Cornell Cooperative Extension

Lake Erie Regional Grape Program

PennState Extension

Newsletter- March 2020

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.

In this Issue:

The Lake Erie Regional Grape Program is a partnership between Cornell University, Penn State University and the Cornell Cooperative Extension Associations in Chautauqua, Erie and Niagara County NY and Penn State Extension in Erie County PA.

2020 Lake Erie Regional Grape Program Growers' Conference
March 19, 2020
Williams Center
SUNY at Fredonia Campus

Agenda

7:00 AM	Tradeshow set up begins
7:30 AM	Registration and Tradeshow open
8:20 AM	Welcome
8:30 - 9:15 AM	Labor Trends and How Will Those Trends Affect Grape Farms in our Region *Richard Stup, Agricultural Workforce Specialist, Cornell University*
9:15 - 9:45 AM	Labor Cost in our Region *Kevin Martin, LERGP, Penn State University*
9:45 – 10:15 AM	Grape Pest Talk – Greg Loeb
10:15 – 10:45 AM	Break
10:45 – 11:15 AM	Spray Program Strategies to Avoid Resistance *Bryan Hed, LERGP, Penn State University*
11:15 – 11:45 AM	Pesticides, 2 ee's and Spotted Lanternfly *Andy Muza, LERGP, Penn State University*
11:45 – 12:15 PM	Fungal Pathogens Show Promise as IPM Spotted Lanternfly Management Strategies *Eric Clifton, Department of Entomology, Cornell University*
12:15 - 1:15 PM	Lunch and Visit Tradeshow
1:15 – 1.45 PM	Vineyard Weed Management Strategies *Lynn Sosnoskie, Department of Horticulture, Cornell University*
1:45 – 2:15 PM	Hyperspectral Sensors and Plant Pathogens *Kaitlin Gold, Department of Plant Pathology, Cornell University*
2:15 – 2:45 PM	VitisGen2: New Technologies Accelerate Disease Resistant Cultivar Development *Lance Cadle-Davidson, USDA, Cornell University*
2:45 –3:15 PM	Cold Hardiness and Climate Change *Jason Londo, USDA, Cornell University*
3:15 – 4:00 PM	Understanding Soil & Petiole Tests and Vine Nutrition *Terry Bates, CLEREL, Cornell AgriTech, Cornell University*
4:00 PM	Adjourn

LAKE ERIE REGIONAL GRAPE PROGRAM

2020 GRAPE GROWERS' CONFERENCE REGISTRATION FORM

SUNY Fredonia Williams Center

Thursday, March 19, 2020

Deadline for registration is Friday, March 6, 2020.

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 6, 2020

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

Labor: Linking Decisions and Strategy to Cost

Growers should approach labor costs like a chain, linking the costs to the strategy. As costs rise, the things we need evolve. As we've mentioned vineyard labor cost continues to rise. There are two ways to index prices to measure their rise. Traditional indexing would pool the common labor activities of vineyard management and measure changes in cost based on the assumption that practices are not evolving simply because the price of labor is changing. A chained index attempts to measure changes in price based on a more realistic world view. The chained index attempts to capture changes in labor cost as behavior evolves because of changes in price. What behaviors might evolve because of labor costs? This article will discuss a few techniques to reduce labor costs. Some growers may already be doing some (or all) of these things. Machinery and technology continue to evolve and higher capacity machinery does require additional capital. While large growers may be doing all of these things generally, the future holds larger sprayers, faster harvesters and more reliance on pre-pruning.

An important shift in the last 20 years has been vineyard consolidation. With respect to labor, that means most labor is now paid labor. The flexibility of the owner paying himself has been on the decline. No, owners are not suddenly working less. Rather, the number of owners has fallen by nearly 50%. Running a harvester, for example, was almost always unpaid labor 30 years ago. On a per acreage basis, there is a significant amount of acreage that pays even the harvest operator. As labor prices rise we would expect much slower change in activities that are unpaid. While the operator may be working for less than minimum wage, at least he isn't violating laws to do it. Paid labor is an inherently inflexible expense. The cost is incurred one week and paid the next. Primarily for this reason moving to a labor savings practice should not require actual monetary savings. The grower should value the flexibility even if the practice is only expected to break-even.

Potential savings for mechanical pre-pruning

In operations that do not complete mechanical pre-pruning, pruning and renewal work represents about 70% of total labor costs. After mechanization, that drops to 55% of total labor cost.

From a cost perspective, mechanical pre-pruning savings vary significantly from farm to farm. Per vine costs for hand follow-up range between $0 and $.44 per vine. While some vineyards realize no savings, most save about $120 per acre with effective training and the right workforce. Increased cost in other practices generally reduce gross savings from $120 to a net savings of $55 per acre. Savings do vary based on market as well. Below is a discussion regarding cost and strategy changes that come along with pre-pruning.

Capital investment for mechanical pre-pruning is extremely small relative to saving. It is why we have seen a majority of owners (measured by acreage) at least experiment with the practice. More important than the actual machine, is the comprehensive change in management strategy that has to be effectively implemented to get the same results. The market for used machinery makes the practice available to even the smallest of operations. For large farms, high-tech machines have recently increased the price of pre-pruners but may be justified by increased ground speed and less pre-pruning.

The biggest challenge is effectively developing and maintaining a supply of paid labor to efficiently complete hand follow-up and renewal activities. Higher hourly rates for hand pruning usually

incentivize paid labor away from mechanically oriented operations. Maintaining reliable labor force will be more expensive. Growers may also need to plan on more pruning rehabilitation efforts, depending on the extent of the hand follow up that is completed annually. Growers less than 20 acres might consider the idea of completing these tasks themselves. Some of the larger growers are hardest hit by these issues.

Disease and insect pressure has the potential to be harder to control in these systems. Budgeting at least $60 per acre seems to be effective in many years. For $60 a grower can make an additional spray application with highly effective materials in the post-bloom period. Effective canopy coverage may be very difficult and it is somewhat more likely that pressure can get out of hand as late season spray coverage is even less effective at cleaning up early season misses.

Mechanical pre-pruning may also result in an overhaul in crop load management strategies. With less actual cash being spent on managing crop, growers may push bud counts and yields higher. This is not a requirement of a mechanical strategy but it can be effectively implemented to increase average yields. If higher yields are part of the strategy, more frequent fruit thinning will also need to be budgeted for. Net revenue is highly variable because of a complete shift in risk management. In general, it should be possible to ripen at least an extra ton per year, on average. The added expense being fruit thinning at least once every five years. An unusual 5-year weather pattern might lead to less optimal results. Most of the time net proceeds will improve by $150 per acre, per year. Effective implementation will take into account vine size and health as well as site specific risk like the probability of a spring frost event. It is possible to implement this strategy without mechanical pre-pruning and increases in net revenue do not tie directly to the labor savings.

Potential Savings for multi-row equipment

Typical total labor cost for a farm that has not increased labor efficiency since 1995 is approximately $575 per acre. Where all possible tasks have transitioned to large multi-row capabilities, labor costs have fallen to approximately $485 per acre. Yield, vineyard passes and year to year variation can change these costs and these represent costs in a year with average conditions. With some fairly significant capital investments labor costs can drop by about $90 per acre. Cost of obtaining operators skilled enough to operate variable rate equipment does vary. While some owners see no increase in hourly rates, others have seen significant increases. While the average savings is $90, knowing the capabilities of existing employees will help you understand if you will save more or less than average.

