winter temperatures. The first, endodormancy is initiated with the shortening of the photoperiod to 4 consecutive weeks below 8h in late summer[10]. This physiological state is especially important in buds, who otherwise might be fooled into early bud-break by warm spells in the winter[8]. Only when sufficient chilling hours, where temperatures are between 32°F and 45°F, have been experienced, will ecodormancy be initiated (Table 1)[4].

A complex cascade of genetic activations and protein and hormone production regulates the metabolic processes governing the cycles of dormancy. The key players in this regulation are abscisic acid (ABA), which inhibits metabolism and growth and stimulates senescence, and gibberellin (GA), growth hormones that help in breaking dormancy and triggering the accelerated growth starting at budbreak[5]. These hormones are part of a central nervous system of sorts that allow grapevines to respond to and protect themselves from changes in their environment.

Table 1. Chilling requirements of some grape cultivars

Cultivar	Chilling requirement (32°F<h<45°F)	Min days needed for maximal budburst
Concord	1250	21
Seyval Blanc	750	21
Cabernet Franc	750	14
Cabernet Sauvignon	1250	21
Riesling	750	14

Data from Londo et al. 2014

When mother nature has a mood swing

Despite the built-in safety features a grapevine grows up with, sometimes environmental conditions fool a grapevine into coming out of dormancy early. Other times, minimum temperatures exceed a vine's cold hardiness. Then, it is up to the caretakers of

these vines to give them a check-up and do what they can to ensure their survival. The first part of a grapevine that typically suffers from cold injury are the buds, which hold the potential for the crop in the upcoming season. Buds have a compound structure, with a primary bud holding full crop potential, secondary buds typically holding about a third of that crop potential and tertiary buds with the potential to bear just a fraction of full crop but offering leaf area to sustain the life of the vine (citation - Zabatal 2007). If primary buds are inured from cold temperatures, there may still be hope for some growth after bud break. The only way to get an idea of the magnitude of suspected winter injury is to get out in the vineyard and collect some bud samples.

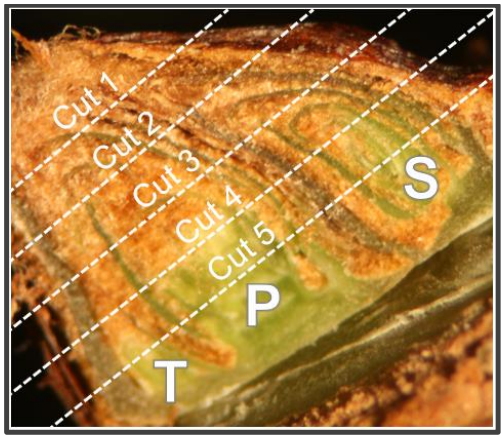

Figure 4 Bud disection. Photo taken by L. Haggerty

Taking a representative sample is vital to ensure that a clear picture of any bud damage is painted. There is a general gravitation toward sampling in the areas of the vineyard suspected to have the worst damage, which is certainly a fine place to begin to determine if there is bud damage at all. However, taking samples that cover both the geographic distribution and the vine size distribution in the vineyard is the best way to determine the scale of bud injury in the vineyard.

The minimum sample number depends on the amount of variation in the vineyard in factors influencing bud hardiness but taking 10-15 canes (about 10 buds per cane) per commercial block is a good starting point. The canes selected should be healthy canes close to the head of the vine. With a sharp razor blade, make a series of cuts at a 45° angle starting at the tip of the bud and sequentially removing layers until the primary, secondary and tertiary buds are all visible (Figure 4). Dead tissue will appear brown while living tissue will be green (Figure 5). Leaving buds at room temperature for 48 hours before inspection ensures oxidation occurs and the dead tissue will turn brown. The more time that has elapsed after a freeze event, the more obvious damage will be.

