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## 2013 CCE Summer Internships

CATEGORY ARCHIVES: UNDER-VINE GROUNDCOVERS TO REDUCE HERBICIDE USE AND VINE VIGOR IN VINIFERA WINE GRAPES

# Penultimate Week

Posted on **August 12, 2013** by **mrg95@cornell.edu**

This week was extremely busy both in the office and out in the field. I authored another grower interview with Barbara Shinn, partner and vineyard manager at Shinn Estate Vineyard and Farmhouse. The article will appear on the research blog of the grape program here at the Long Island Horticulture Research and Extension Center. I have previously written about because she is rather an anomaly among growers on Long Island being a biodynamic grower. Having maintained under-vine cover for many years now, Barbara has many credible things to say about the practice and its role in more sustainable grape growing:

'We spoke with Barbara Shinn, owner and vineyard manager at Shinn Estate Vineyards, about her thoughts on under-vine covers. She has been maintaining an under-vine cover crop for just short of a decade now. This was not always the case: "We began maintaining under-trellis cover in all earnest in 2004, 4 years after we began planting the vineyard. At first we kept the growth mowed very low throughout the growing season believing that aggressive growth under the vines may prove unmanageable and hinder air flow. Now we understand the rhythm of our vineyard meadow." Shinn Estates utilizes a custom built under-vine mower to strike a balance between controlling aggressive weeds penetrating the fruit zone while remaining concurrent with her biodynamic approach to management : "We mow twice in quick succession in April and May then mow only once in June, July, and August for a total of 5 mowings per year. The important issue is timing the mowings in unison with the progression of the predominant pollinating species at any given time, as long as it is a species that you want to thrive on the vineyard floor. It is important to allow the pollinating species to set a hard seed thereby allowing them to complete a full life cycle. Pollen is quite important in maintaining beneficial insect habitat." Committing to a cover, however, did not come without some hesitation: "Ideally the under-vine cover crop should not consist of tall weeds that will inhabit the fruit zone of the vine. As the mowing becomes a standard practice in a given vineyard this concern basically disappears due to the fact that tall weeds can never set a hard seed. They are mowed before the seed head forms. With that said I tolerate some tall dry grasses that have gone to seed and late season flowering weeds that reach

the fruit zone." Within the lens of biodynamic philosophy, Barbara elected to allow for natural cover to initiate under the vine rather than seeding: "Every plant has an earth, water, air and fire zone. The earth zone is the root, water is the leaf, air is the flower, and fire is the fruit or seed. The earth and water are cool/watery elements and the air and fire are hot/dry. So when you think about this, you don't want a watery element in the fruit zone such as green grasses or broadleafs, we all know a watery element in the fruit zone is trouble. However a hot/dry element is probably fine. Late season dry grass seed heads or aster and goldenrod flowers have never proven to be a problem. This way of conceiving of plants by elements is a Biodynamic practice and has helped me make important decisions about our under-trellis biomass." Barbara decided that the most sensible option for under-vine cover was natural vegetation: "I believe opportunistic plants grow where they are needed so we have allowed natural cover to come in. We have about 20 grass species and over 40 broadleaf species on the vineyard floor. As the meadow evolves new plant species appear every year signaling a more complex ecosystem. I have interseeded clover twice in 13 years down the row middles in order to fix more nitrogen in the soil. Since shifting away from herbicides in 2004, she notes that the observed results have been favorable: "Quite frankly the entire vineyard has gone through a paradigm change and me along with it. To give a simple list in regards to the vineyard ecology: excess rain water uptake by shallow rooted opportunistic weeds, better soil tilth, increase in soil microorganisms and soil animals, lower requirements for outside soil amendments, beneficial insect population, less frequent hedging, a happier vineyard crew and a general sense of peace in the vineyard. In regards to the fruit and wine: earlier ripening, higher Brix, better native yeast population on the berries, and more balanced wines." Having been very pleased with her results since initiating and maintaining an under-vine cover, Barbara is optimistic about the potential sustainable progression that under-vine covers could foster style regionally and beyond: "If the East Coast can eliminate or at least greatly reduce herbicide dependence in vineyards, and I believe we can do this on a large scale, East Coast vineyards will constitute some of the healthiest farm soils in America. We are farming a permanent crop and a woody species at that; we don't require yearly tilling which destroys soil structure and the vines will out-compete weeds as long as the vineyard floor is maintained. Allowing the vineyard soil to regulate its natural cycles autonomously will bring about ecological balance that is hard to match by human hands. The theory of entropy is that eventually all order will turn to chaos but with natural cycles the fact is that all chaos will turn to order.'

