Show Me Grape and Wine Conference and Symposium
March 6-8, 2019
Hampton Inn and Suites at the University of Missouri

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University of Missouri
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The Great Missouri Wine Tasting sponsored by
Missouri Wine and Grape Board
&
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<td>7:30 A.M.</td>
<td><strong>Attendee check-in</strong> University Atrium</td>
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<td>8:30 A.M.</td>
<td><strong>Welcome</strong> Dr. Dean Volenberg, Grape and Wine Institute</td>
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<td><strong>Vegetative and reproductive responses of mature Vidal blanc grapes to simulated drift of dicamba</strong> Sarah E. Dixon, D.S. Volenberg and R. J. Smeda</td>
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<td><strong>Grapevine vein clearing virus is prevalent in grape aphids of Missouri</strong> Adam Uhls, S. Peterson, X. Bao, and W. Qiu</td>
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Symposium Wednesday March 6

11:30 A.M.  Optimization of Chambourcin grape breeding using molecular genetic approaches  
Chin-Feng Hwang, L-L. Chen, B. Bentley and S. Land

11:45 A.M.  Rootstocks effects on leaves and fruits of grafted Chambourcin grapevines  
Allison Miller, A. Bozzolo, D.H. Chitwood, A. Fennell, Z. Harris, L.L. Klein, L. Kovacs, M. Li, P. Londo, Q. Ma, Z. Migicovsky, A. McDermaid and M. Kwasniewski

12:00 P.M.  Complimentary Lunch Break

Conference Wednesday March 6

1:00 P.M.  A multidisciplinary research effort to mitigate the impact of grape vine viruses in British Columbia  
Dr. José Ramón Úrbez-Torres, Agri-Food Canada Summerland Research and Development Centre

1:45 P.M.  Wine, Brandy and Beyond  
Philippe Coquard, Wollersheim Winery

2:30 P.M.  Break

3:00 P.M.  Case study: How 6 brands target 6 different wine consumers  
Rebecca Ritz, Founder & Designer, Bauerhaus Design, Inc.

3:45 P.M.  Understanding grapevine trunk diseases to better develop effective management strategies  
Dr. José Ramón Úrbez-Torres, Agri-Food Canada Summerland Research and Development Centre

4:30 P.M.  Missouri Wine and Grape Board: Here and Now  
Annette Alden, Marketing Director and Jim Anderson Missouri Wine 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 8:00 P.M. Hosted and sponsored by the Missouri Grape Growers Association and the Missouri Wine and Grape Board
Conference Thursday March 7

7:00 A.M. Complimentary Continental Breakfast
7:45 A.M. Welcome
Dr. Dean Volenberg, Grape and Wine Institute
8:00 A.M. Capital T Truth: Ground-truthing vineyard maps to improve wine quality
Bubba Beasley, Geologist HydroGeo Environmental
8:45 A.M. Why we should care about microbial terroir
Dr. Megan Hall, Grape and Wine Institute
9:30 A.M. Break
10:00 A.M. Was it the Colletotrichum? The nose knows. Being nosy about gluconic acid
Lucie Morton, Consultant and Ampelographer
10:45 A.M. Sour shrivel—Grapes behaving badly
Dr. Bhasker Bondada, Washington State University, Viticulture and Enology Program
11:30 A.M. Complimentary Lunch Break
12:30 P.M. Oxygen: Friend or Foe? Basics of oxygen management
Michael Jones, Scott Laboratories
1:15 P.M. Volatile acidity in our wines...Where did it come from? What can you do?
Dr. Misha Kwasniewski, Grape and Wine Institute
2:00 P.M. Break
2:30 P.M. VESTA and Registered Apprenticeships for the Missouri Grape and Wine Industry
Michelle Norgren, Director of the VESTA Program, Bill Alter, VESTA Special Projects Coordinator, and Shane Moriarity, Project Manager, Central MO Workforce Investment Board
5:30 P.M. Adjourn
## Beginner Grape School