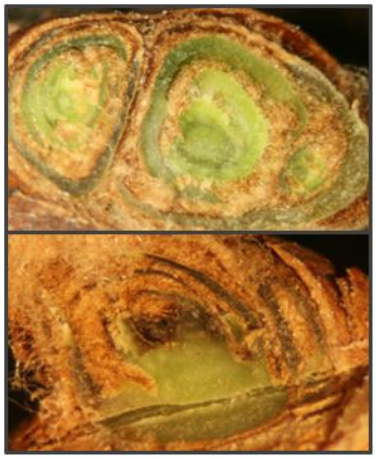

Figure 5 Top: Healthy bud. Bottom: Winter-injured bud. Photo taken by L. Haggerty

The amount of damage to primary and secondary buds, representing two thirds and one third of production potential, can be extrapolated to can be used to determine the percentage of remaining crop potential. Although, secondary buds may compensate for the loss of primary bud and increase their fruitfulness. Other factors affecting crop potential will still come into play, so it is important to appropriately manage crop load through either shoot thinning or fruit thinning to maintain vine balance.

Cane, cordon and trunk winter injury is also a threat that can be examined through sampling. Healthy vascular tissue under canes, trunks and cordons will appear green and injured tissue will appear brown. Vascular tissues that are winter injured are also prone to crown gall infections, which may become severe enough to stop the flow of water and nutrients through vascular tissues in the vine. Crown gall symptoms may not be obvious until years after infection.

Managing winter Injury

Growers in the Lake Erie region have experienced unfavorable winter temperatures enough to have adopted management practices that minimize the rebound time for re-establishing winter injured vines. Using double trunks increases the probability of survival of a winter-injured vine and keeping newer shoots emerging from the base of the vine as renewals provides added insurance. A holistic approach to management to reduce the incidence and impact of winter injury is the best way to ensure perennial vineyard health in the face of harsh winters.

Preventative management strategies start with good soil and water management and end with crop load management. Inadequate soil drainage may result in waterlogging of tissues in the grapevine, depending on precipitation, and limit cold hardiness potential. Maintaining adequate tile drainage, especially in heavier clay soils will reduce the propensity for winter injury. Conversely, water stress will also limit cold hardiness potential. Though irrigation is not common in the Lake Erie region, its benefits in vineyards planted in soils with low water holding capacity would far exceed reduction of winter injury.

Maintaining adequate soil nutrition and pH allows vines to develop strong and healthy tissues and supports metabolic functions that are crucial for cold acclimation and sustained dormancy. Crop load management that balances fruit load to vine size helps the vine build carbohydrate stores that strengthen vascular tissues and serve as a resource for early season growth. Avoiding excessive hang time allows the initiation of dormancy and the process of acclimation to begin sooner. Incidence of disease and pest damage compromise vine health and cold tolerance, so a good IPM program provides benefits, even in the dormant season. Wind machines have shown promising results in frost and winter injury protection[11].There has also been research into chemical applications that could increase hardiness, though the costs of applying these materials may be prohibitive[11]. For grafted vines, hilling up around grafting unions is often practiced, insulating them from winter injury.

Despite all efforts to manage in a way that minimizes winter injury, sometimes the power of cold temperatures is stronger than the power of good management. Pruning after winter injury is a tool that can be used to rehabilitate winter injured vines. If injury is limited to buds, sample data can be used to calculate the number of additional buds that must be left to compensate for injury and restore crop potential. A good rule of thumb is to leave double the buds as were damaged by winter injury if more than 25% damage is present. Assessment of shoot number in the spring, though emergence will likely be delayed on injured vines, will inform any shoot thinning that may be necessary to bring vines into balance. It is possible that secondary shoots may produce a larger crop than anticipated, so mid-season crop estimation and fruit thinning may also be needed.

If canes or trunks are damaged, maximizing leaf area becomes the focus for recovering the health of the vine, so minimal or no pruning may be the best practice until shoots emerge and growth can be assessed. Some trunk damage may not appear for many seasons, so making sure renewals from the base of the vine are tied and protected is important even if visible symptoms of trunk injury are not obvious. Though it may be tempting to remove some suckers, leaving all the suckers that grow will prevent over-vigorous growth (and compromised cold hardiness) of any one renewal and maximize leaf area if trunks or cordons are damaged.

