

# GRAPE PRESS

Spring 2022

The Quarterly Newsletter of the VIRGINIA VINEYARDS ASSOCIATION

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Distinguished enologist Bruce Zoecklein provides an in-depth review of vineyard and winemaking strategies worth considering now.

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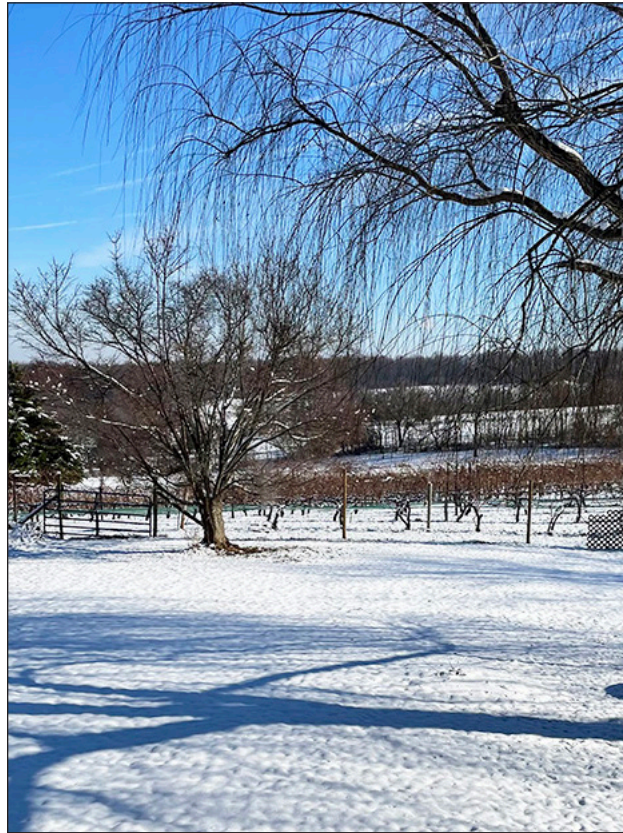


## Virginia's Viticulturist

A special section marks Tony Wolf's retirement with a Q&A and recollections from growers and colleagues.

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## A QUESTION OF DEGREES



Dean Triplett

Overly warm temperatures, snow, rain and ice – depending on where you're growing, you might have seen it all this winter. Weather is always a hot topic in some of our Regional Reports, beginning on page 3. Above, Greenstone Vineyard in Loudoun County earlier this winter.

President's Corner

## VVA Plans Technical Meeting for May 12-13

By Skip Causey

Potomac Point Vineyard & Winery

With the rise in Covid cases, we held a virtual meeting Feb. 17 on vineyard protection, and postponed the main program of our 2022 Winter Technical Meeting until late spring. The new date for this year's VVA Technical Meeting is May 12-13.

We are planning a half-day field trip to a local vineyard and a full day-and-a-half in-person meeting at the Omni hotel in downtown Charlottesville. The field portion will cover some new trends in handheld and larger mechanization equipment and products with demonstrations.

Sessions will include the annual VVA business meeting, our Grower of the Year presentation, regional updates, further discussions on

See *PRESIDENT* on page 2

## VVA Elects Three to Board Posts

By Bob Garsson  
*Grape Press*

The Virginia Vineyards Association (VVA) membership has voted to fill three seats on the VVA Board of Directors for 2022-23. Jeanette Smith was elected vice president, Kevin Sutherland was elected secretary, and Aury Holtslag was selected to fill an at-large seat.

"The great strength of our association is the willingness of our members to volunteer their time,

talents, and expertise to help further the interests of Virginia viticulture," said VVA President Skip Causey.

"I want to congratulate Kevin and Aury as they join the board, and Jeanette as she steps into this new position," he added. "I also want to thank Todd Henkle and Emily Belcher for their service on our board and for all that they did for the VVA." Todd had served as vice president and Emily as secretary.

See *ELECTIONS* on page 5

## VVA BOARD 2022

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**Skip Causey**

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**Special thanks for this issue to:**

Rachel Lagergren, Gonzalo Ortiz,  
Mizuho Nita, Dean Triplett, Bruce  
Zoecklein

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## PRESIDENT'S CORNER (cont.)

*PRESIDENT, from page 1*

downy mildew, ripe rot, and the spotted lanternfly invasion, and two comparative tastings of Tannat and Albarino.

The May 12-13 meeting will be a combination of our Winter & Summer Technical meetings. We normally meet in June or July; last year we pushed it to August and were able to time ourselves between variants.

We should also have some updates on legal issues affecting the grape and wine industries, as well as an update on the search by Virginia Tech for a replacement for Tony Wolf. And speaking of Tony, I hope you'll take a look at the special section in this issue that recalls Tony's service through the eyes of those who knew him well — growers and his colleagues at Virginia Tech.

The agenda for the May meeting will be released soon along with registration information.

### **Vineyard Protection Webinar Held**

Our Feb. 17 virtual meeting was devoted to vineyard protection. The webinar included sessions needed for the Pesticides Applicators License recertification, and 55 of our 80 participants took advantage of that opportunity and had their recertifications signed off on by Tremain Hatch.

The recertification program is usually conducted during an in-person meeting, but we were able to obtain authorization to conduct it this year in a virtual setting. That involved a sign-in process along with small quizzes at the end of each session to verify attendance, which satisfied requirements of the Virginia Department of Agriculture and Consumer Services.

I want to thank Tremain, Mizuho Nita and Doug Pfeiffer from Virginia Tech and Marlene Larios from VDACS for helping to make this webinar happen. This is always a good update even for those who don't need the recertification. The legalities regarding these chemicals and workforce safety standards are constantly changing and are ever so important.

Doug brought in a few vineyard owners from Pennsylvania who are battling the spotted lanternfly now and they gave both a warning and good advice for handling this invasive pest.

Doug and Mizuho also presented several SLF research projects that will help all states

combat this plague. Everyone in Virginia recognizes that the lessons and knowledge that the Pennsylvania farmers have acquired will help us to be better prepared as the SLF comes our way.

The latter part of our webinar featured Mizuho's Grape Disease Management Updates. This is always a very popular program and was again well attended. We will work to add an abbreviated session from him at the May Technical meeting, as well.

During the webinar, we also announced the results of our VVA elections to fill three Board seats (see article on page 1). I want to welcome the new board members and officers and extend my sincere thanks to Todd Henkle and Emily Belcher for their time on the Board.

The VVA Board will be meeting over the next few months to revamp some of our committees. Some have not met in a while or have dwindled down to one or two members through attrition. Several committees are no longer needed, but we will probably need to beef up others to help us meet new challenges facing the industry.

If you would like to volunteer your time, stay tuned for an announcement. And thank you in advance for helping out.

### **Grape Report Results Due Soon**

We should have our Virginia Commercial Grape Report out before our Technical Meeting in May. We are working on the final tallies and calculations, and we appreciate everyone's input and time.

This year's report will show the strong growth that the Virginia wine and grape industry has experienced in recent years. We are now showing over 4,400 acres of vineyards sitting on farms consisting of more than 35,000 acres.

Past reports have always shown that the number one planted grape in Virginia is Chardonnay. We can officially announce that Cabernet Franc now tops the list, and by a wide margin.

The new report will also show what varieties are being planted and coming into harvest in the next couple of years.

We are still wrapping up the Crush Report but the last I checked, we have topped 9,000 tons of grapes processed in Virginia in 2021. Stay tuned for the full report and thank you again for helping us make this the best one yet.

The Virginia Vineyards Association (VVA) provides Grape Press for general information purposes only. The views and opinions expressed here do not necessarily reflect any official position or policy of the VVA and are not a VVA endorsement of products, practices or services. Before adopting any practices discussed here or purchasing any product or service, users should exercise due diligence and seek professional advice when appropriate.

▶ **NORTHERN VA.** “Our guys are very good at pruning and get us in good shape very quickly.”

By Dean Triplett  
Greenstone Vineyard

Here we are again in the throes of winter, or at least what amounts to winter these days. December 2021 was the second warmest on record and according to Drought.gov, a website maintained by the National Oceanic and Atmospheric Administration, the month was the third driest as well. Even though we finally got some needed rain the last week of the month, we were still down 2.3 inches. January, on the other hand, has been cold and wet.

So far, as I write this report, we’ve reached a low of 11 degrees twice in the week of January 17th. We’ve had five snow events so far totaling just over 6 inches here in the Leesburg area. We just dodged one big nor’easter the last weekend of January.

None of the snow events themselves have been really troublesome, unless you were one of those truly unfortunate folks stuck on Interstate 95 for 24 hours or more. The problem we’ve had lately is that the temperatures have remained below freezing for quite some time, so the snow we had has turned to ice.

The forecast that I’ve seen for the first week of February promises a break from the cold for about three days, then right back into the deep freeze. The good news is that nothing really needs to be taken care of in the vineyard. We don’t typically start final pruning until February/March and I don’t rough prune in January anymore.

Our guys are very good at pruning and get us in good shape very quickly. The bad news is I’m completely spoiled by the very mild winters of the previous two years. That’s not to say that this year has been tough by

any means. Eleven degrees above zero is not really all that cold.

But the low temperatures, along with our gray, gloomy cloudy days, just take what little oomph I have right out of me. And the latest round of Covid has kept all in-person meetings of the Loudoun Wine Growers Association on hold. This has, unfortunately, made it difficult to know how other vineyards in the region are faring.

One big concern I’ve heard about is the difficulty several local wineries are having in getting bottling supplies. Bottles themselves are in high demand and short supply. This, of course, is causing a ripple effect for both wineries and the mobile bottling lines many of them rely upon. Hopefully, this, along with all of our other Covid-related issues, will get better as spring approaches.

See NORTHERN on page 4

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► **EASTERN VA.** “The soils here are exciting because they are very deep and drain very well ...”

By **Gonzalo Ortiz**  
*Rustic Vintage*

The diversity of landscapes in the beautiful state of Virginia is as vast as the backgrounds of our fellow grape growers. Here, in the eastern part of Virginia, the landscape is full of row crops, nurseries, vegetable farms, tree farms, forests, historic places, and welcoming communities.

From the Northern Neck and Middle Peninsula to the Eastern Shore and the larger Hampton Roads area, one can find farms with well-drained, deep sandy loam soils at low elevations and long growing seasons suitable for high-quality grape growing. Within these beautiful localities are beautiful vineyards managed by dedicated growers producing very high-quality grapes.

