GRAPE PRESS

Winter 2020 | The Quarterly Newsletter of the VIRGINIA VINEYARDS ASSOCIATION | Vol. 36 No. 4

Spotted Lanternfly Advancing in Virginia

The area in Virginia infested by spotted lanternfly (adult seen at right) has grown from one square mile in June 2018 to 108 square miles in October 2020. Virginia Tech fruit entomologist Douglas G. Pfeiffer provides an in-depth review of the pest and control measures. **Page 11.**

Photos courtesy of Douglas G. Pfeiffer

Among cultivated crops, grapes are at the highest risk, being a highly preferred host, second only to the tree-of-heaven (TOH). Above, young TOH sprouts after mature TOH was cut down.

WINEMAKERS RESEARCH EXCHANGE

Trial Evaluates Optimum Time To Harvest Dry Petit Manseng

By Joy Ting
Research Enologist and Coordinator, Winemakers Research Exchange

It is not easy to define when grapes are truly mature. The plant's definition of maturity (the seeds are capable of germinating and ready for dispersal) may be different from the one used by viticulturists (sugar, acid, and aromas have developed to be able to produce a pleasing wine). (1,2)

The changes in primary and secondary metabolites in grapes during ripening are complex, with many layers of hormonal control determined by both genetic and environmental factors (1–4). A number of processes are at work during berry development that eventually lead to ripeness (see Figure 1 on page 9).

Sugar accumulation begins after veraison and continues rapidly up to a point, but eventually levels off. Water is used to transport sugar into grapes, leading to rapid enlargement of berry size during this time. Tartaric and malic acids are formed early in berry development,

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President's Corner

Annual Meeting To Focus on Soil Health

By Nate Walsh
Walsh Family Wine

The VVA will host our first virtual Winter Technical Meeting on the mornings of Feb. 25 and 26, 2021. With the uncertainly of public health, we want to focus exclusively on curating an informative, interesting, and constructive presentation while still doing our part to keep everyone as safe and healthy as possible.

We are aware that the networking and social aspects of the VVA's technical meetings have always been a big part of the allure. We can't mimic them this year, but what we can do is pare the presentations down to their core, with an information-packed, no-filler event.

On Feb. 25, we will present a half-day collection of seminars focused on soil health, both

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INSIDE

PRESIDENT'S CORNER (cont.)

PRESIDENT, from page 1

broadly speaking and through a viticultural lens. As vineyards mature into their "middle age," so to speak, growers find it more and more important to focus on aspects of growing that promote consistent vine health and yields. The nourishing of healthy soils, while admittedly still existing in a bit of a gray area for Virginia viticulture, should be of concern to anybody planning to farm an individual plot for decades.

As always, the Winter Technical Meeting will feature updates on new research in Virginia, as well as on Spotted Lanternfly, disease and spray management, the Winemaker's Research Exchange, the new Sentinel Vineyard Project, and more. These presentations will be on Feb. 26. We will also present our annual Grower of the Year award. Registration for the Winter Technical Meeting will open in mid-January — but please save those dates now.

During the meeting, we'll also announce the results of balloting for three open VVA board positions — president, treasurer, and one at-large member. While the deadline for nominations will have passed by the time this issue of Grape Press is published, please do not hesitate to reach out to the board to learn more about becoming active within the VVA if you have an interest in helping to serve the Virginia grape growing industry.

IN MEMORIAM

Paul Krop, Good Luck Cellars

Paul Krop, winemaker and co-founder and co-owner of Good Luck Cellars in Kilmarnock, passed away on Oct. 28. Paul was an active member of the Virginia Vineyards Association and a familiar face at VVA meetings. He was also a frequent and valued contributor to the VVA's quarterly newsletter, Grape Press.

An orthopeadic surgeon, Paul co-founded Atlantic Orthopaedic Associates in 1983, and was recognized for professional excellence by his peers, who elected him President of the Virginia Orthopaedic Society and presented him with the Virginia Orthopaedic Society Career Award.

In 2011, Paul and his wife, Katie, opened Good Luck Cellars after spending six years planting and tending vines and building a winery that produces award-winning wines.

Learn more about Paul.

Monique MacEachin/Good Luck Cellars

NORTHERN VA. "For my vineyard, quality across the board was very nice..."

By Dean Triplett
Greenstone Vineyard

As 2020 comes to an end — and not too soon, many would say — it's time to look back on our just-completed harvest. One winemaker I've talked to here in Loudoun County described this growing season as a good one for fruit — if you had any.

The frost events of last spring really hit a number of vineyards hard up here. Not as hard as many of the vineyards in Central Virginia, but bad enough. However, if you were lucky like me, this year's harvest was a very good one.

For my vineyard, quality across the board was very nice and quantities were higher than average on nearly all my varieties. And this was in spite of a rather challenging pre-harvest period.

