

Show Me Grape and Wine Conference and Symposium

March 4-6, 2020

Hampton Inn and Suites at the University of Missouri



Grape and Wine Institute

University of Missouri



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**Complimentary lunch buffet on
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The Great Missouri Wine Tasting sponsored by the Missouri Grape Growers Association and the Missouri Wine and Grape Marketing Board

Symposium — Wednesday, March 4

- 7:30 A.M.** **Attendee check-in** University Atrium
- 8:30 A.M.** **Welcome**
Dr. Dean Volenberg, Grape and Wine Institute
- 8:45 A.M.** **Wine metabolome plasticity of a common scion ‘Chambourcin’ on different root systems while under varied irrigation regimes**
Mani Awale, Connie Liu, and Dr. Misha T. Kwasniewski
- 9:00 A.M.** **The incidence of grapevine trunk disease on varieties in Missouri**
Emily Serra and Dr. Megan Hall
- 9:15 A.M.** **Clues from *Vitis vinifera* on tannin extraction and retention in Missouri hybrid grape cultivars**
Alex Fredrickson, Jacob Holman, and Dr. Misha T. Kwasniewski
- 9:30 A.M.** **Implicating early fruit fly life stages in sour rot spray timing applications**
Patrick Kenney and Dr. Megan Hall
- 9:45 A.M.** **Break**
- 10:15 A.M.** **Grapevine survey for viruses of potential economic importance in Norton, Chambourcin, and Vignoles**
Dr. James Schoelz and Dr. Dean Volenberg
- 10:30 A.M.** **Potential insect vectors of grapevine red blotch virus in Missouri vineyards**
Harper Smith, Dr. Dean Volenberg, and Dr. Debbie Finke
- 10:45 A.M.** **‘Norton’ grapevine is resistant to Grapevine Vein Clearing virus**
Dr. Wenping Qiu, Sylvia Petersen, Susanne Howard, Xiangmei Zhang, and Kai Qiao

Symposium — Wednesday, March 4

- 11:00 A.M.** **Grapevine Vein Clearing virus is prevalent in *Aphis illinoisensis***
Adam Uhls, Sylvia Petersen, Xiaokai Bao, and Dr. Wenping Qiu
- 11:15 A.M.** **Detection of grapevine viral diseases using proximal and remote sensing observations**
Canh Nguyen, Dr. Vasit Sagen, Matthew Maimaitiyiming, Dr. James Schoelz, and Dr. Misha T. Kwasniewski
- 11:30 A.M.** **QTL mapping of botrytis bunch rot resistance in *Vitis aestivalis*-derived ‘Norton’-based population**
Dr. Chin-Feng Hwang, Dr. Surya D. Sapkota, and Li-Ling Chen
- 11:45 A.M.** **Signatures of grafting on ‘Chambourcin’ leaves**
Dr. Allison Miller, Laura Klein, and Zach Harris
- 12:00 P.M.** **Complimentary lunch break**

Conference — Wednesday, March 4

- 1:00 P.M.** **Now that you’ve made “it” how do you sell it?**
James “Jim” Moisson, National Sales Manager, Paul Hobbs Wines
- 1:45 P.M.** **Beyond the bottle: Millennial wine consumers profiles and responses towards alternative wine packaging**
Dr. Nicholas “Nick” E. Johnston, Southeast Missouri State University
- 2:30 P.M.** **Break**
- 3:00 P.M.** **Sell more wine: Five marketing tips to grow your brand**
Rebecca Ritz, Founder and Designer, Bauerhaus Design, Inc.
- 3:45 P.M.** **Connecting the wines from producers to consumers on premise**
Barry Tunnell, General Manager and Wine Director, Tannin Wine Bar and Kitchen
- 4:30 P.M.** **Missouri: Industry update**
Jim Anderson, Executive Director Missouri Wine and Grape Board
- 5:15 P.M.** **Break**
- 6:00 P.M.** **Great Taste of Missouri Wine Tasting** with heavy hors d’oeuvres until 9:00 P.M. Hosted and sponsored by the Missouri Grape Growers Association and the Missouri Wine and Grape Board

Conference — Thursday, March 5

- 7:00 A.M.** **Complimentary continental breakfast**
- 8:45 A.M.** **Welcome**
Dr. Dean Volenberg, Grape and Wine Institute
- 9:00 A.M.** **Identification and diagnosis of grape bunch rots**
Dr. Dean Volenberg, Grape and Wine Institute
- 9:45 A.M.** **Understanding *Colletotrichum* species and their biology to improve chemical management options against grape ripe rot**
Dr. Mizuho Nita, Virginia Tech
- 10:30 A.M.** **Break**
- 11:00 A.M.** **Breeding grapes for your where and when**
Ed Swanson, Grape Breeder, Cuthills Vineyards
- 11:45 A.M.** **Complimentary Lunch**
- 12:45 P.M.** **Grapevine trunk diseases in the vineyard, Part I: Starting clean**
Dr. Helen Waite
- 1:30 P.M.** **Grapevine trunk diseases in the vineyard, Part II: Staying healthy**
Dr. Helen Waite
- 3:00 P.M.** **Break**
- 3:30 P.M.** **Hard cider production**
Michael Jones, Scott Laboratories
- 4:15 P.M.** **Management though the microbiome: How manipulating endophytes may affect berry development**
Dr. Megan Hall, Grape and Wine Institute
- 5:00 P.M.** **Behavioral management of Japanese beetle and updates on spotted lanternfly**
Dr. Kevin Rice, University of Missouri
- 5:45 P.M.** **Adjourn**