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| 8:45 A.M. | Welcome Beginner Grape School  
Dr. Dean Volenberg, Grape and Wine Institute                                                  |
| 9:00 A.M. | Introduction into the Missouri Grape and Wine Industry  
Dr. Dean Volenberg, Grape and Wine Institute  
**Costs of establishing a vineyard**  
Michael White, Viticulture Specialist, Iowa State University |
| 10:00 A.M. | **Vineyard pest management**  
Dr. Dean Volenberg, Grape and Wine Institute  
Michael White, Viticulture Specialist, Iowa State University |
| 10:30 A.M. | Break                                                                                       |
| 11:00 A.M. | Spray management and use  
Mike White, Viticulture Specialist, Iowa State University |
| 11:30 A.M. | **Vineyard site selection**  
Dr. Dean Volenberg, Grape and Wine Institute |
| 12:00 A.M. | Complimentary Lunch Break                                                                  |
| 1:00 P.M. | **Grape cultivars and sources**  
Dr. Dean Volenberg, Grape and Wine Institute |
| 1:30 P.M. | **Vineyard establishment**  
Mike White, Viticulture Specialist, Iowa State University |
| 2:00 P.M. | **Trellis design and construction**  
Mike White, Viticulture Specialist, Iowa State University |
| 2:30 P.M. | **Pruning and canopy management**  
Dr. Dean Volenberg, Grape and Wine Institute |
| 3:00 P.M. | Break                                                                                       |
| 3:30 P.M. | Harvest considerations and fruit quality  
Dr. Dean Volenberg, Grape and Wine Institute |
| 4:00 P.M. | **Marketing and building relationships**  
Mike White, Viticulture Specialist, Iowa State University |
| 4:30 P.M. | Q & A  
Dr. Dean Volenberg, Grape and Wine Institute  
Mike White, Viticulture Specialist, Iowa State University |
Concurrent Technical Sessions  
Friday March 8  

Missouri Wine Technical Group  

7:00 A.M.  Complimentary Continental Breakfast  
8:45 A.M.  Missouri Wine Technical Group  
          Whitney Ryan, Vox Vineyards  
9:00 A.M.  Wine Evaluations and Constructive Feedback  
          Whitney Ryan, Vox Vineyards  
12:00 P.M. Adjourn  

Here is a great opportunity to have your wine blindly evaluated by other winemakers. Do you have some wine that is almost ready to bottle or wine that was recently bottled then bring 3 bottles of each along to the conference. The Missouri Wine Technical Group provides constructive feedback to winemakers with the goal of elevating the quality of Missouri wines. Although the Technical Group has Missouri in its name, the group is open to all commercial winemakers regardless of state affiliation.  

Do you have a new wine that you are about to release! Here is a great opportunity to get direct feedback. Seldom in a winemakers daily routine is there the opportunity to sit down with other winemakers and wine enthusiast and receive constructive feedback. Here is your opportunity.  

The Missouri Wine Technical Group is open to all conference attendees.
Vegetative and Reproductive Responses of Mature *Vidal blanc* Grapes to Simulated Drift of Dicamba

Sarah E. Dixon, Dean S. Volenberg, Reid J. Smeda

University of Missouri, Division of Plant Sciences, Waters Hall, Columbia, Mo, 65201

Rising adoption of dicamba-tolerant soybeans increases the potential exposure of grapes to dicamba, where off-target movement may occur via particle or vapor drift. In 2017 in Rocheport, MO and 2018 in Excelsior Springs and Augusta, MO, research in production vineyards focused on the short- and long-term effects of dicamba on hybrid grapes (*Vidal blanc*). During flowering and early fruit set, established grapes were exposed to low rates of dicamba, delivered as a spray solution (36 or 72 ppm) or by vapor from treated soil. The severity of dicamba injury (leaf cupping and feathering) was similar at 2 of 3 site years, with greater injury related to particle versus vapor drift of dicamba. In 2018, season-long shoot growth was reduced from 7 to 100% by particle drift of dicamba. Minimal shoot reduction followed exposure of dicamba delivered as vapor. At harvest, impacts of dicamba on grape yield were variable. Particle drift of dicamba reduced yield at one site year and grape timing. At two site years, yield was reduced 20-51% compared to respective controls for grapes exposed to vapor drift of dicamba, with no differences between timing of grape exposure. Both years, the final sugar content of berries at harvest was reduced by 18% with dicamba as particle drift. Grapes are highly sensitive to dicamba, with visual symptoms extending throughout the growing season. Reductions in shoot growth are related to particle drift of dicamba, but less evident with vapor drift. At low concentrations, impacts from dicamba on grape yield are variable, suggesting that environmental and management factors have a significant influence on the response of mature grapes.