Every part of our state brings its own unique positive attributes, challenges, and complexities to our craft. In Eastern Virginia, some of the specific attributes that are particularly important to grape growers have to do with our proximity to the coast, the soils found here, and the length of the growing season.

The soils here are exciting because they are very deep and drain very well in an area with a long, warm growing season that consistently has a moisture-drying steady coastal breeze.

Water excesses and deficiencies tend to be

the unifying topic of many of the different Southeastern and mid-Atlantic grape growing regions of the United States. Because of the relatively flat land found in much of our Coastal Plain region, the importance of knowing how fields react after rainfall is paramount in site selection.

In many parts of this region, there is no ponding after it rains and you can dig four to five feet down and feel that the sandy loam soil is moist, but not wet. On higher quality sites in the region, one can effortlessly dig six feet down without finding wet soil. The well-drained soils of our region are perfect for high-quality grape production.

On the other end of the spectrum, those same rains will result in some farms being waterlogged. So, attention to detail in site selection is critical in these areas.

The presence of high-water tables is a limiting factor for vineyards and one that needs to be taken

account of by viticulturists.

But in areas without high-water tables, it's easy to get excited about the possibilities when digging soil pits. Knowing which clone of what variety will grow best in any specific area takes substantial time to determine. Avoiding vigorous rootstocks is important, as is the need to be aware of soil compaction.

This winter brought some snow events to the region, but the temperatures I saw on the Eastern Edge of the Northern Neck were

not of major concern. What was of concern this winter and going into the spring is not unique to our region, but definitely worth mentioning.

That concern is availability of materials and equipment. The businesses that support our industry and the knowledgeable people who run them have done a great job in providing selections of high-quality modern equipment, implements, sprayers, tractors, and parts for service. Through no fault of theirs, the wait time for some equipment and trellis material is intimidating. For growers, the increased costs sting, but the lack of availability really hurts.

In the months and years to come, I hope to present seasonal information that provides perspective from the Eastern side of our beautiful Commonwealth of Virginia. I hope to accomplish this by having conversations with local growers and sharing their insights.

***Editor's Note:** Gonzalo Ortiz is a new regional reporter for Grape Press, covering Eastern Virginia. He has spent his entire career in viticulture and managed many large to mid-size vineyards and wineries in Virginia, Pennsylvania and New Jersey, including Breaux Vineyards in Purcellville, Va. He will be planting 15 acres of vines over the next two springs in the Northern Neck. We hope to feature more news about Eastern Virginia vineyards and wineries in future columns. Please contact Gonzalo at [eastvagrrowers@gmail.com](mailto:eastvagrrowers@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.*

“... The wait time for some equipment and trellis material is intimidating.”

► **NORTHERN VA.** (cont.)

*NORTHERN, from page 3*

For those of you who were around and growing grapes in 1991, I'm sure you remember the cool summer we experienced when Mt. Pinatubo in the Philippines erupted, throwing enough sulfur dioxide into the atmosphere to cool the planet by about 1 degree Fahrenheit for nearly three years.

The Jan. 15, 2022, eruption of Hunga Tonga-Hunga Ha'apai in the South Pacific is being compared to Pinatubo in its power and sulfur dioxide production. The ensuing tsunami was highly destructive to the island

nation of Tonga, (though fortunately there were very few deaths) and caused damage as far away as Japan, New Zealand and Peru.

I'm wondering if 2022 will be our “Hunga” year. Time will tell, but global cooling of even 1 degree will be enough to have a major effect on grape quality around the world. Late season varieties like Petit Verdot and Cab Sauvignon could be particularly problematic.

I plan on keeping as close an eye as I can on the long-range temperature forecasts as the season progresses. Strategies might have to be developed to hurry ripening in late-season varieties.

As always, grape growing here in Virginia is not for the faint of heart. Let's all hope 2022 is a kind year.

***Editor's Note:** Dean Triplett is a regional reporter for Grape Press, covering Northern Virginia. We hope to feature more news about Northern Virginia vineyards and wineries in future columns. Please contact Dean at [gsvineyard13@gmail.com](mailto: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.*

## ▶ SOUTHERN VA.

“... As we moved into the new year, the weather continued to be warm and dry ...”

By Rachel Lagergren  
Southern Regional Reporter

All is relatively quiet in the southern region so this report will be brief.

“Temperatures in November and December were too warm,” observed Kevin Sutherland of Nicewonder Farm & Vineyards, Bristol, as he started working on his winter to-do list.

“It has been great weather for working outside, but not the greatest for the vines,” he said. “I was able to take some time off around Christmas and with temperatures like these, I ALMOST felt guilty for not being out in the vineyard.”

Indeed, as we moved into the new year, the weather continued to be warm and dry for Southern Virginia from the mountains to the coast. Most of our region remained in an “abnormally dry to moderate drought.”

Change came in January with temperatures starting out with highs in the mid-70s to lows near 10 degrees Fahrenheit by February.

January also brought ice and snow. Storm Izzy dropped 8 to 12 inches of snow, which remained on the ground for weeks due to cold temperatures and overcast skies.

Kevin said he started rough pruning with the Chardonnay.

“I’ve noticed a lot of split bark in vines in their 3rd and 4th leaf. We will be retraining those vines as we move through the vineyard.”

Pruning is also in full swing for Steve VanSutphin up on the Blue Ridge Parkway at Chateau Morrisette. He is focusing on cleaning up any vines that need attention from the late freeze of last spring.

**Editor’s Note:** Rachel Lagergren is a regional reporter for Grape Press, covering Southern Virginia. We hope to feature more news about Southern Virginia vineyards and wineries in future columns. Please contact Rachel at [lager0862@gmail.com](mailto: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.

# Free Pesticide Safety Materials Available

Materials to provide training and information on pesticide safety for agricultural employers and workers are available online and by mail.

Marlene B. Larios, coordinator of the Office of Pesticide Services in the Virginia Department of Agriculture and Consumer Services, said the following materials can be ordered by **emailing her at: [marlene.larios@vdacs.virginia.gov](mailto:marlene.larios@vdacs.virginia.gov)** (include your mailing address and how many of each item you want):

- Worker Protection Standard: How to protect yourself posters (English/Spanish)
- Training DVD’s for workers (English/Spanish)
- How to Comply Manual (English and a limited amount in Spanish)
- Respiratory Protection — A guide for Employers (English and Spanish)
- Recordkeeping Books for Pesticide Applicators


The WPS Protect Yourself posters (at right) are also available for download in several languages here.

### PROTECT YOURSELF FROM PESTICIDES

**1 AVOID...**


- Getting pesticides on your skin or in your body.
- Pesticide residue that may be in or on plants, soil, irrigation water, tractors and other equipment, and used work clothing or gear (PPE).
- Pesticide drifting from nearby applications.

Wear long-sleeved shirts, long pants, shoes, socks and hat or scarf to protect your body from pesticide residues.




**2 STAY OUT...**

- Of treated areas when told, whenever you see signs displayed, and when a pesticide application is taking place (application exclusion zone).



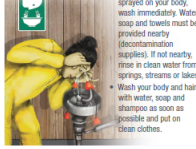
**3 WASH...**

- Your hands immediately before you eat, drink, smoke, chew gum or tobacco, and before using the toilet or your phone.
- Your body and hair thoroughly with water, soap, and shampoo, and put on clean clothes after work.
- Your work clothes after each use. Keep separate from non-work clothing.



**4 TAKE ACTION...**

- If pesticides are spilled or sprayed on your body, wash immediately. Use soap and towels must be provided nearby (decontamination supplies). If not nearby, rinse in clean water from springs, streams or lakes.
- Wash your body and hair with water, soap and shampoo as soon as possible and put on clean clothes.



IN AN EMERGENCY:

Get medical help nearby: Call the Poison Control Center: **1.800.222.1222**


Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_

If you need an ambulance, call them: \_\_\_\_\_

Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_

Call the State or Tribal Pesticide Regulatory Agency: \_\_\_\_\_

Address: \_\_\_\_\_  
City: \_\_\_\_\_  
State: \_\_\_\_\_

For medical treatment information, call the Poison Control Center: **1.800.222.1222**  EPA

Questions about pesticides? Call: **1.800.858.7378**  
(National Pesticide Information Center)

## Three Elected to Seats on VVA Board

ELECTIONS, from page 1

Jeanette, of Mount Jackson, began working in Virginia vineyards in 1981 while studying horticulture at Virginia Tech. Since receiving her bachelor’s degree in 1983, she has been involved in the planning, management, and maintenance of wine grape vineyards in New York, North Carolina, Pennsylvania, Maryland, and Virginia.

Jeanette founded VineSmith Vineyard Services, a vineyard consulting business, in 1998. She operates her own farm in Shenandoah County and has served as an at-large member on the VVA Board for the past two years.

She noted that over the years, she “has worked as a vineyard laborer, manager, agricultural extension agent and consultant.”

Kevin, vineyard manager and cellar master/winemaker at Nicewonder Farm & Vineyards, Bristol, has been involved in Virginia viticulture since 1998, when he began working part-time during the harvest and planting seasons at Abingdon Vineyards. In 2005, he joined Abingdon full time and worked there

until he joined Nicewonder in 2019.

“I have actively worked with regional and statewide viticulture organizations on several spray studies and other research programs,” he said. “We are currently part of the vineyard Sentinel project and are always open to any studies that our vineyard or winery can help with.”

Aury, vineyard manager at Brown Bear Vineyards, Woodstock, graduated from Virginia Tech in 2015 with a B.S. degree in Agriculture and Applied Economics and a minor in Horticulture. He interned with E&J Gallo Winery, Modesto, Calif., in the Viticulture, Chemistry and Enology Department, then returned to Virginia where he worked in several vineyards before joining Brown Bear in 2017.

“I would love to see the Virginia wine industry head into a more sustainable future through variety selection, better (and less) use of pesticides, and more technological innovations,” he said. “I’m excited to have the opportunity to serve on the VVA Board at a time when Virginia wines continue to distinguish themselves.”