However, as wet as August was, September turned into a very good month for ripening fruit. Starting around Sept. 9, daytime temperatures dropped into the 60s and 70s and into the 50s at night, straight through October. These cooler day and night temperatures allowed for nice flavor development.

Toward the end of September, sugar and acid production started slowing to a crawl and then hit a plateau in October. Flavors, however, continued to develop slowly but nicely. To put the weather situation in perspective, August was the eighth warmest month on record and precipitation was 216 percent above average.

While September temperatures were above average, it was the coolest September since 2013 with precipitation 58 percent of normal. October temperatures were above average, but still the coolest since 2018, and precipitation was 109 percent of normal with less than 3 inches of rain. At my vineyard, the first freeze arrived on Nov. 18, when it got down to 30 degrees. As I write this piece at the beginning of December, that is still the coldest day I've experienced this growing season.

As was the case when I wrote my last regional report, I haven't had much of a chance to meet up with my fellow growers due to the Covid-19 situation. What I have heard from growers, however, seems to mirror my experiences regarding fruit quality and yields.

One very good thing I have heard is that visitation at many of our wineries has increased significantly this fall. With the overall beautiful weather of September and October, many people here took off for wine country. Wineries for their part have been doing an excellent job of maintaining social distancing of their guests.

One winemaker I talked to said that at her winery, Mother's Day is usually the busiest day of the year. With Mother's Day pretty much a bust this year, Labor Day turned out to be the busiest day she has ever had! With the approach of winter weather, however, it will be interesting to see how wineries cope.

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NORTHERN VA. (cont.)

NORTHERN, from page 3

I've heard of more than one that will just be shutting the doors for most of January and February.

I have had the pleasure of communicating with one of my long-term customers, Katie DeSouza Henley, winemaker and owner of Casanel Vineyards & Winery. I asked Katie to give me some of her thoughts about the 2020 season and harvest.

She said everything in the vineyard looked good with the exception of her Chardonnay. She, along with a number of other growers, took a heavy loss in this variety because of the April/May frosts. Katie said she experienced six total frost events during this period. After bloom, throughout veraison and up to harvest, her team closely monitored her Chard, as well as the Merlot and Cab Sauv that she purchases from me for her rosé production.

In my vineyard for example they tested multiple samples on individual berries and clusters. Katie noted the same lower levels of pH and slowly creeping Brix levels that I did, which allowed her to let the fruit hang a bit longer than in previous years. One interesting thing she noticed during harvest was the very high dew points.

I have to agree with her. It seemed like every morning or evening, when you walked the vineyard your shoes got soaking wet. For me, this was one reason I kept up my spray program as long as I did. Downy mildew can go crazy in this situation.

As September progressed, we worried about the threat of hurricanes (we dodged a few), insects, and the usual deer and raccoon concerns.

Because of these conditions, plus the dew situation and the chance of compromised skin integrity, she decided to pick my fruit on Sept. 17. Her usual procedure is to store fruit overnight in a cold room with processing taking place the next day. Fortunately, the condition of the fruit was good enough that minimal sorting was needed.

She cold soaked the fruit for three days and fermented low and slow for 43 days, keeping the temperature around the mid 50s. The fermented juice went into stainless steel and should be ready for bottling in the early spring. Katie went on to say that her grape varieties for red wine production are showing amazing color and very nice anthocyanin production this year.

Overall yields were pretty much the same as in 2019 with some exceptions. This was the first year that she has had excess Norton and Carménère production. She thinks minimal rainfall at fruit set contributed to the increase. Katie and her husband, Tyler Henley, are very diligent growers and winemakers and it shows in the wine they produce. And besides being good people to know and work with, Katie and Tyler understand the vagaries of grape growing in Virginia and know that each year brings its own set of challenges.

Another client I've been able to talk with is Bill Hatch of Zephaniah Farm Vineyard, who purchases my Petit Verdot. Bill noticed an unusual occurrence with all of his red wine grapes expect Chambourcin. While the fruit came in with nice flavors, the pH readings were on the low side. For the most part they were in the 3.4-3.5 range.

Bill co-ferments his reds, so malolactic fermentation was conducted along with his primary fermentation. After the wines completed both fermentations, the pH had jumped to 3.9 and higher. He sent samples out to be analyzed both before and after fermentation. It appears that the fruit had a higher concentration of malic acid than normal so that once ML fermentation was complete, the pH just shot through the roof.

Bill doesn't like to make acid additions, preferring to blend in higher acid wines to balance out the finished wine. He intends to do the same this year, but with so many of his reds having the same issue, it may be a bit trickier than normal.

With all that's been going on, and succumbing to a bit of cabin fever, I ventured out and visited Three Creeks Winery, a new operation just about 2 miles from my vineyard. P-J and John Lawrence purchased the property, a former dairy farm, three years ago and have since planted roughly 8.5 acres of vines.

First in was Cab Franc, which they planted in 2018 after clearing and working the overgrown property. In 2019 they planted Petit Verdot, Cab Sauv, Merlot, Viognier, Chardonnay, Petit Manseng and a bit more Cab Franc. All the vines are on 101-14 rootstock and VSP trained.