VMech demo at Gallo

The savings of multi-row equipment is very farm specific and does tend to favor the very large and sometimes very small farms (with less expensive custom applications). It is particularly important to look at individual farm practice and when size justifies an upgrade typically that upgrade should be fairly well timed with both high income years and the normal cycle of equipment replacement. Older newsletter articles have dealt in this specific topic in more detail and can be found on our website. There have been some changes in the market since those articles were written.

- Multi-row fungicide sprayers are much more available in the used equipment market.
- The cost of new single row sprayers has increased in price much faster than multi-row sprayers.
- Developments in multi-row trellis equipment have expanded significantly in the last five years.
- Tractor and skid-steer mounts have increased the commercial availability of these post driving units and increased the speed of the operation.
- In NY the 7-day work week for over-time rules may help justify multi-row fungicide equipment.

For growers that have been on the edge of transitioning an additional practice to multi-row, these factors may impact the expected return on investment going forward. We have reached a stage where larger growers may not need to realize any additional capital expense. Two traditional fungicide sprayers, for example, are more expensive than one two row unit.

Bulk bin for semi trailer

Bulk Harvest Cost

Harvest labor represents a significant portion of total labor costs. Whether an operation is hiring a custom harvester or doing it himself, the grapes need to pay for the labor required to complete harvest. A few factors have changed the cost of adopting bulk harvesting. In particular, changes in NYS regulations, like overtime, that are easily avoidable will not be so avoidable during the harvest season. Also, USDA can provide inexpensive financing for the purchase of bulk equipment.

Field Gondola for bulk harvesting

The capacity limits for a minimal venture into bulk harvest would involve two field gondolas and two bins for a flat-bed trailer. Total upfront cost of the equipment is $43,000. This investment would provide enough capacity to harvest 1,300 ton of grapes in a season with a crew of 3. Farms with a close proximity to a processing facility would likely find such an investment would provide enough capacity to harvest 1625 tons per year.

For farms harvesting more than 150 acres of grapes, the capital investment would increase to $63,000. By adding two bins to equip a second flat-bed trailer the capacity of the operation would increase to 3,100 tons per year. This would still be accomplished by a crew of 3.
Theoretically additional trailers would be needed to service plants that did not accept bulk and the cost of that would depend on the split the grower has between markets and how many trailers are

necessary. Additionally, significantly more trailer bins would be required if distant plants began to accept bulk (i.e. Gallo). For the time being these numbers make sense for anyone within the Lake Erie Region other than Niagara County growers.

If two flatbed trailers do not max out the capacity of a single harvester, three certainly would. Growers delivering grapes in the same or adjacent counties would have no need to own more than 3 bulk trailers and in almost all cases two would be adequate. For large operations the time spent securing loads adds enough turn time to each load that one less trailer is needed to haul the same amount of grapes per week. The average harvest crew brings in under 1,000 tons per year and the investment of 43,000.

USDA offers low interest financing for bulk harvest equipment as it qualifies for the on farm storage Facility Loan Program. Loans have an application fee of $100 and 15% down. Annual payments would be just under $4,000 per year given current interest rates. Assuming a 5-week harvest program, reducing harvest labor by 40 hours per week would justify the $43,000 investment. https://www.fsa.usda.gov/Internet/FSA_File/frm_storage_facility_lns.pdf

While the capacity of this investment is a harvest of 1,300 tons, cash flow is a different story. Creating positive cash flow from labor savings is likely around ½ of that at 700 tons harvested per year. This is a conservative estimate and bulk harvesting offers more savings in extreme years. Savings will be greater than $6 per ton when yields are below 3 or above 8. At very high yields speed and capacity increases result in more savings and truck turn times become more important. At very low yields harvest crews can be reduced even further.

It has probably been said too much over the last three years but labor prices are edging higher. Often the analysis of labor savings technology is based on the current price of labor. It is important to keep in mind, when technology eliminates the need for labor that cost becomes somewhat fixed for the life of the equipment. More importantly, current trends show much of this technology to have price inflation significantly lower than labor. Investments that look good now will look even better with hindsight as labor prices rise much faster than 2%.

Many growers have done some or all of these things already. As the largest growers wear out these expensive investments all of these labor saving ideas can save more labor (with more money). Multi-row pre-pruners, GVWR trucks at 100,000lbs, and 4-6 row sprayers are pushing the cost and engineering further.

Viticulture

Jennifer Phillips Russo, Viticulture Extension Specialist, LERGP

Journey to Soil Health

It is easy to take the soil beneath our feet for granted. It supports our homes, roads, and food. In our industry, our success is directly tied to the health of our soils, but what is it? Soil is the top layer of the earth and one of the most important natural resources that we have. Per the USDA, soil health is defined at the continued capacity of the soil to function as a *vital living ecosystem* that sustains plants, animals, and humans (USDA-NRCS, 2012). Generally speaking, it is the quality of your soil. High quality soil drives agriculture production. Without organic matter and microorganisms, then basically you just have dirt. One motivation to have healthy soils, is to improve your soils resilience to commercial farming and increase profits, not to mention that you become a natural resource steward to combat erosion and improve water quality.

When soils are healthy they support our grape production by:

- Capturing and reusing nutrients for vine availability
- Allow for adequate water infiltration, and availability through holding capacity
- Allow water to carry nutrients throughout the profile
- Allow for gas exchange between roots and soil microbes
- Sequester (hold onto) carbon
- Suppress pests, disease, and weeds
- Encourage root growth and discourage root compaction
- Detoxification of harmful chemicals
- Improved plant health equates to improved quality and yields
- Contributes to reduced risk of loss during environmental stresses like drought, heavy rain events, and pest or disease outbreaks
- Better access to vineyards during wet periods
- Improved efficiency of fertilizers, pesticide, herbicide, and irrigation practices
- Possible reduction in soil amendments (inputs) due to more availability in healthy soils

With all of these benefits that potentially increase your production, quality, and yields, why not try implementing some soil health building techniques into your vineyard management operations? The following article will first break down the five components of soil and what that means to you. Then I discuss a grower's journey to soil health through experimenting with cover cropping to demonstrate that it works at the farm level.

There are five major components of soil and each are important for supporting grapevine growth, microbial communities, and chemical decomposition. Changing just one of these components will produce different soil health attributes. Out of the following five components, Organic Matter is the key to Soil Health:

1. Mineral
2. Water
3. Gases
4. Microorganisms
5. Organic matter (OM)

Mineral - basically the kind of rocks that your soils came from. Mineral makes up the largest component of soils by volume and is made of primary and secondary minerals. The primary minerals are similar to the parent rock material that formed them and are bigger. Secondary minerals are the smaller bits of rock material that result from weathering, or breaking down, the primary minerals. Important ions are released when weathering occurs and negative and neutral charges associated with the mineral content influence the soil's ability to retain important nutrients, such as cations, that contribute to the soils cation exchange capacity (CEC). The mineral material has negative or neutral charges and the positive charges (cations) are ions such as calcium (Ca^{2+}), magnesium (Mg^{2+}), and potassium (K^{+}), sodium (Na^{+}) hydrogen (H^{+}), aluminum (Al^{3+}), iron (Fe^{2+}), manganese (Mn^{2+}), zinc (Zn^{2+}) and copper (Cu^{2+}). Think back to playing with magnets, positive and negative poles attract and like poles repel, so the negative in your soil can hold onto more positive charges. The CEC of a soil represents the total amount of exchangeable cations that the soil can adsorb. Soils with higher clay and organic matter content have higher CEC values.