As with any phenomenon in the vineyard, cold hardiness and dormancy are closely interwoven with vine nutrition, water status, incidence of insects and disease, crop load balance, cultivar and site selection which can all be manipulated through vineyard management. The interaction of genetic, management, and environmental factors influence how cycles of dormancy progress and how cold acclimation fluctuates throughout the winter.

References

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[6]Mills, L.J., Ferguson, J.C. and Keller, M., 2006. Cold-hardiness evaluation of grapevine buds and cane tissues. Am J Enol Vitic 57(2):194-200.

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[10]Wake, C.M. and Fennell, A. 2000. Morphological, physiological and dormancy responses of three Vitis genotypes to short photoperiod. Physiologia Plantarum 109(2):203-210.

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Winter Conference Previews

Here is a little taste of what you will see at this year's LERGP Winter Grape Grower Conference. I look forward to seeing everyone again this year.
-Katie

Mechanized Vineyard Management: Past, Present and Future

Jacqueline Dresser, Viticulture Extension Support Specialist, LERGP

In the millennia of viticultural history, human hands have been a fundamental tool in the cultivation of grapes from planting to harvest. Though the human mind is still the ultimate tool, mechanized technologies have emerged for nearly every vineyard practice since the development of the mechanical harvester in the 1950s. While some estates may be well suited to the traditional, hands-on, approach to the cultivation of grapes, labor shortages and economic constraints persuade others to incorporate some level of mechanization in the vineyard. As machines start to displace the human touch, how can the human mind remain an integral part of vineyard operations? How can we ensure that the efficiency associated with vineyard mechanization does not come at the expense of perennial vine health and fruit quality? With variable rate upgrades and sensors that stand in for the human eye, it has never been easier to keep your head in the vineyard mechanization game.

NYS IPM Talks for Conference-

Tim Weigle, NYSIPM, LERGP

If you have been following the work of the Lake Erie Regional Grape Program, you will not be surprised with the research and extension programming developed through the $6 million USDA/NIFA Specialty Crop Research Initiative (SCRI) project, Efficient Vineyard, headed up by our own Dr. Terry Bates. The LERGP extension team is providing leadership in the Technology Adoption and Outreach portion of the project. A presentation on the tools and techniques the team is using to ensure the research-based information developed by the Efficient Vineyard project is part of the morning general session.

The ever-popular pesticide recertification credits for both NY and PA growers have been applied for and are awaiting approval by NYS DEC and PDA. This year's talks with credits attached may look much like last year, and in a way, they are. We are repeating a number of topics in hopes that Mother Nature will smile upon us this year and allow our speakers great driving weather, as opposed to the snowstorms that kept all of our speakers bundled up in their homes for last year's conference.

The general session in the morning will have a talk on **Update on Changes in the Worker Protection Standard Regulations** – A representative of the NYS DEC Pest Management staff out of the Buffalo, NY office will provide outreach on the new Environmental Protection Agency (EPA) Worker Protection Standard (WPS), which went into effect on January 2, 2017. The new WPS provides occupational protections from pesticide exposure in agricultural settings. The WPS is aimed at reducing the risk of pesticide poisoning and injury among agricultural workers and pesticide handlers. This is your opportunity to hear from, and ask questions of, the agency that will be interpreting and enforcing these new regulations.

There will be two breakout sessions in the afternoon. One breakout session will have a pest management track with pesticide credits applied for and will include the following talks.

Respirator Fit Testing and Other Requirements of WPS for Vineyard Owners – Anna Meyerhoff, New York Center for Agricultural Medicine and Health (NYCAMH) will provide an overview of the services NYCAMH provides in the way of Respiratory Protection Services as well as a more in depth presentation on

the new respirator fit training required under the new Worker Protection Standard regulations.
Overview of Grape Insect Pests – Jody Timer, LERGP, Penn State University, will provide an overview of primary and secondary insect pests found in vineyard setting, including when to scout, what to look for, and how best to manage a pest when they are found.

