

# GRAPE PRESS

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## Spotted Wing Drosophila in Virginia Vineyards

Doug Pfeiffer, Department of Entomology, Virginia Tech

Spotted wing drosophila (SWD), *Drosophila suzukii*, was introduced into California in 2008, where it was found infesting several berry crops. In 2009 it spread northward to British Columbia. Significantly to Virginia grape growers, SWD also turned up in Florida in 2009. In 2010, we participated in a trapping program for SWD in South Carolina, North Carolina and Virginia; SWD was found in both Carolinas, but not yet in Virginia (it was also found in Michigan in 2010).

We expanded our trapping in Virginia

in 2011, and SWD was found in all trapping locations, including those with no finds in the previous year; it was also found in New Jersey and Pennsylvania. It has now spread north in to New England. I have posted a spotted wing drosophila page in the Virginia Vineyard web site (<http://www.virginiafruit.ento.vt.edu/SWD.html>), where a map showing counties with SWD is updated when needed.



Grape growers and winemakers are very familiar with *Drosophila* species. Native species of drosophilids, commonly called vinegar or pomace flies

(and more widely though less appropriately, fruit flies), lay their eggs in overripe or rotting fruit material.

SWD is very different. Females possess an ovipositor that is enlarged, hardened and serrated. This allows them to cut into intact, ripening fruit to deposit their eggs. Larvae then develop in the fruit while they are still ripening on the vine, cane or tree. Larvae are typical of drosophilid larvae - translucent maggots 2-3 mm long, with black mouth hooks visible at the anterior end. Respiratory projections are present on the posterior end.

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## President's Corner ...

By Bill Tonkins, VVA President

With our crop in safely, I can now breathe a breath of relief and do my piece for our *Grape Press*. I trust you have all had a successful harvest.

It is clear from our regional reports that we have had another varied year throughout the Commonwealth with a mixture of hot, cold, humid and dry weather. Petit Verdot were our last grapes to bring in; thankfully they stood up well consider-

ing those awful tropical days of August when we had over 7½ inches of rain on Afton Mountain. Not only was there nearly 2 inches of rain every week and a quarter to half an inch of rain most evenings but also we had cloud cover for most of the month. Thinking about the conditions this year in discussion with Chris Hill it would be worthwhile to reevaluate our post veraison spray

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**VVA**  
VIRGINIA VINEYARDS ASSOCIATION

# Regional Reports

## Central Virginia

*Turtle Zwadlo, Pollak Vineyards*

Another harvest is winding down and it has proven to be another unique season complete with all new challenges to keep us on our toes. After a warm beginning to the summer when the entire season seemed to be ahead by several weeks, the later part of summer cooled down and was fairly wet, slowing ripening and putting several varieties back on a much more normal schedule. We have been ahead slightly, but not as far ahead as anticipated, and certainly not on par with 2010 when we were finished with harvest here at Pollak on September 15.

Across the region the white varieties came in clean and had great phenolics and should produce some amazing wines if the excitement of the winemakers I've spoken with is any indication. One interesting note is that our Viognier ripened well ahead of Chardonnay this year and this seemed to be the case for a lot of vineyards. Curious but not troubling as the fruit quality was excellent.

The reds in general have been trickier. The cooler, wet weather that predominated much of August and September seemed to cause slow accumulations of sugar but without slowing overall maturation. The result has been fruit with great flavors, ripe seeds and skins, and good pH at lower brix levels. Much of the red fruit was picked on metrics other than sugar. The attempt to wait for higher sugar levels proved risky between frequent rain and the fact that skins started breaking down from normal maturation. This was exacerbated by the dis-

covery of a new pest in the area that forced the early harvest of a lot of fruit, Petit Verdot and Merlot in particular.

In addition to Spotted Wing Drosophila being positively identified in area vineyards the Brazilian Zaprionus indianus was a real problem in our area. This drosophilid, like SWD, attacks ripe fruit on the vine. It seemed to have a preference for Petit Verdot at around 19 – 20 brix but was also prevalent in Merlot. They didn't seem to move into the Cabernets until the other fruits were harvested. They are very easy to identify with two silver stripes that run through the eyes and down the back. I personally found them to be opportunists, moving into vineyard blocks after the birds from which there was a lot of pressure and this pattern was consistent throughout the harvest of my red varieties. The cooler nights seemed to slow them down, especially once we dipped into the mid-forties, the same temperatures that reminded us that our friends the brown marmorated stink bugs hadn't gone away, they were just waiting until it was time to come inside.

Many vineyards have reported overall reduced yields this year as well. I initially attributed that to some pretty heavy thinning we did early in the season due to low shoot vigor but it has proven true in vineyard blocks we didn't thin as well as throughout the region. Our winemaker is very happy with the small berry and cluster sizes even if the lower yields mean fewer cases in the tasting room. All in all the outlook for the 2012 vintage is great and I can't wait for these wines to be in bottle.

## Eastern Region

*Pete Johns, New Kent Winery*

As the end of harvest nears in the Eastern Region of the Commonwealth we find that this year's grape crop was above average in quantity and slightly above average in quality.

Only a few "Stink Bugs" were seen during harvest in this region, far less than last year and the year before. We did, however, see some impact from the Spotted Wing Drosophila fruit fly. A month before harvest some of the growers experienced "mushy clusters," especially in the red grape varieties. As the fruit ripened, less humid air settled into the region and the affected grapes seemed to dry out and the skins hardened. Many of us sprayed for this critter and our vines saw little damage while those growers who did not spray experienced moderate loss.

As the crop ripened many of our growers experienced extremely high bird damage, especially in late July and the first two weeks

of August as large flocks of birds circled our vineyards. Many of us encountered far greater bird pressure than we have seen in recent years. Even with netting on the vines, the damage was extensive. During the second week in August we experienced the first "cold front" that swept through our region. This change of weather must have triggered the migration instincts of these large flocks of birds and from that date forward little pressure was felt from birds and very few birds were seen in the vineyards. During this same period, however, the wild turkeys made their presence felt especially in the more remote and quieter vineyard settings.

With restricted hunting of these wild game birds imposed in recent years by the State Game & Inland Fisheries Commission the wild turkey population in this region of the Commonwealth has exploded. We all know that turkeys love our grapes and even netting on the vines did little to disrupt these large birds in their quest for the ripening fruit. At our own vineyards we saw a number of turkeys perched on our high cordon wires in our Norton vineyard. These birds were helping themselves to the unpicked fruit that was left after harvest. We had never seen these large gangly birds perched on our high wire cordon before; it was quite a sight to see.

Many growers in our region have had some difficulty reaching the desired Brix count in their late season red varieties. The color and PH of some of the later varieties has also been dramatically affected by the cooler overcast weather and late rains. The white wine varieties do not seem to have encountered the same problems and the growers in this region seem very pleased with their white wine crop this season.

Powdery and Downy Mildews pressures were minimal this year in most vineyards in this region. Some growers did experience Black Rot just after fruit set, but this was not an issue for most of the growers.