They plan on finishing out the planting to give them a total of 10 acres. They also very wisely put up an eight-foot tall wire mesh fence around the entire vineyard. Given the critter issues we have up here, I can't recommend this enough to new growers.

The thing I find very interesting is that they planted the vineyard with what are called medium and tall vines from a nursery in California. By medium and tall, I mean that the dormant vines consist of a two-year-old rootstock, approximately 30 inches tall, with scion wood grafted onto the top portion of the rootstock.

"The thing I find very interesting is that they (the owners of Three Creeks Winery) planted the vineyard with what are called medium and tall vines ..."

This gives you a vine at planting that has the scion wood already at the cordon wire. Since the trunk is already formed, the growth from the scion can be trained to the main cordon wire immediately. The advantages are a vine that can, under good growing conditions, produce a crop in two or three years. It also allows for a very uniform vineyard with easier under-the-trellis weed control.

I've heard of other California nurseries producing similar grapevines but have never seen any planted in Virginia. The vineyard is very well maintained and looks very nice. I will be curious to see if they have any issues given our sometimes crazy winter weather.

P-J and John have designed and built a very pretty and well-thought-out winery. The production facility is in a new metal building and the old barn has been very nicely refurbished and turned into the tasting room. They have created lots of outdoor spaces for guests with plenty of places to sit and look out over one of three creeks.

And the wines they've produced so far are very nice, with my two favorites being their Chardonnay and Petit Verdot. P-J and John have sunk a lot of time, effort and expense in what I think is a lovely addition to Loudoun's wine country. It's very nice seeing folks bringing back to life an old dairy farm and repurposing it the way they have.

As the year ends, I'm pretty sure not too many of us will miss 2020. But from a wine growing perspective, I've been very fortunate and can't complain one bit. Now let's all hope we have a mild winter and just get to 2021 healthy and safe!

Editor's Note: *Dean Triplett is a regional reporter for Grape Press, covering Northern Virginia. We hope to feature more news about Northern Virginia's vineyards and wineries in future columns. Please contact Dean at* ***gsvineyard13@gmail.com*** *if you'd like to provide information for upcoming columns about growing conditions, new plantings or anything else you think would be of interest to other growers.*

CENTRAL VA: "Another feature of the 2020 season was the delayed ripening."

By Grayson Poats
Valley Road Vineyards

December has arrived. It's a time when we traditionally take a look back at the previous twelve months, at both the highs and the lows, to see what lessons we may learn that can inform our decisions as we move into and through the new year. While I am mightily tempted to skip all that — because, let's face it, 2020 wasn't the best of years for a lot of reasons — I think it best to put on our big boy pants and take that hard look back.

The big story in this section of Virginia was the devastating freeze of Mother's Day morning. A frost that late in the season is pretty rare and most varieties were showing growth of 6-12 inches.

This unsettling fact was compounded by the severity of the freeze with multiple sites that had temperatures drop to as low as 26 degrees and stay there for several hours. This event featured a radiational freeze with no breeze for the several hours that temperatures remained below the freezing mark, plus a very high inversion layer.

As a result, even those vineyards that employed wind machines or vineyard candles saw little-to-no positive effect from their efforts. Only those vineyards at altitudes above 950-1000 feet were saved from widespread damage. Vineyards below that point saw a destruction of 30-80 percent of their primary buds.

While I make no claim to be able to predict exactly what our climate will look like over the next twenty years, it does seem that wide temperature swings and perhaps an increased risk of spring frosts may be part of that scenario.

I think most of us saw vines pushing water as we did our dormant pruning in February and even, in some cases, in January. That was a cause of justified concern for either an early bud break and prolonged exposure to a potential spring freeze or to a return of the damage caused by the polar vortex situation of 2014 and 2015.

With this in mind, I would recommend that each of us think about our current vineyard blocks (as well as possible future sites) and consider what steps, both active and passive, we might take to lessen our exposure to future frost events.

It is beyond the scope of this report to go into much detail regarding the options that are available to you. However, it is important to keep in mind that not all frost/freeze events are the same and remedies that work for one type of event may not work for another. One resource that I found helpful was **"Vineyard Frost Protection" from University of Georgia Extension**.

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CENTRAL VA. (cont.)

CENTRAL, from page 5

Another feature of the 2020 season was the delayed ripening we saw in most of the vineyards in Central Virginia. This aspect of the season was very much linked to the cooler than average temperatures we experienced in April and May and of course the Mother's Day freeze, which got us off to a very slow start.

Despite more normal summertime temperatures in July, we never seemed to catch up in terms of heat accumulation in the vines, which resulted in some strange grape chemistry, as we saw when samples were taken during veraison.

Brix numbers were well behind where they would normally be for that time of year, while TA remained high. The high TA is not surprising with low Brix, but pH numbers were about on par with "normal" readings for that time of year, which meant that you now had high pH relative to the TA.