Characterization of the composition of viruses found in grapevine cultivars grown in Missouri

James E. Schoelz¹, Dean S. Volenberg¹, Mustafa Adhab¹, Vicki Klaassen², and Maher Al Rwahnih²

¹University of Missouri, 214 Waters Hall, Columbia, MO 65211, USA
²Foundation Plant Services, University of California, Davis, CA, 95616

In 2017 a survey was initiated of vineyards throughout Missouri for the presence of 26 different grapevine viruses, as well as a grapevine phytoplasma and *Xylella fastidiosa*. A total of 400 samples were collected with a sample consisting of 16 petioles (4 petioles from 4 different vines). A total of 25 grape cultivars were sampled. Vineyard blocks were randomly sampled in a “W” pattern. After nucleic acids were extracted from petiole samples, nucleic acid samples were analyzed using reverse transcriptase-polymerase chain reaction to detect viral RNA/DNA. Approximately 90% of samples had at least one virus. By contrast, the phytoplasma was detected in only one sample and *X. fastidiosa* was not detected in the survey. The most common virus found in the survey was GSPaV, which was present in 59% of the samples, followed by GLRaV3 (53%), GRBV (35%), GVE (31%), GLRaV2 (19%), GVB (17%), GFV (13.5%), GLRaV2RG (9%), GVCV (8%), GVA (0.5%), GLRaV5 (0.2%). Approximately 65% of the samples in the survey had two or more viruses. For example, each of the 70 Vignoles samples collected in the survey contained at least two viruses and the majority of the samples contained three to five viruses. Similarly, each of the 45 Vidal blanc samples collected in the survey contained at least two viruses, with one Vidal blanc sample carrying a combination of seven viruses. An analysis of the survey results indicated that the composition of viruses in each grapevine cultivar appears to be specific to that variety.
Symposium Abstracts

Potential Insect Vectors of Red Blotch Virus in Missouri Vineyards
Harper Smith, Dr. Dean Volenberg, and Dr. Deborah Finke
University of Missouri, Division of Plant Sciences, Columbia, Mo, 65201
Red Blotch disease was recently confirmed in grapevines in Missouri. This disease affects the profitability of vineyards by reducing fruit quality at harvest as well decreasing overall vine health over time. Currently, there is no information about the potential vectors of Grapevine Red Blotch-associated virus (GRBaV) in Missouri. Researchers in California have confirmed one insect vector of GRBaV, the three-cornered alfalfa treehopper, Spissistilus festinus (Hemiptera: Membracidae); however, it is likely that there are other insect vectors. Some genera of leafhoppers (Hemiptera: Cicadellidae) have been implicated as potential vectors as well. Our objective was to identify the potential vectors of GRBaV in Missouri vineyards. We sampled insect communities from bud break until harvest at four vineyards with confirmed GRBaV infections. Insects were sampled weekly using unbaited yellow sticky card traps. Card traps were placed in the surrounding habitat, at the edge of the vineyard, and in the interior of the vineyard to quantify the movement of insects into vineyards. We did not find the three-cornered alfalfa treehopper in our survey but other potential treehopper vectors were present. Leafhopper genera which have been implicated as potential vectors were also abundant. Treehoppers and leafhoppers collected in our survey will be tested for the viral DNA of Red Blotch. Future research will include transmission experiments to confirm that the potential vectors can transmit GRBaV to healthy grapevines.

Relating sour rot severity to fly number and fine-tuning spray timing
Patrick Kenney and Megan Hall
University of Missouri, Division of Plant Science, Waters Hall, Columbia, Mo, 65201, USA.
Sour rot in Vitis spp. is present in viticulture regions worldwide, and is described as a disease of ripening clusters, characterized by the onset of berry skin oxidation, oozing of berry pulp and the smell of acetic acid, in the presence of fruit flies (Drosophila spp.). In Fall 2018, 102 clusters of varying Vitis interspecific hybrid cultivars exhibiting sour rot symptoms were collected from commercial and research vineyards throughout Missouri. Each cultivar was rated for sour rot severity (% of cluster affected) and placed in a plastic collection container. At one and two weeks post-harvest, containers were opened, flies were anesthetized, counted, and cluster severity was rated. A mixed effects model shows a significant correlation ($R^2=0.8$) between severity ratings and the total number of fruit flies reared from clusters, indicating that sour rot severity increases as fly number increases. In a separate experiment, spray timing trials were conducted at two commercial vineyards to determine the impact (severity and incidence) of varying post-symptom development spray applications. In both vineyards, Oxidate 2.0 (hydrogen dioxide) and Mustang MAXX (zeta-cypermethrin) were applied to entire vineyard rows. Spray timings were: (i) 16 Brix and 20 Brix, (ii) 16 Brix, 19 Brix and 22 Brix, and (iii) weekly sprays beginning at 16 Brix. Sour rot severity and incidence were rated in each row at harvest. There was no significant difference in either sour rot incidence or severity between the rows in which there were two applications, three applications or weekly (4 or 5) applications.
The effect of grapevine trunk disease on young vines and its relation to trunk splitting 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. A previous survey of mature Vitis vinifera and V. interspecific hybrid cultivars in Missouri revealed several fungal pathogens (Botryosphaeria spp., Diatrypella spp., Eutypa spp., Pestalotiopsis spp., and Plasmopara viticola) isolated from canker samples. Much less is known about the effects of these same fungal pathogens on young vines. In an experiment initiated in January 2019, young vines (<1 year) will be potted in a greenhouse and inoculated with Botryosphaeria spp. and Eutypa lata to observe the symptoms of common GTD pathogens. In a separate experiment, the relationship between trunk splitting and GTD will be explored. Trunk splitting is common in certain varieties throughout MO due to drastic fluctuations in winter temperatures. Collection of split trunk tissue versus healthy tissue from commercial vineyards throughout Missouri will be plated, and the isolated organisms identified, with the goal of determining whether split trunk tissue is more or less likely to be infected with GTD pathogens. Lastly, a survey of GTD pathogens in vines is taking place in January 2019 at a research vineyard in New Franklin, MO. Pruning weights will be measured on mature grapevines, and pruned shoots sampled and plated to identify the presence/absence of pathogens in asymptomatic and symptomatic vines. Furthering the current research on GTD in Missouri will contribute to management strategies specific to the region and elucidate the complex etiology of this disease.

