

Assistant Professor of Viticulture

Department of Viticulture and Enology
and Viticulture & Enology Research Center
California State University, Fresno

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Main Research Interests

- a) Investigation of winegrape berry/wine flavonoid composition and concentration as affected by abiotic stress derived from environmental challenges, such as heat waves, solar exposure, and water scarcity in California.
- b) Use of mechanized cultural practices for optimizing grapevine yield efficiency, berry/wine quality and vineyard sustainability, and minimizing labor and economic inputs in California.
- c) Application of precision agriculture technologies to minimize spatial variability in vineyard productivity and quality in California.
- d) Investigation of soil-plant water relations and approaches assessing soil water content and actual evapotranspiration to direct drip irrigation scheduling, and how the various irrigation regimes generated by these approaches would affect grapevine physiological responses in hot climate in California.

Employment**Assistant Professor of Viticulture**

Aug 2021-Present

Department of Viticulture and Enology

California State University, Fresno

Post-doctoral researcher

Jul 2020-July 2021

Department of Viticulture and Enology

University of California, Davis

Education**Ph.D.****Major:** Horticulture & Agronomy (Specialty: Viticulture)

University of California, Davis

Sep 2016-Jun 2020

M.S.**Major:** Viticulture and Enology

California State University, Fresno

Aug 2014-Jue 2016

B.S.**Major:** Viticulture and Enology

Northwest A&F University, China

Sep 2010-Jue 2014

Publications**Peer-reviewed Journal Articles:**

1. Torres, N., **Yu, R.**, Martínez-Lüscher, J., Girardello, R., Kostaki, E., Oberholster, A., & Kurtural, S. K. (2021). Shifts in the Phenolic Composition and Aromatic Profiles of Cabernet Sauvignon (*Vitis vinifera* L.) Wines are Driven by Different Irrigation Amounts in a Hot Climate. ***Food Chemistry***, under review
2. **Yu, R.**, Torres, N., & Kurtural, S. K. (2021). Plant Water Status Mapping Discriminated Harvest Zones and Wine Composition in Hyper-Arid Growing Seasons. ***Precision Agriculture***, under review
3. Torres, N., **Yu, R.**, Martínez-Lüscher, J., & Kurtural, S. K. (2021). Evaluation of the Application of Different Fractions of Crop Evapotranspiration on Yield, Berry quality, Water Footprint and Mycorrhizal Colonization of Grapevine in Warm Climate. ***Frontiers in plant science***, under review
4. **Yu, R.**, Fidelibus M., Kennedy J. A., & Kurtural, S. K. (2021). Precipitation Before Flowering Determined Effectiveness of Leaf Removal and Irrigation on Wine Composition of Merlot. ***Plants***, under review
5. Torres, N., **Yu, R.**, & Kurtural, S. K. (2021). Inoculation with mycorrhizal fungi and irrigation management shaped the bacterial and fungal communities and networks in vineyard soils. ***Microorganisms***, 9(6). DOI: **10.3390/microorganisms9061273**
6. **Yu, R.**, Brillante, L., Torres, N., & Kurtural, S. K. (2021). Proximal sensing of vineyard soil and canopy vegetation for determining vineyard spatial variability in plant physiology and berry chemistry. ***OENO One***, 55(2), 315-333. DOI: **10.20870/oenone.2021.55.2.4598**
7. Torres, N., Martínez-Lüscher, J., Porte, E., **Yu, R.**, & Kurtural, S. K. (2021). Impacts of leaf removal and shoot thinning on cumulative daily light intensity and thermal time and their cascading effects of grapevine (*Vitis vinifera* L.) berry and wine chemistry in warm climates. ***Food Chemistry***, 343, 128447. DOI: **10.1016/j.foodchem.2020.128447**
8. **Yu, R.**, Zaccaria, D., Kisekka, I., & Kurtural, S. K. (2021). Soil apparent electrical conductivity and must carbon isotope ratio provide indication of plant water status in wine grape vineyards. ***Precision Agriculture***, 1-20. DOI: **10.1007/s11119-021-09787-x**
9. Torres, N., **Yu, R.**, Martínez-Lüscher, J., Kostaki, E., & Kurtural, S. K. (2021). Application of Fractions of Crop Evapotranspiration Affects Carbon Partitioning of Grapevine Differentially in a Hot Climate. ***Frontiers in plant science***, 12, 75. DOI: **10.3389/fpls.2021.633600**
10. Brillante, L., Martínez-Lüscher, J., **Yu, R.**, & Kurtural, S. K. (2020). Carbon isotope discrimination ($\delta^{13}C$) of grape musts is a reliable tool for zoning and the physiological ground-truthing of sensor maps in precision viticulture. ***Frontiers in environmental science***. DOI: **10.3389/fenvs.2020.561477**
11. **Yu, R.**, & Kurtural, S. K. (2020). Proximal sensing of soil electrical conductivity provides a link to soil-plant water relationships and supports the identification of plant water status zones in vineyards. ***Frontiers in plant science***, 11, 244. DOI: **10.3389/fpls.2020.00244**
12. Torres, N., **Yu, R.**, & Kurtural, S. K. (2020). Arbuscular Mycorrhizal Fungi Inoculation and Applied Water Amounts Modulate the Response of Young Grapevines to Mild Water Stress in a Hyper-Arid Season. ***Frontiers in plant science***, 11. DOI: **10.3389/fpls.2020.622209**
13. **Yu, R.**, Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (2020). Spatial variability of soil and plant water status and their cascading effects on grapevine physiology are linked to berry and wine chemistry. ***Frontiers in plant science***, 11. DOI: **10.3389/fpls.2020.00790**
14. Martínez-Lüscher, J., Plank, C. M., Brillante, L., Cooper, M. L., Smith, R. J., Al-Rwahnih, M., **Yu, R.**, Oberholster, A., Girardello, R., & Kurtural, S. K. (2019). Grapevine red blotch virus may reduce carbon translocation leading to impaired grape berry ripening. ***Journal of agricultural and food chemistry***, 67(9), 2437-2448. DOI: **10.1021/acs.jafc.8b05555**
15. Brillante, L., Martínez-Lüscher, J., **Yu, R.**, Plank, C. M., Sanchez, L., Bates, T. L., Brenneman C., Oberholster A., & Kurtural, S. K. (2017). Assessing spatial variability of grape skin flavonoids at the vineyard scale based on plant water status mapping. ***Journal of agricultural and food chemistry***, 65(26), 5255-5265. DOI: **10.1021/acs.jafc.7b01749**