I spoke with both Stephen Barnard at Keswick Vineyards and Mike Henry at Michael Shaps Wineworks, and they both saw this scenario play out. As Stephen said to me, "this will make for some difficult choices in the winery." Mike told me that he noticed this difficult chemistry in vineyards with both low and high elevations whether they had been hard hit by the spring frosts or not, which leads me to think that the generally cool temperatures of April and May were the chief factor here.

While there is nothing that we as growers can do regarding cool spring temperatures, there is something we can do with the knowledge that those conditions will cause a delay in ripening come veraison. That something is doubling down on the importance of keeping your canopy healthy and disease free during the longer than expected period that will be needed to fully ripen our crop.

August, as we know, can often be rainy, and is always humid — perfect conditions for downy mildew and Botrytis to flourish. Taking care to guard against these diseases will go a long way toward ensuring that we have a healthy canopy long enough to do the job we need it to do at this stage.

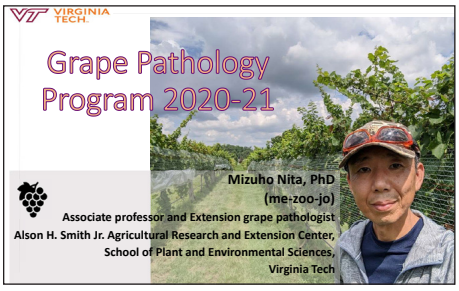
While this year has run the gamut from challenging to heartbreaking, a bit of good news came from the winemakers I spoke with. Both Stephen Barnard and Mike Henry were encouraged by the initial tastings of this year's wines. Stephen said many of his wines were tasting better than expected and while there was less of it, some high-quality wines would result from the vintage.

Mike said he was surprised, "in a good way," by how the wines were tasting, with good aromatics on the whites and no underripe green flavors in the reds. He added that the reds were benefiting from blending to bring out the best aspects from each lot. In such a challenging year as 2020 these encouraging words will help us as we prepare for the year ahead.

Here's to a great 2021, everyone. Cheers!

Editor's Note: Grayson Poats is a regional reporter for Grape Press, covering the central part of Virginia. We hope to feature more news about Central Virginia's vineyards and wineries in future columns. Please contact Grayson at ***grayson@valleyroadwines.com*** *if you'd like to provide information for upcoming columns about growing conditions, new plantings or anything else you think would be of interest to other growers.*

Video Offers Info on Grape Pathology Program



For a look at current projects in the Grape Pathology Program at Virginia Tech, check out this video prepared by grape pathologist Mizuho Nita.

Click on the photo or go to Mizuho's blog, Virginia Grape Disease Updates, **http://grapepathology.blogspot.com**, to view the video and keep up with tips from Mizuho on grape disease management.

SOUTHERN VA.: "Our biggest project this winter ... the 'sore shoulders project.'"

By Rachel Lagergren
Stanburn Winery

For such a challenging growing year, it was a quiet harvest.

We started by harvesting the Chardonnay on Sept. 22, quickly followed by Traminette, Barbera, Chambourcin and Vidal Blanc. All were picked by the 28th. On Oct. 8, we finished the season with the Cabernet Franc.

Harvest began about two weeks later than in years past and, as we had previously estimated, production was down about 70 percent because of the severe damage from this year's late frost. However, we were happy to pick fruit that was clean, though not as ripe, from all the varieties we grow.

November was a month of mild temperatures and rainstorms. There was only one night that fell into the low 30s, and the ground remained soggy thanks to the 59 inches of rain that fell this year. The vines finally gave up their leaves, which were quickly blown out of the vineyard by each passing storm.

And now, with temperatures dipping into the 20s, it is time to walk through the vineyard to look over the vines and make plans for winter and early spring.

Our biggest project this winter has been dubbed the "sore shoulders project," which consists of pulling wire for trellising in about 11 acres of vineyard.

First, we will be finishing the trellising for blocks of Barbera and Petit Verdot planted in 2019.

Then, we'll be adding a third set of catch wires for the blocks of Chardonnay, Cabernet Franc and Traminette. We decided to add those catch wires based on our experience with our Vidal Blanc and Chambourcin. We added a third set of wires to those vines last winter and liked how it helped with keeping the shoots positioned.

Over the last two years, "kicker canes" and renewals have been trained up to replace damaged 20-plus-year-old cordons in the Chardonnay and Cabernet Franc. We are ready to remove the old wood and lay down new cordons.

Closer to spring we will work on vines planted in 2019. These vines survived the frosts this last spring and have grown well (almost in defiance). It is time to select canes for cordons to be established on the fruiting wire.

Cabernet Franc, Chardonnay and Vidal Blanc replacement vines planted this year will be reset back to two to four buds and tucked away in grow tubes. And finally, we need to get ready for more Chambourcin vines expected this spring.