The bulk of the week was spent in the fields finishing installation of side panel bird-netting. Quite a few varietals began veraison including Chardonnay, Sauvignon Blanc, Cabernet Sauvignon, and even trace amounts in Merlot. For white varieties, one cannot detect veraison by color change. Instead, one has to feel the cluster. If the skins are soft and the berry is somewhat squishy, then that signals veraison has begun.

At this point in the season, shoots on the vine are beginning to prepare for harsher weather in the coming weeks and winter months. More specifically, the exterior tissue of the shoots is beginning to lignify. Like berries, this can be visually detected on some varieties as shoots redden. Henceforth, shoots should theoretically be finished increasing in width, and hopefully, length. Conditions promoting excessive vigor, like plentiful rainfall in this region, will continue to spur shoot length growth. I conducted shoot caliper measurements, which is another key parameter that examines vine size for the under-vine cover crop trials. I utilized a digital tool that provides the width of the shoot.

After shoot caliper measurements, another round of enhanced point quadrant analysis readings had to be conducted that corresponds with the veraison period.

In my last week, there will be plenty of data to input and statistically analyze. I am quite eager to see some results, and hopefully some fruits of our labor. Now that bird netting is finished, I will have all the time in the world. But if there's anything I learned about vineyard management this summer, it's that there is always something that needs to be done.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**

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## Foxy Week

Posted on **August 4, 2013** by **mrg95@cornell.edu**

There are three mulch piles near the north end of the research vineyard at LIHREC. When you drive by them you can see that the middle pile has a sizable hole dug out in the middle of the pile. When I came roaring down the path toward the vineyard in the gator, I saw two drowsy eyes of a young fox blinking awake and bringing me into focus. Two other older, warier foxes were already dashing off toward a pile of building materials for safe cover from me. Unfortunately, I did not have my camera on me at the time to include a picture for this blog. Of course, when I did bring my camera to try to snap a picture of them during the remainder of the week, they must have already booked it for better cover by the time they heard the sound of the gator's engine.

Foxes are a threat to grapes just like birds. Unrelated and perhaps irrelevant, some grapes and their wines, typically those with native parentage, are said to have 'foxy' aromas. I've always wondered what that means. Anyway, when I told my boss about seeing the foxes, she grew apprehensive about the potential damage the den could do. It now became imperative to throw more bird netting up to mitigate the risk that the foxes pose. Much of the early part of my week was spent zipping threw the rows trimming lateral shoots and pulling leaves to prepare for installing the net. The latter part of the week was spent putting up the net and tying it in place with twist ties- rather tedious, but critical.

Another round of water samples for the cover crop trial was scheduled to be gathered this week. I pressurized lysimeters at Martha Clara and LIHREC, but few samples were pulled due to meager rains. It's possible that some of the lysimeters may be damaged or broken because no samples have been procured from them all season. I'm looking forward to the chance to participate in installing a replacement.

I also conducted a weed survey for the under-vine mowing trials being conducted at LIHREC. Summer annuals have begun to succeed winter annuals at this point in the season. The most pervasive weeds are hairy crabgrass

and purslane. Purslane happens to be edible and is one of the few plants that contain omega 3 fatty acids. Personally, I would not add any bits of purslane harvested from a vineyard to my salad knowing how we address pest and disease pressures. Seeing the spread of purslane, however, got me thinking about ways a grower could add value to his business with another crop under the vine. Such a practice could satisfy enhancing the three integral aspects of sustainability of an ag firm: environment, economics, and social equity.