Friday, March 6 — Advanced Beginner Grape School

- 7:00 A.M.** **Complimentary continental breakfast**
- 8:45 A.M.** **Welcome Advanced Beginner Grape School**
Dr. Dean Volenberg, Grape and Wine Institute
- 9:00 A.M.** **Vineyard business plan**
Dr. Dean Volenberg, Grape and Wine Institute
- 10:00 A.M.** **Fine-tuning site selection**
Dr. Dean Volenberg, Grape and Wine Institute
- 11:00 A.M.** **Break**
- 11:15 A.M.** **Successful vine establishment**
Dr. Dean Volenberg, Grape and Wine Institute
- 12:15 P.M.** **Complimentary lunch**
- 1:15 P.M.** **Grape insect pests and management**
Dr. Dean Volenberg, Grape and Wine Institute
- 2:15 P.M.** **Grape diseases and management**
Dr. Dean Volenberg, Grape and Wine Institute
- 3:15 P.M.** **Break**
- 3:30 P.M.** **Managing non-bearing vines**
Dr. Dean Volenberg, Grape and Wine Institute
- 4:30 P.M.** **Managing bearing vines**
Dr. Dean Volenberg, Grape and Wine Institute
- 5:30 P.M.** **Questions and answers**
Dr. Dean Volenberg, Grape and Wine Institute
- 6:00 P.M.** **Adjourn**

Symposium Abstracts

Wine metabolome plasticity of a common scion 'Chambourcin' on different root systems while under varied irrigation regimes

Mani Awale, Connie Liu, and Misha T. Kwasniewski

Grape and Wine Institute, University of Missouri, 135 Eckles Hall, Columbia, MO 65211, USA

Rootstock genotype grafted to grapevine and water availability can play an important role in the final wine aroma. However, the role of the rootstocks on wine volatiles in hybrid cultivars has not been well-studied. We investigated the effect of three commercial rootstocks (1103P, 3309C and SO4) grafted to Chambourcin and own-rooted vines, under different irrigation regimes (full compensation of evapotranspiration (ET), 50% of ET and unirrigated) on wine volatiles in an experimental vineyard in Mount Vernon, MO in 2017 and 2018. Wines were analyzed by SPME-GCMS/MS initially using a more inclusive and comprehensive metabolomics approach followed by confirmation of compound differences using authentic standards. We observed 682 and 877 features differences (m/z by time) in 2017 wine samples and 2018 wine samples respectively across treatments and 221 and 382 significant features defining the differences between rootstocks independent of irrigation in 2017 and 2018 respectively. We identified 94 different compounds in wine 2017 and 2018 that are significantly different due to rootstocks and irrigation including a large number of esters, terpenoids and C₁₃ norisoprenoids. Confirmation and quantitation of identified compounds showed that own rooted vines differ from the rootstocks for many volatiles including β -Damascenone which is present in higher concentration in own-rooted vines than rootstocks. Additionally, we also observed significant interaction effect between rootstocks and irrigation treatments for many volatile compounds including Isoamyl Acetate, Terpinolene, Ethyl Dihydrocinnamate, and Isoamyl Hexanoate. Thus, using non-targeted approach we are able to identify many wine volatiles which we would have missed using a traditional targeted approach.

The incidence of grapevine trunk disease on varieties in Missouri

Emily Serra and Megan Hall

University of Missouri, Division of Plant Sciences, Columbia, MO 65211, USA

Grapevine Trunk Disease (GTD) is an emerging fungal disease complex in vineyards worldwide. In January 2019, pruning weight and pruning wood samples were collected from nine different interspecific *Vitis* cultivars in a research vineyard in New Franklin, MO. Four 1 cm-wide pruning wood samples were surface sterilized in 10% bleach, plated onto potato dextrose agar (PDA) petri plates, and grown under fluorescent light. Extracted DNA from 56 individual isolates were submitted for Sanger Sequencing at the DNA Core Facility at the University of Missouri. Across all varieties, 45% of the surveyed vines contained *Phomopsis viticola*, a known GTD pathogen. Other identified endophytes include *Diplodia seriata*, *Neofusicoccum parvum*, *Neofusicoccum ribis*, *Aspergillus heteromorphus*, *Basidiomycota* sp., and *Pestalotiopsis uvicola*. Pruning weights were collected for each surveyed vine, yet no significant differences were found in any variety between infected and non-infected vines. In a separate experiment, a commercial block of Vidal blanc in Augusta, MO was surveyed following the removal of vines due to decline symptoms consistent with GTD. Incidence and severity ratings were collected on a random sample of 100 vines, along with trunk samples which were used for culturing fungal endophytes. Of the 100 vines, 90% showed visual symptoms of GTD. Known GTD pathogens *Phomopsis viticola*, *Basidiomycota* sp., *Neofusicoccum ribis*, and *Neofusicoccum parvum* were found in 41% of the samples. While *Botryosphaeria* sp. and *Eutypa* sp. are commonly identified GTD pathogens in previously studied regions, only two samples were found containing *Botryosphaeria* sp. and *Eutypa* sp. was never found.