# Preventing Phomopsis

## *Grape Pathologist Provides Overview of Suggested Applications*

By Mizuho Nita

*Grape Pathologist, Virginia Tech*

There are several diseases that can harm grapevines, and one that you need to address soon after bud break is Phomopsis cane and leaf spot. It causes minor leaf spots, which are evident to our eyes and necrotic lesions that cause more critical damage on shoots and rachis.

Phomopsis cane and leaf spot can also cause berry rot, though this is not common with wine grapes because of our spray programs. It can also cause necrotic lesions on cordons and trunks, which can harm the vines for years, and the infected cordons can become sources for new inoculum.

This pathogen tends to produce spores in spring from previously infected canes and cordons. These spores require water for their activities and can germinate in a relatively cooler environment. They can be active when temperatures are in the upper 40s.

Thus, springtime rain events, which we tend to experience soon after bud break, are ideal for the development of Phomopsis. Therefore, it is vital to protect young tissues when they come out from the older canes and cordons. Unfortunately, we do not have any curative fungicides against Phomopsis. Thus, the only means of control is to protect the young green tissues.

This disease typically takes some time to establish itself in the vineyard. It may take four to five years for Phomopsis to become noticeable after you start a new vineyard. However, once established in a vineyard, it is difficult to get rid of because the fungus survives in canes and trunks that were infected in previous years. These infected cordons and trunks will be damaged and weakened, and as a result, this disease can cause long-term damage to the infected vines.

If rain events are coming into the picture after bud break, mancozeb (FRAC = M3, Penncozeb, Dithane, Manzate, etc.), Ziram (FRAC = M3), and captan (FRAC = M4) are useful protective materials against Phomopsis. Since shoots will proliferate quickly, you may need to spray several

times, depending on how much rain we receive. One or two applications, starting when shoots are one to two inches in length and repeated seven to ten days apart, is sufficient in a typical year. After that period, your downy mildew or black rot applications, which come in the late spring, will most likely provide protection against Phomopsis.

QoI (FRAC = 11), such as Abound and Pristine, as well as SDHI (FRAC = 7), such as Luna Experience, Miravis, and Aprovia, are effective, too. However, you probably don't want to use them this early

### Workshops

**For info on Virginia Cooperative Extension's upcoming series of IPM and grape disease management workshops, check out Grower's Datebook on the following page.**

in the season because you will need these materials later to control other diseases (e.g., ripe rot and bitter rot).

Materials for black rot and downy mildew are often effective against Phomopsis and are especially helpful later in the spring and early summer. Some cultivars, such as Viognier, Cabernet Sauvignon, and Seyval Blanc, are more susceptible to Phomopsis than the others.

The other disease that you may need to address around this time of the year is anthracnose, which is more common with certain hybrid species. Typical symptoms are black necrotic lesions on leaves, shoots, and fruits, and often, the black lesion has an ash-colored center, as if you burnt the leaf or shoot tissue with a cigarette. The management strategies will be similar to that of Phomopsis, and in addition to the list above, Topsin-M (FRAC = 1) is also known to be effective.

A dormant application of lime sulfur is effective against both Phomopsis

and anthracnose. We used a 10 percent application rate (i.e., 10 gal per 100 gal of water) in our study using regular lime sulfur; however, the label of a relatively new product called Sulforix calls for 1 percent. With the corrosiveness of lime sulfur, the low rate of Sulforix is appealing to me. (Note: in our trial, fixed copper applied at a high rate was not effective.)

The dormant fungicide application can reduce Phomopsis to some extent; however, the application's efficacy is not strong enough to allow you to skip any preventative fungicide applications soon after bud break. The dormant application knocks down spores produced on the infected canes, but it won't protect new shoots. Therefore, you still need to protect your shoots when they emerge.

Although I see the benefit of the dormant application, it is one more application to make on top of the others. Also, it is more effective to spray mancozeb or captan soon after bud break.

Thus, I typically recommend a dormant application of lime sulfur only if you have a severe Phomopsis and/or anthracnose issue, and you need an extra kick to your regular preventative application after bud break.

The dormant application is less likely to be very effective against downy or powdery because both are called polycyclic diseases with a rapid secondary cycle. Even if you can knock down the initial inoculum, they can rapidly produce the next round of spores, especially under favorable conditions. Moreover, these pathogens' winter survival structures are tough, so I don't think the dormant fungicide application is the best approach.

Having said that, one study showed that if you had an outbreak of downy mildew in the previous year, the risk of downy mildew for this year would be high. Thus, if you are concerned about what happened in the previous year, be sure to have a good protection program against downy mildew.

The dormant application of lime sulfur is used for ripe rot prevention in Japan. However, there are not much data to confirm whether the efficacy is valid or not. If you are interested, please let me know so that we can set up a trial.



## GROWER'S DATEBOOK

*Highlighting events that may be of interest to members of the Virginia wine industry.  
For more info as well as registration details, click on each event.  
For more happenings, check out the VVA website.*

### VCE to Hold IPM, Disease Management Workshops

Virginia Cooperative Extension (VCE) will hold a training session and IPM and grape disease management workshops online in March and April. Click for more info and to register for each session.

- grapeIPM.org workshop: March 11 and April 15. Learn how to use this recordkeeping and decision support website at a virtual meeting.

- Vineyard IPM meeting: March 17. Review pest management strategies with the specialists in this virtual meeting.

- Disease Management Workshop (English): March 30. A review of disease management in the vineyard. A virtual meeting hosted by grape pathologist Mizuho Nita.

- Taller de Manejo de Enfermedades: 31 de marzo

- Disease Management Workshop (Spanish): March 31

- Revisaremos en manejo de enfermedades en el viñedo. Esta reunión será presentada en español. Los presentadores serán en Mizuho Nita y Beth Sastre.

A review of disease management in the vineyard. This meeting will be held in Spanish. Virtual meeting hosted by Mizuho Nita and Beth Sastre.

### VVA 2022 Technical Meeting Scheduled For May in Charlottesville

Save the date for the two-day VVA Technical Meeting, which is scheduled to be held May 12-13. The meeting, which combines our Summer and Winter Technical meetings, will include a half-day in a vineyard and one-and-a-half days of workshops, tastings and presentations at the Omni hotel in Charlottesville. More information and registration details will be posted as they become available.

### Pesticide Safety Training for Workers

- ▶ Virginia Cooperative Extension will conduct an annual pesticide safety training — "Worker Protection Standard Training Hybrid and in Spanish for Agricultural Workers" — on Friday, April 1, from 3:30 p.m. to 5 p.m. at the Virginia Tech Agricultural Research and Extension Center in Winchester.

- **REGISTRATION FORM IN ENGLISH**

- **FORMATO DE REGISTRO EN ESPAÑOL**

For more information, email [flores69@vt.edu](mailto:flores69@vt.edu)

### Eastern Forum Continuing Webinars

- ▶ **The Eastern Viticulture and Enology Forum** is continuing its 2021-2022 Winter Webinar Series. Upcoming sessions include: "Variability in Toasting: Implications for Winemaking with Oak" on March 22 and "Practical Precision Viticulture Tools for Modest-Sized Vineyards" on April 12. The virtual series is presented by Cornell AgriTech, Virginia Tech Extension, and Penn State Extension. Registration is required for each session. See the full schedule on the Forum website.

### Viticulture, Enology Classes at PVCC

- ▶ **Piedmont Virginia Community College (PVCC)** Workforce Services in Charlottesville has scheduled several classes in viticulture and enology in the coming months, including dormant pruning and soil prep and planting. Registration is required.

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*Information listed here is current at the time of publication, but for all events, be sure to check directly with each organizer for the latest on any changes or cancellations. Do you know of an event that would be of interest to Virginia wine grape growers? Contact [cgarsson@gmail.com](mailto:cgarsson@gmail.com).*

# Maintaining Wine Quality Amid Climate Change

## *A Look at the Science and the Strategies That May Help Make a Difference Now*

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

*Intelligence is the ability to adapt to change.*

— Stephen Hawking

*In Greek mythology, the ups and downs of nature were given a simple explanation. Hades, the god of the underworld, abducted Persephone, daughter of Demeter, the goddess of fruit, crops, and vegetation. Demeter was so devastated by the loss of her daughter that she went into deep mourning and neglected her duties, resulting in crop failure threatening all of humanity. To save the situation, Zeus intervened and worked out a deal. Persephone was to spend half a year on earth and half a year in the underworld with Hades. When Persephone was in the underworld, Demeter mourned, leaves fell and trees became bare, fields barren. When Persephone emerged, life was again renewed.*

According to Miguel Torres, “Climate change is the greatest threat to the wine business in general and winegrowers in particular.” Unfortunately, many climate change models use nonlinear systems and different emission scenarios, resulting in a range of potential predictions regarding deviations in temperature and precipitation (Jones et al., 2022). However, it is safe to say that changes will likely be highly variable across geographic regions and cultivars. The challenges facing the wine industry are many and include more rapid phenological development, alterations

in suitable locations for some cultivars, and a reduction in the optimum harvest window for high-quality wines (Jones et al 2022).

Wine quality refers to the degree to which a set of subjective characteristics fulfills a requirement (Young and Vivier 2022). Regardless of how they’re defined, both wine quality and style may well be impacted by climate change due to changes in terroir features (Patterson and Buechsenstein 2018).

The term “terroir” refers to a cultivated ecosystem in which the vine interacts with the many influences from the natural environment. Terroir has been traditionally divided into two realms, the physical characteristics of a site and the organoleptic properties of wines originating from that site. Both may be impacted.

Because this ecosystem is cultivated, winegrowers can play a major role in terroir expression. Therefore, it is essential to understand some basic climate effects and ways to abate those influences, particularly concerning optimizing wine complexity and aromatic integration. The following is a review of some short-term climate management strategies to consider.

### The Changing Kaleidoscope

Gladstones (2011), van Leeuwen (2004) and Jones et al (2022) summarized some of the overall effects of a changing climate:

- Increased temperatures during the growing season
- Increase in growing degree days
- Increase in mean temperature during fruit maturation
- Increase in mean temperature of the warmest month of the growing season
- Increase in mean temperature of the coldest month of the growing season

- Increase in length of the growing season (frost-free days) and decline in frost frequency
- Occurrence of extreme winter minimum temperatures
- Increases in precipitation for July through October
- Increase in precipitation seasonality
- Change in the Aridity Index (annual precipitation/potential evapotranspiration)
- Increase in atmospheric carbon dioxide
- Increased intensity of pest and vine diseases

Adaptation to these changes will likely be a major challenge for viticulturists worldwide over the next decades. Flexibility in practice including grapevine canopy and soil moisture management, maturity evaluation, and attenuation of some processing protocols may be required to help maintain stylistic goals.