My roommate and fellow intern at LIHEC, Drew, completed his last day this Friday. It was another reminder that my time grows short with each day. More varieties are coming closer to turning every day, and the earlier ripening varieties like Zweigelt are nearly finished turning. Check back for some pictures of beautiful, dark fruit this week.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**

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## Things Are Getting Sweeter Around Here

Posted on **July 30, 2013** by **mrg95@cornell.edu**

The fungal disease pressures in Long Island and throughout much of the Northeast are fierce due to climate and precipitation. Left untreated, these diseases can decimate a crop. Whatever growing style-organic, sustainable, or conventional- requires a strict spray schedule from beginning to end of season. This is coupled with intensive hand and machine labor for conducive canopy management to alleviate these pressures as best one can given site conditions and weather. Of course, it gets even trickier with insects and mites, especially if they affect the cluster and not just vegetative growth. These, too, will range from season start to end.

But it doesn't stop there! What if I told you there was a pest as fierce as a fungus, as mobile as a moth, and swoops in and out of the vineyard in a couple blinks of an eye? Enough of these pests together can destroy a crop overnight, and just one of them could wipe out a costly amount terrifyingly quickly. Behold:

— Berry Connoisseur

Some cultivars ripen earlier than others, and many of those designated as ‘early ripening’ are beginning to go through veraison. At this point, sugars will begin to accumulate while acids in the berry begin to diminish. One can visualize the ripening process as many of the berries begin to turn color as anthocyanin pigments also accumulate in the berry. This Marquette cluster was one of the first clusters illustrating veraison in the research vineyard:

My interests in plants was sparked by learning of many simply wonderful examples of evolution. I love veraison because I think it’s an elegant example of co-evolution in wildlife. Birds and other wildlife know that the berry is nutritious and delicious to eat when it turns color, and that coincides with mature enough seeds to be disseminated perhaps on your windshield.

Most places use nets to control as best as possible against grapes. There are other methods, like bird canons: http://www.youtube.com/watch?v=3_YPpcCQZGY. Birds also facilitate other rots and diseases as pathogens fester in the wounded berries. These can quickly spread to healthier berries that the birds left behind.

Bird netting went up on early ripening varieties like Dornfelder, Zeweigelt, and Pinot Noir. A few years ago, the viticulturalists at LIHREC conducted experiments on the effects of styles of bird net on ripening, since many are essentially shade cloth. This is another example of the pertinent and useful research Alice Wise and Libby Tarleton conduct here:

Here's a before and after shot of some side panel bird netting we installed:

It is not a perfect control as many birds will still peck from the sides, but it is certainly better than nothing. These nets are also useful to prevent loss from raccoon, opossums, foxes, and any other animals with a taste for grapes.

Much of my time henceforth will be pulling leaves and trimming lateral shoots to prepare for installing bird netting in addition to installing it. There is still plenty of data to be collected and processed for the trial, like more lysimeter samples, weed surveys, and shoot caliper readings. The berries beginning to turn, however, is a sign that my time is quickly passing.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**

# Heat Hath No Mercy

Posted on **July 22, 2013** by **mrg95@cornell.edu**

The heat and humidity this week was sweltering and thick. It was on everyone's minds from start to finish. What time the crew and I did bear out in the field was spent on a concerted push to manage the canopy in anticipation of the second hedging of the season. Where growth is sparse and thin, we tucked lateral shoots where otherwise the hedger or our hands would thin them off. Generally, excessive lateral shoot development is indicative or excessively vigorous vines. Lateral shoots can shade the cluster zone and congest the canopy. The latter condition often results in greater disease pressure due to reduced canopy circulation and spray deposition. Much time was spent positioning and re-positioning shoots as straight as possible, which helps the hedger get a cleaner, straighter cut. Mechanization creates major buzz in viticulture where labor costs often are the most expensive in the budget statements. One is hard pressed to find a vertical shoot positioning machine. Plenty other types exist though: http://www.fresnostate.edu/jcast/ve/documents/pdf/RIEGER-MechanicalPruning.pdf