Evaluating Tannin Retention in Missouri Cultivars

Alex Fredrickson and Misha T. Kwasniewski*
Grape and Wine Institute, University of Missouri, 135 Eckles Hall, Columbia, MO, 65211, USA (email: kwasniewski@missouri.edu)

Missouri red wines are commonly made from hybrid cultivars which have little native (grape derived) tannin in finished wines. Winemakers commonly use techniques that are effective in Vitis vinifera based wines, despite many recently demonstrated differences between hybrid and V. vinifera grapes. Ultimately these techniques result in little increased tannin in hybrid wines. Decreased tannin content leads to low astringency, and less co-pigmentation which reduces color stability. To increase tannin content, winemakers often add exogenous tannin products to their wines which are costly and often a large amount is lost before the wine is bottled/consumed. In 2018, Chambourcin from Mt. Vernon, MO was harvested and produced with processing techniques that are not typical used to increase tannins in V. vinifera wines but there is evidence that they may be a viable option in hybrid wines. Treatments included a bentonite treatment, enzyme treatments, and must blending. Exogenous tannin additions at eight different time points prior to bottling were explored to see if there are times where more tannin is retained. Three months after pressing the fruit, the control had 16.8 mg/l of tannin while wines blended at crush and 24 hours prior to pressing had 119.9 and 79.5 mg/l of tannin, respectively. All exogenous tannin additions increased over the control with later additions retaining more tannin than earlier additions, but the long-term stability of these additions is unclear and will be monitored.
Untargeted Metabolomics approach to identify the aroma differences in hybrid grapes

Mani Awale, Connie Liu and Misha T. Kwasniewski*

Grape and Wine Institute, University of Missouri, 135 Eckles Hall, Columbia, MO, 65211, USA
Mani Awale1, Connie Liu1, Chin-Feng Wang2 and Misha T. Kwasniewski1*

1Grape and Wine Institute, University of Missouri, 135 Eckles Hall, Columbia, MO, 65211, USA
William H. Darr College of Agriculture, Missouri State University, Springfield, MO, 65897, USA
(Corresponding email: kwasniewskim@missouri.edu)

Untargeted metabolomics approach is an emerging tool that enables profiling the entire chemical profile of an organism tissue sample. While earlier efforts have been made to determine the volatile profile of hybrid wines using a targeted approach, we opted for the more inclusive non-targeted metabolomics approach to investigate the differences in Norton and Cabernet Sauvignon grapes and wines. We investigated the grape-derived free and bound volatiles in Cabernet Sauvignon, a popular Vitis vinifera grape, and an interspecific hybrid, Norton. Although Norton possess important viticultural traits such as cold hardiness and disease tolerance that have made it economically important to Missouri, Norton is less popular than the vinifera wines globally. Twenty-one samples of Norton and Cabernet Sauvignon grapes, along with their ten different commercial wines were analyzed using headspace SPME-GCMS. Data processing using XCMS identified 825, 697 and 403 features that are different for free grape volatiles, bound volatiles and wine volatiles respectively, at least at 0.05 significance level and with a 1.5-fold change. Those features were used to identify and quantify odor active compounds that varied in concentration. We did not find any compounds present in one that was absent in the other cultivar, however, the concentrations of the compounds identified were always higher in Norton than Cabernet Sauvignon. We also quantified the identified compounds in Norton x Cabernet Sauvignon F1 mapping population and found segregation of the aroma compounds in the F1 population. Identification of these differences are critical in optimization of management of Norton and useful in varietal development where the end goal is disease tolerant fruit with a widely accepted aroma profile.