Symposium Abstracts

Clues from *Vitis vinifera* on tannin extraction and retention in Missouri hybrid cultivars

Alex Fredrickson¹, Jacob Holman², and Misha T. Kwasniewski¹

¹Grape and Wine Institute, University of Missouri, 135 Eckles Hall, Columbia, MO 65211, USA
(email: ajfpvn@mail.missouri.edu)

²Les Bourgeois Vineyards, 12847 W Hwy Bb, Rocheport, MO 65279, USA

Missouri red wines are commonly made from hybrid cultivars which have little native tannin in finished wines. For example, a Chambourcin made in 2018 had 47mg/l Catechin equivalents (CE) of tannin while a previous study found *Vitis vinifera* cv. Pinot noir (known as a lower tannin red) had a mean tannin concentration of 348 mg/L CE of tannin (Harbertson et al. 2008).

We do not fully understand what is causing tannin to be low in hybrid cultivars as there is generally more tannin in the fruit than found in the wine. In order to get a better idea on how skin, pulp, and juice impact tannin retention, one hybrid cultivar, Chambourcin from Missouri (low tannin) and one *V. vinifera* cultivar, Syrah from California (high tannin) were compared in a 2019 study. In collaboration with Les Bourgeois Vineyards each cultivar was lightly pressed to separate juice from skins. Four treatments were created, Chambourcin control, Syrah control, Chambourcin juice with Syrah Skins, and Syrah juice with Chambourcin skins. Treatments were replicated at research scale to compare industry and research winemaking. Tannin, proteomics, and volatiles were analyzed to compare the two cultivars and to understand what factor the different components play in tannin retention. This work seeks to better explain if an increase in tannin can be made with Chambourcin juice and Syrah skins (over Chambourcin control) or is the poor tannin retention factor already in the juice. As well as how wine aroma maybe impacted by the crossover treatments compared with standard vinification.

Implicating early fruit fly life stages in sour rot and spray timing applications

Patrick Kenney and Megan Hall

University of Missouri, Division of Plant Science, Waters Hall, Columbia, MO 65201, USA

Sour rot is a late season disease of ripening grape clusters affecting susceptible red and white varieties of *Vitis* spp. Signs and symptoms include browning of the berry skin, liquefaction of berries, the pungent smell of acetic acid, and the presence of *Drosophila* spp. To determine the role of various fruit fly life stages on symptom development, undamaged ripe berries of *Vitis* interspecific hybrid cv. Chambourcin were surface-sterilized, wounded, and co-inoculated with causal organisms *Metschnikowia pulcherrima* and *Gluconobacter cerinus*, then exposed to either axenic *D. melanogaster* eggs, 24hr-old larvae, or adult life stages. Symptoms were rated daily based on severity scale of 0-4. After recording disease progression over nine days, all life stages eventually scored the highest rating level (4), implicating prepupal fruit flies as a critical component in the development of sour rot. In a separate experiment in 2018 and 2019, spray timing trials were conducted at two commercial vineyards to determine the efficacy of post-symptom development sprays. In both vineyards, Oxidate 2.0 (hydrogen dioxide) and Mustang Maxx (zeta-cypermethrin) were applied to entire vineyard rows. Spray timings were: i) 15-16 and 20-21 Brix, ii) 12-13 Brix and 17-18 Brix, and iii) weekly sprays beginning at 15-16 Brix until harvest. Sour rot incidence and severity were rated in each row at harvest. In both years of the experiment, there were no significant differences between two sprays or weekly sprays applied post-symptoms, indicating that additional post-symptom sprays do not provide better control of the disease.

Symposium Abstracts

Grapevine survey for viruses of potential economic importance in Norton, Chambourcin, and Vignoles

James Schoelz¹ and Dean Volenberg²

¹University of Missouri, Division of Plant Science, Waters Hall, Columbia, MO 65211, USA

²Grape and Wine Institute, University of Missouri, 214 Waters Hall, Columbia, MO 65211, USA

Plant viruses such as Grapevine leafroll-associated virus 3 (GLRaV-3) and Grapevine red blotch virus (GRBV) are considered to be major threats to grape and wine production in the United States. Both GLRaV-3 and GRBV have been associated with delays in ripening and altered fruit juice chemistry in *Vitis vinifera*, including a reduction in Brix and lower anthocyanin contents, as well as diminishing vine health. In addition, Grapevine leafroll-associated virus 2 (GLRaV-2) has also been implicated in vine decline. However, little is known about the impact of these viruses on the physiology of grape hybrids. We completed a statewide survey for grapevine viruses in Missouri in 2017 and found that GRBV, GLRaV-3, and GLRaV-2 were detected in a significant number of our samples. However, since this was the first comprehensive survey for grapevine viruses in Missouri, all of the samples were “composites” composed of four vines growing next to each other. Consequently, we do not have data on the status of individual vines, which is necessary to determine the true incidence of these viruses and the impact of virus infections on grapevine health and berry quality. We are now in the first year of a multi-year project to determine the incidence and impact of grapevine viruses GRBV, GLRaV-3, and GLRaV-2 in the varieties Norton, Chambourcin, and Vignoles. In the past growing season we selected 50 vines for each variety at three locations for a total of 150 vines per variety and screened each vine for the three viruses. The long term goal of the project will be to identify individual vines infected with multiple viruses and then to assess their effect on berry quality and vine health.