Water - is important for transporting nutrients in the soil to the grapevine root system and also to the soil organisms. Water aids biological and chemical decomposition, or the breaking down of the OM and rock material to release the nutrients and create CEC site. Not all soils can hold the same amount of water either, just look at some of the blocks on clay soil compared to the gravel soil at the end of July. Soil water availability, or the capacity to hold water, is dependent on soil texture. The smaller the soil primary rock minerals, the more water the soil can hold. For instance, clay particles are tiny and have larger surface area, or places for water (and soil chemistry for that matter) to bind to. This is why clay soils have the greatest water holding capacity and sand the least. There is so much more that could be written about different soil types ability to hold water and what that means for grapevine growth, thankfully, we have more Newsletters and Crop Updates to publish.

Gases – Just think about gases in terms of air. They can occupy the same spaces in the soil as water. Oxygen is essential for root growth and for microbial respiration. Carbon dioxide and nitrogen (present in air) are also important in our soils for nitrogen-fixing bacteria. In terms of soil structure, there are soil aggregates (groups of soil particles that bind together) that create pockets of space in the soil. The space between the aggregates provide pore space for retention and exchange of air and water. Because water and air can occupy the same spaces in soil, if too much water fill the spaces, it can prevent the root gas exchange leading to plant death. Grapevines do not like, nor do they grow well, with wet feet.

Micro Organisms - It is the microorganisms that make up living portion of a healthy soil ecosystem. They are found in the soil in very large numbers yet make up only about 1% or the soil volume. There is a common estimate that a thimble of topsoil can hold more than 20,000 microbial organisms. So what are microorganisms? List group is mostly made up of earthworms, nematodes, algae, fungi, and bacteria that are considered decomposers. They are the forces that break down the organic material into a form of readily available plant nutrients.

Mycorrhizae are fungal complexes that create symbiotic relationships with grapevine roots that benefit both the plant and the fungi. They grow into the root and extend out into the soil to mine it for water and access nutrients, in return, the plant provides the fungi with essential sugar (carbon). The earthworms eat the organic material and break it down in their guts then deposited out the other end as castings (poop) that adds readily available nutrients to the soil, adds sticky aggregates, all while creating great aeration in its wake as it cuts threw the soil. Without living microorganisms and organic matter the soil is essentially dead, or just dirt.

"The plow is one of the most ancient and
most valuable of man's inventions; but long
before he existed the land was in fact
regularly plowed, and still continues to be
plowed by earthworms."
- Charles Darwin, 1881

Organic matter is the key to soil health and also contributes to the soils water holding capacity. Organic matter is the food for the many beneficial organisms living in the soil. In a natural system, anything that was once living and falls on the forest floor and decays is OM. I have written about OM in previous publications discussing how everything living releases the nutrients bound in the cells when they die. The dead and decaying plants and animals provide the essential elements and water that the grapevines need for growth. Soils that are high in OM also have a high CEC. Building your organic matter on soils that do not have a high capacity to hold water, such as sand, is essential to soil health.

When organisms decompose the OM, they release a sticky substance that aid in soil aggregation (clumping). What happens if you drop honey into sugar? If your soil is well aggregated, or has clumps, then spaces are created in the soil that hold the water (we learned earlier in this article that it carries nutrients to the root system and aids in the biological and chemical decomposition) and air to buffer plants through environmental stresses like drought, flood, and compaction. Not to mention its role in carbon sequestering to slow climate change.

A majority of the vineyards in the Lake Erie grape region have been in production for over 50 years, with an intense regiment of management practices leading to a range of soil health problems. Okay, so how exactly can we rehabilitate our commercially farmed soils, that we continue to pull nutrients out of for yields? We keep hearing about sustainable agriculture. This term tends to be misleading with the perception that in order to be sustainable, one must not use chemical fertilizer and pesticides. Sustainable agriculture is an approach that focuses on production with minimal consequences on the living ecosystems or the environment, preserving the land's ability to sustain future production. One tool that you can incorporate into your sustainability practices and soil restoration management strategy is cover cropping. Cover crops provide many of the soil benefits that were discussed above. It is important to think about what your goals are and then select your cover crop from there.

Bob Betts, of Betts Farms in Westfield, NY, decided eight years ago to incorporate cover crops into some of his vineyards in efforts to reduce soil compaction. Compaction can limit many of the healthy soil functions mentioned above, i.e. water and gases (air) infiltration, and hinder root growth and vine potential. Bob decided to add tillable radish to a few of his row middles to see if it would help with the compaction. They started out with just tillable radish down every other row where they had just put in drainage tiling to keep pores open to the tile. Radish are legumes, which form a taproot, like a carrot, that mines the soil for Nitrogen (N). When the vegetable dies, it leaves tunnels in the compacted soil

that allow for water and gases to infiltrate, as well as add decaying organic matter (N) back into the soil which in turn attracts the microorganisms.

The Betts were impressed with and intrigued by the amount of biomass that radishes added and wanted to add another species to the cover crop experiment. They decided the addition of rye grass would complement the huge holes that the radishes left and hoped that it would stabilize the ground during wet periods to allow for the tractors to get into the vineyard. In year two, rye grass and radish were applied with the seeder in bands seven inches apart totaling nine bands within each row middle. The radishes were so big that they crowded the rye grass out. That year, the National Resource Conservation Service (NRCS) was subsidizing cover cropping efforts to combat soil compaction. The Betts took advantage of this program and incorporated multi-species mixes varying from three to seven different species in his middle rows. Working with LERGP, they added a check, or control bands, within the block where they did not apply any cover crop in sections three panels long (24 feet each panel) and three rows wide (9 feet row width) beginning the Cover Crop Experimental Block to compare and contrast the effects of the cover crop addition on the soil and vine production. This experiment has been ongoing for eight years.

The Betts started their cover cropping journey to reduce compaction but ended up with more soil health benefits that they didn't anticipate. There were visual observations that the soil microorganisms were increasing. Earthworms burrow and pull plant litter into the ground. Bob began to notice rye grass stalks sticking out of the dirt. As earthworms eat, soil gets passed through their guts where buffering action or organic molecules neutralize the pH. Some earthworms even eat harmful nematodes decreasing pest pressures. In regards to water, yes the cover crops use water and may compete with the vines during times of drought, but the ground under the cover crops is shaded and kept cooler, thereby conserving water in the soil from evaporation. The cooler temperatures in the cover cropped soil promotes quality habitat for the microorganisms versus the hot dry soil with no cover crop. Having the roots of the cover crops holds soil in place during periods of intense rain, decreasing runoff that carries valuable nutrients and pesticides away from our vines. Look at Bob's Photo #1 where you can see that there was a heavy rain event and the soil stayed in place. The Betts also roll crimp their cereal rye to terminate, which creates a mat of biomass that not only shades the ground and feeds the microorganisms, and it also suppresses weeds. One is hard pressed to find marestail in the rows where the cover crops are, but the control strips that do not get seeded have the weed. See the Bob's photo #2 where you can see marestail growing in the control strip and not where the cover crop starts just after that.