Grapevine vein clearing virus is prevalent in grape aphids of Missouri

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

Center for Grapevine Biotechnology, Darr College of Agriculture, Missouri State University

Grapevine vein clearing virus (GVCV) is associated with a severe disease in Missouri vineyards, and is endemic among native Vitaceae in the Midwest region. Greenhouse transmission experiments showed that grape aphids (Aphis illinoisensis) are able to transmit GVCV from native plants to cultivated grapevines. In this study, we investigated prevalence of GVCV in A. illinoisensis populations colonizing native Vitaceae in Missouri. We collected 105 A. illinoisensis colonies from 70 individual vines in Ampelopsis and Vitis genera growing around Springfield, and Festus, MO in the summer of 2018. DNA was extracted from ten aphids of each population and subjected to a PCR assay for detection of GVCV with specific primers. GVCV was detected in 85 of 105 grape aphid populations (81%), while it was found in only 20 of 70 vines (29%). To refine the investigation, we randomly selected 400 single aphids from the 105 colonies to assay for GVCV. We found GVCV in 66% among 38 individual grape aphids analyzed so far. Sequence data derived from GVCV-positive grape aphid samples showed 92 to 99% identity to viral genome sequences derived from infected plants. These results indicate a high prevalence of GVCV in native Missouri flora and fauna. This information is crucial for managing GVCV-associated disease in vineyards.
Characterizing diurnal physiological response of grapevine to water stress using UAS based hyperspectral and thermal imagery

Matthew Maimaitiyiming¹,², Vasit Sagan¹, and Misha Kwasniewski²

¹Department of Earth and Atmospheric Sciences, Saint Louis University, St. Louis, MO 63108, USA
²Grape and Wine Institute, University of Missouri, 221 Eckles Hall, Columbia, MO 65211, USA

Non-invasive and fast determining of grapevine physiological responses to water stress is of considerable significance in improving berry yield and quality. Deep understanding of the vine physiology through such accurate monitoring is important given the projected trend of climate change and global water scarcity. Within past few years, huge strides made in unmanned aerial systems (UAS) and sensor technology enabled us to acquire images at every high spectral, spatial and temporal resolutions over small to medium fields. Inexpensive and agile UASs equipped with lightweight miniaturized sensors have become attractive alternatives for viticulture community. In this context, we will share our findings to characterize diurnal vine physiology using UAS based high spatial resolution hyperspectral and thermal imagery collected for two growing seasons.

Optimization of Chambourcin Grape Breeding Using Molecular Genetic Approaches

Chin-Feng Hwang*, Li-Ling Chen, Bryce Bentley and Sadie Land

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

Vitis interspecific hybrid ‘Chambourcin’ is a popular red wine grape in mid-Atlantic and Midwestern states including Missouri. It is a cultivar of largely unknown parentage which exhibits greater cold hardiness and disease resistance than V. vinifera cultivars. In view of this, a mapping population was constructed including 319 individuals from a cross between Chambourcin and V. vinifera ‘Cabernet Sauvignon’. A haploid Chambourcin genetic map has been constructed with 318 simple sequence repeats (SSR) markers clustered in 19 linkage groups. Also, in collaboration with VitisGen Program, approximately 2,000 single nucleotide polymorphism (SNP) markers generated by amplicon sequencing (AmpSeq) have been identified in this population. The results from this study will also allow for the comparison of this population with a V. aestivalis-derived ‘Norton’ and Cabernet Sauvignon population for disease resistance, cold hardiness and berry quality. However, the ability to produce novel grapevine cultivars by conventional breeding is hampered by the high degree of heterozygosity found in grapes and the long juvenile period before grape seedlings produce fruit. The advantages of marker-assisted selection in plant breeding are well documented and have already been applied to grape breeding. Careful genetic mapping of this population provides the foundation and tools to associate molecular markers with favorable traits of Chambourcin. The ultimate goal of this project is to use genetic markers to rapidly deploy favorable alleles and accelerate breeding cycles for new cultivar releases.
Symposium Abstracts

Rootstock effects on leaves and fruits of grafted ‘Chambourcin’ grapevines

Allison Miller, Arianna Bozzolo, Daniel H. Chitwood, Anne Fennell, Zachary Harris, Laura L. Klein, Laszlo Kovacs, Mao Li, Jason P. Londo, Qin Ma, Zoë Migicovsky, Adam McDermaid, and Misha Kwasniewski.