Potential insect vectors of grapevine red blotch virus in Missouri vineyards

Harper Smith¹, Dean Volenberg², and Debbie Finke¹

¹University of Missouri, Division of Plant Sciences, 3-22C Agriculture Building, Columbia, MO 65211, USA

²Grape and Wine Institute, University of Missouri, 214 Waters Hall, Columbia, MO 65211, USA

Red Blotch disease was recently confirmed in grapevines in Missouri. This disease has been shown to affect the profitability of vineyards by reducing fruit quality at harvest as well as decreasing vine health over time. Currently, there is no information about the potential vectors of Grapevine Red Blotch Virus (GRBV) in Missouri. Researchers in California have confirmed one insect vector of GRBV, the three-cornered alfalfa treehopper, *Spissistilus festinus* (Hemiptera: Membracidae). Some genera of leafhoppers (Hemiptera: Cicadellidae) have been implicated as potential vectors as well. Our objective was to identify the potential vectors of GRBV in Missouri vineyards. We sampled insect communities in 2018 and 2019 beginning at bud break in four vineyards with confirmed GRBV infections. Insects were sampled weekly using unbaited yellow sticky card traps, and vacuum and sweepnet sampling. Card traps were placed at the edge habitat surrounding the vineyard, and in the interior of the vineyard to quantify the movement of insects into vineyards. We did not find the confirmed vector, *S. festinus*, in our survey but previously implicated vectors were abundant. We have also identified two new potential treehopper vectors, *Microtalis calva* and *Entylia bacciana*, which were found in high numbers in our survey. Interestingly, *Microtalis calva* is a congener of the confirmed vector of Tomato-Pseudo Curly Top Virus, the virus most closely related to GRBV. Vector candidates will be tested for the ability to transmit GRBV to healthy grapevines.

Symposium Abstracts

'Norton' grapevine is resistant to Grapevine Vein Clearing virus

Wenping Qiu, Sylvia M Petersen, Susanne Howard, Xiangmei Zhang, and Kai Qiao

Center for Grapevine Biotechnology, The Darr College of Agriculture, Missouri State University, Springfield, MO 65897, USA

'Norton' grapevine is known to be resistant to the two most important fungal diseases, powdery mildew, and downy mildew. It is unknown if 'Norton' is able to resist a virus. Grapevine Vein Clearing virus (GVCV) has caused the removal of several vineyards in the Midwest. It is transmitted by grape aphids and prevalent in wild native plants. The best management of a viral disease is to plant virus-tested cultivars and grow virus-resistant cultivars. In this project, we grafted GVCV-infected 'Chardone' onto 'Norton' either as the scion or the rootstock and grew grafted vines up to three years. We did not detect GVCV in grafted 'Norton' vines by polymerase chain reaction assay. We applied RNAseq, a comprehensive method of detecting viruses, and did not find GVCV in 'Norton', whether scion or rootstock. We then analyzed genetic factors that determine 'Norton's' resistance by assessing resistance to GVCV of a progeny population from the cross of 'Norton' and 'Cabernet Sauvignon.' We will present the latest results in the Symposium. The discovery of 'Norton's' resistance to GVCV adds a new trait to 'Norton', a historically and economically important grape cultivar to the Midwest.

Grapevine Vein Clearing virus is prevalent in *Aphis illinoisensis*

Adam Uhls, Sylvia Peterson, Xiaokai Bao, and Wenping Qiu

Center for Grapevine Biotechnology, The Darr College of Agriculture, Missouri State University, Springfield, MO 65897, USA

Grapevine Vein Clearing virus (GVCV) is associated with severe disease symptoms in Missouri vineyards, and is endemic in native Vitaceae populations in the Midwest. GVCV has been found to infect hosts of at least eight grape cultivars causing stunted vines and eventual death. GVCV has also been found to infect wild *Vitis* spp. and *Ampelopsis cordata*, a close relative of *Vitis* in the Vitaceae family. These wild species create a reservoir for GVCV, allowing the virus to accumulate and spread through the native hosts and into vineyards with the aid of a vector, *Aphis illinoisensis* (grape aphid). In this study, grape aphids were collected from native Vitaceae in 2018 and 2019 from three different American Viticulture Areas (AVAs) and were tested for GVCV using polymerase chain reaction (PCR). We found that 187 of 455 single grape aphids (41%) tested carried the virus. When comparing DNA sequences of GVCV derived from grape aphids and plants, we found variants in grape aphids that match variants in wild and cultivated Vitaceae, that in some instances are more than 100 miles apart. Using real time quantitative PCR (qPCR) to quantify the transmissible portion of virus in the stylets of grape aphids, we found significant levels of virus particles in the stylets when compared to those in the body. This evidence strongly suggests that grape aphids are linked to the spread of GVCV from wild Vitaceae into cultivated vineyards.