Early rains did leach some of the nutrients from the clay soils. Two of the most common mineral shortfalls were Boron and Manganese. Both these mineral shortages can be addressed with canopy sprays during the growing season.

Most growers in the eastern region of the Commonwealth are pleased with this year's crop. Many are catching their breath and preparing for what is predicted to be a very difficult winter with lots of snow. Our region has not experienced the near drought conditions that other areas of the Commonwealth have endured. In the Eastern Region our rainfall for the season is only ½" below our normal annual rain fall.

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# Regional Reports

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Every year spent dealing with grapes is different, this year is no exception!

## Northern Virginia

Dean Triplett, Greenstone Vineyard

The vintage of 2012 is almost in the history book as I write this report and it's hard to remember where the last couple of months have gone. The main thing I can remember about the summer is the seemingly endless heat. Much of June and nearly all of July were scorchers. Mid to upper nineties were the name of the game. Throw in a couple of hundreds just for good measure. Along with the heat came a lack of rainfall. We didn't get the drought that many places south of us did, so we feel pretty fortunate. Nor did we get hit with the worst of the derecho that came through on June 29th. There were reports of vineyards in our region having rows of vines literally flattened as these strong winds came through. We seemed to get just enough rain during the derecho and throughout the growing season that the vines and weeds didn't want to stop growing.

The new vines we planted in April made very good growth as did the second year vines. We should be looking at a small crop off of them next season. The heat and infrequent rainfall made for easy disease control this year. Powdery mildew was nonexistent. We did see early season black rot lesions on some of our hybrid vines, but just on the leaves, with no fruit outbreaks to speak of. Late season downy mildew has shown up on upper leaves in some of our vines. Harvest is literally within days of being over, so I'm not concerned about the downy. I'll plan on coming back after harvest with a clean up spray.

All in all, the heat, as rough as it was on the body, was a boon to fruit quality as harvest approached. August was mercifully warm, but not blistering. September has been beautiful. One small brush with tropical storm Isaac was the worst weather event of the harvest so far. We only got about two inches of rain out of Isaac without any damaging winds. Other than Isaac and a couple of rain events here and there, this harvest has been uneventful. We have been seeing lower than expected quantities of fruit in nearly all varieties. But this has been made up for by some really nice grapes with excellent flavors.

Sugars are high, almost harvest of 2010 high. Acids in the reds have been lower than we've seen in a number of years. The wines across the board should be very nice.

North American Grapevine Yellows contin-

ues to be a concern for us and we may rip out the remaining Chardonnay in our vineyard. We're also seeing NAGY in a section of our Petit Verdot and this is a concern. Japanese beetles made a reappearance this year but didn't require any control measures. I'll be on the lookout for them next year with the expectation that they will increase in numbers. Stink bugs are a bit higher in number than last year, but again nothing to cause us to intervene. Yellow jackets and other bees and wasps have been out in huge numbers in our late season reds. I didn't get the bird netting up early enough in our early season aromatic varieties and had quite a bit of bird damage. I need to get in the habit of putting up the netting on these vines well before veraison in the future. Raccoons were a problem again this year but I started a trapping program early. I trapped and dispatched 16 raccoons, half the number from last year. This kept the damage in most of our varieties down, but we still had more loss than I care to see.

I'm afraid this report is a little on the short side with not much details. The truth is that we've been so busy getting through harvest that I haven't had a chance to communicate with many other growers or winemakers. I'll make an extra effort to reach out to others in our region for the end of harvest report. I certainly hope that everyone else has survived the heat wave of 2012. I wonder what the winter of 2012 will have in store for us.

## Southern Virginia

Paul Anctil, Winemaker,  
Sans Soucy Vineyards

We all say it year after year, but truly, this has been a year to remember. The early warm, then cold, then wet, then dry, then cool spring transitioned into another very hot and dry summer. Proper canopy management is always important but this year the challenges were exacerbated by the weather. Sulphur sprays were removed from the rotation early due to the extreme heat. I didn't use liquid fertilizers for fear of burning new growth, but the ground

was so hard from the dry heat that granular fertilizers were a waste of time and money. At my vineyard, and with discussions with others in the area, we all noticed a lot of asymmetrical fruit set and berry development. There were normally developing berries on one vine and just inches away there was a totally green undeveloped bunch full of pea-size berries. I noticed a greater incidence of this problem in my late-ripening varieties such as Petit Verdot. The problem may have started in the spring with the up and down temperature swings during bloom. However, I also think that the onset of the extreme heat and dryness and the particular varietal's stage of veraison may have something to do with it. It was hardly noticeable in the early ripening Tempranillo, but very prominent in the Petit Verdot.

The June 29th "Derecho" that crashed through Virginia was very destructive. When we first envisioned starting the winery we thought we would be as environmentally responsible as possible. We opted for metal posts with the thinking that we would avoid putting hundreds of wood posts laced with ugly chemicals into the ground only yards from the family well. That proved to be a bad choice. We had some sporadic post failures after the 8-9 year mark, but the early summer storm was devastating. I had over 20 rows in one block completely bent over, the vines in a painful L-shape, full of canopy and developing fruit, laying on the ground. In another block I had about 12 rows bent over. We were in a panic

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# Regional Reports

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trying to dig holes in brick-hard red clay, weaving new posts between the VSP trellis wire, and straining to push them upright. Our average row length is 600 ft! The temperatures climbed into the high 90's and low 100's very early in the day making it impossible to continue working in the vineyard much past 12 noon. In the areas where I had already replaced the failing metal with wood, I had no problems with the canopy folding over. So, if anyone is planning to use the same kind of metal posts we originally bought, call us for a more animated product review before you spend your money! Other weather related events in the region caused several of the vineyards to report significant wind damage and hail damage.

We all experienced early bud-break back in March so we were all ready for an early harvest. There were no exceptions. All the vineyards in the area reported harvesting very early. At my vineyard we harvested the Tempranillo on August 11. This is our 2nd year of harvest-

ing at night. Once you get over the 3 am reveille, it is a great way to harvest in our region. The work crew is happy, no bees or hornets, no sweat pouring down your brow, and the grapes are in the winery by 8 am long before they can begin to break down and sour. Our twilight harvest is immediately followed by a sunrise breakfast for all hands as we sip on our ginger wine mimosa eating sausage and eggs prepared on a wood-fired barbecue.

Almost every vineyard owner I spoke with along our Southern Virginia Wine Trail also reported significant reductions in overall crop yields. Aside from the spring report from Annefield Vineyards of their complete crop loss, the worst reported harvest shortfall was from De Vault Family Vineyards. They reported whole blocks of grapes without any fruit at all. Boyd Archer at Bright Meadow also reported that he had some disappointing yields on some of his american varieties. I had about a 20% overall reduction in crop yield

but I will also quickly say that the initial wine quality I am experiencing with my harvest is probably going to be excellent. My Viognier and Traminette are very floral, and have good acid levels. The reds also have great metrics. High sugars, good acid levels and great varietal character. Time will tell but for right now, this may prove to be a real "vintage" year.