Grapevine is an excellent model for understanding how rootstocks can impact shoot systems phenotypes due to the available genomic resources and ability to grow across diverse environments. We examined an experimental vineyard in Mount Vernon, Missouri which includes a locally important scion (‘Chambourcin’) own-rooted as well as grafted onto three different rootstocks (SO4, 1103P and 3309C). The vineyard also includes 3 different irrigation treatments. From 2013-2016, we assessed different kinds of phenotypic variation including leaf ion concentrations, viticulture measurements such as pruning weight, and GC-MS using a targeted panel of metabolites in berries and wine. We also examined rootstock-induced changes in gene expression in the scion using RNA-seq. Each phenotype was studied for 1 to 3 years. We found distinct and significant effects of rootstock and irrigation on the phenotypes examined. Current work underway expands sampling to include additional phenotypes, samples, and time points across three years.

Conference Speakers and Topics

A multidisciplinary research effort to mitigate the impact of grapevine viruses in British Columbia

Understanding Grapevine Trunk Diseases to Better Develop Effective Management Strategies

Dr. José Ramón Úrbez-Torres, Agriculture and Agriculture Food Canada Summerland Research and Development Centre, British Columbia

Dr. José Ramón Úrbez-Torres is a Research Scientist at the Agriculture and Agriculture Food Canada Summerland Research and Development Centre in British Columbia since June 2013 and serves as Adjunct Professor in the Biology Department at the University of British Columbia Okanagan Campus since October 2017. He received a postgraduate master’s degree in viticulture, enology and wine marketing in 2001 from the International Social Science Council and the degree of Agricultural Engineering in 2004 from the University of Valladolid in Spain. Dr. Úrbez-Torres completed a Ph.D. in Plant Pathology in 2009 in the Plant Pathology Department at the University of California Davis, studying the biology, epidemiology, and control of grapevine trunk diseases in California. Dr. Úrbez-Torres has studied diseases of woody perennial crops, primarily grapevines, tree fruits and nut crops since 1999 and his current research focuses on the development and implementation of sustainable management strategies for fungal, bacterial, and viral diseases of grapevines and tree fruits in Canada. Though still at an early stage of his scientific career, Dr. Úrbez-Torres has published over 50 peer-reviewed publications, several book chapters and trade journal articles. José extension and technology transfer include over 150 oral and/or poster presentations in scientific conferences, workshops, and commodity groups or stakeholders meetings. He is the regional representative for North America on the International Council for Grapevine Trunk Diseases and current President of the American Phytopathological Society Pacific Division. Dr. Úrbez-Torres has served as Associated Editor first (2013-2015) and Senior Editor last (2016-2018) for the American Phytopathological Society Journal ‘Plant Disease’.
### Wine, Brandy and Beyond

**Philippe Coquard**, Wollersheim Winery, Prairie du Sac, WI

Winemaker and owner of Wollersheim Winery, Philippe originates from Beaujolais, France and has been making wine since he was a young boy, having been trained by his grandfather, father, and uncles, as well as graduating with degrees in winemaking, viticulture, and marketing. Philippe has received numerous awards including “Blockbuster Winemaker of the Year” east of the Rockies, and more recently “2018 Best White Wine” at the Pacific Rim San Bernadino Wine Competition. In 2010 Philippe began distilling all-Wisconsin brandy and expanded into opening a full distillery in 2015. He prides himself on combining tradition with the unique climate of Wisconsin to produce distinctive regional wines and spirits.

### Case Study: How 6 brands target 6 different wine consumers

**Rebecca Ritz**, Founder & 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 Association, and the Women of the Vine & Spirits, an organization dedicated to the support and advancement of women in the alcohol beverage industry.
Annette Alden serves the Missouri Wine and Grape board as the Marketing Director. Prior to joining the Department of Agriculture she spent eight years in agricultural marketing with True Media, Swanson Russell and Monsanto. Annette received her B.S. in Agribusiness Management with a Minor in International Agriculture from the University of Missouri-Columbia.

Jim Anderson has led the Missouri Wine and Grape board as Executive Director for over 20 years. During his years at the helm, Jim has overseen the expansion of Missouri wineries from 28 to 134. 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.