Symposium Abstracts

Detection of grapevine viral diseases using proximal and remote sensing observations

Canh Nguyen^a, Vaist Sagan^a, Maimaiti Maimaitiyiming^b, James Schoelz^b, Misha T. Kwasniewski^b

^aDepartment of Earth and Atmospheric Sciences, Saint Louis University, St. Louis, MO 63108, USA

^bDivision of Plant Sciences, University of Missouri, Columbia, MO 65211, USA

Early detection and mapping spatial extent of grapevine viral diseases is critical in preserving yields and grape quality. Remote sensing techniques can potentially detect and quantify grapevine viral diseases, yet models to predict across grapevine varieties and different viruses are deficient. Although plant disease and stress detection has a long history and can be successfully achieved by a variety of nondestructive methods, imaging techniques are recently emerging as one of the reliable methods in precision agriculture and crop monitoring. The aim of this project is to evaluate the feasibility of proximal and remote sensing observations to detect grapevine viral diseases (i.e., red blotch and Grapevine Vein Clear viruses) and quantify the spatial development of disease. An experiment was set up at a test site of South Farm Research Center, Columbia, MO (38.92N, -92.28W) with two grapevine groups: healthy and infected, as other conditions were controlled. Images of each plant were captured by a 400-1000 nm hyperspectral sensor, SPECIM IQ (Oulu, Finland), and a RGB optical camera in a series of time between August and October 2019. Hyperspectral images were pre-processed and calibrated to account for atmospheric effects before imputing for foliar properties and spectral indices of grapevine. A statistical analysis, independent samples t-test, was employed to discriminate two grapevine groups. The result showed a promising capability of detecting plant diseases through spectral data and had a practical implication of remote sensing technology on early crop monitoring.

QTL mapping of Botrytis Bunch Rot resistance in a *Vitis aestivalis*-derived 'Norton'-based population

Chin-Feng Hwang*, Surya D. Sapkota, and Li-Ling Chen

State Fruit Experiment Station at Mountain Grove Campus, Darr College of Agriculture, Missouri State University, Springfield, MO 65897, USA

Vitis aestivalis-derived 'Norton' is the official grape of the State of Missouri grown in regions with high disease pressure and cold winter temperatures where *V. vinifera* (the European grape used for most wine-making worldwide, e.g., Cabernet Sauvignon) is not adapted. It reportedly offers an abundance of traits, including resistance to powdery and downy mildew as well as Botrytis bunch rot, which can be used to naturally improve existing *V. vinifera* germplasm. To identify genetic determinants for resistance to

Botrytis bunch rot caused by *Botrytis cinerea*, a mapping population of 182 individuals was constructed from a cross between 'Norton' and 'Cabernet Sauvignon.' A consensus genetic map was constructed with 411 simple sequence repeat (SSR) markers. In collaboration with VitisGen (www.vitisgen.org), approximately 43,320 single nucleotide polymorphism (SNP) markers generated by genotyping-by-sequencing (GBS) were identified, and a consensus map of 3,825 SNPs was developed. Of these, 1,665 SNP and 407 SSR markers were clustered into 19 linkage groups for a total of 2,072 markers spanning a genetic distance of 2,203.5 cM. In preparation for placing traits on this integrated high-resolution map, disease progression and resistance reaction in response to *B. cinerea* was evaluated in this population for two years. The quantitative trait loci (QTL) analysis indicated a major resistance locus on linkage group 2 for Botrytis bunch rot. This data will be further presented and discussed. The ultimate goal of this program is to use genetic markers to rapidly deploy favorable alleles and accelerate breeding cycles for new cultivar releases.

Symposium Abstracts

Signatures of grafting on 'Chambourcin' leaves

Allison Miller¹, Laura Klein², and Zach Harris³

¹Member and Principal Investigator, Danforth Plant Science Center; Professor of Biology, Saint Louis University, USA

²Herbarium Director, Leafworks, Sebastapol, CA, USA

³Graduate Student, Saint Louis University, USA

Grafting is a process by which the above-ground shoot system of one plant (the scion) is surgically connected to the primarily below-ground root system of another plant (the rootstock). In grapevine, grafting was utilized initially to impart root-system resistance to the aphid phylloxera. Subsequent work has shown that rootstock genotype impacts the scion in various ways. Here, we present the effects of rootstock genotype on leaf features of the scion. We explore scion leaves at three phenological stages to quantify the extent to which grafting impacts scion gene expression, scion metabolomic profiles, and scion ion concentration profiles. We show that for gene expression and metabolomics, no individual gene or metabolite shows strong evidence of programming by the rootstock genotype, however there are complicated interactions that could be parsed with more comprehensive sampling. Additionally, we show that leaf ionome shows distinct signatures of rootstock genotype, phenological stage, and the rootstock by phenology interactions. These data indicate that rootstock selection exerts subtle influences on traits observed in the leaves.