Finally, a word about bugs. This year the brown stink bug was not very evident. That pest was conspicuous by its absence. However, the spotted wing drosophila was suspected at several vineyards. The level of destruction is hard to evaluate at this point but it is significant. Better identification and treatment plans have to be developed to handle this new pest. The long term effect on wine quality is yet to be determined but we are all concerned. One more challenge to demand a slice of my already limited resources of time and treasure.



## President's Corner

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programs because historically we have gone light on these; the result post veraison Downey and Powdery that greatly inhibit fruit maturation and ripening.

The difficult conditions this year made Lucie Morton comment that the days of using brix as the chief parameter for picking are over! She suggests that skin integrity, seed ripeness, flavors, and pH/TA ratios are what are important in understanding the many aspects of fruit maturation.

As if challenges of ripening fruit were not enough, we were invaded by a bazillion

Brazilian Fig Fruit Flies, which feasted on the damage done by the well-armed Spotted Winged Drosophila. See Doug Pfeiffer's extremely important article on this subject; in particular note his comments on chemical and non-chemical approaches to this pest and the need to harvest fruit promptly to eliminate breeding sites. These points tie in with the weather factors and our propensity in Virginia to leave berries on the vine to improve fruit maturation. Doug also recommends that any overripe or rotten fruit nearby should be destroyed. Christine Vrooman in her column on "Leaning Green" even goes as far as to suggest

removing surrounding blackberry bushes – some "Peaceable Kingdom" that is ☺

These clean up recommendations are easily said! We normally drop fruit to the ground or toss from the Harvest Bins during field sorting. Hmmm! And what about all the fruit that is still on the vines - fruit that has either been missed during harvest, simply not sold or is unsellable. Add to that there is the pomace from the crush that has clouds of fruit flies around it on the compost heap. How we deal with these problems will make for great discussion at our winter meeting.

Notwithstanding all these challenges, Virginians are nonetheless making great wine and this has been made clear for the world to see and learn about at the inaugural Virginia Wine Summit. Governor and Mrs. McDonnell hosted the event to kick off Virginia Wine month. The summit brought together wine and food professionals and started with our own "Judgment in Richmond/Virginia" led by our guest of honor Steven Spurrier of "Judgment in Paris" fame who is a known and highly respected international wine writer and critic.

Jean Case added value to the Summit; she spoke of her and her husband Steve's excitement at joining the Virginia Wine industry with their recent purchase of Early Mountain

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# Spotted wing drosophila

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In eastern Asia, there are up to 13 generations. A life cycle can be completed in 8-14 days, but adults can live up to 9 weeks. Each female lays 7-16 eggs/day. Eggs hatch in 1-3 days, and larval feeding on the flesh causes a collapse of localized tissue after another 2 days, followed by growth of fungal or bacterial organisms; yeasts may be carried on the ovipositor

Hosts include apples, blackberries, blueberries, cherries, nectarines, peaches, pears, plums, grapes, raspberries, and strawberries – all of the main fruit crops grown in Virginia. The pome fruits, with their tougher skin, are at lower risk. While cherries are a preferred



early season host, grapes have been reported to be a preferred late season host. Berry crops are at greatest risk. Cherries were reported to have 70-80% injury by SWD, with eggs laid in sound fruit. Crop losses of blueberries, caneberries and cherries have been reported ranging from 33-100%. SWD has been found attacking wine grapes following véraison. Berries may take on a shriveled appearance, with small maggots feeding in the interior, and sour rot may develop in the vineyard.

Trap using bait of apple cider vinegar with or without added yeast may be used for moni-

toring. Links to instructions for construction of simple plastic cup traps are included in the web site. Traps should be checked at least weekly. Most of the *Drosophila* flies collected will not be SWD, so the flies collected must be checked carefully. Male SWD have a characteristic black spot at the tip of the wings. Females lack this spot, but are slightly larger than other females, and have the large ovipositor mentioned above.

Beginning at véraison, clusters should be examined frequently for SWD infestation. Preliminary indications are that dark varieties are at greater risk, but this needs further confirmation. We have detected infestation in Chardonnay as well. Control measures are directed against the adults; there are no effective controls for larvae in the fruit. As vulnerable fruit crops approach ripeness, weekly spray applications should be made. When using organic materials, shorter spray intervals will be needed because of the shorter residual life of botanical insecticides. A key point when combating SWD: Insecticide with different mode of actions should be rotated in order to delay the development of pesticide resistance. This species poses a high likelihood of resistance to insecticides because of the short generation time couple with high fecundity. There are several modes of action included in the 2012 Pest Management Guide for Commercial Vineyards.

We will work on non-chemical approaches to this pest. Harvest fruit promptly to eliminate breeding sites. This issue should be kept in mind once SWD established in an area, since at times grape growers may leave berries in the vine to allow greater development of some harvest parameters. Any overripe or rotten fruit nearby should be destroyed.



In September 2012, an additional exotic drosophilid was found to be common in some vineyard blocks, and some growers noticed it because of its unusual coloration. This fly is red-brown in color, with longitudinal white body stripes, thinly bordered by black. The fig fruit fly, *Zaprionus indianus*, is originally from Africa but in recent years has been expanding its range. From Brazil it moved northward, and was found in Florida in 2005 and South Carolina in 2007. When present in our vineyard blocks, concurrent infestation with SWD generally existed. However in one block, *Zaprionus* was far more common than SWD. The fig fruit fly is not likely to be able to penetrate intact grapes on its own – it lacks the enlarged, serrate ovipositor seen in SWD. It may be following initial attack by SWD. The interactions between these species and the grape crop will be pursued.



## VVA trip to Bordeaux, France

*Jim Benefiel*

**VVA** is excited to announce we have finalized an 8-day, 7-night trip to Bordeaux, France, this winter to meet with vinegrowers, winemakers, researchers, and brokers to discuss production techniques, current research, winemaking, marketing, and promotion. There will be tastings, of course, and some sightseeing, but the focus will be on making contacts and learning practical techniques and management initiatives. 15,000 independent growers and 4,000 producers have had centuries to identify what works and what doesn't. Let representatives share their insights with you.

We know that you're in harvest, but take a few moments to check out the itinerary--you must enroll and pay a deposit by October 10th to

ensure your place on the tour. Seating is limited, so reserve now. You will save \$100 by paying in full by October 15th--early bird price will be \$2700 plus trans-Atlantic air fare.

The full itinerary is available at <http://www.virginiavineyardsassociation.com/2012/09/the-vines-and-wines-of-bordeaux/>

Click on the link for details. An enrollment form with instructions can be downloaded at the VVA website above.

If you have questions, contact [Jim@BenevinoVineyards.com](mailto:Jim@BenevinoVineyards.com)

# Spotted Wings and Red Tails Disrupting the Peace

Christine Vrooman, Ankida Ridge Vineyards

In my last column I wrote about a project upon which I was about to embark, a bio-diverse approach to varmint pest control in the vineyard... to create what I labeled a "Peaceable Kingdom" amongst the vines. To help deal with the assortment of pests we growers face in the vineyard, the plan was to bring in chickens and guineas to eat ground bugs, to attract bluebirds and martins for the flying insects, add barn cats to eat the mice, voles and moles and hopefully a barn owl would find its way for nighttime patrol. These critters, along with the sheep that come into the vineyard after harvest to take care of weed growth made up my army, along with a dog to protect them all.