Bubba Beasley, Geologist, HydroGeo

Bubba helps growers optimize their vineyard design and management strategies to improve wine quality. With a foundation in classical geology, he uses principles of soil science and innovative mapping technology to illuminate soil variability in his clients' vineyards. His team's terroir research is internationally recognized and his studies in soil mineralogy and potassium (K) with Lucie Morton and Clifford Ambers revolutionized industry-wide soil K nutrition recommendations for the Mid-Atlantic. He operates a geoscience consulting firm called HydroGeo out of Charlottesville, VA; in addition to providing terroir mapping services to vineyard clients, HydroGeo is a leader in fractured bedrock groundwater prospecting and environmental consulting.
Why we should care about microbial terroir

Dr. Megan Hall, Viticulture Research Leader, 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 projects 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.

Was it the Colletotrichum? The nose knows.
Being nosy about gluconic acid

Lucie Morton

Lucie Morton is an independent viticulturist based in Virginia. She is an internationally recognized author, ampelographer, lecturer, and consultant. Her higher education in viticulture occurred in Europe, while her practical education began as vineyard manager on the family farm along the banks of the Potomac River.
Conference Speakers and Topics

**SOUR Shrivel – Grapes behaving badly**

Dr. Bondada, Viticulture and Enology Program, Washington State University

Dr. Bondada is an associate professor of viticulture engaged in research, teaching, and extension activities in support of the Viticulture and Enology Program located at WSU Tri-Cities. He received his PhD from University of Arkansas, Fayetteville, AR. Prior to joining the faculty at WSU, Dr. Bondada did his last post doc at UC Davis, CA. His research focus is in the area of grapevine physiology with interests in both basic and applied research geared up to address the goals of the wine industry. At WSU, he conducts both basic and applied research in viticulture geared up to address the industry goals. His particular area of research is integrative plant physiology and plant anatomy; basically utilize the knowledge of structure-function relationships to improve vine health and fruit quality. More specifically, his lab investigates water relations of grapevine and berry, developmental anatomy of grape berry, physiological and structural adaptations to water stress, physiological ripening disorders, and hydraulic architecture of grapevine and berry. We investigate the above research goals using light, confocal and electron microscopy in combination with contemporary approaches adopted to study the physiology of the plants. In addition to research, he teaches classes in viticulture, horticulture, and plant physiology, train undergraduate and graduate students and manages a teaching vineyard at Tri-Cities campus.

**Oxygen: Friend or Foe? Basics of oxygen management**

Michael Jones, Scott Laboratories

Working in wineries since 1971, Michael made his first wine in the family cellar in 1974. He has made wine every year since, including two vintages in Burgundy and one in the Hunter Valley, Australia. Suffering from a degree in Viticulture and Enology from UC Davis, he found solace amongst the vines of NovaVine Nursery and the barrels of Hanzell in Sonoma. Previously, he had been 19 years at Domaine Chandon. Currently, he is fermentation specialist for Scott Laboratories.
Conference Speakers and Topics

Volatile acidity in our wines... Where did it come from? What can you do?

Dr. Misha Kwasniewski, Enology Program Leader, Grape and Wine Institute

Misha T. Kwasniewski has been an Assistant Research Professor and Enology Program Leader at the University of Missouri since 2013. Misha grew up in a farming family in Western NY where he still has family involved in the Concord Grape Industry. He received a PhD. in Food Science in 2013 and a B.S. in Viticulture and Enology in 2009, both from Cornell University. His research focuses on using analytical tools such as GC-MS and LC-MS to understand changes in metabolites, especially those important to flavor, that are impacted by decisions made in the vineyard, vinification or during storage. He currently collaborates with researchers across the U.S. and a paper he co-authored was awarded the American Journal of Enology and Viticulture Best Viticulture paper of 2014. He has taught several upper level winemaking and analysis courses as well as is involved with the direction of graduate projects based both in Food Science and Plant Science departments involving the impacts of various viticulturally interventions on plant metabolites as well as finding winemaking solutions to minimize quality issues.

Apprenticeship 101 – Registered Apprenticeships for the Missouri Grape and Wine Industry

Michelle Norgren, VESTA Director, Missouri State University

Bill Alter, VESTA Special Projects Coordinator, Missouri State University

Shane Moriarity, Project Manager, Central MO Workforce Investment Board

Michelle Norgren is serving as the Principle Investigator and Director of the Viticulture & Enology Science & Technology Alliance (VESTA). Michelle has lead the VESTA National Center for the past 15 years and under her leadership has seen the program grow from a three state partnership with offering 3 courses and an enrollment of 25 students; to an ever growing multi-state partnership offering 39 online courses and a participation of 1,900 students from around the world. Ms. Norgren graduated from Missouri State University with a BS in Education and a Master of Science degree in Educational Administration.