Bob's Photo #1

Bob's Photo #2

Now let's put some actual numbers to this. In November 2019, we worked with Cornell's Soil Health Program to take soil samples from the cover crop (CC) and non-cover crop (NCC) areas for a soil health assessment. The sampling protocol required us to take a scattered 0-6" sample at 6-10 locations from each field being tested, and take a penetrometer reading at 0-6" and 6-18" at the same sites to measure compaction. Then mix the soil and put a few handfuls in a labelled freezer bag. Ship the samples with their paperwork off to the Cornell Soil Health Lab. Here are some of the results that we obtained from those samples:

Table *1* Cornell Soil Health Assessment Table Betts 2019

Soil Health	surface hardness rating	OM	root pathogen pressure rating	resp rating	pH	P	K	Mg	Fe	Mn	Zn	total score
CC	19.00	3.80	69.00	41.00	6.00	3.20	74.60	207.70	16.30	8.80	3.20	66
NCC	18.00	2.80	30.00	27.00	6.20	2.20	64.70	187.70	11.50	7.30	1.10	55

The cover crop soil health assessment out-performed the non-cover crop samples in every category with the exception of pH, which is still within the recommended levels of 5.5-6.5. The surface hardness rating improved, and big boosts in Phosphorus (P) and Magnesium (Mg). The Betts began this journey to reduce compaction and it has led to many soil health benefits and has sparked many more research questions they are looking into. The Betts did not start off cover cropping their entire farm, but worked in a trial area to test it out and see how it worked in their operations. Bob learned that the addition of biodiversity from cover mixes had many soil health benefits beyond just mitigating soil compaction. Collaboration with the Research and Extension Teams at the Cornell Lake Erie Research and Extension Laboratory, NRCS, Cornell Soil Health Department, and the New York Farm Viability Institute helped the Betts implement cover cropping into portions of their farm to obtain their farm goals.

In our vineyard production terms, soil health is the idea of regaining and maintaining healthy soils that are full of life that allow our vines to function optimally. Plan your cover crop species and management based on your objective(s): soil erosion, water quality, nutrient management, forage and/or soil quality. Not only is soil erosion greatly reduced, but many other benefits can be derived. However, there are risks too. Proper planning and timing of termination can help to minimize or eliminate risk, leading to success.

Cornell Soil Health Program has a wonderful resource available online at http://www.css.cornell.edu/extension/soil-health/manual.pdf, or you can purchase a hard copy of it as well.

https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/technical/nra/nri/

https://soilhealth.cals.cornell.edu/soil-health-manual-series/

https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/f/5772/files/2016/12/02_CASH_SH_Series_What_Is_Soil_Health_040517-1ruc3sq.pdf

https://cpb-us-e1.wpmucdn.com/blogs.cornell.edu/dist/f/5772/files/2018/12/03-Soil-Health-Principles-and-Functions-1y64532.pdf

GRAPE IPM VACANCY IN NYS

Lake Erie Regional Grape Program's 2020 Winter Grower Conference

Stop and Visit Our Table to Sign Our Grower Letter

To Fill Tim Weigle's Grape IPM Specialist Position

Dear Growers,
We are providing an opportunity for our growers to sign a petition to attach to our pre-form letter to decision makers for a call to action.
Your support and immediate action are required to ensure the grape integrated pest management position that is currently vacant, continues into the future and housed in the Lake Erie Grape Region. Letters of support from our grower stakeholders are necessary to convey the needs of the work that Tim Weigle provided to our industry and the impacts, or success stories, that have improved your operations.

As of November 4, 2019, the industry lost critical support at Cornell University in grape pest management because of the retirement of our resident IPM specialist, Tim Weigle. In his 30-year career as NYSIPM Specialist, Tim co-edited the annual NY and PA Pest Management Guidelines for Grapes, instituted NEWA models for pest management, led research and education on grape root worm, Japanese beetle, and grape berry moth. Tim has also stayed in the forefront of invasive species such as the multicolored Asian lady beetle and the spotted lanternfly. Tim's program was exceptional at listening and responding to the needs of the grape industry in western New York.

Tim Weigle's position is not currently filled. There is a void in our program.

This position has been an integral part of the four-member, two-state, five-county Lake Erie Regional Grape Program since its inception in 1992. This vacancy leaves a hole in our industry and we need support to immediately address our current needs in:

- Integrated pest management
- Pesticide recommendations
- updating NY and PA Pest Management Guidelines for Grapes
- pesticide credits at Coffee Pot meetings
- invasive species education
- contact to address the continual need to modify spray programs to maintain pest control
- updating grape berry moth and disease models on NEWA

What would happen to your operations if the above bullet points were not available to you?

If you agree, it is imperative that you either write your own letter and drop it off at our table, or sign the letter that we will have at the 2020 Winter Grower's Conference, March 19th.

We believe there is a critical and obvious need to support farm-level grape integrated pest management in western NY and Erie County, PA. As of November 4, 2019, the Grape IPM Specialist position has been vacant. Having a physical presence of IPM in our region has assisted in adoption of IPM practices and sustainability of our industry. A grape IPM specialist on the Lake Erie team will insure that their research and extension will immediately address our current needs in IPM, invasive species, and address the continual need to modify spray programs to maintain pest control. If writing your own letter, then please send it to the following decision makers:

Richard Ball
Commissioner, NYS Department of Agriculture and Markets
10B Airline Drive
Albany, NY 12235
Telephone: 518-457-8876

Kathryn J. Boor
Dean of the College of Agriculture and Life Sciences (CALS) at Cornell University
260 Roberts Hall
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Christopher Watkins
Director, Cornell Cooperative Extension
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Jennifer Grant
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607 West North St., Geneva, NY 14456
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Andy Goodell -- District 150
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LETTER:

March 6, 2020

Richard Ball

Commissioner, NYS Department of Agriculture and Markets

10B Airline Drive

Albany, NY 12235

Dear Commissioner Ball,

I am writing to express my concerns about future funding for Grape Integrated Pest Management in our area. Our Lake Erie Grape Region industry lost critical support at Cornell University in grape pest management because of the retirement of our resident Grape IPM specialist, Tim Weigle. In his 30-year career as NYSIPM Specialist, Tim co-edited the annual NY and PA Pest Management Guidelines for Grapes, instituted NEWA models for pest management, led research and education on grape root worm, Japanese beetle, and grape berry moth. Tim has also stayed in the forefront of invasive species such as the multicolored Asian lady beetle and the spotted lanternfly. Tim's program was exceptional at listening and responding to the needs of the grape industry in western New York.

As growers, we need IPM support because it helps us to be sustainable in this industry and continue to contribute to our state's economy. Grape IPM's grape berry moth spray program saved my vines, my spray costs, and provided resources about pest management that have supported my operations. I am especially concerned about not having support when the invasive species the Spotted Lanternfly gets here.

It is imperative that our industry has access to an IPM support specialist in the Lake Erie Grape Region to continue to be sustainable. Thank you for continually supporting the Lake Erie Regional Grape Program.