To my delight it all came together unexpectedly easily with a little patience and luck. Even a barn owl found its way to the Kingdom.

We discovered it one evening at dusk perched on a fence post between the "barracks" and the rows of vines. In the barracks, their little cottage of companionship, each of the species accepted the other. There was very little aggression or dominance amongst them. Over time, the chickens and kittens followed me everywhere. I had never raised chickens and was very surprised by the level of companionship they provide and have loved the fresh eggs. The chickens and guineas chased down

hundreds of bugs daily. And what did the kittens offer? I never saw them catch a mouse or vole. But they seemed to offer an unexpected benefit by their presence. We faced essentially no bird pressure this year. The kittens spent much of the day running up the end posts and perching themselves there, overlooking their domain. I

once witnessed a small flock of birds swoop toward the vines and suddenly lift away, I presume when seeing the cats atop the posts. All was well in the Peaceable Kingdom. Nature seemed so beautifully in balance. Ahhhh....

And then....

A few weeks before we anticipated harvest of our Pinot Noir, I read Dr. Pfeiffer's announcement in the VVA site to be on the lookout for a new fruit fly pest, the Spotted Winged Drosophila (SWD). I hadn't noticed any, but then I wasn't specifically looking for them either. Once I looked closely I did in fact see fruit flies, many, many of them. I snapped an image and zoomed in. Spots! I see spots on the wings. Dr. Pfeiffer soon confirmed their presence. Our days of little to no insecticide this season were finished. Caput! Finis!

Fellow growers, feel free to contact me to learn details of our efforts. I am happy to share all I can with you. We will take a multi-faceted approach before next season. We will spend the winter

removing huge patches of wild blackberries that surround the vineyard. My observation is that the blackberries attracted them and as the berry season ended they swarmed en-masse into the vineyard, only going to the Pinot and not bothering with the Chardonnay at all. I will set out traps next year and be ready for the assault at the first sign of them. During our spraying this season I kept the Kingdom critters inside. And after harvest they returned to roam freely. We had weathered the storm. However, danger was lurking.

As you all know, there is much less activity in the vineyard after harvest. And with this scarcity of humans roaming about came an unwelcomed predator, one from which Jack, the dog, could not protect our dear chickens and guineas.

Swooping over the vineyard and making a diving attack on the unsuspecting fowl, a red-tailed hawk had found a feast of his own. One of the chickens ended up missing one afternoon. The very next day, another chicken

and three guineas, all within a four hour span. I never saw the hawk in action but I know we have at least one resident hawk, if not more, in the woods outside the vineyard. And there are no other non-nocturnal animals that could have crawled in under the deer fence and carried off the victims. So to protect the critters from these aerial attacks we built an outside pen with a net over it that is connected to the barracks. They will only roam the vineyard freely now when we are out there working. This will of course limit the amount of insects they can eat amongst the rows, making them less effective for insect control.

This season of assorted challenges brings me back to the French term I talked about in a previous column, "La Lutte Raisonnée," the reasoned struggle, a rather pragmatic approach to environmentally sensitive farming with the minimal use of chemicals. It is obvious there was no choice but to spray insecticides in order to save the crop and so we did what was necessary, but that does not mean we will not continue to strive for the most environmentally sensitive approach to our vineyard practices in this bio-diverse setting.

A project like the Peaceable Kingdom would not be practical for a large commercial operation. But for the smaller, family-run vineyard operations, of which there are many in Virginia, the addition of these diverse forms of life and our interactions with them, can add a rich, warm element to our days in the vineyard while at the same time serving a function that can reduce the amount of chemicals we introduce into our environment.



## EXCHANGE

Due to the large number of items for sale, I would direct our members to the following web site:  
**Virginiavineyards  
association.com**

Editors note:  
Please take note of the change of email address for our office manager Katie Meeks  
**vavineyardsassoc@gmail.com**



# Fruit Pests and Rot in Virginia

Dr. Bruce Zoecklein, *Enology Professor Emeritus, Virginia Tech*

*“A good life does not mean avoiding the storms, it means learning how to dance in the rain”-anonymous.*

Rain and the associated fruit rots are usually part of the Virginia harvest. Temperature, moisture, and wounds in the fruit have a strong effect on rot development and with *Drosophila*, stink bugs, birds, etc., it is not always easy to bring clean fruit to the winery and dance in the rain.

A universal question is how much rot does it take to detrimentally impact wine quality? The question is difficult to answer due to the types of rots, variations in incidence (percentage of clusters with visual rot) severity (percentage of rot per cluster) and most importantly, the overall production of rot metabolites. The following is a list of the effects of rot on wine. It is intuitive that antifungal agents used in the vineyard could have some impact on yeast- after all they are fungi. It is interesting to note that this same list applies to the influence of some vineyard spray residues on wine.

- Stuck or protracted yeast and/or bacterial fermentations
- Change in the microbiological population dynamics
- Off odor/flavor
- Oxidation, loss of aroma/flavor intensity
- Palate imbalance, poor integration of mouth-feel elements
- Haze and/or precipitates
- Shortened longevity

In Virginia we can often get a wide range of saprophytic organisms developing on and in the grape. Sometimes we get *Botrytis* growth. Under wet conditions, *Penicillium*, *Mucor*, and *Aspergillus* spp., as well as other molds and yeast. Many may overgrow *Botrytis*; this is referred to in France as vulgar rot (*pourriture vulgaire*). Breakdown of the grape skin provides a substrate for the growth of yeasts and acetic acid bacteria, and may produce a condition called *pourriture acide*, or sour rot. Other fruit rots include black rot, white rot and bitter rot.

## Effects of Rot on Fruit and Wine Chemistry

Fruit rots have significant influence on fruit chemistry, therefore winemaking and ultimate wine quality. Table 1 lists some of the rela-

tive data from my lab looking at the effects of *Botrytis* and sour rot complex. The largest quantitative changes occurring as a result of *Botrytis* growth are those of sugars and acids. From 70 to 90% of the tartaric acid, and from 50 to 70% of the malic acid, can be metabolized by the mold. However, the concentration effect resulting from berry dehydration can obscure these effects. Change in the tartaric-to-malic acid ratio leads to a reduction in titratable acidity and elevation in fruit pH. What we do not need in VA is additional sources of elevated pH values!

Mold complexes use ammonia nitrogen, reducing the levels available for wine yeast metabolism. Additionally, thiamine (vitamin B1), and pyridoxine (vitamin B6) are depleted. Each of these can impact the ability to ferment

and volatile compounds produced during fermentation.

**Laccase.** *Botrytis cinerea* strains differ in the production of laccase, an enzyme that impacts the ability to clarify juice and wine. Perhaps of greater concern is the oxidation of aroma/flavor compounds caused by this enzyme, dramatically impacting the resultant wine.