Bill is serving as the VESTA Special Projects Coordinator at Missouri State University after “retiring” from the University in 2008. Prior to joining MSU, he worked as the Research Director for a bioremediation company, served as a Space Grant Fellow at NASA Johnson Space Center, and was a Research Coordinator at the University of Texas at San Antonio. Bill “retired” from the USAF in 1988 having served on the faculty of the Uniformed Services University of the Health Sciences, managed the Air Force’s Applied Research Chemical Defense Program, and trained aircrews in physiological effects of high altitude environments. His educational background includes a Ph.D. in cardiovascular physiology from the University of New Mexico. Bill and his wife, Marlee, have 4 children and 8 grandchildren. He is an avid bicyclist having completed his 17th Bike MS ride.
Conference Speakers and Topics

Apprenticeship 101 – Registered Apprenticeships for the Missouri Grape and Wine Industry

Michelle Norgren, VESTA Director, Missouri State University
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Missouri’s grape and wine industry (GWI) continues to grow, but is challenged by the need to recruit, advance and retain a high quality workforce. Registered Apprenticeships (RAs) can be the answer to this challenge. The RA program was established by the U.S. Department of Labor (DOL) in 1937. By the end of FY 2017, there were over 533,000 RAs in U.S. industries. Alas, only winemaker and cellar worker were approved by the DOL for apprenticeships, and less than 16 were active in the U.S. GWI.

Registered Apprenticeships are an employer-driven, highly customizable career skills training model that is a proven solution for businesses to recruit, train and retain highly skilled employees. These programs include employer-designed on-the-job learning (OJL) and related technical instruction (RTI) components. The Viticulture and Enology Science and Technology Alliance (VESTA) at Missouri State University is working with industry associations and government agencies to enable Registered Apprenticeships to become a reality for vineyards and wineries. As a result of this collaboration, there are now eight GWI occupations approved for RAs. Most importantly, a new occupation – Production Technician (Vineyards/Winery) – is now available and is proving to be ideal for smaller operations.

VESTA staff and representatives of MO Job Centers will conduct an Apprenticeship 101 Workshop that will enable employers to understand how RAs can be implemented to enhance recruiting, advancing and retaining a knowledgeable and highly-skilled workforce. Employers will learn of the services and financial support available through MO Job Centers, as well as the role that VESTA can serve in minimizing administrative burdens and funding available to defray some of the initial costs associated with the RTI.
Concurrent Technical Session
Speakers

**Beginner Grape School**

**Dean S. Volenberg, Viticulture and Winery Operations, Grape and Wine Institute**

Dean Volenberg received his Master’s and PhD degrees from the University of Wisconsin – Madison. Dean furthered his academic experience focusing on molecular biology as a post-doctoral associate at the University of Illinois – Urbana Champaign. Prior to joining the Division of Plant Sciences Extension at the University of Missouri, Dean was at the University of Wisconsin Extension focusing on building cold-climate viticulture. 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. His Extension program is multifaceted with attention focused on fungal and viral pests and their management.

**Beginner Grape School**

**Mike White, Viticulture Specialist, Iowa State University**

Mike White is a Viticulture Specialist for Iowa State University Extension & Outreach and is a team member of the ISU Midwest Grape & Wine Industry Institute. Mike provides technical assistance and educational training to vineyards and wineries in Iowa and neighboring states and has been working with the cold climate winegrape industry since 2000. Mike received an A.S. degree from Iowa Western Community College in Council Bluffs, IA and holds a B.S. and M.A. from Iowa State University. He is a Certified Crop Advisor and Certified Professional Agronomist through the Agronomy Society of America and a Certified Specialist of Wine through the Society of Wine Educators. Mike also operates a small hobby farm that raises Christmas Trees and Honeybees.

**Missouri Wine Technical Group**

**Whitney Ryan, whitney@voxvineyards.com**

Whitney Ryan is a Mizzou Food Science graduate with nine years of experience in the Missouri wine industry. She specializes in managing winery and vineyard operations, training and development, scientific research, and converting to environmentally sustainable practices.
On behalf of the Grape and Wine Institute, I would like to thank all of you for attending the 2019 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 4th Show Me Grape and Wine Conference a success. Thanks to the Missouri Wine and Grape Board for your continued support.

Dean Volenberg
Viticulture and Winery Operations Extension Specialist
Director GWI

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.