At this point, I think I've written enough about tucking and positioning shoots. If any readers are especially curious, or are visual learners, I'd love for you to come on over to the vineyard where I can show you how to do it and then watch to make sure you don't mess up at some point amid the 2 acres…

I took a visit out to Corwith Vineyards in Water Mill, NY a week ago, where I met vineyard manager Dave Corwith. A pilot by trade, Dave recently planted a couple acres of some Austrian varieties like Lemberger, as well as various hybrid varieties. I was there to discuss his floor management strategies. Rather than herbicide or seed a cover crop, Dave has thus far chosen to cultivate beneath the vines to control weeds. He let me operate his 'weed badger' first hand: https://docs.google.com/a/cornell.edu/file/d/0B_ZWf_syAz8IODBPOEVsczRCaGs/edit

The operator has a joy stick to swing the badger back to avoid taking out a vine. Focus is critical. An awesome feature is the ability to tilt the badger in toward the tractor or out, which allows a grower to hill up or down. In cold climates like the Finger Lakes, this practice is essential to protect the graft union.

Cultivating as a floor management tactic has plenty of drawbacks for the soil health of a vineyard. The practice itself destroys soil structure, which increases risk of erosion, compaction, and soil crusting. Much research is being conducted regarding effects on the soil biota. Each pass with the cultivator essentially prepares a fresh new seedbed for weeds to germinate.

The beauty of a weed badger: an attachment exists to convert to an under-vine mower.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**

# Put Your Shoots Up and Drop That Cluster

Posted on **July 16, 2013** by **mrg95@cornell.edu**

After a long July 4th weekend, I kicked it right back into gear last Monday back into the research vineyard at LIHREC. The crux of the research conducted in vineyard is to observe how well certain varieties thrive in the region. This lends to a great deal of difficulty from a vineyard management context because there is virtually no uniformity within the blocks. Consequently, my bosses love having interns because these conditions dictate lots of hand labor. In half of one row, five vines look drought stressed, four vines manifest some sort of nutrient deficiency, and eight vines look excessively vigorous. For vines that look especially anemic, stressed, or had set a great deal of fruit, we've reached the point of the season to cluster thin if need be. The status quo of viticulture through much of the world relays that lower yields lead to higher quality fruit, yet there is little science to support this notion. In fact, published studies exist suggesting the opposite. What it comes down to is vine balance, or the degree of reproductive growth versus vegetative growth. While it's rather heart-wrenching to execute, I had to go through the vineyard to the heavily cropped varieties this year and snip clusters off. With these vines, there was simply not enough leaves to support adequate ripening of the fruit. We had to take measures to address the balance in this season. If you cluster thin too early, the vine will compensate with bigger berries. Since Long Island is an enormous steam room in the summer, the bigger berries result in more compact clusters, and thus there are great fungal disease pressures. If you cluster thin too late in the season, the vine may not have time to respond physiologically that will benefit ripening. A tough decision may have to be made in vineyard management every day. In the industry, the simple practice of cluster thinning is not so simple in the context of sustaining the business. Check out this overview of research conducted by Trent Prezler, CEO of the local estate winery Bedell Cellars: http://agribusiness.dyson.cornell.edu/docs/pub/trade/RIPE-Econ-Cluster-Rem.pdf

If cluster thinning is necessary to conduct, one must consider increasing vine size to support the productive tendencies of this vines so that we can benefit from the higher yields coupled with sufficient ripening. Vineyard management is a balancing act.

On Tuesday, my professors Justine Vanden Heuvel (also my adviser) and Wayne Wilcox came down with their grad students to visit and tour the research trials. We all had an absolutely wonderful hopping from vineyard to vineyard that host cover crop and leaf pulling trials. The night was capped with a lovely dinner of ever-fresh seafood available on Long Island. I was able to interview Justine's grad student Lindsay Jordan, who is researching under-vine cover crop varieties for her masters. I'm drafting up a lengthy article about her's and other research on the subject on the east coast for publication. I'm looking forward to posting up here too!