**Glycerol.** Glycerol is an alcohol which is produced by molds. Owing to its relatively-high specific gravity, it may contribute to the overall organoleptic perception of wine body. Most of the glycerol produced by molds will remain inside the infected berry due to the fact that glycerol is non-volatile. Glycerol itself

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**Table 1. Comparison of Virginia Riesling Musts**

Parameter	“Clean” Grapes	<i>Botrytis cinerea</i>	Sour Rot
Brix	18.5	21	≥ 16.0
Titratable Acidity (g/L)	8.0	6.5	5.0
Tartaric + Malic acid (g/L)	7.2	5.2	4.4
pH	3.3	3.5	> 3.4
Gluconic acid (g/L)	0.5	1-5	≥ .5
Acetic acid (g/L)	0	1.1	≥ 1.5
Glycerol (g/L)	Trace	1-10	Trace
Ethanol (% v/v)	0	0-trace	≥ 0.2%
Laccase (µg/mL)	Trace	0.1-8	trace to 0.5
Glucan (mg/L)	0	247	65

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# Fruit Pests and Rot in Virginia

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possesses no significant problem for the winemaker but can be used as a barometer of fruit rot incidence.

**Gluconic Acid.** Infected fruit can contain a relatively-high (25 g/L) gluconic acid level as a result of glucose metabolism. Since gluconic acid is not utilized by yeast or bacteria, it may be used as an indicator of fruit deterioration. The ratio of glycerol to gluconic acid indicates the “quality” of the rot. Higher ratios indicated the growth of true noble rot (pure *Botrytis cinerea*), whereas lower ratios suggest sour rot (Pfeffer et al., 1985).

**Acetic Acid.** Acetic acid is a normal byproduct of yeast and bacteria. When acetic acid bacteria and yeast are combined with fungal growth, high levels of volatile acidity can be produced. Sour rot complex (production of acetic acid in the presence of bacteria and yeast) may show significant variations in acetic acid content in the fruit. Acetic acid is volatile at normal vineyard temperatures and can easily be detected by scent during a vineyard stroll.

In some cases, fruit enters the winery showing limited visual rot, only to have excessive acetic acid produced during fermentation. Several species of *Lactobacillus* (lactic acid type bacteria) present in the fruit can convert grape sugars to acetic acid, thus raising the acetic acid level or volatile acidity excessively, even prior to the completion of alcoholic fermentation. Unfortunately, this was not uncommon

in 2011, where wines had a VA greater than the legal limit prior to the completion of fermentation.

**Ethyl Acetate.** The volatile character or “acetic nose” is not exclusively the result of acetic acid production. Acetate esters, most specifically ethyl acetate, (finger nail polish remove smell) contribute significantly to this defect. Ethyl acetate produced by lactic acid bacteria is the result of sugar metabolism, hence the reason that acetic acid level may increase significantly during fermentation.

**Galacturonic Acid.** Molds causes an increase in the galacturonic acid content as a result of enzymatic hydrolysis of cell wall pectin compounds. This acid may be transformed and combined with calcium to form an insoluble salt, calcium mucate. We have certainly experienced this problem in Virginia, which usually develops post-bottling.

**Instability.** One of the greatest impacts of fruit rot is the formation of polysaccharides (sugar complexes) that create clarification problems. Pectins (complex sugars that hold plant tissues together) are transformed by mold-produced enzymes, creating these polymers. Polysaccharides can form protective colloids in juices and wines, inhibiting clarification.

**Aroma and Varietal Character.** Grape aroma compounds can be lost as a result of the oxidizing effect of fruit rots. Metabolites such

as gluconic acid, oxidase enzymes, volatile esters, aldehydes, and traces of other organic compounds may alter grape aroma/flavor compounds or their aroma intensities (Zoecklein et al., 2005).

A very small amount of rot (rot metabolites) goes a long way. A principle means of dealing with rot is sorting in the field and pre and post-destemming. Except in seasons where we are simply overwhelmed (2011), this is usually a viable strategy to reduce the rot metabolite load. The best approach for a grower is to work carefully with the winery on all vineyard management plans, including attempts to control fruit rots. Remember-luck is the residue of design!

## References

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## First Chris Breiner Scholarship Awarded to Local Student

The first scholarship in memory of Chris Breiner, winemaker and managing partner at Stone Mountain Vineyards in Dyke, has been awarded.

The recipient is Gregory Marcellus, who is working to establish a winery on a family farm in Powhatan. He is enrolled in the year-long certificate program in viticulture at Piedmont Virginia Community College. PVCC's viticulture and enology program has enrolled more than 400 students and awarded nearly 50 certificates since it began in 2005. It is the only program of its kind in the commonwealth.

Breiner, who died in February, was known for creating Italian-influenced Virginia wines and working to promote Virginia vintages. He served as vice president of the Virginia Wineries Association

and was past chair of the Jeffersonian Grape Growing Society/Monticello Wine Trail. He supported PVCC's viticulture and enology program from the beginning, teaching the bottling class at Stone Mountain and helping with the wine marketing class.

Friends and family established the Chris Breiner Scholarship for Viticulture and Enology to honor his memory and to support students who will be the future grape growers and wine makers in Virginia. The annual scholarship covers the cost of either certificate program. Contributions to the fund may be made to the PVCC Educational Foundation. For information call 434.961.5204 or email [development@pvcc.edu](mailto:development@pvcc.edu).



Left to right are: Kate Breiner from Stone Mountain Vineyards, Dr. Frank Friedman, President of PVCC and Gregory Marcellus, Breiner Scholarship recipient.



# Is Virginia Wine Ready for the Big Time?

Mark L. Chien, Viticulture Educator, Penn State Cooperative Extension

I have written and talked about what it takes to put an emerging wine region on the world wine map before but with all the cool stuff happening in Virginia I thought it might be worthwhile to revisit the topic and see how this leader in the Mid-Atlantic wine region is doing. This is a bit of free association rambling (nothing new for me) so I hope you can follow along. It is also just one person's opinion but a decidedly interested one as Virginia wines are concerned.

I attended the Virginia Wine Summit this week, which was sponsored by the Virginia Wine Board and hosted by Governor and Mrs. McDonnell. This in itself is significant for Virginia wine, that they have a wine board with the funds to stage an event like this and the governor and first lady would attach their names directly to it. On the surface this might appear to be just another promotion event but I think it may mark a change in stature of Virginia wines in the big, wide wine world. I always draw on my experience in Oregon to inform me about what it takes for a new wine region to ascend the mountain to wine respectability, recognition and success, and to calibrate our progress in the Eastern U.S.

This event brought together a lot of forces at work in Virginia, probably first and foremost a legislative funding mechanism that created the Virginia Wine Board which paid for the event. To my knowledge, there is no wine marketing (or research) order or program that the wine industry uses to its benefit, and having matching funds to put on the table is always useful in the state capitol when money is being allocated. The second element here is support from the Governor, and maybe more importantly from Mrs. McDonnell, who appear to have a genuine affection for the Virginia wine industry and like drinking (and sharing) their wines. Also, I had a chance to meet Todd Haymore, a young and dynamic secretary of agriculture, who isn't stuck on traditional commodity crops, such as dairy or timber, but willing to recognize the potential of wine as a new player in the agricultural landscape of the Commonwealth. Their support, while not absolutely critical, certainly helps make things easier in the funding field.