Respectfully,

The Lake Erie Region Grape Growers

PA Update

Andy Muza, LERGP Extension Team/Penn State Extension- Erie County

Spotted Lanternfly (SLF) – UPDATE

On March 3, 2020, the Pennsylvania Department of Agriculture (PDA) added twelve counties to the Spotted Lanternfly quarantine resulting in a total at 26 counties currently under a state-imposed quarantine. A county is placed under quarantine when evidence of a reproducing population of spotted lanternflies, such as an egg mass, is found by PDA. The new counties are not completely infested, but have a few municipalities with a known infestation which led to a quarantine being placed on the entire county out of an abundance of caution. Two of the new counties include both Beaver and Allegheny in southwestern, PA. which are only 4 counties away from Erie County, PA. (PDA's updated map of the quarantine zone : https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/quarantine/Documents/2020%20Quarantine%20Detailed.pdf).

Note: The most likely long distance dispersal of SLF is by movement of egg masses and fertilized females on vehicles (e.g., cars, trucks, campers, railway cars) or contaminated materials from sites with SLF. Businesses/organizations that operate in or travel through quarantined counties are required to obtain a spotted lanternfly permit. Businesses may check whether they need a permit by using this resource: https://www.agriculture.pa.gov/Plants_Land_Water/PlantIndustry/Entomology/spotted_lanternfly/quarantine/Pages/Do-I-Need-a-Permit.aspx
Spotted lanternfly, *Lycorma delicatula* (White), is a new invasive insect that was first discovered in the United States in Berks County, Pennsylvania in September 2014. This planthopper is native to Asia and is suspected to have been introduced into southeastern PA on shipments of stone from China that were infested with egg masses.

Spotted lanternfly (SLF) is reported to be a serious pest of grapes in Korea and has also been recorded as feeding on at least 67 host plants in that country. Many of these same host plants can also be found in PA and NY. Consequently, SLF poses a serious economic threat to various crops including grapes, tree fruit, hops, as well as ornamental trees and the timber industry.

It is important to note that tree-of-heaven, *Ailanthus altissima* is a highly preferred host plant of this insect and these trees provide ideal sites for monitoring for the presence of this invasive insect. Tree-of-heaven is a fast growing, invasive tree that is native to China and was introduced in the late 1700's in America for use as an urban tree (For information concerning tree-of-heaven refer to: "Invasive Exotic Plant Species: Ailanthus (*Ailanthus altissima*)" and "Managing Tree-of-Heaven *(Ailanthus altissima)* on Roadsides" under **Resources**).

Figure 1. Egg masses of spotted lanternfly covered by waxy deposits. Photo – A. Cusumano

Spotted lanternfly: Life Cycle, Description and Feeding

In Pennsylvania SLF has 1 generation/year and develops from an egg to a wingless nymph to a winged adult.

Figure 2. First – third instar nymph of spotted lanternfly. Photo – Andy Muza, Penn State

Eggs – SLF overwinter in the egg stage. Egg masses are comprised of 30-50 eggs and are covered with a waxy secretion resulting in a gray-brown coloration which looks like a smear of mud on the surface where they are laid (Figure 1).
Nymphs – The nymphal stage has 4 instars. The 1st instar is less than ¼" long. The coloration of the first 3 instars is black with white spots and has been described as looking "tick-like" (Figure 2). The fourth instar is red and black with white spots and over ½" long (Figure 3). In southeastern PA, nymphs begin hatching in late April or early May.

Figure 3. Fourth instar nymphs of spotted lanternfly. Photo – Andy Muza, Penn State

Adults – The head and legs of the adult are black and the abdomen is yellow with black bands. The wings cover the body "tent-like" while the insect is feeding or resting on a surface (Figure 4). The forewings are gray with black spots (near the wing base), with black and gray markings near the tips. The hindwings are colorful and comprised of a red area with black spots, with a white band and black area near the tips. The hindwings are only visible when the insect is alarmed or in flight.

Figure 4. Three adult spotted lanternfly. Photo – Erica Smyers, Penn State

In southeastern PA, SLF reach adulthood around late July and are about 1" in length. SLF adults begin mating in early fall and will aggregate in large numbers often on tree-of-heaven. Females begin laying eggs in late September or early October. Egg laying continues until females are killed by cold temperatures. SLF females lay at least 2-3 egg masses with 30-50 eggs/mass. Females will deposit eggs on tree trunks, limbs or **any smooth surface** (e.g., vehicles, farm equipment, rusty metal, outdoor furniture, firewood, etc.).

Feeding - The spotted lanternfly has a piercing-sucking mouthpart which is used to extract phloem sap from plants. Feeding by large aggregations of this insect can reduce plant vigor and can result in mortality of the host. In addition, the copious amounts of "honeydew" excreted from feeding SLF results in extensive sooty mold growth which covers leaves and contaminates fruit. Younger SLF instars typically prefer to feed on the more succulent parts of plants (e.g., stems, leaf veins). Older nymphs (fourth instar) and adults can feed on woody tissue such as trunks, limbs, and canes.

REPORTING

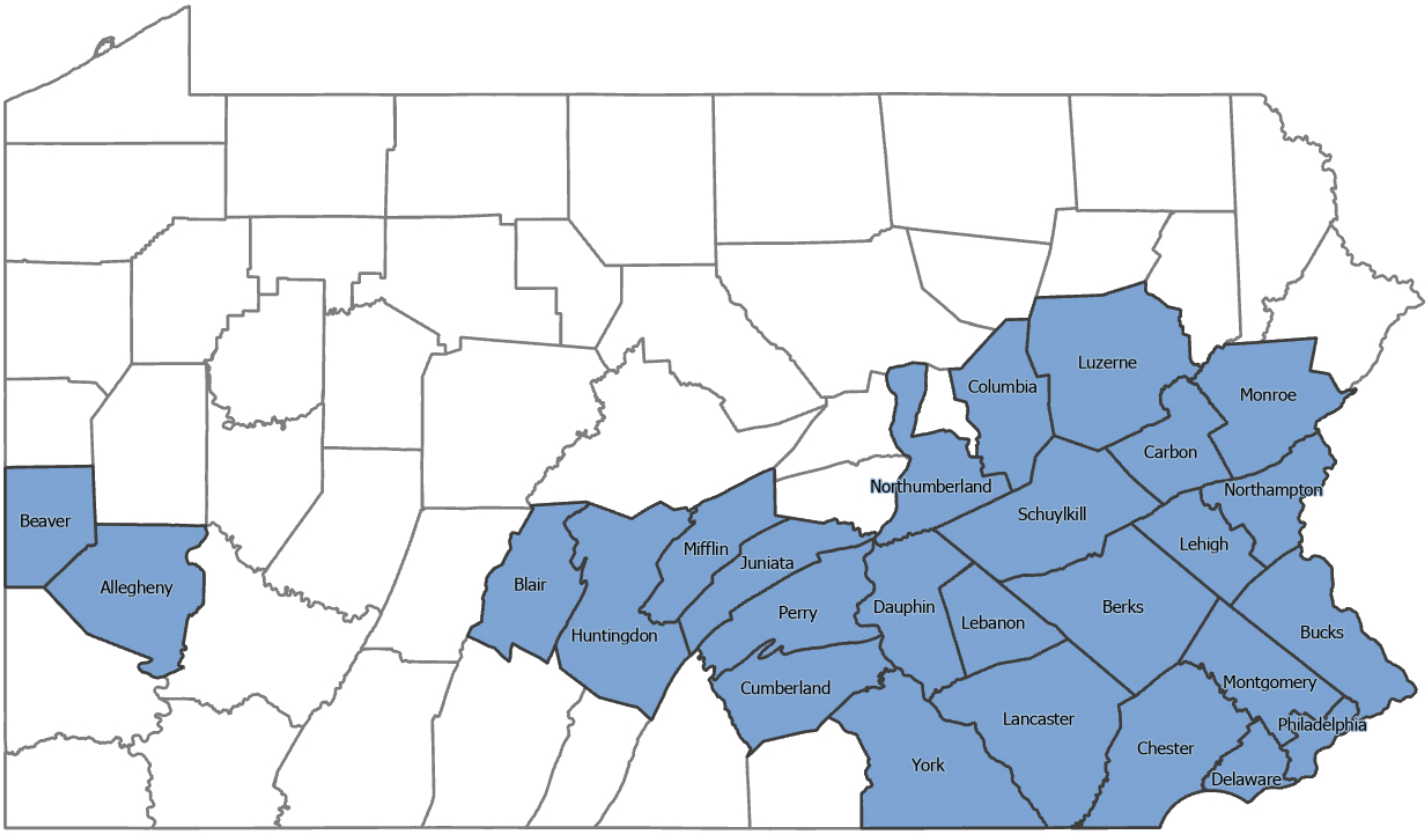
Early detection is vital for the management of SLF. **Therefore, if you see it, destroy it.** But first, take a photo if possible and make note of when, where and how many were seen. Then, report it by calling the spotted lanternfly hotline at 1-888-422-3359 or report it online at https://extension.psu.edu/have-you-seen-a-spottedlanternfly. In addition, contact any member of the LERGP Extension Team. Be sure that you do not move any life stage of spotted lanternfly, including the egg masses.