I'm interested in grower feedback about research in under-vine cover crops and what vision each may have for their vineyard in the coming years. Here's an excerpt of an interview I did with Jim Thompson, vineyard manager at Martha Clara Vineyards, that will be posted on my supervisor's research blog:

Prompted by observing practices in the western US and Europe, Jim has been interested in alley and under-vine cover crops for many years. The exposure led him to critically reflect on the impact of conventional practices involving herbicide use: "As it became more obvious that herbicides were going to become an issue for growers, like leaching, disruption of the dynamics of the ecosystem on the vineyard floor…and it became more popular to think about these issues, I felt that [covercrops] just made sense."

Jim was confident that the vines thrived where he observed cover cropping techniques. He recognized the relevance such strategies could have in his own vineyard: "[My] vines are crazy vigorous, and in a region where some years you can get 10 inches of rain in June, what better way to soak up some of that water than these cover crops."

Jim has experimented with wall to wall cover crops in years past, but he primarily maintains an herbicide strip under the vine. As he continuously follows under-vine cover crop research, I asked him if he considered the results positive such that he may be ready to adopt the practice: "Encouraging, but not positive. We haven't hit it yet as far as I'm concerned." As to what particularly concerns him, Jim replied: "Simply the management of them. As they get too tall and get too close to the bottom of the vines, an issue is moisture retained by those ground covers that transpires into the canopy. If the soil is bare, then that would never happen. There's more to think about."

Grower feedback is critical for research conducted by CCE as the underlying mission of the organization is grower benefit. I look forward to posting more interviews when I do some traveling of the region in the coming weeks.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**

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## Hard Knocks for Merlot

Posted on **July 10, 2013** by **mrg95@cornell.edu**

Most of the vines in our vineyard are European in origin, so they refused to take the day off on the 4th. That's the best I got for a vine joke. Thankfully I, however, had the day off on Thursday to further my education tasting some local wines and toasted to the founding fathers. I could always use more practice with sensory description. Yet there was plenty to get done this week on limited time.

It is no secret that vineyard labor can be monotonous, and recounting my tasks from day to day as I have done in posts from weeks past undoubtedly may reflect that. So, I thought that this week I would change it up and feature some material I have investigated based on some observations of many vineyards in the area.

This year, we have witnessed poor fruit set in certain varieties. Fruit set refers to the degree to which flowers will

proceed to developing berries. In particular, Merlot was plagued heavily as well as the Syrah vines in our research plot at Martha Clara. Merlot tends to be sensitive and expressive of a range of issues relative to other varieties for reasons why that are not explicitly clear. This led me to question causal factors of poor fruit set. Check out this great article from Illinois extension summarizing the process of fruit set itself as well as factors affecting it: http://www.extension.org/pages/33106/causes-of-poor-fruit-set-in-grapes

The motif of the season up until fruit set has been persistent wet and overcast conditions. Early in the season near bud break, the temperature in the region was uncharacteristically cool. I can confidently say that the poor fruit set in Merlot is attributed to these climatic conditions. Merlot's vegetative growth early in the season was observably anemic, and conditions through bloom were mostly overcast with some sporadic rain. Therefore the C:N ratio did not seem to be conducive for Merlot to grace us with its bounty. Merlot relative to other varieties just must be particularly reactive to such conditions. The Syrah block, however, expresses excessive vigor, and so the C:N ratio was likely higher than ideal. Excessive vigor, a prominent issue I have been exposed to while studying in the Finger Lakes, leads to a vicious cycle of poor cluster development. Because fruit set is poor, clusters won't effectively compete with shoot tips for nutrients throughout the season. Therefore shoot vigor will continue to burgeon. Shading of the fruiting zone from unruly and freakishly long shoots results in poor bud fertility in the next season. Again, less clusters leads to higher vigor, and then higher vigor leads to poorer set, and so on and so forth year to year. As a manager, one can't control the sun, but nutrient status, at least on the lighter Long Island soils, can more easily be managed.