The wine summit invited Steven Spurrier, of "Judgment in Paris" fame to visit, taste, and talk about Virginia wines. Is it really worthwhile

to bring in a celebrity to help to validate an emerging wine region? Certainly Mr. Spurrier has an impeccable reputation in the wine trade,



*The wine world gathers in Richmond: growers, wine makers, writers, retailers, restaurateurs, sommeliers, educators, consumers, politicians and even an extension educator.*

and, in fact, his comments about the wines we tasted were helpful. When I think back to Oregon, this step was skipped or omitted, I'm not sure intentionally or not, but I question a bit the utility and practicality of it. It might create a brief spike in interest in Virginia wines from people who read about his visit, but swooping in, tasting a few wines, writing something polite (or not) about the experience, does not have enduring impact or value to the wine industry. But what it does show is that Virginia is thinking about itself and how it will get itself recognized and onto the world wine map.

Mr. Spurrier is perhaps best known for orga-

nizing the wine competition in Paris that pitted French wines against wines from California. The results are well known and since then these types of mano-o-mano wine events are commonplace. Recently, the "Judgment in Princeton" shined a light on New Jersey wines that were tasted against their French counterparts. Richard Bomrich, MW wrote a smart piece in the October issue (pages 18-19) of Wine Business Monthly about how inherently flawed, and in some respects silly these kinds of "competitions" are and he's absolutely right. But it would be a bad case of sour grapes to dismiss these dramatic events because they make no logical or statistical sense. Wine consumers love them! How else could George Taber's book "Judgment in Paris" become a best-seller and then be made into an awful movie called Bottle Shock (please read the book, do not watch the movie!).

In Oregon, the 1975 Eyrie South Block Reserve Pinot Noir won a judgment tasting against some of Burgundy's finest, helping to establish Oregon's Pinot reputation, and perhaps attracting Robert Drouhin to the

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# Virginia wine

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Willamette Valley. And I guess California is doing okay, at least the last time I checked.

So if there is to be an outcome to the Judgment in Richmond (or Virginia), it will hopefully raise consumer awareness of the quality of Virginia wines. I tasted 16 Virginia wines and all were very good quality, on one very exceptional. We tasted two wines in each varietal category, including Viognier, Cabernet Franc, Bordeaux red blend, Cabernet



Steven Spurrier addresses the lunch audience

Sauvignon, Nebbiolo (how did that get in there?), Petit Verdot and Touriga Nacional. For the most part, the Virginia wines had more forward fruit, lushness and good acidity. These are wines that deserve consumer and critical recognition and respect. They also show that the wine industry in the East has a lot more to learn and do before we can compare ourselves with the benchmarks in each of these categories. But that is no surprise and we are reminded of that fact every single day in the vineyards and cellars.

As I consider how other wine regions like Oregon, Washington, the Finger Lakes and Long Island created their brand and identities, there are some common denominators that an emerging wine region like Virginia can use to its own advantage.

First and foremost, the wine has to be good. I would guess that 10% of the wine producers have to be making very good to outstanding wines by international standards, let's say 90-95 Parker or WS scores, and they must do it consistently. The great challenge in the Mid-Atlantic is vintage variation and how we cope with the wine quality peaks and valleys, but I think we can cope with this using our viticulture and wine making knowledge and technologies. I think there are over 200 wineries in Virginia right now so even if just 20 or so are really devoted to producing world class wines it's enough for the press to pay attention.

We do not know for sure, but are getting closer to an understanding of what is needed to make a world-class bottle of Virginia wine. It's mostly about site selection and, unfortunately, until the key wine districts are viticultur-

ally mapped for soil and climate and terroir of this caliber analyzed and quantified, it will be hard for anyone to find a great wine site. I am mainly referring to well to extremely well-drained soils, proper slope and aspect, local elevation and topographical, macro-meso climate features, preferably taking advantage of any rain shadow effects. I am pretty convinced by now that the closer you are to the ocean, the harder it is to produce consistently fine wines, there is just too much pressure from rain after veraison, which dilutes fruit and

causes fruit rots (see Pennsylvania 2003, 2004, 2009, 2011 for evidence)

Other necessary components of wine region success are capital, because it just isn't cheap to install a high quality vineyard and winery, and, in fact, infrastructure and personnel make a huge difference in obtaining every ounce of potential quality from the terroir. Funding, at the global (wine industry) and personal (vineyard and winery business) levels has to be durable, sustainable and sensible, i.e. it has to be well directed.

In Oregon, the check off funds could either go towards research/education or marketing/promotion, with a minimum of 33% allocated to either area. In the early years two-thirds was devoted to pushing grape and wine quality through research

and education. I admit to a bias towards research and education but I still believe to my core that wine quality is the foundation upon which a wine industry is built. Otherwise, it's a one bottle sale and end of story, relationship, etc. It's hard to measure the contribution that Tony and Bruce have made to the current success of the wine industry in Virginia. Personally, I think it's substantial, but it could be even more if they are given more resources. There are still big challenges to producing consistently high quality Virginia wines and it will take a lot of science and hard work to figure out solutions.

Are Virginia wine makers and growers having regular technical production meetings? In Oregon, the Pinot noir technical conference at Steamboat was a key to improving wine quality. Winemakers and growers, talking among themselves, is an incredible way to compound the amount of knowledge in a region. It's

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# Ready for the big time?

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mostly for naught if it's stuck in one person's head. That's why I write so much. Also, an international dialogue needs to develop to get to the highest level. Regular critical tastings, discussions and tours of cellars and vineyards is critical to intellectual growth and quality improvements.

There is a lot of conversation about what the signature white and red varieties should be in Virginia, and if it's necessary for a wine region to have marquee varieties in order to take its place on the world wine map. It's a very difficult question. It appears that Cabernet Franc and Petit Verdot are the red candidates, and Viognier has been crowned the Virginia white grape. We had a spirited conversation about the red wine in the afternoon where we tasted a Bordeaux blend, Cabernet Franc, Petit Verdot and Norton. Determining a signature variety is complicated and fraught with risk. That's what makes areas such as the Willamette Valley and

Finger Lakes such a no brainer and easy to develop and promote because from Day 1 it was all about Pinot and Riesling, respectively. Washington has been up and down with Merlot and Syrah. But each of these states is much more than any one variety can represent, and so is Virginia. I believe that the best wine makers will learn about the terroir and make the logical variety matches, and hopefully make great wines that will dance into the marketplace to a captivated audience. This is a declaration that should not be hurried.