Resources

It is important that grape growers know how to accurately identify all life stages of the spotted lanternfly. To learn more about the spotted lanternfly including pictures, visit the Penn State Extension website at https://extension.psu.edu/spotted-lanternfly.

Invasive Exotic Plant Species: Ailanthus (*Ailanthus altissima*). Virginia Cooperative Extension, Publication 420-322 https://pubs.ext.vt.edu/content/dam/pubs_ext_vt_edu/420/420-322/420-322_pdf.pdf

Managing Tree-of-Heaven *(Ailanthus altissima)* on Roadsides. Roadside Research Project, Fact Sheet 3, Penn State http://plantscience.psu.edu/research/projects/vegetative-management/publications/roadside-vegetative-mangement-factsheets/3ailanthus-on-roadsides



Pennsylvania Spotted Lanternfly Quarantine

Quarantine

pennsylvania
DEPARTMENT OF AGRICULTURE

Gowan USA

GOWANCO.COM

Torino® Fungicide

The Only FRAC Group U6 Fungicide
Labeled for Grapes, Cucurbits, Cherries, and Pome Fruit
Highly Effective on Powdery Mildew
No Cross-Resistance
Protectant / Preventative Action

Mettle® 125 ME Fungicide

FRAC Group 3
Labeled for Grapes and Cucurbits
Controls Powdery Mildew, Black Rot, & Anthracnose
Protectant + Curative Activity
Highly Systemic

Badge® SC Fungicide/Bactericide Badge® X2 Fungicide/Bactericide

OMRI Listed® For Organic Use

High Quality Copper
Excellent Mixing Characteristics
Highly Active at Lower Rates
Enhanced Crop Safety

EcoSwing® Botanical Fungicide

OMRI Listed® For Organic Use

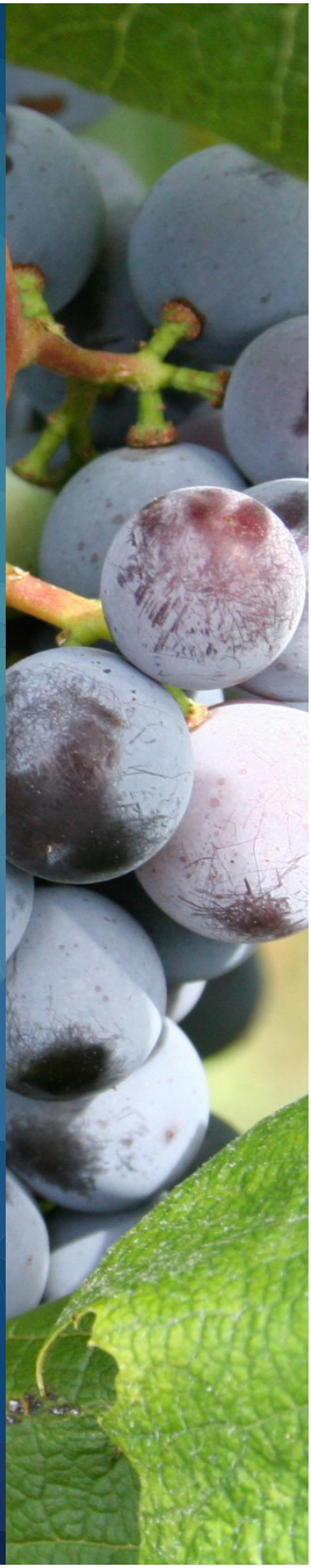
Flexibility, versatility & a unique approach for your disease control program
EPA registered with tolerance exemption
Controls Botrytis & Powdery Mildew

Quintec® Fungicide

The only FRAC Group 13 Fungicide
Labeled for Grapes, Melons, Winter Squash, Gourds, Pumpkin, and Stone Fruit
Exceptional Preventative Control of Powdery Mildew
No Cross-Resistance

ISAGRO USA

Gowan Company
800.883.1844

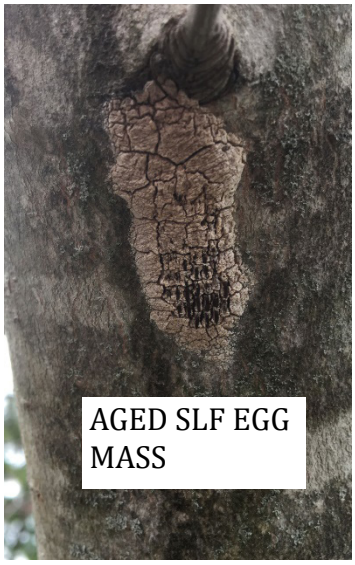


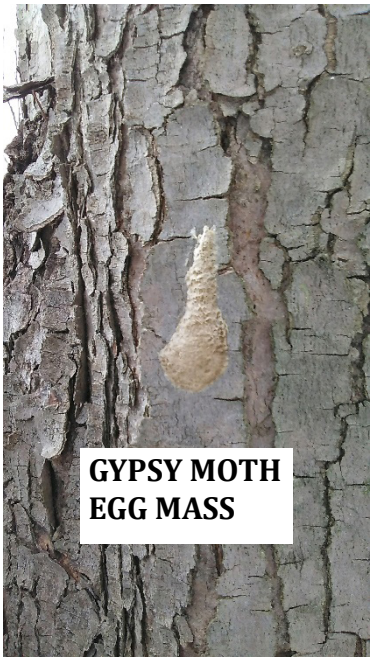
Spotted Lantern Fly

Kimberly Knappenberger, Viticulture Assistant, LERGP

Don't forget to scout!