If you're ever eating out and this happens to you, now you may scientifically know why: "We're Out of Merlot"

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**, **_Uncategorized**

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## Week 4: 'This Vineyard Smells Fishy," and Bug Hunting

Posted on **July 1, 2013** by **mrg95@cornell.edu**

It's hard to believe another week of my internship has come to pass, and what a busy week it was! One of my duties earlier this week was to scout the research vineyard at LIREC to document the phenological progress of the many varieties and clones cultivated there. Coursing up and down the rows, I became conscious of certain feelings of attachment and pride for the vines as I observed many transgressing from bloom into fruit set. While I didn't plant these vines, or prune them in freezing temperatures this past winter, or apply the last spray that staved off potentially crippling diseases, these feelings have been cultivated during the hours I have spent tending them in the first three weeks. Such sensations sculpt my interests and ambitions in agriculture. I imagine the satisfaction and gratification of what it must be like to manage a vineyard and observe the progression from year to year, especially when one has planted a vine and nurtures it to its first season of full crop. Semantic mental digressions like this combat the monotony of vineyard work.

For the first time in this drenched season, there was a brief dry spell this week. Shoot growth slowed relative to the rapidity of the previous three wet weeks. I spent the majority of this sunny time managing the canopy via shoot positioning. This consists of making sure shoots are tucked into the catch wires as well as untangling bunched and congested regions along the cane or cordon. The cane-pruned VSP system predominating in this vineyard commonly results in apical dominance, and thus congested regions often occur at the distal portion of the cane. Some varieties like Cabernet Sauvignon and Syrah cop some attitude during the season and do not care to grow shoots very vertically. One has to carefully pull and straighten these shoots up into the catch wires as best and possible. Breakage is unfortunately common. Catch wires are then repeatedly clipped together to keep the shoots in place. Positioning the shoots serves to improve light exposure, circulation, and spray deposition in canopy. Clipping the wires, I learned, also protects wires from snapping during mechanical hedging.

Besides getting a little dirty this week, I got smelly too. For the newly planted vines, or what we like to call “babies,” I applied some liquid fish hydrolysate, or more simply, ground up fish. As you may have ascertained, this is an organic fertilizer, which you will quickly affirm with a whiff.

— Hand Fertilizing Year One Vines with Fish Oil Solution

I was very fortunate this week to be able to go out scouting for pests at Harbes family vineyard with Ken, a technician at CCE-Suffolk County. Getting up close and personal with the vines to scope out pests is probably the best way to learn about grape pests and how to most effectively manage them. Ken and I observed extensive potato leaf hopper presence and damage. Distal portions of shoots of their Merlot and Chardonnay plantings appeared pale yellow, which could pass for a nutrient deficiency. It was, however, extensive hopper damage. I also observed this funky critter:

The name of this insect, a hornworm, comes from the glaring appendage on its backside. They feed on leaves, and so young vines with limited leaf area are especially susceptible. Additionally, I observed a single grape berry moth larvae. One can detect the larvae on a blossoming cluster when the cluster bunches in a localized area and is covered with a web like exudate. Research has demonstrated that the first grape berry moth generation typically emerges when growing degree days reach between 800-850. Sure enough, that occurred this week on the North Fork. Grape Berry Moth infestations are particularly strong on rows bordering near woods since they overwinter in vegetation there. This is known as the 'edge effect.' Growers often implement sustainable practices by fluctuating their spray rates due to the phenomenon.

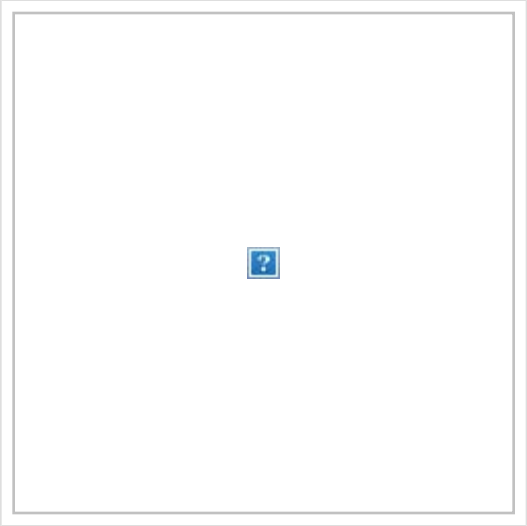
Check back soon for pictures and posts about my trip to a local biodynamic vineyard, as well as updates from my research project. Cheers!