### A Shifting Vineyard Climate

We know that the climatic conditions of the vintage have the strongest effect on most vineyard and fruit variables followed by soil type and cultivar (Seguin 1986 and van Leeuwen et al 2004). These influences include pH, titratable acidity, malic acid, tartaric acid, Botrytis, and anthocyanin concentration (Robinson et al 2012).

Climate has an important influence through the complex interactions affecting plant physiology: temperature, rainfall, vapor pressure, evapotranspiration (ET), sunshine hours, and wind (Keller 2010). It is well established that the phenology of bud break, flowering, and véraison are largely temperature dependent. In some regions, the intervals between these events have decreased as a result of climate shifts.

In cool climate regions (alpha zones), grapes attain ripeness in relatively cool conditions at the end of the season (September or October). In warmer climates (beta zones), grapes ripen in July or August, the warmest part of the summer (Jackson and Lombard 1993). Terroir expression can be high in alpha zones while in beta zones, it is suggested that terroir expression is weak or nonexistent (Gladstones 2011).

With global changes, some alpha zones might become beta zones. For this reason, traditional viticulture regions such as Bordeaux are exploring planting new varieties to help offset climate changes.

Another possible effect of a changing climate has been a decrease in the diurnal temperature range (the difference between day and night). This is the result of increased

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# Wine Quality and Climate

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levels of atmospheric carbon dioxide (Gladstones 2011).

A large diurnal range during grape ripening has been considered by some to be a quality-enhancing factor. It is thought to increase the production of secondary metabolites (aroma/ flavor, and phenolic compounds) in grapes, although scientific evidence for this is contradictory and likely confounded by many variables, including cultivar, temperature extremes, elevation, soils, proximity to water, etc.

We know that maximum photosynthesis occurs when the air temperature is around 25 degrees C (77 degrees F), while anthocyanin and aroma/ flavor production is optimal between 17 to 26 degrees C (63 degrees to 79 degrees F). Warmer ambient temperatures may necessitate less direct solar exposure on the fruit by limiting leaf removal, for example.

For most red cultivars, optimum grape skin anthocyanin concentrations occur at a small percentage of direct solar exposure (Keller 2010). Generally, enough light is transmitted through one leaf layer so as not to inhibit color production while helping to reduce fruit temperature. This may also help to enhance the retention of grape acidity, an important component of fruit balance.

Elevated fruit temperatures have both a quantitative and qualitative impact on grape aroma components, impacting both ester components and the general perception of varietal character. It is not uncommon to ferment certain whites at warmer temperatures to help minimize some estery fruit character, thus potentially increasing aromatic complexity. Floral whites are often fermented at relatively cool temperatures to enhance fruit ester retention.

Several of my West Coast clients adjust their canopy management to use shade cloth and/or kaolin (Chinese clay) sprays as a means of reducing heat load. While the effects of these activities are limited (approximately 2 degrees C), it is often enough to make a difference.

The degree of solar exposure of the fruit can be determined by measuring a certain class of grape phenols, flavanol phenols. These act as the grape's sunscreen. As such, there is a direct relationship between the degree of solar exposure and their concentration. Too much exposure provides a high level of flavanol phenols which can

add a dry-dusty tannin finish to red wines. With increased UV radiation resulting from climate change, solar exposure will become an issue of greater importance.

## The Importance of Plant Hormones

Plant hormones govern growth and development. As such, there is increased interest in using these to help impact fruit components and/or the rate of maturation. For example, as stated, fruit anthocyanin and aroma/ flavor production are optimal between 17 to 26 degrees C (63 degrees to 79 degrees F). Warming fruit temperatures may exceed this optimal range, thereby limiting production. As such, in addition to monitoring, some of my West Coast clients are using commercial preparations, including natural products such as ABA (abscisic acid) and ethanol sprays (Pirie and

**“As a result of changing rainfall patterns, monitoring plant N will likely become even more important.”**

Mullins 1976 and Zoecklein et al 2011) to help boost anthocyanin production.

Intervals between the main phenological events have exhibited significant trends to shorter time spans (Jones et al 2022). This has resulted in earlier berry development and compressed harvests causing modifications to grape and wine composition, such as elevated concentration of berry sugar and potential wine alcohol.

Auxin treatment (1-naphthaleneacetic acid) of bunches prior to veraison is being explored to counteract these adverse changes by delaying berry maturation. Auxin treatments have been shown to delay ripening, reduce berry shrivel, and increase ripening synchronicity with little effect on berry and wine composition

## Soil Moisture and Plant N

It is impossible to define the best vineyard

soil in terms of soil texture, type, or minerals given that high-quality wines are produced worldwide on a wide range of soils (White et al 2007).

However, an important aspect of soil with regard to terroir manifestation is water holding capacity. For this reason, calcareous soils are favored by some, as are soil amendments such as biochar and proprietary formulations such as Blu Vite for non-irrigated vineyards.

Research has confirmed that terroir expression is correlated to water deficits (van Leeuwen et al (2004). Hence, terroir representation is depressed, if not eliminated, by a high level of soil moisture (Gladstones 2011). Many New World vignerons consider that the production of high-quality wines requires at least moderate water deficit stress in at least part of the season. According to Mark Greenspan (2019), the “magic window” for moisture stress for Cabernet Sauvignon in California's North Coast is two weeks before veraison and through veraison, followed by stress reduction.

The ability to provide moisture to the plant in a thrifty and measured way is essential (Grahn 2018). This may become even more important with climate change, as soils may intervene by limiting hydrolytic extremes.

In an irrigation study conducted by one of my students on California's central coast, fruit from vines were evaluated comparing 100 percent vs. 50 percent ET. The reduced soil moisture produced grapes with considerably higher (30 percent) glycoconjugate (aroma/ flavor and color precursor) levels (Graves et al 2006).

These results are plant hormone-dependent which rely on continuous and moderate moisture stress and favorable soil temperatures. It is thought that irregular patterns of moisture stress will certainly have an impact in the future (Gladstones 2011). Many premium producers are measuring, and managing where possible, either plant moisture and/or soil moisture, directly or indirectly, to help optimize fruit quality. Climate extremes will make this effort more challenging, particularly in wet regions and on poorly drained soils.

Water uptake can impact the vine's nitrogen uptake from the soil and influence terroir. Most vineyards producing high-quality red wines receive little or very limited nitrogen fertilization, a practice referred

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to as regulated nutrient deficiency (RND) (Keller 2010), which reduces vine vigor, berry weight, and yield while increasing anthocyanin and tannin concentration (Chone et al 2006).

For most white varieties, low vine nitrogen may be a detriment due to the potential limit in the production of aromatic compounds. As noted in several previous editions of my *Enology Notes* ([www.vtwines.info](http://www.vtwines.info)), vine nitrogen status can be easily assessed by measuring the yeast available nitrogen (YAN) in juice at harvest. As a result of changing rainfall patterns, monitoring plant N will likely become even more important.

### Ripeness Assessment

Climate shifts will likely be evidenced through more out-of-balance ripening profiles (Jones et al 2022). Ripeness assessment is naturally a key wine quality parameter. Zoecklein and Gump (2022) have extensively reviewed the methods for the evaluation of grape maturity under changing climatic conditions.

An important barometer of a warming climate has been the elevation in atmospheric CO<sub>2</sub> concentration, which has increased 38 percent in 150 years and 20 percent in just the last 20 years. We are currently at a carbon dioxide level that last occurred about 3 million years ago (Jones et al 2022). Continued elevated CO<sub>2</sub> may produce an accelerated accumulation of Brix, resulting in a further decoupling between sugar concentrations and grape aroma/ flavor and phenol elements.

There is a positive correlation between anthocyanin concentration and red wine quality. Because of this relationship many West Coast winemakers I work with use anthocyanin “plateau” (the maximum concentration on a per berry basis) as a harvest gauge. I am currently working with members of the Winemakers Research Exchange to explore this idea in Virginia.

### Red Wine Phenol Management.

In the grape and during processing, polymerization of tannins continues until a terminal end reacts with an anthocyanin molecule, stopping the process. Thus, anthocyanins can act as bookends, limiting chain elongation. As such, the more anthocyanins relative to tannins, the shorter the resulting polymers and the “finer” the tannins. Smaller polymers lead to smaller colloids that have a softer mouthfeel and provide aromatic integration (Cheynier et al 2006).

Aromatic integration refers to the ability

**“Climate has an important influence through the complex interactions affecting plant physiology: temperature, rainfall, vapor pressure, evapotranspiration (ET), sunshine hours, and wind (Keller 2010).”**

to hold aroma compounds and release them slowly over time (such as extended bottle aging). Some small phenols are stacked in a ping-pong paddle-like arrangement. This stacking drives water molecules out from between the stacks and allows for hydrophobic aroma molecules to be trapped within. These molecules are released slowly over time, thus helping to provide aromatic complexity.

Red wine fermentation involves phenol extraction from the two primary grape components, the seeds, and skins. Each of these parts of the grape has different types of phenols and extraction dynamics and very different sensory features. Seed tannins are generally harsher and much more bitter. Seed tannin extraction is simply correlated to time and temperature: the warmer the fermentation, the longer the contact period, the higher the concentration of seed tannins in the wine.

On the other hand, skin phenol extraction (both anthocyanins and skin tannins), is dependent on a concentration gradient, with extraction going from a high concentration in the skins to a lower one in the fermenting liquid. Therefore, frequent tank mixing and relatively early dejuicing can significantly alter the ratio of skin tannins and anthocyanins to seed tannins. This can have a profound impact on the wine style and longevity.

The greater the degree of crushing or berry breakage, the more dramatic the above change can be. For example, some relatively new technology called Cut Edge or Accentuated Cut Edge cuts skins into small pieces entering the fermenter, thus reducing the time needed for skin extraction and therefore changing the ratio of skin tannins to seed tannins. This represents another tool in providing stylistic variation.

### Yeast, MLF, and Co-fermentations

Yeasts and bacteria are part of a complex series of interactions where competition, equilibrium, and collaboration form a dynamic ecosystem during fermentation.