That's not to say that wine marketing isn't vital to this whole exercise. At the Atlantic Canada Wine Symposium in Halifax this summer I stumbled upon a talk by Morgen McLaughlin, the president of Finger Lakes Wine Country, a private promotion organization whose mission is to popularize the Finger Lakes area (not just the wine industry, but Corning and other attractions). In her dynamic and take-no-prisoners way, Morgen explained how they, in a very cool and calculating fashion, decided to get the Wine Spectator to pay attention to FL wines. They executed their plan and now WS regularly reviews FL wines which often score in the high 80s and low 90s. The next step is to get wine quality to mid 90s. This opened New York City restaurant wine lists to FL wines. Welcome in the world!

Part of Morgen's success depended on her

ability to show the BEST of FL wines to WS. Given the politics of the industry, it's easier said than done. But the good thing about FLWC is that it is a private organization that doesn't need to make everyone happy. At some point, or at least for targeted occasions, an industry has to decide that it's going to put its



best stuff in the glass, and when it does, it will, in fact, benefit everyone. You can NOT pour bad wines when you are trying to get people to like your wines!

The wines have to be available outside of the home marketplace, and in places where fine wines are appreciated and noted. Oregon Pinot, driven by the costs of low yield viticulture, demanded higher bottle prices, which Oregonians (including myself) could not afford to pay so it committed itself very early to the wholesale, out of state market to large wine centers.

While the wine press is probably not as important as the restaurant trade, Virginia wine is very lucky to have Dave McIntyre, the wine writer for the Washington Post, as one of its boosters. That can't hurt. Dave can encourage people to taste local wines but I believe it was wines by the glass being poured in many of Portland's better restaurants that launched Oregon Pinot into space. Not many consumers, including myself, will take a chance on a (name your price) bottle of wine from an unknown area, at least not without a direct and personal recommendation. So the challenge is to get a wine consumer to taste the wine first, without having to plunk down a big wad of dough. It's all about confidence and education. Get that first sip across the lips and all of a sudden everything falls into

place – buy fresh, buy local, matching local foods and wines, reduce the carbon footprint, support local agriculture, spend a day (or two) visiting local wineries, it's an epiphany for the wine consumer that, in a short 50 years, has made Napa Valley the #1 tourist destination in California. By comparison, it took nature eons to create Yosemite, so we have her beat hands down, and it's not even the top attraction! Nevertheless, engage Dave and his colleagues at every possible opportunity.

What's next for Virginia? Well, if it is confident of its wine quality, it is welcoming the world to its wines. As I said earlier, that means sharing them openly, getting them "out there." In Oregon, there were two main sharing devices, the International Pinot Noir Celebration and Oregon Pinot Camp. IPNC invites Pinot lovers (consumers, trade, writers, etc) to McMinnville each summer for an unbeatable festival of Pinot noir. Pinot camp focuses on the wine trade (retailers, sommeliers, wholesalers, etc), and for 3-days carts

them around to the best wineries and then sends them back to their stores and restaurants as new disciples of Oregon Pinot. Before you do any of this, check the wine quality.

All of this takes three things: vision, leadership and cooperation. This is one thing that Oregon and Washington have both had from the beginning. People like David Adelsheim, and Dick Erath in Oregon, and Chateau Ste Michelle in Washington. Who are the leaders here and what kind of vision do they have for Virginia wines? Can there be enough consensus building to get the job done? I'll never forget what Jim Anderson, the charismatic leader of the Missouri wine industry, who convinced St Louis that it needed to drink hybrid wines, told me that you simply have to ignore the negative naysayers, the "nattering naybobs of negativism" to quote a former politician, and in the end make and execute a plan. Act. Even if it's a mistake, do something, and always look forward.

Oh, and you've heard me say this before, and I was glad to have Mr. Spurrier offer the same admonition . . . get out of your bunker (I mean cellar) and taste wines! Especially benchmark wines that can inform you of the type, style and price point of the wines you are or want to make. Justin Willet at Tyler Winery

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# Virginia Wine Summit

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in the Santa Rita Hills told us that the benchmark for his Chardonnay is Domaine Roulot Meursault Les Tessons. You can taste it, visit there, talk to Jean-Pierre and work backwards from their through the cellar to the vineyard to try, not to recreate his wines, but to emulate them in the best viticultural and wine making way.

I think a lot about this stuff. Each and every day I think hard enough that my brain hurts about how we can make consistently better wines in the Eastern US. I hope this is fodder for conversation. It's impossible to know, of course, what's going to happen in Virginia but the indicators are looking promising. I get the buzz in Virginia. To me, that's when things start really moving. I'm not exactly sure what the buzz is, or when it happens, or exactly why, but there was a time in the early 90's when Oregon buzzed and the rest, as they say, is Pinot history. The wine industry is growing so fast that I have lost track of who the players are, and for the most part that is a good thing but the wine future of Virginia should be directed, and not completely left to fate. I'm pretty sure that wine quality, at this point in time, is really good but there's lots of room for improvement. Decisions that leaders make now will decide where this industry ends up in the context of great wines of the world, or the U.S., or the Mid-Atlantic. The indicators, such as the wine summit, funding, research and education, a strategic plan, vineyard sustainability and other road markers that other wine regions have passed on their way to success are in the view of Virginia wine. It will take a lot of vision, cooperation and effort to overcome the environmental and consumer perception challenges, not to mention those that we create for ourselves, to get to wherever that mythical place we hope to be on the world wine map.

I would be terribly remiss if I did not recognize, thank, and praise Annette Boyd, the director of the Virginia Wine Board Marketing Office and her amazing staff and crew who organized and delivered the wine summit. I have been to a lot of wine meetings but never have I seen a room full of glasses turned around so quickly and efficiently. It was beyond impressive. Her hospitality and grace are completely Virginian.

Here's a list of the wines I tasted at the summit:

## Viognier:

2010 E. Guigal Condrieu  
2010 Ducard Signature Viognier

## Cabernet Franc:

2010 Domaine Bernard Baudry Les Grezeaux Chinon (Loire)  
2010 Barboursville Reserve

## Bordeaux Red Blend:

2008 Chateau du Tertre (Margaux fifth growth)  
2009 Potomac Point Richland Reserve Heritage

## Cabernet Sauvignon:

2009 Keswick Vineyards Monticello Reserve  
2009 Chateau Montelena

## Nebbiolo:

2008 Barboursville Reserve  
2008 Vietti Castiglione Barolo

## Petit Verdot:

2008 Delfosse Vineyards  
2009 Casale del Giglio (Italy)

## Touriga Nacional:


2007 Barren Ridge Vineyard  
Quinta do Crasto (Portugal)

## Viognier tasting:

Breaux Vineyards  
King Family Vineyard  
Keswick Vineyards

## Virginia Reds:

Barboursville Vineyards Cabernet Franc  
2009 RdV Vineyards Lost Mountain  
Veritas Vineyards Petit Verdot  
2011 Chrysalis Barrel Select Norton

I cannot resist mentioning perhaps my favorite wine of this visit to Virginia, a very interesting and unique 2010 Hudson-Chatham Winery Mason Place Vineyard Pultney Farms Old Vines Baco Noir from 60+ year old vines near the Hudson River. Dave McIntyre brought it to a dinner at Peter Chang's and it was the best red wine (along with Finger Lakes Riesling and Gewurztraminer) with spicy Chinese food. 