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**, **_Uncategorized**

# Week Three: “Earth laughs in flowers.” -Ralph Waldo Emerson

Posted on **June 25, 2013** by **mrg95@cornell.edu**

What an exciting time in the vineyard here at LIREC! Nearly all of the vines have bloomed, and the Marquette plantings have even progressed into fruit set. As we scouted the vineyard, my supervisor Alice Wise continually iterated to me the importance of sound pest control during this stage of the season as it is the time when vines are at the greatest risk for powdery mildew. Given wet, warm, and humid conditions, downy mildew can also wreak havoc, as well as black rot and Botrytis to a lesser extent. Primary infections of Botrytis on the cluster may occur at this critical stage, but may not manifest symptoms until far later in the season, as the infection has a proclivity to remain latent. Additionally, we have observed a strong presence of potato leafhoppers. Symptoms of this infestation manifest as marginal chlorosis on the leaves. Alice noted that it is difficult to distinguish between potato leafhopper damage and vine nutrition issues resulting from poor nutrient mobilization early due to successive, heavy rains early in the season. When shaking the catch wires, however, we often witnessed a couple potato leafhoppers fall to the soil. Here’s a picture of a typical adult:



They can’t bear the frigid New York winters, but each year they ride wind currents up from the south and may aptly establish economically detrimental populations in a vineyard.

One of my greatest interests of viticutlure is soil and nutrient management. This week, I was very excited to be able to conduct my first run of petiole collections to ascertain vine nutrient status of my project’s Syrah trials at Martha Clara Vineyards and Merlot trials at the LIREC research vineyard. While soil samples were taken earlier in the spring and analyzed for nutrient content, these results do not provide the grower with the full nutrient story. Soil

tests will indicate the potential total nutrient content of that site, but that will not translate to what is available to the vine and what the vine will uptake. That's why we need to take petiole samples, which provide the grower with the nutrient status of the vines themselves. Comparing the soil tests to the petiole tests provides the grower with the most thorough information and best aids in making sound management decisions. In case you were wondering, this is what over 1,000 petioles looks like:

— Stems of my Labor

— More Stems of my Labor

Conventional vineyard management wisdom states that bloom is the best time to take petiole samples for vine nutrient status since the grower will still probably be left with enough time to make effective additions if test results indicate that additions are necessary. To put it more simply, fertilizing later in the season may not have an effect on vine development and fruit quality to justify the addition. I look forward to publishing the results of the petiole tests when we get them back from the lab.

For the fourth week of my internship, I'm devoting focus to preparing for grower interviews about their experience and thoughts on undervine cover crops. The plan is to post some video footage of those interviews on this blog, so be sure to check back soon!

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**, **_Uncategorized**

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## Week Two: Vine Pampering

Posted on **June 24, 2013** by **mrg95@cornell.edu**

Rain dampened eager efforts to get out in the field and manage the canopy at a critical time when bloom is imminent. The crew and I devoted a good deal of time tucking shoots into the trellis catch wires. Many shoots are reaching lengths of two to three feet at this point in the season, which makes them difficult to tuck between the catch wires without shoot breakage. One would hear an "oh shucks," or a "darn it" sporadically from within the rows and witness a snapped shoot drop to the ground. The heavy rains spurred a rapid growth spurt in the past week. I've spent time thinning buds and suckers off the trunks in the intermittent dry periods. It is important to disbud and sucker vines to limit the risk of glyphosate injury in current and subsequent seasons.

I continued collecting data for the mowing and ground cover trials in the research vineyard and at Martha Clara Vineyards. I now have three sets of shoot measurements and two sets of lysimeter samples. The current lysimeter samples will be sent to the lab and analyzed for nitrite/nitrate concentrations.