Special Thanks to the Missouri Wine and Grape Board Research Committee for their support of many of the Symposium research projects presented

Missouri Wine and Grape Board Research Committee Members

Tony Kooyumjian — Research Committee Chairperson, Augusta and Montelle wineries

Peter Hofherr — Missouri Wine and Grape Board Chairperson, St. James Winery

Cory Bomgaars — President Missouri Vintners Association, Les Bourgeois Winery

Jon Held — Missouri Wine and Grape Board Member, Stone Hill Winery

Dave Baker — Assistant Dean Emeritus & Associate Professor Emeritus, CAFNR, University of Missouri

Sarah Schmidt — Missouri Wine and Grape Board Member, Baltimore Bend Winery

Linda Koch — President Missouri Grape Growers Association, Cedar Crest Vineyards

Bill Sadler — Sadler's Natural Solutions, LLC & Consultant

Eli Bergmeier — Crown Vineyards

Walter Gassmann — Professor, University of Missouri, & Interim Director, Bond Life Sciences Center

Amy LaHue — Oak Solutions Group

Rick Ryan — CEO/Co-Founder Apertus Pharmaceuticals

Conference Speakers — Wednesday



Now that you've made "it" how do you sell it?

James "Jim" Moisson, National Sales Manager, Paul Hobbs Wines

National Sales manager for Paul Hobbs Wines. Thirty-four years of consumer products sales and marketing with over 25 years in the Adult Beverage, mostly focused on the wine business.

WSET* Level III certified — passed with Merit

Category Management Knowledge Group — Certified Strategic Advisor

Development Leadership Training through Dartmouth College

Currently managing domestic sales for Paul Hobbs Wines located in Sebastopol California, including all National on premise and retail customers. Prior to the current role, Director of Strategic Retail Accounts for Copper Cane Wines & Provisions, a start-up company based in Napa California. Previous experience includes Vice President of Strategic Accounts with Constellation Brands spearheading Constellation Brands opening an Office and building a team to manage the Walmart Corporate, Military Global and Convenience channel Category and Sales initiatives. Prior to joining Constellation in 2005, Jim had worked for Johnson Outdoors where he had sold his start up outdoor product business to in 2004. Jim started his career with the Earnest & Julio Gallo Family Winery where he held graduating level of responsibilities in several markets.

While a passionate wine enthusiast, he does not consider himself a wine "expert." Expertise lies in navigating a complicated route to market and vision to exceed customer and ultimately consumer expectations. His affection for wine only surpassed by the love of learning and telling the story of the wine. The wine industry offers great privilege to travel the world and learn local customs that make us all unique but with a common interest.

Jim attended University of Missouri and currently resides in Rogers, Arkansas with his wife of 29 years. He batted 1 for 3 with one attending MIZZOU class of '18.



Beyond the bottle: Millennial wine consumers profiles and responses towards alternative wine packaging

Nicholas "Nick" Johnston, Assistant Professor, Southeast Missouri State University

Dr. Nicholas "Nick" Edward Johnston is an Assistant Professor of Hospitality Management in the Harrison College of Business and Computing at Southeast Missouri State University. He holds a doctoral degree in Hospitality Administration from Texas Tech University and has over 15 years of experience in beverage and food management. Currently Dr. Johnston is teaching and advising students while maintaining an active

research agenda with a focus on consumer behavior and workplace culture in the foodservice and wine industries. Dr. Johnston's work has been published in academic journals and presented at numerous national and international conferences. In addition, his research has been supported by a grant from the Wine Market Council, and during his graduate studies he served as a research assistant for the Texas Wine Marketing Institute.

Conference Speakers — Wednesday



Sell more wine: Five marketing tips to grow your brand

**Rebecca Ritz, Founder and Designer,
Bauerhaus Design, Inc. www.bauerhaus.com**

Rebecca is passionate about the wine industry, and making it easier for businesses to achieve their goals. In 2010, she blended two of her loves — design and wine — and began to focus on helping wine brands tell their brand story. Rebecca specializes in integrating this brand story and strategy into print, packaging, website design, and development to stand out from the competition. Her motto is: “Will design for wine.”

Rebecca is pleased to teach brands the marketing strategies and tools they can use to get more customers and increase their sales. Based in Illinois she travels the world to share her 20 years of design and branding expertise via workshops on marketing, website strategy, wine label design, and social media. Rebecca prides herself on providing tangible takeaways that owners and marketing managers can apply to their specific winery. When not speaking, she partners with wineries and vineyards around the country to create unforgettable brands.

Bauerhaus Design is a member of the Wine Industry Network, Texas Wine and Grape Growers Association, Illinois Grape Growers and Vintners Alliance, and the Women of the Vine & Spirits, an organization dedicated to the support and advancement of women in the alcohol beverage industry.