Just because it's cold outside and you don't have to swat away those pesky bugs, it doesn't mean that you should let your guard down. With the snow levels at almost nothing and no foliage to peer through, it is pretty easy to check out those posts and vines while you are out pruning. So far we have not had any reports of Spotted Lanternfly in the Lake Erie Grape Region and we want it to stay that way. Staying vigilant about scouting will help with early detection when and if it moves up to this area, so it is important to know what you are looking for. Just this week Jennifer Phillips Russo received a picture from a grower in the area. He was concerned that the egg mass that he found was Spotted Lanternfly. Upon further inspection they were able to identify the mass as belonging to the Gypsy Moth which is a non-native species from France and is responsible for tree defoliation in the larval stage. Gypsy moth egg masses are brown and have a fuzzy appearance. Spotted Lanternfly egg masses have a smooth gray/brown appearance when newly laid. The egg masses will change from gray to brown coloration and can look like a splash of mud on a post, vine or almost any surface.





In the picture below taken by Gregory Hoover, Professor of Entomology at Penn State University, you can see a side-by-side comparison of the two different egg masses. The Spotted Lanternfly are on the left and above, and the Gypsy moth are the brown mass on the right.

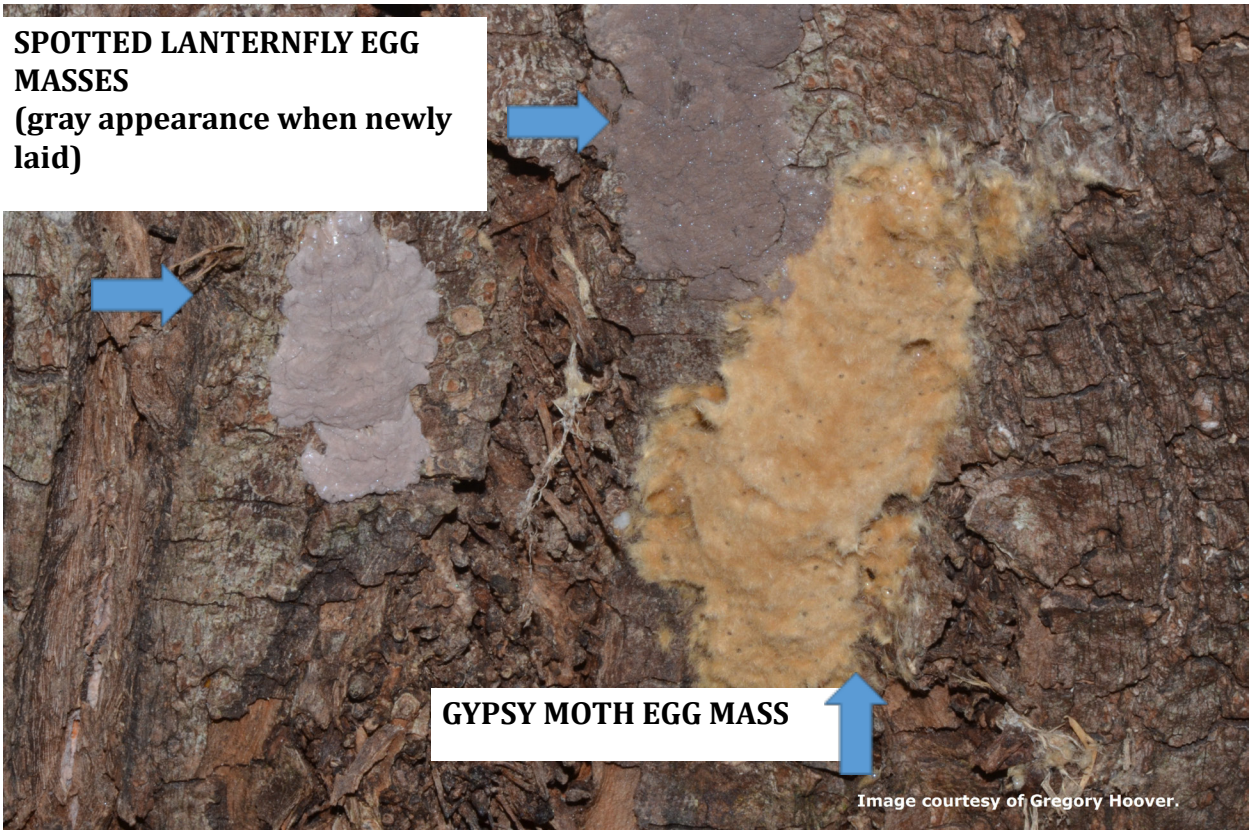
If you think you might have found Spotted Lanternfly you should follow these steps outlined on the NYS IPM website:

- Take pictures of the egg mass, using something to indicate size such as a coin, key or ruler.
- If possible, collect the mass on the bark and place in a zipper bag. Freeze the sample or add rubbing alcohol or hand sanitizer to the bag.
- Note the location (street address and zip code, intersecting roads, landmarks, or GPS coordinates that you can get with any smartphone)

- Email pictures and location to spottedlanternfly@agriculture.ny.gov or fill out the form at Spotted Lanternfly Observation which includes specimen information.
- If found in Pennsylvania you can report it online at services.agriculture.pa.gov/SLFReport/ or call 1-888-4BADFLY.

For more information visit the New York State Department of Environmental Conservation website page on Spotted Lanternfly.

Don't hesitate to contact us here if you have questions or suspect that you have found Spotted Lanternfly. Even though we don't have Tim here anymore, we will still do all we can to prevent this pest from getting established here.



Concords to Solar Panels? This is new for VIP!

A question came in late last week whether the Vineyard Improvement Program could be used to remove Concord vineyards on land destined to be a part of a solar project. The answer from Ag and Markets arrived that it can! This can be an excellent way to move from an underproducing (or non-producing) vineyard to something more profitable. If this is something that might work for you, please take a look at the website at lergp.com/about-vip or call Kim at 716-792-2800 ext 209.

As always, this is a grant available for Concord vineyards in the eligible counties in New York State.

2020 Fungicide Spray Schedule – What's Your Plan?

Bryan Hed, Andy Muza, Kevin Martin, LERGP Extension Team

In preparation for the 2020 season, 2 meetings will be conducted (1 in New York and 1 in Erie County, PA) to assist growers in developing a plan for disease management in the upcoming season. These meetings will focus primarily on diseases but depending on grower concerns insect management may also be addressed. These meetings will be interactive and designed to enable growers to develop their individual disease management plans for their specific blocks. Meeting dates and sites will be announced in the near future. Pest management concerns will also be addressed at the 2020 LERGP Grape Growers' Conference and at Coffee Pot meetings throughout the season.