During my time in Long Island, I hope to initiate and execute an undergraduate thesis project related to the projects with which I am assisting. With the rain unrelenting through much of the later portion of the week, I was able to sit down and construct an outline. The project will involve an enhanced point quadrant analysis of the different floor management trials at Martha Clara. The goal of the study will be to investigate effects of different floor management techniques on canopy microclimate.

To conclude the week, my supervisor, Alice Wise, begun yet another study. It will look at the effects of severe leaf pull on cluster architecture. In other words, what will happen to the cluster if we remove the first six leaves of the shoot? A study conducted by Palliotti et al. titled "Early Leaf Removal to Improve Vineyard Efficiency: Gas Exchange, Source-to-Sink Balance, and Reserve Storage Responses" demonstrated that removing those six leaves early in the season actually improved fruit quality and may aid in expanding the rachises. These elongated rachises mitigate the degree of cluster compactness, and thus may decrease fungal disease pressures. Here are some pictures of the trials after leaf removal:

— Leaves and lateral shoots are removed from the first six nodes starting at the basal end.

— A close-up shot of severely defoliated Chardonnay vines.

It's like giving the vines a summer buzz cut! We all found it really hard to believe we weren't killing or inflicting a major wound on the vines. I guess that really remains to be seen, and I sure hope it can stave off devastating sour rot later in the season. The question is whether or not it can be economically viable since many mechanical leaf pullers cannot perform so extensively. Vineyard Management sure is a tricky business.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**, **_Uncategorized**

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## Off and Running

Posted on **June 9, 2013** by **mrg95@cornell.edu**

Greetings and welcome to the first installment of my blog for my summer internship at the Long Island Research and Extension Center! Under the direction and guidance of resident viticulturalist Alice Wise and her assistant Libby Tarleton, I'll be devoting my time to conducting and maintaining ongoing research trials concerning under-vine cover crop and under-vine mowing trials. Leaching of fertilizers and pesticides into the ground water is of paramount concern in Long Island as their primary source of water is a series of underground aquifers. The depth to some of these aquifers beneath the soil surface is quite shallow. The idea behind the use of under-vine cover crops is simple and practical: it may reduce inputs for the farmer, and thus may be a more economically and environmental sustainable practice. Specifically, the farmer may reduce his need to apply herbicides beneath the vine due to the efficacy of cover crops to suppress local weed pressures. Additionally, certain cover crop species or mixes of species may eliminate the need for the grower to purchase or operate an under-vine mower. Finally, it is possible that root systems of these cover crops may serve as an agent to sequester potential leachates. In plots within the research vineyard at LIREC as well as in various local vineyards, my project is looking at the effectiveness of certain common cover crops such as dutch white clover and a "low grow, no mow" fescue in accomplishing the aforementioned aims.

Alice and Libby wasted no time in immersing me in the project on my first day at the beginning of this week. We visited all the plots located in local vineyards in the area where I got to meet some vineyard managers. Throughout the week, I garnered experience with data collection via taking shoot measurements, surveying for weed populations, and collecting water samples from lysimeters to send to a lab to assay for nitrate concentrations.

On Thursday, I traveled to Bedell Cellars where the Long Island Sustainable Winegrowing association celebrated their one year anniversary. Its mission is to codify sustainable winegrowing practices specific to the characteristics of the region, and to additionally accredit and regulate local firms wishing to participate. The body is the first of its kind in New York State while similar programs exist on the West Coast.

I am very much looking forward to garnering invaluable experience in designing and executing vineyard experiments that have great implications for growers and local communities. Moreover, I am eager to continue to expand my knowledge and skill set of viticulture and vineyard management. It will be an amazing opportunity to interact with local vineyard managers who are masters of their craft.

In the coming weeks, check back for more posts and updates regarding the ongoing experiments. I also plan to post pictures, videos, and interviews with local growers to provide viewers with exposure to the blossoming viticulture industry on Long Island.

Posted in **Under-vine Groundcovers to Reduce Herbicide Use and Vine Vigor in Vinifera Wine Grapes**, **_Uncategorized**