Photos by Rachel Lagergren

Stanburn Winery looks ahead to 2021: In the Chardonnay, a kicker cane (above) that was started two years ago is ready to replace a damaged cordon, and renewal shoots (left) are in place.

There is always too much to do. But 2020 has been that kind of year and it might be wise to stay out in the vineyard where social distancing is never a problem.

After harvest, I caught up with Kevin Sutherland from Nicewonder Farm & Vineyards in Bristol, who told me that fall and winter activities were underway.

"We had our first hard frost on November 4, and we are close to saying goodbye to 2020," he said. "Now we start our fall and winter activities — removing dead plants, repairing erosion areas, replacing broken poles, hilling up first-year plants, etc. January will be here before we know it and pruning will start.

"We are also preparing for our next expansion of 2.2 acres of Cabernet Franc," he added. "Last winter, we added lime and ripped and tilled (rows only). We have over-seeded and are now we are installing line posts and H braces. We will then be able to install the in-ground portion of the irrigation.

"Let us hope for a nice long, cold – but not too cold – winter."

Editor's Note: Rachel Lagergren is a regional reporter for Grape Press, covering Southern Virginia. We hope to feature more news about Southern Virginia's vineyards and wineries in future columns. Please contact Rachel at **lager0862@gmail.com** *if you'd like to provide information for upcoming columns about growing conditions, new plantings or anything else you think would be of interest to other growers.*

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then decrease after veraison due to the metabolism of malic acid and the dilution of both acids as berries enlarge.

Acid dilution usually means an increase in pH as harvest draws near. Varietal aroma compounds are usually formed toward the end of sugar loading, after berries have enlarged and may be beginning to shrink due to dehydration. At some point in all of this, the balance of sugar and acid and aromas is just right, and it's time to pick. But sometimes finding the right balance is not easy.

Take Petit Manseng, for example.

Petit Manseng was introduced to Virginia by Dr. Tony Wolf in the late 1980s and has become popular among grape growers for its loose clusters, thick skins, and resistance to bunch rots (5). In the last 30 years, the popularity of this variety has grown such that Virginia now boasts the second largest planting of Petit Manseng in the world with more than 64 acres* of Petit Manseng planted around the state (6,7).

Petit Manseng wines are described as having unique fruity and spicy aromas such as pineapple, peach, melon, grapefruit, nutmeg, honey, wildflowers, box tree, and roasted coffee bean (8). Notable levels of thiols (9) and esters (10) have been reported in wines made from Petit Manseng grapes and contribute to these descriptors.

In its home region of the Jurançon in Southwest France, Petit Manseng is primarily used for the production of distinctive off dry or dessert wines, often blended with Gros Manseng. In Virginia, a growing number of winemakers believe this variety has the potential to produce an excellent, distinctive, ageable dry white wine with consistency, even across vintages with highly variable rainfall and temperature.

Despite its promise in the vineyard, Petit Manseng presents challenges in the winery, where it is difficult to balance the acidity, alcohol and distinctive strong tropical flavors to craft a harmonious wine.

Petit Manseng can exhibit rapid Brix accumulation with very little acid depletion, leading to high potential alcohol (15-16 percent) with high acidity (10 g/L titratable acidity or more). Long hang times (in the hope of dropping the acidity) allow strong tropical flavors and aromas to develop, to the point where some winemakers find them overpowering.

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Petit Manseng Harvest Times

PETIT MANSENG, from page 8

Several winemaking strategies have been explored to find a balance of acid and alcohol in dry Petit Manseng including skin contact to precipitate tartaric acid, use of malic consuming yeast and malolactic fermentation to tame malic acid.

In 2019, winemakers from three Virginia wineries (Early Mountain Vineyards, Tarara Winery, and Hark Vineyards) participated in a Winemakers Research Exchange (WRE) trial examining the chemical and sensory effects of harvesting Petit Manseng at different levels of ripeness with the hope of finding a balance of alcohol, acid, and aromas.

Each vineyard was picked in two to three passes with several days in between. Each winery was free to use its own winemaking protocols, but that protocol was applied to each of the picks at that winery. Wines were then blind tasted at a WRE sensory session and ranked for overall aromatic intensity, Petit Manseng varietal character, acidity and overall balance.

Summary data for the grapes and harvest and resulting wines can be found in Table 1. Full reports can be found on the WRE website (**http://www.winemakersresearchexchange.com/**).

Several metrics of sugar/acid balance have been defined as indicators of maturity for quality wine production, as reviewed by du Plessis in 1984 (2) and Bisson in 2001 (1). Both authors caution that the ranges listed for quality wine are variable across regions and are not always good indicators of varietal character. However, these measures do provide a value for balance that can be compared across vintages and sites (2).

Two metrics that can be calculated from easily obtained fruit and juice data are reported here: Brix multiplied by the square of the pH, with values from 220–260 considered optimal, and Brix/TA (g/100mL) with preferred values ranging from 30-32. Values for each harvest in this study are shown in Table 1.