PA Update

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

Spray Program Strategies to Avoid Resistance

I) Resistance management strategies to preserve the efficacy of our fungicides. We will review i) our list of fungicides available to us, ii) the FRAC code system on labels and iii) general resistance delaying strategies to keep our arsenal of chemical tools as robust as possible. Strategies will include:
1. Scouting ("what's going on in my vineyard? is my program working…or not?")
2. Apply IPM/cultural control (to reduce reliance on fungicides)
3. Avoid consecutive applications/no more than two applications/season of each high or moderate risk FRAC code (minimize the number of times a pathogen population is 'challenged' to develop resistance)
4. Rotate in and out of as many different FRAC codes as possible throughout the season/apply tank mixes (minimize the opportunities for resistant pathogen populations to increase)
5. Keep diseases well under control/avoid playing catch-up (minimize the size of the pathogen population you are 'challenging', minimize the size of the resistant population)
6. Use full rates, maximize coverage (to maximize your 'kill').
7. Etc.

Fungicide use restrictions do not generally apply to copper, sulfur, mancozeb, captan, and ziram fungicides, which are at much less risk for the development of resistance.

Here is a list of our 'at risk' fungicides, arranged by chemical class/product and FRAC codes

Gavel	22
Phosphorus acid products: Prophyt, Phostrol, Fosphite, Rampart, Reveille, etc.	33
Quintec	13
Ranman	21
Revus, Revus Top	40, 40+3
Ridomil Gold/MZ, Ridomil Gold/Copper	4
Sterol inhibitors: Rally, Elite, Orius, Rhyme, Mettle, Tebuzol, Tebustar, Inspire Super, Revus Top, Aprovia Top, Luna Experience, Topguard EQ, Viticure, Trionic, Procure, etc	3
Strobilurins: Flint/Flint Extra, Sovran, Abound, Azaka, Quadris, Quadris Top, Pristine, Reason, Luna Sensation, Dexter Max, Topguard EQ, Intuity	11
Succinate dehydrogenase inhibitors: Luna Experience, Luna Sensation, Aprovia, Aprovia Top, Pristine, Endura, Miravis Prime	7
Torino	U6
Vivando, Prolivo	U8
Zampro	40+45

II) Trials to help with combating powdery mildew resistance

1) Add a *succinate dehydrogenase inhibitor* to your spray program.

In a simple trial we conducted on Concord last year, we compared several powdery mildew materials for efficacy on fruit around bloom: Quintec and Vivando (which we typically recommend for fruit

protection around bloom) were compared to Endura and Luna Experience (fungicides containing succinate dehydrogenase inhibitors or SDHIs). Luna Experience and Endura outperformed two rates of Vivando (10.3 and 15.4 fl oz/A), while Luna also outperformed Quintec. If you've not used any of the SDHIs and have been dissatisfied with mildew control lately, try an SDHI fungicide around bloom (Endura for juice varieties, Aprovia/Aprovia Top, Luna Experience/Sensation for wine varieties). The newer SDHIs (Luna, Aprovia) are likely to be *pricey,* but the older product, Endura, looks to be coming down in price significantly (just under $20/A, depending on supplier), making it more appealing to Concord and Niagara growers, who have likely never applied this chemistry to their acreage before. The best position (best "single shot" bang for your buck) for a single application of one of these SDHI materials would be at "first post bloom" spray, when fruit are most susceptible.

2) Use of Harvest More Urea Mate

In 2017, we started a three-year trial (Concord) to examine the integration of Harvest More Urea Mate (HMUM) into disease management programs for powdery mildew control, as well as effects on brix, yield, and grapevine nutritional status. Applications were made every 12-14 days, starting at 3-6" shoots, then 10-12" shoots, immediately before bloom, followed by 2 post bloom sprays (5 sprays total). There were 4 treatments: an unsprayed check, Harvest More Urea Mate alone (HMUM at 5 lbs/A), a standard rotational program (SRP) of conventional fungicides (rotations of Quintec, Vivando, and Tebustar), and a tank mix combination of HMUM x SRP.

Over 3 years, the average reductions in powdery mildew on fruit were 28.5% (HMUM), 50% (SRP), and 61% (HMUM x SRP). On leaves in August and September, reductions in mildew were 34.6 and 11.2% (HMUM), 73 and 30% (SRP), and 69.3 and 44.9% (HMUM x SRP), respectively. However, the apparent boost in control of powdery mildew with the addition of HMUM to the SRP (over the SRP alone), was not generally significant.

The takeaway: HMUM is not a fungicide but can enhance the efficacy of a Standard Rotational Program of conventional fungicides for powdery mildew control. When tank mixed with standard synthetic fungicides, its mode of action is generally thought to provide a measure of protection against resistance development by the powdery mildew fungus. However, within the 3-year trial, there are *still no clear beneficial effects* on yield, brix, or vine size associated with the addition of HMUM to a Concord spray program.

III) New fungicide for grape disease management: Lastly, let me introduce Cevya, a new sterol inhibitor (same FRAC class as tebuconazole, tetraconazole, difenoconazole, flutriafol, etc) that appears to be good to excellent on powdery mildew. However, its black rot activity has not been firmly defined. ***There is a caveat: the label states that it **cannot be applied to *Labrusca* and *Labrusca* hybrids**, so it is currently only for you *Vitis vinifera* growers. Not yet available for NY growers.

Pre-Exam Training and Test to Become a Certified Pesticide Applicator

CORE PESTICIDE TRAININGS

- PRE-REGISTER 3 DAYS PRIOR TO DESIRED EVENT -

Register by calling: Kelly Bourne at 585-268-7644 ext. 10 or email at klb288@cornell.edu or sign up online at: https://swnydlfc.cce.cornell.edu/events.php

For event information contact: Josh Putman, Field Crops Specialist, at 716-490-5572 or jap473@cornell.edu.

Workshop cost: $20/person
Checks payable to: SWNYDLFC
Pay by card through online registration.

Please plan to bring your own lunch as it will NOT be provided.

Training classes will be held on:

Thursday, March 26, 2020 from 8:30AM - 12PM
CCE-Chautauqua @ JCC-Carnahan Center
241 James Avenue
Jamestown, NY 14702

Thursday, April 2, 2020 from 8:30AM - 12PM
CCE-Steuben
20 East Morris Street
Bath, NY 14810

THE CERTIFICATION EXAM

Will be administered following each training from 1PM-4PM by **DEC** to qualified applicants.

Fee for the exam is $100.

Checks or money orders payable to **NYSDEC** the day of the exam.

To register for the exam, or for exam related questions, please contact:

Rob Freese (Jamestown event) at 716-851-7275 or Chris Wainwright (Bath event) at 607-622-8264.

You MUST pre-register for the exam!

All participants will need to have the most recent CORE manual and applicable category manuals.

**CORE and category training manuals are available through the Cornell Store by calling (800) 624-4080 or visiting: http://store.cornell.edu/c-876-manuals.aspx

3.0 Pesticide recertification credits in the CORE category have been applied for.

Participants looking to receive their applicators license must have experience working on their own farm, or through employment on another farm. **Participants must register directly with DEC to take the exam!**

If you have any questions on exam eligibility they will be answered by DEC representatives.

This training DOES NOT qualify for the 30 hour pre-test commercial training.

6592 W. Main Rd.
Portland NY 14769

Lake Erie Regional Grape Program Team Members:

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Jennifer Russo, (jjr268@cornell.edu) Viticulture Extension Specialist, 716.792.2800 ext 204
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