NEWA – Where We Are and Where We Are Heading – Dan Olmstead, NYS IPM Program, is Coordinator of the Network for Environment and Weather Applications (NEWA) http://newa.cornell.edu which provides weather and pest model information for a number of commodities across NYS and the Northeastern United States. In this presentation, the concentration will be on what resources are available for grape growers to use in implementing a vineyard IPM strategy as well as an overview of the types of resources NEWA is looking at implementing in the future.

Disease Management Update – Bryan Hed, LERGP, Penn State University, will provide an update on the latest research-based information on new products. He will also present on how best to develop, and implement, a vineyard disease management strategy to address the control problems encountered in 2017. Bryan will also provide information on incorporating resistance management strategies to ensure materials are available for years to come.

Why Were My Leaves Black?

Andy Muza, LERGP and Penn State Extension

This past season, as we approached harvest, many of the canopies across the region had a black – brown cast instead of a healthy, dark green, coloration. **WHY?**

Could it be due to late season powdery mildew?

Were crop loads too heavy?

Were potassium levels too low?

What about the hot, sunny weather and lack of water?

Is there a simple answer?

Find answers to these questions and information on a variety of topics concerning business management, viticulture, insects and diseases by attending the 2018 LERGP Grape Growers' Conference.

INSURING GRAPES

NY, 2017

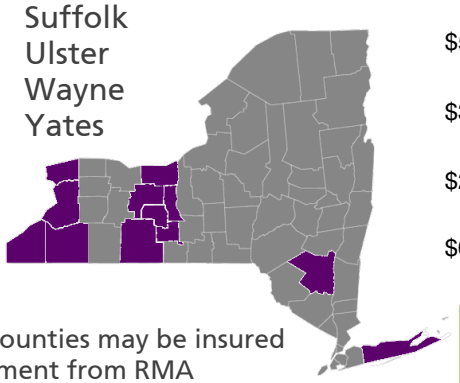
Crop insurance is a safety net for farmers that helps you **manage risk**. If you have a crop failure, crop insurance can help you farm again next year.

Important Insurance Deadlines

- **Aug. 15, 2017:** Premium Billing Date
- **Nov. 20, 2017:** Sales Closing, Policy Change, Cancellation, Termination Date
- **Nov. 20, 2017:** End of Insurance Period
- **Jan. 15, 2018:** Acreage / Production Report Date

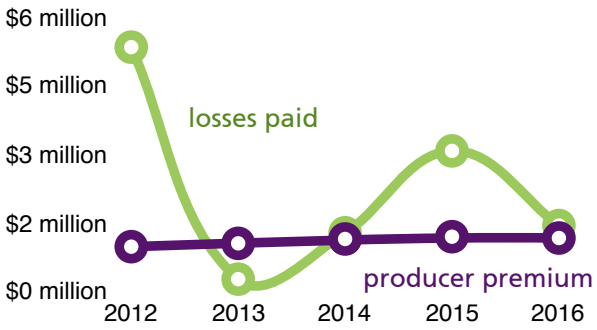
Over 40 grape varieties are insurable in these counties:

Cattaraugus
Chautauqua
Erie
Niagara
Ontario
Schuyler
Seneca
Steuben
Suffolk
Ulster
Wayne
Yates



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

NYS Grape Crop Insurance Performance



for every $1 grape producers spent on crop insurance premiums from 2012 to 2016, **they received $2.07** in losses paid, on average

Learn more & sign up:

Explore your personalized crop insurance costs and loss payments under different yield outcomes at ag-analytics.org. To sign up, contact a crop insurance agent. Find an agent using the Agent Locator tool at rma.usda.gov/tools/agent.html

Ag-Analytics.org
@aganalytics

USDA

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