Mark L. Chien  
Viticulture Educator  
Penn State Cooperative Extension  
<http://pawinegrape.com/>



*A sea of wine glasses, and to my knowledge, not a single broken glass or spilled wine, well, except for mine (sorry Bill!)*

# Grapeberry Moth

Tim Jordan

In this and years past, I must extend sincere thanks for your valuable contributions to my research. I have learned so much from all of you, and I have been fortunate to work with so many of you across the state. From the beginning, you have embraced me with kindness and friendship, for which I will always be grateful. Through my fruitful interactions with you and your commitment to Virginia viticulture, I anticipate a quality outcome that will facilitate our management of grape berry moth (GBM) in the state.

Before I wrap up my studies, I can tell you we have learned much about GBM in Virginia that was not already published. Here are some of my thoughts:

First, historical records suggest we will see emergence of the spring (overwintering) generation around bloom. Instead, my research has shown that the bloom-time flight is emergence of the 1st generation, while the spring generation emerges as early as March. We did not detect the earlier emergence because we normally set out pheromone traps in May, and we did not place traps in the woods.

Second, traditional management guidelines for GBM suggest that larval populations are highest, and most detrimental, just before harvest. Much of the information came from northeastern and Midwest states where work on GBM has been done for several decades. My work in Virginia has shown that larval populations reach their highest levels of infestation at veraison before significantly declin-

ing pre-harvest. Aside from direct yield loss, the risk of GBM infestation at harvest stems from the larval association with Botrytis rot. A number of factors contribute to risk of rot from infestation. Most commonly I found that white fruited and compact cluster varieties exhibited greater levels of infestation, while I observed the occasional gray mold on both red and white fruit.

Next, no matter the time of season, the edge of vineyards exhibited greater levels of infestation than did the interior. With the exception at pre-harvest, vineyard edges frequently exceeded the threshold. On average, the interior infestation rarely exceeded the treatment threshold\* (6%). While my work has yet to establish that wild grapevines in wooded borders are a principal cause of edge infestations, wild vines are a known implication of risk. In vineyards that have taken measures to remove wild vines, I have seen little to no infestation in the vineyard edge or interior.

Lastly, work in the Midwest has shown that early-season management of GBM is an effective means of preventing population build-up. The use of consecutive, well-timed control applications around bloom was shown to be as effective as a conventional, season-long program. Through our trapping, we have seen a shift of catch from the woods (overwinter generation) in April to the vineyard (1st generation) in May

and June around bloom. Instead of rigorous season-long monitoring, I anticipate we will be able to use growing degree-days from biofix (first catch) to predict the emergence of the 1st and subsequent generations. This will facilitate our early season management and, hopefully, reduce unnecessary inputs later in the season. Confucius says, “Settle one problem, keep one hundred away.”

\*Caveat—the mention of treatment threshold is nominal at best. Early to mid-season thresholds of 15% infested clusters and late season threshold of 6% were devised for table grapes in the northeast. No threshold has been devised for wine grapes because of the premium risk inherent to their production. As such, we may assume that any infestation warrants control. Your experience with GBM is the most critical indicator for whether or not to manage GBM. Some get away with no applications and have minimal damage, while others must maintain a rigorous schedule to suppress the population from creating substantial losses.



## Online Workbook!

The VVA announces that it has selected a contractor to convert the Sustainable Viticulture Practices workbook to a database and make it available on line. The project is funded in part by a grant from the Virginia Wine Board.

The online Sustainable Viticulture Practices workbook will offer all of the features of the paper version of the workbook, plus automated data analysis, comparisons with up-to-the-minute benchmarks, high-priority practices recommendations, and the tracking of improvements over time. To keep the tool simple, inviting, and informative, it will be organized to encourage exploration, with a clean interface that draws the user's attention to those practices that give them the greatest room for improvement, motivates them to learn more, and provides them with the educational resources to do so.

Some of the key features include:

- Instant saving - Unlike many other form-based survey websites, the

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# Virginia Vineyards Association Grape Press

## Online Workbook!

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workbook will save user's submissions as soon as they click on a selection.

- Comparison of the user's reported practices to others (in blind) within the region - Working group members have recognized that some practices may vary according to soil types, topography, and precipitation patterns, so will report practice comparisons by region.

- Intuitive graphical indicators - A variety of simple graphical indicators will help users visually differentiate between practices for which they are above and below average, allowing practices that may be of interest to draw the user's attention from even a quick scan of the page.

- Availability of additional explanations and resources - A simple "learn more" link below each practice keeps the interface clean while placing extended information at the user's fingertips.

- Update responses - A user can choose to update their responses at any time if they would like to record a change in their practices. The workbook system retains all of their past responses, so that they can visualize their improvement in practices over time.

The project is planned for performance over the next six months, with rollout set for the start of the next growing season. To meet this schedule, VVA members of the workgroup and the communications committee will be meeting to:

- Supply the contractor with language for all workbook practices, narrative information, URLs for outside references, and documentation on the precise methods to be used for scoring and practice recommendation.

- Work with the contractor to finalize specifications for the workbook application, including its appearance, features, and administrative functions.

- Update pages on the current VVA website that will refer visitors to the workbook signup and login pages.

Our goal is to have a prototype available for presentation at the winter VVA meeting. Stay tuned!



## President's Corner

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Vineyard. The Case Foundation has committed to invest in the Virginia Wine industry - as a result of their enthusiasm they have committed all profits from their vineyard operations to be re invested into the Virginia Wine industry. To start the ball rolling the Case foundation has offered \$50,000.00 for ideas on how we can improve quality. We welcome the Cases to Virginia viticulture and we will be putting forward ideas for funding - thank you! Jean emphasized the need to increase not only quality but also the single most important thing that Virginia needs - more planting of Virginia grapes to make more Virginia wine.

I won't say anything more about the Summit here but encourage you to read Mark Chien's article on the Summit titled, "Is Virginia Wine Ready for the Big Time?" This will, I hope, lead to a lively discussion paralleling our goal of providing quality grapes for the Virginia Wine industry.



## Calendar

### Winter Technical Meeting

January 31 - February 2, 2013

Omni Charlottesville

Annual Virginia Vineyards Association Winter Technical Meeting. More details will be posted on <http://www.virginiavineyardsassociation.com/>

### The Vines and Wines of Bordeaux

The VVA has finalized an 8-day, 7-night trip to Bordeaux, France, this winter to meet with vinegrowers, winemakers, researchers, and brokers to discuss production techniques, current research, winemaking, marketing,

and promotion. There will be tastings, of course, and some sightseeing, but the focus will be on making contacts and learning practical techniques and management initiatives. 15,000 independent growers and 4,000 producers have had centuries to identify what works and what doesn't.

Members must enroll and pay a deposit by October 10th to ensure their place on the tour. Seating is limited, so reserve your place. Save \$100 by paying in full by October 15th, the early bird price will be \$2700 plus trans-Atlantic air fare.