Many vignerons attempt to increase wine complexity by using a variety of *Saccharomyces*, non-*Saccharomyces* yeast species, and/ or non-inoculated fermentations. UV radiation is increasing as a function of climate change and will impact both the dominant species and titer of those yeasts on the fruit. This can impact both uninoculated and inoculated fermentations. Even with the addition of sulfur dioxide and cultured yeasts, a portion of the fermentation can be conducted by other, native organisms, (Bokulich et al 2013) suggesting the importance of the microbial ecology to terroir expression.

### Minimizing Oxidative Degradation

Controlling the rate of oxidative degradation is important to optimizing wine quality and complexity. This becomes a more challenging issue in a changing, variable climate.

The reductive strength or antioxidative power of a wine is a measure of the uptake of oxygen without resulting in a build-up of dissolved oxygen. This is influenced by addition compounds, the phenol composition of red wines, and by lees and the mineral content of white wines.

Certain grape phenols (vicinal diphenols) can react with oxygen, bind with other compounds, and recreate the original structure, thus allowing them to react over and over again binding oxygen and thus helping to preserve aroma/ flavor components. With climate variation, the importance of oxidative buffering capacity will be enhanced. For example, excessive fruit maturity can lower the reductive strength by a significant factor.

During sur lie storage, yeast lees components such as cell wall polysaccharides and mannoproteins are released into the wine. These macromolecules can positively influence structural integration, phenols (including tannins), body, aroma, oxygen buffering, and wine stability (both

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protein and bitartrate).

The storage of white wines on lees increases the protein stability, thus reducing the bentonite requirement. The use of lees, or lees products, may become an even more important tool for increasing wine complexity and minimizing oxidative degradation.

The use of minimalistic winemaking practices, including alternative methods to reach protein and bitartrate stability may become more significant, along with judicious use of antioxidants including sulfur dioxide, ascorbic acid, and glutathione-containing products.

### Conclusion

One important feature of climate change is that the impacts on viticulture and winemaking will likely continue to be highly variable across geographic regions and cultivars. Unfortunately, predictive models are limited.

Perhaps we should keep in mind the Jainism doctrine of respect, the *anekantavadas*. It tells the story of blind men who were invited to describe an elephant by feeling different parts of its body. One who felt a leg said the elephant was like a pillar, one who felt the tail said the elephant was like a rope, the one that examined the trunk thought it was like the branch of a tree. The one that felt the tusk said that the elephant was like a solid pipe.

The teacher informed them they were all correct, in part.

The moral of the story is the reminder that humans are often limited in the grasp of reality when it comes to the full impacts of climate change.

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# Virginia's Viticulturist

## A Man for All Seasons



**Tony conducting a pruning workshop on a cold January day in 2018 and speaking at a VVA Summer Technical Meeting in 2013.**

In this special section marking Tony Wolf's retirement, Virginia's longtime viticulturist reflects on a career among the grapevines, and growers and colleagues share their thoughts and memories

**I**t's hard to imagine what Virginia's wine industry would look like today without Virginia Tech's Tony Wolf, who retired in January after 36 years of service to the Commonwealth and its wine growers.

Since he arrived in Virginia in 1986 with a Ph.D. in Pomology and Viticulture from Cornell University, Tony's scientific research and outreach have helped vineyard owners determine what grape varieties to grow, where to grow them, how to grow them, and how to overcome challenges of weather and geography.

He wrote or co-wrote more than 50 journal publications, plus several books. In particular, he edited the "Wine Grape Production Guide for Eastern North America," which became something of a bible for new and experienced growers alike.

He served as professor of viticulture at Virginia Tech, director of the Alson H. Smith Jr. Agricultural Research and Extension Center, and technical advisor to the Virginia Vineyards Association.

Many growers got their start by attending one of Tony's new grower workshops, and vineyards throughout the Commonwealth benefitted from his visits and advice.

And, of course, Tony was a fixture at VVA technical meetings. In addition to speaking and moderating panels, he played a key role in planning the meetings and ensuring their success.

He will be missed.



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## How Far We've Come And What's Ahead

**P**rior to his retirement, Tony took time out in January to talk with VVA President Skip Causey and Grape Press co-editor Bob Garsson about growing wine grapes in Virginia. Here are highlights from their conversation:

**Q. I think we'd all like to be able to see a vineyard through Tony Wolf's eyes. When it comes to healthy, productive vines in Virginia, what are you looking for when you step out of the car and visit a vineyard for the first time? What's your process?**



The first thing I think about is the site. Where is the vineyard located? If we think about the Piedmont region, if I am approaching a site and I have to drive uphill to get to it, that is usually a good thing. If I cross a major stream or water course immediately before the driveway, I usually

just start downgrading the site because it's apt to have low relative elevation and be subject to frost injury.

In our new grower seminars, and at the end of the site evaluation process, I have a prioritization of site features — those things that we can compromise on and those things that we don't — and right at the very top of the list is the relative elevation of the site and to a lesser extent, the absolute elevation of the site.

When I visit a vineyard, even though it is established, my immediate reaction is to assess how well somebody listened to our advice and used the recommendations in their site evaluation. That often goes a long way toward explaining why a vineyard might be suffering from frost problems, for example.

The second part is getting into the vineyard and looking at the vineyard management. I look at the big picture first. Does it make sense the way the vineyard was designed? That speaks volumes about the individual, the vineyard owner. Then I look at the more detailed aspects of vineyard management — canopy management in particular.

The ideal time to look at a vineyard is right around veraison — the canopy is completely formed at that point. How conscientious or fastidious was the grower in doing the recommended canopy management practices? What is the degree of fruit exposure; is it relevant to the variety being grown? What is the overall health of the canopy from a nutritional standpoint, from a disease standpoint?

I'm looking at things that speak to the health of the vines and the profitability of the vineyard.

If I'm there troubleshooting, the grower has acknowledged

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## Making a Difference, Vineyard by Vineyard

**T**he development and success of the modern Virginia wine industry is intertwined with Tony's career at Virginia Tech. As he prepared to move into retirement, Grape Press asked a few of the many growers, consultants, and researchers who have worked alongside him to discuss what he has meant to the industry.

### 'Our Fearless Leader'

By Chris Hill  
*Vineyard consultant*

**I**n the mid-1980s in central Virginia, wine-grape growing was in its infancy, and, as commercial grape growers, we did not have experience or education in commercial wine-grape production. We stumbled about and made a lot of mistakes, grew poor quality grapes, and made poor quality wine. Many of us did not think through, systematically, what we were doing to produce a grape crop.

For example, in the early '80s, there was a lot of cold damage to our vines. We lost a lot of vines. We had not examined variety cold hardiness as a criterion in the placement of our vines on a vineyard site, or even whether our site was a sustainable vineyard site at all. What was the midwinter cold tolerance of each variety?

We were clueless. Why were most *Vitis vinifera* vineyard locations, worldwide, generally located in a region that has relatively dry summers, and low relative humidity, with relatively mild winter temperatures? And if a grower was going to buck that trend, and plant in a region with high summer humidity and rainfall, even hurricanes, and the potential for vine killing temperatures in midwinter, what adjustments needed to be made in a grower's knowledge base and understanding of grape growing? Were growing conditions in central Virginia the same as those in Napa Valley, California or Cape Town, South Africa?

Enter Dr. Tony Wolf. He arrived in 1986 with a brand-new Ph.D. from Cornell University that focused on grapevine cold hardiness and eastern U.S. viticulture in general. From that time onward, our industry began to move from crawling, to stumbling, (almost upright), and within a couple of years, to walking fully upright.

Tony taught us many lessons. How important is sunlight outside and inside the vine canopy? What could we do to enhance air flow within a dense, midsummer canopy and why would we want to do that? We had never heard of canopy management, except to keep our tractor tires from running over canopy that had fallen to the ground. Canopy management thinking led us to the annual discipline of leaf pulling in the fruit zone. And when is the best time during the growing season to

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## Virginia's Viticulturist



Hannah Keller

Tony in the field with Virginia Tech colleagues, from left, extension associate Tremain Hatch and grape pathologist Mizuho Nita.

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there's a problem, so we're focused on that. If she asks why the vines have downy mildew, we'd look at spray schedules or other aspects of the vineyard to help inform the answer to that question.

The matching of the variety to the site is important as well. Is it a variety that's recommended for a particular site or for the area? We have quite a few varieties grown in Virginia, so we have a wide range of what is possible to grow, but some might do better on a particular site than on another.

**Q. What do you see as the biggest challenges facing Virginia winegrowers today?**

There are really three big challenges. The first is labor. A lot of our vineyards here are very small, labor-intense operations that don't really have the scale to afford the mechanization that is available to larger producers.

The second issue is the climate that we are growing grapes under, and the weather it produces. It is not the perfect climate for grape growing. So, we have to deal with that. With a more variable climate that appears to be occurring due to climate change, I think this is probably going to be an increasing problem in the future as well — stronger winds, more violent storms with respect to wind speed and the amount of water that is deposited at one time.

And then pests and diseases would be third on my list. Pests include invasive species such as the spotted lanternfly. I think the spotted lanternfly is underappreciated. I call it a wrecking-ball of sorts. And on diseases, we have always dealt with powdery mildew, we've always dealt with downy; that hasn't changed over the years.

The thing that has changed is that we see some new diseases, such as ripe rot. We either didn't recognize it or we didn't have as much of a problem with it 30 years ago. It is climate-driven. We are having warmer, more humid weather, and those are favorable conditions for this particular disease. We can make a long list of challenges, but those are the three that come to my mind.

**Q. Is labor a solvable problem — perhaps through the H-2A program or, for larger growers, mechanization?**

Those are two very good examples of what I think some of the solutions might be. The H-2A program is not the easiest program to navigate, but there are companies in Virginia that help with that process, assisting in lining up the labor and providing transportation into the state. You still have the housing issue and local transportation issues, but it is a legitimate, legal way of getting labor here and it's particularly helpful for those people

who can use the same H-2A personnel from year to year.

As far as mechanization is concerned, we have moved that way with some of the things that are easiest to do, such as selective leaf removal from the fruit zone of canopies. If you have an operation large enough to afford

the capital purchase — 20 acres maybe or more — it makes a lot of sense to go in that direction. Looking ahead, with the advent of machine learning, we might have the ability to train robotics to do some of the more detailed work

like dormant pruning, canopy management and even harvesting. We haven't done much in the way of mechanical harvesting, and yet worldwide a lot of it is done. But if you are only operating a 10-acre vineyard, most of this equipment is out of your price range.