Connecting the wines from producers to consumers on premise

**Barry Tunnell, General Manager and Wine Director,
Tannin Wine Bar and Kitchen**

Barry Tunnell is the general manager and wine director at Tannin Wine Bar & Kitchen, in Kansas City, Missouri. Barry has worked in the food, beverage, and hospitality industry since 1998. He opened Tannin Wine Bar & Kitchen, a comfortable neighborhood wine bar in Kansas City's dynamic Crossroads neighborhood, in February 2011. Since then, Tannin has received regional and national acclaim, especially for its wine program, which aims to present top quality handmade, small production wines from around the globe in a relaxed and fun to explore context. Tannin has twice been named one of “America's Top 100 Wine Restaurants” by *Wine Enthusiast Magazine*.

Conference Speakers — Wednesday



Missouri: Industry update

Jim Anderson, Executive Director, Missouri Wine and Grape Board



Jim Anderson has led the Missouri Wine and Grape board as Executive Director for more than 20 years. During his years at the helm, Jim has overseen the expansion of Missouri wineries from 28 to 131. As Wine and Grape Board Director, his duties are to coordinate and develop an agency to administer a program that guarantees long-term sustainability. His overall goal is to have a resourceful program that assures quality wine and juice products, and serves to stimulate growth of a viable grape and wine industry in Missouri.

Conference Speakers — Thursday



Identification and diagnosis of grape bunch rots

Dr. Dean Volenberg, Viticulture and Winery Operations Extension Specialist, Grape and Wine Institute

Dean Volenberg cut his teeth on cold-climate viticulture in the far reaches of Wisconsin. During his tenure in Wisconsin, Dr. Volenberg established three replicated cultivar trials in three different USDA plant hardiness zones. In the far northern zone trial, the objective was to learn which cultivars would survive and produce grapes in extreme cold temperatures ranging from -45 to -50 °F. Further, Dr. Volenberg helped establish the Wisconsin Grape Growers Association and over his eight-year tenure in Wisconsin, the Wisconsin wine industry grew from 40 wineries to more

than 120. Currently, Dr. Volenberg is the Extension program specialist for viticulture and winery operation at the Grape and Wine Institute at the University of Missouri. Dean's current research program is focused on applied and hypothesis driven discovery of pests that have economic implications for Eastern United States grape growers. Dr. Volenberg was first to confirm the presence of Grapevine Red Blotch virus (GRBV) in Missouri. These results lead to a statewide survey of grapevine viruses. Further research on GRBV is surveying potential insect vectors of the virus. His Extension program is multifaceted with attention focused on fungal and viral pests and their management.

Conference Speakers — Thursday



Understanding *Colletotrichum* species and their biology to improve chemical management options against grape ripe rot

Dr. Mizuho Nita, Virginia Tech

Mizuho Nita is an assistant professor and extension specialist of grape pathology at Virginia Tech's AHS AREC at Winchester, VA. His academic interest is in the applied plant pathology and plant disease epidemiology. At Virginia Tech, he engages in a range of research and extension activities, including exploration of cultural and chemical means of disease management, fungicide, and fungicide-alternative testing, variety susceptibility evaluation, and development of novel diagnostic tools. His current research projects are 1) Management options for ripe rot of grape, 2) Use of a biological control agent for grapevine crown gall management, 3) Epidemiological studies of grapevine leafroll-associated virus and its vectors, 4) Development of disease risk assessment tools for grape diseases, 5) Trunk diseases management, 6) Organic and alternative wine grape disease management tools, and 7) Fungicide efficacy evaluations. He has been active on extension programs target growers and Cooperative Extension agents not only in Virginia and other states and countries. He provides training in disease identification and management using the mix of web and traditional resources.



Breeding grapes for your where and when

Ed Swanson, Grape Breeder, Cuthills Vineyards

A native of Nebraska, Ed Swanson has been involved in growing and testing grape varieties for over forty years. In December of 1994, with vines that were planted in 1985, Ed and his wife Holly opened Cuthills Vineyards, Nebraska's first post-prohibition winery.

Ed began breeding grapes in 1996, because of the lack of good tannin structure in the red grapes that were available for northeast Nebraska. In 2001 Ed released ES-7-4-76 as Brianna, for the late Elmer Swenson, and later named and released Petite Amie for Grape Breeder David McGregor. His Grape Temparia, a hybrid of Riparia x Tempranillo, is listed in Jands Robinson's book: "Wine Grapes."

Ed is currently making wine at "Capitol View Winery," just south of Lincoln, Nebraska, as well as doing consulting for vineyard and winery, and custom field grafting.

Conference Speakers — Thursday



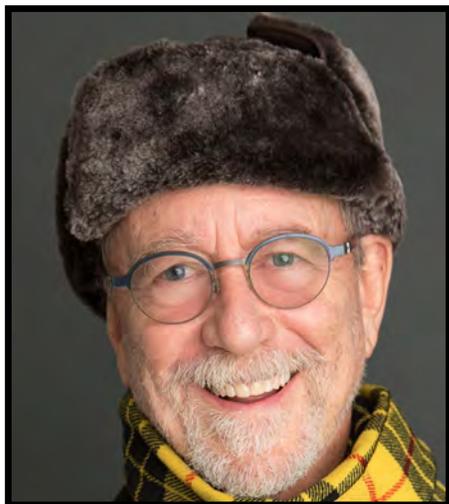
Grapevine trunk diseases in the vineyard, Part I: Starting clean

Grapevine trunk diseases in the vineyard, Part II: Staying healthy

Dr. Helen Waite

Helen is recognised internationally for her pioneering research and unique expertise in grapevine propagation, vineyard establishment and grapevine trunk diseases and for her ability to solve problems and provide practical, cost-effective solutions for nurseries and grape growers. She has presented her work at international conferences and industry workshops in the USA, UK, Australia, South Africa, Canada, Europe, and Chile. Her research has been published in both industry and peer reviewed journals and she is the author of the Fit Vine app for evaluating grapevine planting material prior to planting in the vineyard. In addition to her research, Helen has worked and lectured

in the fields of both general horticulture and viticulture for more than 30 years and is now specializing in providing consultancy services to grape growers and the vine propagation industry.