When Petit Manseng was harvested multiple times off the same vineyard, acid levels were very high and maturity indices were very low for the early picks. Brix accumulated over time while acids decreased slowly, producing wines with alcohol levels ranging from 13% to over 16% and pH values from 2.9 to 3.3.

As is often the case for Petit Manseng,

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Figure 1: Diagram showing physical and chemical changes in the grape berry during various stages of berry development. From: Kennedy 2002; illustration by Jordan Koutroumanidis, Winetitles[3].

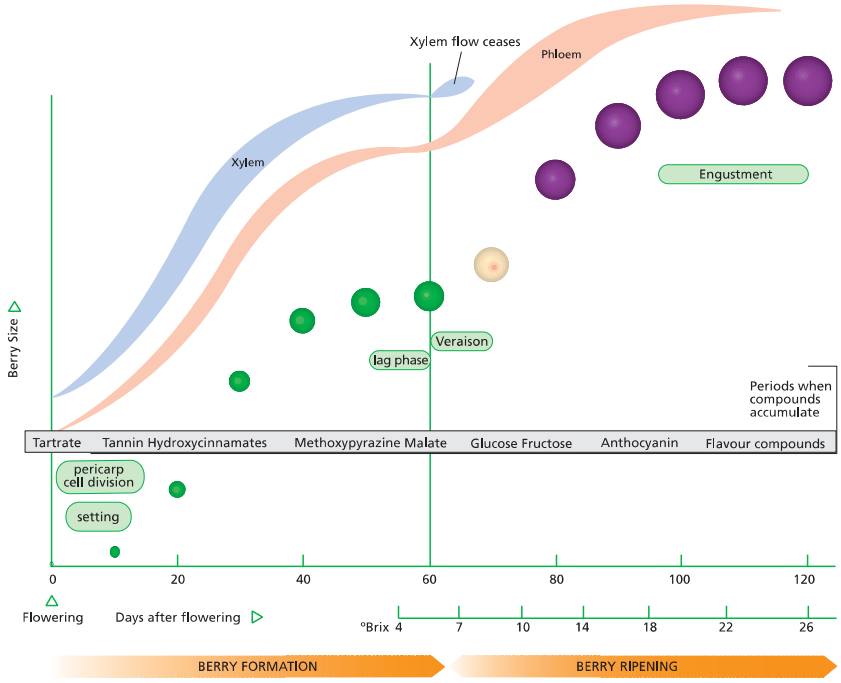

Table 1: Fruit and wine chemistry for multiple picks of Petit Manseng from Early Mountain Vineyards, Tarara Winery, and Hark Vineyards. Maturity index values within the preferred range are shown in bold.

	Sugar		pH		TA (g/L)		Maturity Index	
Early Mountain	°Brix	% Alcohol	Harvest	Wine	Harvest	Wine	Brix*pH^2	Brix/TA
8/20/19	22.8	13.3	2.91	2.8	11.5	10.8	193	19.8
8/28/19	24.7	14.4	3.01	3.06	8.9	8*	**224**	27.8
8/31/19	25.6	15.1	3.1	3.13	8	8.4	**246**	**32**
Hark	°Brix	% Alcohol	Harvest	Wine	Harvest	Wine	Brix*pH^2	Brix/TA
9/2/19	22.8	13**	3.29	3.31	n/a	7.2	**247**	n/a
9/8/19	23.5	13.5**	3.36	3.37	n/a	7.2	265	n/a
Tarara	°Brix	% Alcohol	Harvest	Wine	Harvest	Wine	Brix*pH^2	Brix/TA
8/23/19	22.5	13.5	2.94	2.78	12.6	12.3	194	17.9
9/2/19	24.9	15.2	2.93	2.71	11.1	10.6	214	22.4
9/12/19	26.3	16.3	3.32	3.43	7.2	6.5	290	36.5

*The second pick of Early Mountain Petit Manseng underwent partial malolactic fermentation

**Hark Vineyards Petit Manseng had 1.6-1.7% residual sugar, so alcohol conversion is lower

Petit Manseng Harvest Times

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alcohol levels of 14% or higher were often needed to produce wines with TA less than 10 g/L and pH greater than 3.0, which also generally corresponded to maturity indices within the preferred range.

Varietal character ranked significantly higher for the third pick when compared to the first at both Early Mountain Vineyards and Tarara Winery. At Tarara Winery, wine from the third pick also ranked significantly lower in the perception of acidity and significantly higher in aromatic intensity and balance. There were no significant differences in acidity, aromatic intensity or balance at Early Mountain Vineyards or at Hark Vineyards.

These results provide a few insights for harvesting Petit Manseng for dry wine.

1. Measuring the acidity (pH and TA) and evaluating balance using maturity indices can be a valuable tool in determining when to pick Petit Manseng for dry wine. The optimal timing for harvest when gauged by the maturity index and sensory scores occurred at different Brix levels at different sites.