**Virginia's  
Viticulturist**

**Q. So, what does the future look like for small independent growers? They can't afford the mechanization, they may have trouble getting labor, and they deal with the same climate and pests as everyone else.**

Let's define small as 10 acres or less. We have a number of those operations in the state. Frankly, if you look at it strictly as a

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*Q&A, from page 14*

business, from an economic standpoint, I don't really understand how they can stay in business if they are doing the things we recommend. Our grape prices are good, but they're not that good.

So, what is it about grape growing that makes it a viable enterprise for them? I don't like to use the word hobby grower, but as I near retirement I can probably better appreciate this. You do need something to do to occupy your time. And if you derive enjoyment from it, so be it. Maybe standing out there in the winter sun isn't the worst thing to be doing with your time.

And small vineyards have been some of our best producers. If you look at the quality of the fruit coming out of small operations, some can be very good.

So, what is the future for them? I think we'll always have people that have enough land that they can put in a small vineyard. They have an affinity for wine and want to try the grape-growing part of it. I think we'll probably continue to see new vineyards of that size going in, but by the same token, it could be something of a revolving door. As we age, we don't enjoy doing some of the things we did when we were younger.

**Q. You've done extensive research over the years. Which projects do you think were most important for Virginia viticulture?**

Some of the work John Boyer and I did back in the early '90s — his wizardry at developing geographic information systems, an evaluation system for vineyard sites — was very important for the industry. Some of the producers we have were catalyzed to put in a vineyard because of this program which showed the better areas to put in a vineyard. That GIS system is something I look back upon and say, that was a really good product, an output from our research.

I think the variety evaluations have been important for obvious reasons. We have things like Petit Manseng, Tannat and some of the lesser-known varieties that have been really helpful in shaping the industry.

There were also some varieties that didn't work out, Nebbiolo and Sangiovese, for example. There may be better clones of those varieties today, but I still think they have weaknesses that don't make them the best candidates for Virginia. And that's important information as well.

The floor management work we did — the more intensive use of cover cropping, not

just between the rows, but under the trellis — that has been important, and will continue to be going forward. It is still easier to apply herbicide under the trellis, but for those people who want to reduce their pesticide footprint, it gives them an opportunity to do things a bit differently.

The training system work that Bruce Zoecklein and I did together, looking at fruit quality as a function of training systems — we probably should have done more in that area and published more, but that was pretty important work for Virginia. Some of it was just fine-tuning recommendations that

came from elsewhere. Canopy management came of age in the '80s, and to a lesser extent in the '90s, but we were really just taking the work that people like Richard Smart had done, applying it to Virginia,

and teaching growers how to do it. So that was important, the teaching part of it as well.

**Q. It sounds like the research tied in well to the other parts of your job.**

I was hired as a 100-percent extension person, and the expectation was that I would also do applied research, something I could give to growers. If you've done the research in Virginia, you can say, "this is what we've found in our growing conditions." I think that's very meaningful to a grower, rather than saying, in California, for example, this is what they do. To have that home-grown research and be able to turn it into recommendations is very important.

Going forward, I believe that this position should maintain both the research and extension component. Extension is really important, and it takes the right kind of person to be good at extension. You have to be extroverted, you have to want to get up on the stage and talk about things. That was more difficult for me. I'm not an extrovert, I'm actually an introvert. But getting up to talk about something that I feel I was qualified to talk about took away some of the apprehensions about that.

The teaching is something that I voluntarily took on later in my career. I didn't start teaching until 2013 but I will say that it's been very rewarding: To do the teaching and see students that have done well.

**Q. Are there things you've changed your mind about over the years — vine spacing, perhaps?**

Yeah, that's a really good question. I freely admit that my thinking on some things has evolved over time, and in two areas. You mentioned the one on vine spacing. The other

is in the area of vine training systems. My thinking on both has evolved, and it's tended to go from more complex systems down to simpler systems.

You can't divorce the vine spacing from vine training. Think about why we started out with 7-foot spacing between vines so many years ago. It was sort of the standard, and a lot of that had to do with the cordon training, which was almost universal in the state and, for that matter, in the eastern United States. Those wider spacings were really not that wide when you consider cordons that were only three-and-a-half feet long, with two of those filling the 7-foot spacing. The cost of the vines was an issue as part of the establishment costs of the vineyard, so if you had 700 or 800 vines per acre, that was quite a bit of savings compared to 1,800, or more realistically, 1,400 vines or so per acre.

So where we come down with vine spacing is the change from cordon training to more head-training and cane-pruning systems which require closer spacing. It's really difficult to lay out a three-and-a-half foot-long cane and get good shoot growth along it. So, our vine spacing has come down, and that I think more directly reflects the training systems that are being used today.

The reason VSP is the number one type of training and canopy management system worldwide is that it's easily mechanized — it's easy to pull leaves from it compared to a divided canopy training system. And with cane pruning, we're seeing maybe a little bit better fruit quality from the standpoint of disease management. Cordon training does have some inherent problems with Botrytis and Phomopsis and maybe some other diseases.

I still draw a line when we discuss vine density or in-row vine spacing. The vineyards we put in two years ago were spaced at four feet between vines in the row. I have yet to see convincing, compelling data that suggests going to three feet would result in a fruit quality improvement. If somebody did convince me of that, I'd probably change and come in closer, but right now, I'm content with four feet.

**Q. Then why did so many vineyards go with divided canopy systems?**

The reason we got into divided canopy systems early on is that we had a number of vineyards that were set up with very wide spacing between the rows — 12 feet or more, and that's a lot of wasted sunlight. So going to horizontally divided systems, whether it's Geneva Double Curtain or open Lyre or even Smart Dyson, was an effective way of increasing yields per acre without having to



*See Q&A on page 16*

reestablish the entire vineyard. But I always viewed it as a retrofit.

Some vineyards were put in right from the beginning with divided canopy. I'm not saying that's wrong. Divided canopies can produce very high-quality fruit and wine. But there's no free lunch. The added cost of hardware and labor are the downside. You also have more cultural management issues. It's harder to use bird netting on something like Smart-Dyson than it is on VSP.

When we put in our vineyard in 2006, I was going to train the vines to Smart-Dyson, which is vertically divided, but the more I thought about bird management, the more I thought, "no." I'm just going to go with VSP because it's easier to do the netting with bale wrap on either side of the vine. It comes back to a labor issue. If you have the labor and you're willing to do the extra management, the divided canopy training does produce greater yields.

#### **Q. What do you see in the future for viticulture in Virginia?**

We can talk about lots of things. If we think about the forecast for climate change, the recurring themes I hear are warmer temperatures, warmer night-time temperatures. Warmer air holds more moisture, so we are going to have more violent storms and vineyards will have to be engineered to withstand those threats.

We're already seeing longer growing seasons. You don't have to look back too far to see that the average budbreak day has advanced. I always used to say April 21 was the anticipated bud burst for Chardonnay here in Winchester. Now it's closer to the first of April, maybe April 7.

We've gained a good two weeks on the front end and possibly two weeks on the back end. So that means a longer season, and more pest management. You have foliage out there, you have to protect it. So that means an extra spray or two per season.

I think we'll continue to see the Pierce's Disease manifest itself here in Virginia as we have warmer winters that allow bacteria to overwinter in the vines and build up over time. Those are the big things. We always are going to have a variable climate. We are in a continental climate, so we don't have the benefit of water moderation of our macroclimate.

Because of that, even though we talk about warmer winters, all it takes is that one night below zero to really mess up somebody's day, with a variety like Tannat or Vermentino, and even Merlot. We've been blessed with being able to grow a lot more Merlot in the state since the turn of the century, but that

2013-2014 winter was a hardship on some of the Merlot producers in the state. It isn't just the western and northern parts of the state, the eastern part was also affected.

#### **Q. Are different grape varieties part of the solution?**

We can look to varieties that may be better tolerant of those conditions, and we can make some progress by evaluating varieties that others have already looked at. That's the easy approach. And what we've done with our 2020 vineyard — things like Marselan or San Marco, the variety trademarked by growers up in New Jersey. Some of the new hybrids that are available, interspecific hybrids that are coming out of breeding programs in Italy, in France, in Germany — I think there are some things well worth looking at here.

Even with older varieties like Tannat, I think we need to go back and do some reevaluation of it. Maybe there are better clones, maybe there are parts of the state that haven't really tried growing Tannat that would benefit from a variety like that.

And then I think where the real future may lie, and that's why I'm interested in doing our own home-grown research here in Virginia to come up with new varieties that are really targeting what our growing conditions are here in the Mid-Atlantic, rather than simply assuming that something that did well in Uruguay will do well here.

We need the talent to come up with the genetics that express these traits that we're interested in, and high on the list for me would be resistance to diseases like powdery and downy mildew. Black rot is fairly easy to deal with here, I think we can control it reasonably well, but ripe rot and Botrytis, like the mildews, are a little more challenging. If I could put on a hat that looks really long-term, because it will take a lot of years of research to do this, that's where I see the future.

#### **Q. Tony, what advice do you have for your successor?**

The advice I would give my bosses is that I think this position needs to be refilled, and they are moving in that direction. I don't doubt that they have a conviction that they do want to fill the viticulture position here. I would say to them that it's best that it be a research and extension position, much as mine is. To only do the research would be failing the industry by not providing that extension component to the job or continuing education component.

We live in a global economy, where

we can pull in recommendations from all over the world and make use of those recommendations but tailored for Virginia. We don't have to reinvent the wheel here. If someone has learned something in Italy or Germany, I think we can apply that here if it suits our industry, for example with variety evaluation.

So, I would hope that the person who fills that position embraces that, that they need to do research, that they need to align themselves with the Virginia Vineyards Association and other groups in the state. And maybe form their own advisory panel as we've done over the years.

We have a select group of people, people in the industry that have good ideas and provide a sounding board for our ideas. I think that the next viticulturist needs to continue to work with those industries to shape their research program. I think they should have graduate students, because graduate students amplify the research ability of an individual. And the person hired should look for collaborative opportunities with other faculty here.