Hard cider production

Michael Jones, Scott Laboratories

Michael came on board with Scott Laboratories in 2007 with over 35 years of winemaking experience under his belt. Since then, he has shared his wealth of knowledge with North America by traveling extensively to trade shows and seminars throughout the country, many times as a speaker. A UC Davis graduate, Michael has lived and worked in Burgundy, France and the Hunter Valley, Australia. Domestically, Michael built his experience at Novavine, Hanzell Vineyards and Caymus Vineyards. He also spent 19 years at Domaine Chandon, where he put on a multitude of hats and was involved with the vineyards, operations, winemaking, laboratory, and was part of the team that established the

Wine Education program. Prior to his start in the wine industry, Michael spent a year traveling cross-country by freight train, stopping to work on a shrimp boat in the Gulf of Mexico, pitch hay in San Antonio, and sell art in New Orleans.

Conference Speakers — Thursday



Management through the microbiome: How manipulating endophytes may affect berry development

Dr. Megan Hall, Grape and Wine Institute

Dr. Megan Hall is an Assistant Research Professor of Viticulture at the University of Missouri, located within the Division of Plant Sciences. She earned a Ph.D. from Cornell University in 2018, working on the grape disease complex sour rot. She determined the etiology of sour rot, developed management strategies, characterized the microbiota of both sour rot-infected grapes and healthy grapes, and discovered the presence of fungal endophytes within the grape berry pulp. At MU, Dr. Hall is continuing her research on sour rot, exploring the role of *Drosophila* in the disease complex. In addition, she is working on a project focused on the role of the micronutrient Molybdenum in grapevine nutrition, the

importance of Grapevine Trunk Disease in Missouri and is continuing her research on the endophytic microbiota of grapes, exploring both the source of endophytes and the effects of those endophytes on grape physiology and disease susceptibility.



Behavioral management of Japanese beetle and updates on spotted lanternfly

Dr. Kevin Rice, University of Missouri

Kevin's research involves examining the economic damage created by invasive insects, monitoring dispersal patterns among habitats, creating new pest detection methods that help implement IPM strategies, and examining the effect of host plant species diet on insect development and fitness. He combines lab and field work that connects to ecological theory that ultimately can be translated and transferred to growers through Extension outlets.



Grape and Wine Institute

University of Missouri

On behalf of the Grape and Wine Institute, I would like to thank all of you for attending the 2020 Show Me Grape and Wine Conference and Symposium. This year we have the pleasure of kicking off with the symposium with some exciting research talks. Take the time to interact with these people. Who knows, they may hold the answer to your viticulture or enology concerns. The conference and symposium offers you the venue to forge new relationships and so please take the time and reach out to speakers, vendors, winemakers, and grape growers. Collectively the Missouri Grape and Wine Industry is a team and we offer a warm welcome to new comers entering the industry. If you are new to the grape and wine industry, please introduce yourself. We have a great opportunity to collectively move the wine and grape industries forward in Missouri through education, research and Extension outreach.

Special thanks to all our speakers and vendors for making the 5th Show Me Grape and Wine Conference and Symposium a success. Thanks to the Missouri Wine and Grape Board for your continued support.

Dean Volenberg

Viticulture and Winery Operations Extension Specialist

Conference and Symposium Venue

Hampton Inn & Suites — Columbia (at the University of Missouri)

1225 Fellows Place, Columbia MO 65201

Phone: 573-214-2222 or 800-426-7866

Cross Streets

The Hampton Inn & Suites at the University of Missouri is on the corner of College Avenue (Rock Quarry Road) and Stadium Boulevard.

I-70 exits

East: Highway 63 (exit 128A)

West: Stadium Blvd (exit 124)

Directions from US-63

Take US-63 to Stadium Blvd., then turn west into downtown. Travel to College Avenue (Rock Quarry Road) and turn left. The hotel is on your immediate right.

From Lambert-St. Louis International Airport (STL)

Take I-70 West to US-63 South. Distance from Hotel: 112 miles.

Drive Time: 1.75 hours.

From Kansas City International Airport (MCI)

Take LP Cookingham Drive to I-435 East to I-70 East. Travel I-70 East to US-63 South. Distance from Hotel: 150 miles. Drive Time: 2.25 hours.

From Columbia Regional Airport (COU)

Take Airport Road to Highway H. Turn left, travel to US-63 North to Stadium Blvd. Distance from Hotel: 12 miles. Drive Time: 15 minutes.