At 25° Brix, the Petit Manseng had balanced acidity and potential alcohol at Early Mountain, but at the same Brix, that value would have been too high at Hark Vineyards and too low at Tarara Winery.

2. Additional time on the vine led to significant development of tropical flavors. Many winemakers indicate they would like to diminish these flavors somewhat, indicating an earlier pick would be preferred if possible.

3. The window for optimal ripening for dry Petit Manseng may be narrow. Values at Tarara Winery never fell within the optimal range in 2019, with the first two picks too low and the third too high. This finding is consistent with those reviewed in Plessis (2), which indicates that wine quality by these measures can decrease considerably within a week, and some sites in some seasons do not achieve balance by this metric.

The results of these trials also led to a number of questions about acid metabolism in Petit Manseng. In 2020, the WRE and several industry partners worked with Virginia Tech Extension Enologist Dr. Beth Chang to study Petit Manseng ripening in parallel with Chardonnay that was monitored by the Sentinel Vineyard Project, work we hope to expand in 2021.

It is our hope that tracking the progression of acid depletion over time in Petit Manseng will give us insight into how these acids are behaving and point to potential mitigation strategies to allow for harvesting of grapes with potential to produce elegant, balanced, dry wines.

"Measuring the acidity (pH and TA) and evaluating balance using maturity indices can be a valuable tool in determining when to pick Petit Manseng for dry wine. The optimal timing for harvest when gauged by the maturity index and sensory scores occurred at different Brix levels at different sites."

**This value is taken from the 2019 Commercial Grape Report, which had 67 percent of the unique operators in Virginia reporting results. The true value is likely much higher. Please fill out and return your grape survey each year to allow for better reporting of statistics.*

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Spotted Lanternfly Advancing

Photos courtesy of Douglas G. Pfeiffer

Immature states of spotted lanternfly, showing, from left, egg mass, young and fourth instar nymphs on grapevines.

Control Measures Take Various Forms

By Douglas G. Pfeiffer
Fruit entomologist, Virginia Tech

Many of you are aware of a new invasive insect that is posing a threat to our vineyards — the spotted lanternfly (SLF). This planthopper (an insect family related to leafhoppers) was introduced into Pennsylvania in 2014, and has been expanding its range since.

The native range is in Asia where the pest has been a significant threat to grapes, peaches, and forests. We first found it in Winchester in January 2018 in an area of about one square mile. The potential geographical range has been estimated based on conditions most suitable for SLF development (Wakie et al. 2020). The maps generated there indicate that much of Virginia is highly suitable for establishment of spotted lanternfly.

We have produced a general fact sheet on this insect (Pfeiffer et al. 2018), as well as others more specifically adapted for vineyards (Pfeiffer et al. 2019) and residential areas (Dechaine et al. 2019).

The adult is a large planthopper, about an inch long, with pinkish-brown wings marked with distinctive black spots. The hind wings have bright red markings, apparently an anti-predator scare device.

Eggs are laid in masses covered by a gray or brownish covering, often on the undersides of branches or on lateral trunks. But eggs may also be laid on inanimate objects. The spotted lanternfly has four nymphal instars (each stage between molts is called an instar). The first three instars are black with white spots; the fourth and final instar is bright red with white and black markings. The shift in red color coincides with a movement to tree-of-heaven (TOH). TOH is an invasive species originally from Asia that thrives in disturbed areas. It is a source of defensive chemicals for SLF once the insect shifts more heavily to that host in late summer (Song et al. 2018).

In their immature, or nymphal form, SLFs feed on a wide range of plant hosts, including more than 70 species across its range. These hosts include many commercially valuable plants, including grape, apple, peach, hop and caneberries. Many hosts are common in the surrounding environment, including maple, willow, oak, Virginia creeper, rose, and importantly, TOH.

As nymphal development progresses, the host range constricts, until finally adults feed on just a few favored plants, especially grapevines and TOH. While SLF can develop without TOH, development is substantially improved, with a higher success rate if this plant is used as a host (Uyi et al. 2020). While the host list is extensive, TOH is highly preferred, and high numbers may be collected there (Murman et al. 2020).

As the adults feed on the phloem of this species, they acquire qualities that induce vomiting in birds and other predators that try to feed on them, so the bright coloration is likely an anti-predator display, similar to the bright orange color of monarch butterflies to warn of bad taste from feeding on milkweed. If a naïve bird gets sick from eating one insect, it will remember the warning coloration.

SLF nymphs often fall off the host plant and must then climb back in order to resume feeding. This will aid in a mechanical control approach I'll discuss below.

Among cultivated crops, grapes are at the highest risk, being a highly preferred host (second only to TOH). In Pennsylvania, entire vineyard blocks have been killed following SLF infestation. Infested vines often have reduced yield in the following year (Leach and Leach 2020).

With this wide host range, the potential economic impact is large, especially to vineyards (Urban 2019).

Control may be considered at a couple of different scales. There is currently an eradication program underway. Egg masses should be scraped and destroyed when found. This is limited, however, by the distribution along branches of trees.