Mizuho Nita, for example, is our grape pathologist. It makes a lot of sense to work in collaborative fashion, to work on these things as a team, as we do, rather than as an individual. And we have talent elsewhere, on the campus and really at other universities in the mid-Atlantic. I think you both, Bob and Skip, know that over the years we have worked closely with our extension peers, in particular with folks like Mark Chien, who had been in Pennsylvania, with Joe Fiola in Maryland, and now Cain Hickey, who is now in Pennsylvania. Those interstate collaborations are really helpful as well.

#### **Q. What are your plans for retirement — write a book, grow your own grapes, make your own wine, lie on a beach?**

The last thing you said is probably the first thing I'll do. And read a book, rather than write a book. My immediate goals are R&R, and that will be about a month. And then I'll come back to a part-time position. I've agreed to stay on in a 50 percent capacity here at the Experiment Station, but exclusively in an administrative role until we get a new director on board at the AREC. I'll be helping out in that transition.

I don't really want to grow grapes for myself. I've done that every year that I've been here and I want to do other things now. I do have some consulting that I've been doing, and I will continue with that. It's viticulture, but it's not with wine grapes. ■

## Virginia's Viticulturist



do that? Tony got us all thinking about trellis design and vineyard layout. He got growers thinking about what they were doing. He was a teacher.

We knew that birds and deer, feeding on ripening fruit, was a problem, but what were the solutions to these problems? Tony would advance his ideas, bring in outside ideas, and encourage us to do our own thinking. He, along with our own VVA, organized periodic grower meetings to discuss grape production issues, bringing in the expertise of researchers in plant pathology, plant physiology, biology, entomology, wildlife biology and climatology. Before Tony, we were living in “a world lit only by fire” (thank you, William Manchester).

As far as I know, Tony never taught anyone how to drive a tractor, but that was the only aspect of grape farming he did not teach. The list of Tony’s viticultural teachings goes on and on. I haven’t even mentioned the profundity of learning about the effects of grape berry moth and grape root borer on our ability to ripen grapes.

Before Tony, we knew we had problems, though very often, we had not identified the causal agents of these problems. Ripening fruit would begin to break down before it was ripe enough to make palatable wine. Tony identified the grape berry moth as being a primary cause of our annual fruit rots. Then he went on to explain possible controls for this pest.

Every aspect of the viticulture he taught us was geared toward improving grape quality at harvest so that we could make a better wine. As grape quality improved, so did wine quality. More wine began to be sold at a higher price. As wine quality improved, demand for wine grapes increased. As demand for our wine grapes increased, the value of our crop increased and grape income increased. As wine and grape income increased, there was more money for viticultural and enological research, which improved grape and wine quality further. And it goes on and on.

Tony taught us all to be better at what we do. He has been our fearless leader. And dang, we will miss him.



## ‘The Best Way to Predict The Future Is to Create It’

**By Bruce Zoecklein**

*Enology Professor Emeritus, Virginia Tech*

It appears that nothing goes faster than

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## ‘We Definitely Hit the Jackpot’

**By Doug Flemer**

*Ingleside Vineyards*

When I heard the news that Tony Wolf was going to retire, my first reaction was “No, that’s not possible. What will Virginia wines do without Tony Wolf?”

I began to think about the days when the young Virginia wine industry was struggling to find its way as a new agricultural entity. This was in the early 1980s when we had less than 30 wineries in the entire state.

Luckily, a group of industry pioneers realized that to be successful, we needed to recruit the right people to guide us through this process of growing good grapes and making good wines.

We definitely hit the jackpot with the addition of Tony to the staff of Virginia Tech and the viticultural leadership he has been providing since 1986. We owe a great deal of the state’s success to Tony and his counterpart, Bruce Zoecklein, who also joined Virginia Tech in the mid-1980s.

Having known and worked with Tony since the beginning, I realize the challenge it will be to find a suitable replacement for all the things he has done and accomplished in the 36 years he has dedicated to the Virginia wine industry.

Not only am I disappointed to see Tony retire, but I am also sad that he did it before me! Congratulations, Tony, on all your wonderful support, work, and accomplishments in the world of viticulture. Enjoy your well-deserved retirement!



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the future because it was only yesterday that we were calling today tomorrow. To me, it seems like yesterday (it was 1986) when Tony Wolf and I began a research and extension collaboration that, I believe, helped to elevate the developmental trajectory of the Virginia grape and wine industry. Professors are those that go to college and never seem to leave. Eventually, however, they do leave. I retired from Virginia Tech a few years ago. We are now on the verge of a more significant event, Tony Wolf’s retirement.

It has been said that the further back one looks, the farther forward one sees. It is difficult to adequately describe how truly embryonic the industry was when Tony and I began working together in 1986. At that time there were 34 wineries making wine, some of which you could actually drink!

When we began, sour rot was causing a certain limited problem much in the same vein that the Pacific Ocean has a limited amount of water! Indeed, most growers’ favorite time of year was mid-way between the flood and the drought. We attempted to improve quality through trials in commercial vineyards involving leaf removal, shoot topping, and the use of plant growth regulators. Because the greatest limitation of knowledge is not necessarily ignorance but the illusion of knowledge, these demonstrations under Tony’s direction proved to be an effective strategy in motivating

change.

In those early days, frequently the wrong varieties were planted on the wrong sites. Before our arrival, Virginia Tech had articulated that Vinifera varieties could not or should not be grown in the state, even though some were successfully doing so. This served as a reminder that 60 percent of the time, Virginia Tech was correct every time! Fortunately, this legacy was not long-lasting. Tony and one of our shared students, John Boyer, went on to develop site selection maps for the state, another significant contribution.

Realizing that the best way to predict the future is to create it, Tony planted what were called “alternative varieties” at the station in Winchester. Grapes grown under his direction were harvested, transported to our experimental winery in Blacksburg, vinified under my direction, and presented at winemaker roundtable meetings throughout the state. Allowing industry members to understand how various cultivars perform under Virginia conditions prior to making a sizable investment certainly aided development.

The famous French enologist Emile Peynaud once reminded us: “The faster the scientific advances, the greater the risk of widening the gap between what we know and what we do.” Through some 36 years

*See MAKING A DIFFERENCE on page 18*

of applied research and a kaleidoscope of outreach programs, Tony Wolf helped to shorten that gap by delivering science-based, practical information that has assisted grape growers throughout Virginia.

Perhaps the greatest testimony to one's career is to ask the simple question. Did he make a difference? The answer, without question, is yes. His labors will certainly be missed by all members of the Virginia grape and wine industry.



## 'The ... Dedication That Tony Puts Into His Work'

**By Skip Causey**  
*VVA President*

As I mentioned in the last issue of Grape Press, my wife and I attended a beginners vineyard course taught by Tony Wolf at the AREC in Winchester back in the mid 1990s. I can only imagine how many "Vineyard 101" classes Tony taught over the years, and so I was always astonished that he remembered me whenever we crossed paths. I either made a strong impression (good or bad?) or he had an innate talent for recognizing those of us who took his class and actually jumped into the business.

As I moved onto the VVA Board, I started working with Tony, Tremain, and Mizuho much more often, especially in planning our technical meetings. I have seen the passion and dedication that Tony puts into his work. Most of the time the Board members and I would work to stay out of Tony's way while the training programs developed.

Two years ago, I joined Tony and Tremain for lunch during our WTM in Charlottesville and we spoke about his position and how we in the VVA could do more to help in these sessions. Tony mentioned how long he had been working for Virginia Tech and said that retirement was around the corner, "sometime soon but not now." That little bit of information stuck with me and haunted my thinking about the future.

When Nate Walsh asked me to run as his replacement for president of the VVA Board, I hesitated. After telling me about the position and what it entailed, I was still hesitant. Nate then asked what would be needed to get me to run. My only answer was, "Please make sure that Tony Wolf will not retire on my watch!" Well, we see how that went, and I will not let Nate live that one down.

I have been able to work very closely with Tony in this transition and have tried to give

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## 'Addressing ... the Needs Of an Entire Industry'

**By Nate Walsh**  
*Walsh Family Wine*

While I've been fortunate to enjoy many wonderful winegrowing experiences, working alongside Tony in planning the VVA Technical Meetings remains one of the highlights. Those experiences provided a crash course in understanding what is involved in pushing a viticultural region forward and addressing and anticipating the needs of an entire industry.

I was part of a team that worked alongside Tony, but he has been doing it for his entire career. To say he has done it well is a drastic understatement.

Undoubtedly, had Tony chosen another region, had the cards fallen some other way and Virginia was left without Tony Wolf, we would be 15 or 20 years behind where we are now, maybe more. Many of our best vineyards, our most promising techniques, our best varieties, our most thoughtful growers — they all came from Tony's tutelage.

His leadership, intelligence, and hard work will ripple out for generations in our industry.



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back some of what he gave us. I have been able to meet with several of the Virginia Tech folks as they search for Tony's replacement. I don't envy them that task — Tony has some very big shoes and finding the person who can fill them won't be easy.



## 'Our Connection to the Outside Viticulture World'

**By Jim Law**  
*Linden Vineyards*

I still remember Tony's first visit to Linden in 1986, when our vines were in their second leaf. We were simultaneously proud and nervous, as we had our hearts, soul and money invested in this fledgling planting. Having someone of Tony's stature on board in Virginia was a big relief to us.

Tony knew his stuff and if he didn't know, he would find out. He opened up all of the resources of Virginia Tech to us. Our learning curve became less steep. His approach to problem solving is consistently objective, honest, and rigorously scientific. But perhaps more importantly he has also been a talented communicator and explainer to the layman. In the early years, most of us newbies had little practical experience, so we needed a lot of hand holding.

In the early days, before consultants and the internet, Tony was also our connection to the outside viticulture world. His visits to other viticultural areas and grape

growing conferences introduced new ideas and techniques. Virginia became a stopping-off point for visiting viticulture dignitaries. For example, Richard Smart's visit was hugely impactful. His techniques were specific to high vigor viticulture. He showed us how to think about improving wine quality through better vineyard design and management rather than manipulation in the cellar.

The Virginia vineyard landscape is different now. Tony has managed to continue to adapt to the times and foresee where new roadblocks might present themselves. I'm sure he won't miss the predawn emails and panicked phone messages that come once the growing season is underway!



## 'The Vines Have Been Doing Well for 26 Years'

**By Dean Triplett**  
*Greenstone Vineyard*

I started my vineyard in Loudoun County back in 1995 after a yearlong search for the best site I could afford. As part of that search, I followed all the recommendations for site selection that were coming out of Virginia Tech and being driven home by viticulturalist Tony Wolf.

After I purchased my property, I got in touch with Tony to pick his brain about what

*See MAKING A DIFFERENCE on page 19*

varieties to grow. Still wet behind the ears, I was considering all kinds of grapes for my initial planting. Tony said I had a good site and told me that Merlot would probably do well and that demand for it was strong then and would continue to be.

In 1997, a year after I planted those first Merlot vines, I asked Tony to stop by and check out my vineyard. I was very excited when he arrived, and I fully expected him to tell me that I'd done a wonderful job. As he gazed out over the young vineyard I asked him, "What do you think?" He looked around and said, "Looks like a vineyard to me!"

At that moment I felt like a complete idiot. Obviously, Tony had looked out over hundreds of acres of vineyards, most much more impressive than my measly one acre. But as it turned out he was absolutely right with his advice about the variety and my location. The vines have been doing well for 26 years now.

And thanks to Tony's research in the 1990s with novel grape varieties, I subsequently planted Muscat Ottonel and Petit Verdot. I had attended a workshop where I got to see the vines Tony was experimenting with and taste the wine that Bruce Zoecklein had made from that fruit. Tony's work helped me decide which varieties I wanted to plant, and I'm sure they were the reason so many other growers planted Petit Verdot in the years since.

Over the years as I worked on the VVA Board and later the Wine Board, I got to know Tony much better. All his hard work over the years has been a true blessing to all of us who grow wine grapes in Virginia.

As a VVA Board member, I watched Tony take a lead role in all of our projects and events, especially the winter and summer technical meetings — all while juggling his responsibilities as head of the AREC in Winchester. Tony has been instrumental in connecting our grape growing community with the top researchers from around the country and globe for over 30 years.

As a Wine Board member, I saw numerous presentations for grant requests submitted by Tony, as well as his fellow researchers. The betterment of our grape growing industry was always his top priority.

So, now, as Tony retires, I am happy for him and his family, but sad for us grape growers! All of us in the business of growing wine grapes have been totally spoiled by Tony's leadership and his willingness to take the time to answer all of our questions and listen to our sob stories! Filling Tony's shoes will be an extremely difficult task for those involved. I don't envy them.

Tony, thank you for being a mentor, a

leader and, most importantly, a friend. Our entire community wishes you the very best!



## 'Dedication to Research, Extension and Education'

**By Joyce Rigby**  
*Vineyard Manager, Boxwood Estate Winery*

My husband, Stephen, and I, have known Tony since he first came to Virginia. We have also worked in other states and quickly realized that the success of the Virginia wine industry was due in large part to Tony and Bruce Zoecklein's work through Virginia Tech.

When we came to Virginia in 1982, I knew nothing about grapes or wine. My husband, Stephen, was a trained winemaker. Once the industry started to take off, I quit my engineering work and started working with Stephen in the vineyard. We attended every workshop, seminar and conference that Tony put together. The results of his research shaped how we grew and managed grapes.

When Tony co-authored the "Mid-Atlantic Winegrape Grower's Guide" (1995), we had an excellent reference for growing grapes. In 2008, this resource was expanded to the "Wine Grape Production Guide for Eastern North America." I still encourage new clients to get this book and read it cover to cover.

When we moved to North Carolina in 2000, Tony was always just a phone call away for help or advice. During that time, I worked with him and others as an advisory panel member for a five-year, SCRI (small crops research initiative) project that involved university and stakeholder collaboration from several states in the East.

Tony's steadfast dedication to research, extension, and education has been invaluable to the state of Virginia and the surrounding states.



## 'Size Extra-Large Vineyard Boots to Fill'

**By Stephen Rigby**  
*Winemaker, Boxwood Estate Winery*

The quality and improvement of the Virginia grape and wine industry noticeably accelerated once Tony and Bruce Zoecklein were hired and in place at Virginia Tech. I can remember, for example, seeing vineyard

canopies that were almost nothing but leaves, trailing to the ground, where one would have to dig into the canopy to find the fruit. We have certainly come a long way from those days!

I was hired by Bruce at the VT Enology Lab as a technician to support the research around the 1989-1995 time frame. A major part of my work was to visit both the VT research vineyard at the Winchester station where major varietal trials were underway and several commercial vineyards around the state where Tony and Bruce had designed trellis and canopy trials for investigation.

This is where I got to work most closely with Tony, as he would instruct me on the work to be done to ensure the research would be uncompromised and the results valid. I had spent some years working in and even managing smaller vineyards, but this work included an additional level of precision. Tony's instruction was done with professionalism, respect, and great patience. I still rely on what I learned in those days to guide my approach to any trials or research I may do in the vineyard or cellar today. The bottom line of all this is that I remain very grateful to Tony for having been given this experience and opportunity.

We have had many interactions over the years since, and the expanding knowledge and improvements due to Tony's work and outreach have been a welcome and invaluable, even necessary, constant, not only to Virginia but to the whole Mid-Atlantic industry and beyond. His will be size extra-large vineyard boots to fill.



## 'We Are Now Able to Grow World-Class Grapes'

**By Bill Tonkins**  
*Veritas Vineyards and Winery*

When I first got involved with the Virginia wine industry, I knew absolutely nothing about growing grapes. And today, with over 10 years of experience as a grower under my belt, I still know less than Tony Wolf has forgotten.

Fortunately, when you have support from people like him, knowledge of viticulture is not needed for the job. He and his team were always available to point the way and answer even my most mundane questions. This has enabled me and others to be successful growers.

I say "team" because he is very much a

See MAKING A DIFFERENCE on page 20

team player. He always gave credit where credit was due, and he has built a great cadre of experts around him to carry the baton forward. They all try very hard to help. He has left us in good hands.

However, if there was one thing about him that was somewhat maddening, it was his use of the phrase, "It depends." Everything, he said, depends on one thing or another. As a military man I was used to receiving direct marching orders. Tony, ever the academic, read much more into a problem than I ever would, and of course, he was always right.

Grape growing is not that straightforward, and the Virginia wine industry has been very lucky to have him steer us through the maze of problems and challenges that arise with East Coast viticulture. Thanks in good measure to Tony, we are now able to grow world-class grapes.



## 'Masterfully Embraced New Innovations'

By Lucie Morton  
*Viticulturist*

It will be impossible for his successor to fill Tony's shoes, not because they won't be great at the job, but because the job has changed. Published just the year before he was hired, my book "Winegrowing in Eastern America" was written on a Compaq luggable PC with MS-DOS and floppy disks. Our home phone was a touch tone.

Just saying that the new hire is working within a new operating system, at least in the office. The same cannot be said, however, of the vineyard, where grapevines and Mother Nature communicate pretty much as they always have. No technology can replace the boots-on-the-ground, hands-on-the-vines experience that brings a certain humility, which I think Tony came to understand even as he masterfully embraced new innovations and information.



## 'Tending Vines and Conducting Research'

By Mizuho Nita  
*Grape Pathologist, Virginia Tech*

It is hard to believe that I am starting my

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## 'He ... Can Out-Harvest His Students'

By Tremain Hatch  
*Virginia Tech Research/Extension Associate*

I have been fortunate to work for Tony Wolf for the past 17 years. Not only was I given the opportunity to observe the positive impact his work had on the industry, but I was able to continue to learn from him over a long period of time.

Tony's expertise and professionalism has highlighted the work of grape growers. This is important, as the role of growers is sometimes eclipsed by what happens in the winery. Tony's support for growers and their hard work has greatly improved wine quality in the Mid-Atlantic.

In addition to sharing recommendations about what tasks should be completed in the vineyard, he took time to explain why the tasks were important. In this way he helped us see plant physiology in action. He made the processes in the vineyard come alive in a very emphatic way. Tony has lifted the viticulture expertise in our entire industry.

He is a top-notch whole-plant physiologist. Not only is he a talented researcher but he did the hard physical work as well. He still drives a tractor and can out-harvest his students.

He has always been diligent about making sure his recommendations have a foundation on research-based evidence.

Through Tony's career he has worked on essential questions for our industry, such as how to keep vines alive in our environment. He has, as well, worked on the valuable questions about how to optimize wine quality in our environment.

I think we can all agree that Tony Wolf has been a major factor in the success of the Virginia wine industry. Enjoy your retirement, Tony, you have earned it!



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14th year at Virginia Tech, and it is even harder to believe Tony has been here for 36 years!

Tony has been a great colleague, mentor and supervisor. He ran very productive extension and research programs during his tenure at Virginia Tech, and often planned an entire program for VVA meetings, which takes a considerable amount of time and effort. It was not uncommon to see growers visiting the office for one reason or another, and I cannot imagine how many emails and phone calls he handled in 36 years.

Tony's research program resulted in the publication of numerous research papers in high-impact journals, and it also brought many talented people to Virginia Tech, many of whom are still associated with us in one form or another. For example, his graduate students included Dr. Imed Dami at The Ohio State University, Dr. Cain Hickey at Penn State University, and our own Tremain Hatch, to name a few.

And Tony was always "hands-on." If you did not see him in his office, you would find him tending vines and conducting research in vineyards and his lab. Pruning, canopy management, weeding, spraying, and data collection — yes, he was involved in all of these activities, year after year. There were

many times he helped me with spraying my blocks!

As the director of our research station, Tony cared deeply about the well-being of faculty, staff, and students. He provided tremendous support for me when I was going through my cancer treatments to make sure my program progressed as I had planned, and he checked in on my family from time to time. He also helped our faculty members by providing valuable advice and lending a hand to make sure we progressed in our professional career paths.

You may wonder when and if Tony took a break. I did, too! If I went in during the weekend, he was often already there. It was not uncommon to receive an email from him very early in the morning.

So, while I was surprised when he announced his retirement, I knew he deserved it. It has been a privilege and pleasure to work with Tony and to learn from his work ethic, leadership, passion for research, and compassion for others.

I wish him a good start in this new chapter of his and his family's life, and I hope to see him whenever he feels like stopping by. And FYI, he will be back in a few months as a part-time station director assisting us until we find a successor. ■