In addition to egg scraping and trapping, a trap-tree approach is used. Smaller trees are killed by cutting and treating with a herbicide, generally triclopyr, and larger trees are treated with dinotefuran. When SLF returns to the reduced number of TOH in the fall, they are killed by the systemic insecticide. It is important that the TOH not be simply cut down. This tree sprouts from trunks and roots, and the grower may end with a bigger stand of trees than originally present!

Once SLF is established in an area, local

See LANTERNFLY on page 12

Lanternfly

LANTERNFLY, from page 11

chemical control may be needed. Several insecticides have been shown to be effective. In Pennsylvania insecticide trials (Leach et al. 2019), bifenthrin and thiamethoxam were among the most effective materials. We have included these among several other insecticides in our Pest Management Guide for Commercial Vineyards (Pfeiffer et al. 2020).

Beauveria bassiana is a naturally occurring entomopathogenic fungus (also commercialized) that has shown efficacy against SLF (Clifton et al. 2019, Clifton et al. 2020), and is a promising potential control tool. While there are insecticides effective against SLF, there is a complication in that adults from surrounding wooded habitats continue to invade the vineyard block, re-infesting the vines. Consequently, insecticide use in affected vineyards in Pennsylvania has tripled (Urban 2019). This is unsustainable both economically and environmentally. Additional approaches are needed.

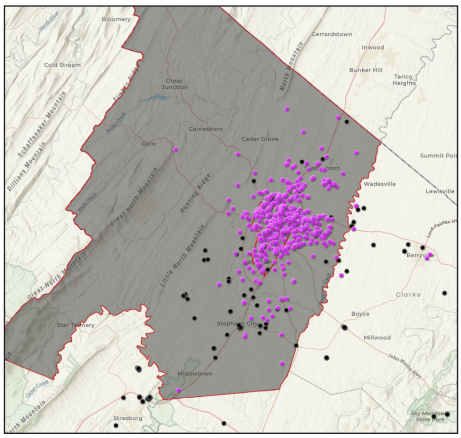
Other needs include a sensitive trap for SLF in order to detect its presence in new areas as well as seasonal activity. Brown sticky bands wrapped around tree trunks capture nymphs as they climb into trees, but there is a problem with by-catch of non-target species, including vertebrates like birds and lizards.

Circle traps (wire screens wrapped around the tree trunk, funneling nymphs or adults into a collecting container) have proven to be more selective than sticky band traps (Nixon et al. 2020), and are being further investigated. Three plant compounds (methyl salicylate, (Z)-3-hexenol, and (E,E)-α-farnesene) were identified as highly attractive to SLF in the laboratory (Cooperband et al. 2019). However, addition of methyl salicylate to lures in traps did not enhance captures in the field in Virginia and Pennsylvania (Nixon et al. 2020). Work on developing an effective lure is proceeding at Virginia Tech, as well.

One element to a pest management program is the ability to predict development through modeling. We have cooperated with researchers at Penn State University in validating a model that uses temperature units to predict egg hatch. The model explained data in Pennsylvania and Virginia very well (Smyers et al. In press).

So where is it now? What is the status of SLF in Virginia? In June 2018, the first spring after SLF was first found in Virginia, the infested area was limited to one square mile. In October of that year, the area had increased to 18 square miles. At the end of the second year, November 2019, the infested area had expanded to 40 square miles. And finally, in October of this year, it has grown to 108 square miles. Clearly, additional tools are needed.

Figure 1



M. Dodd/Virginia Tech

Resources

I will communicate additional information on SLF as appropriate through:

- My Virginia Fruit Insect Updates blog: **https://virginiafruitinsectupdates.blogspot.com/**
- My Grape Insect Google Group for grape growers. Please send me your email address to be added to the list: **dgpfeiff@vt.edu**

Links to more information:

- **SLF fact sheet in English.**
- **SLF fact sheet in Spanish.**
- **Virginia Cooperative Extension SLF page.**
- **Report suspected finds of SLF.**

— Douglas G. Pfeiffer

To supplement VDACS surveys, we have been visiting vineyard sites especially in high risk areas in Frederick, Clarke, Loudoun, Fauquier, Warren and Page counties. Figure 1, above, shows the spread of SLF in the state as of October 2020 (pink indicates positive finds). The original zone has become more intense. It is now reaching some residential areas, so we've seen the beginning of homeowner complaints.

The original square mile is now more densely populated with positive finds. But more important, the edges have moved in each direction. This fall we found SLFs at a commercial winegrape vineyard for the first time, north of Winchester. We continue to search in these sites. Since these data points were confirmed, localized infestations were found in Shenandoah and Warren counties.

We are completing a study of the effects of SLF on tree growth using tree ring analysis, and summarizing our initial project on phenology and development. In addition to continued monitoring of the geographic spread of SLF, we will be investigating the use of Beauveria and factors affecting the efficacy ovicides for this pest.

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