16. **Yu, R.**, Cook, M. G., Yacco, R. S., Watrelot, A. A., Gambetta, G., Kennedy, J. A., & Kurtural, S. K. (2016). Effects of leaf removal and applied water on flavonoid accumulation in grapevine (*Vitis vinifera* L. cv. Merlot) berry in a hot climate. *Journal of agricultural and food chemistry*, **64**(43), 8118-8127. DOI: 10.1021/acs.jafc.6b03748

Conference Posters & Talks, Non-peer Reviewed Articles:

1. **Yu, R.**, Torres, N., & Kurtural, S. K. (Aug 2021). Spatial Variability of Grapevine Berry and Wine Chemistry Is Managed by Differential Harvesting. **Oral presentation.** *American Society for Horticultural Science annual conference*
2. Torres, N., **Yu, R.**, & Kurtural, S. K. (Aug 2021). Carbon Partitioning in Grapevine Is Affected by Irrigation Amounts. **Oral presentation.** *American Society for Horticultural Science annual conference*
3. Marigliano, L., **Yu, R.**, Torres, N., & Kurtural, S. K. (Aug 2021). Photosensitive Shade Films Affect Grapevine Berry Metabolism and Wine Composition. **Oral presentation.** *American Society for Horticultural Science annual conference*
4. Torres, N., **Yu, R.**, & Kurtural, S. K. (Aug 2021). Mycorrhizal Inoculation and Irrigation Management Shaped Bacterial and Fungal Communities and Networks in Vineyard Soils. **Oral presentation.** *American Society for Horticultural Science annual conference*
5. Zumkeller, M., Torres, N., **Yu, R.**, & Kurtural, S. K. (Aug 2021). Cover Crops and Tillage Effects on Grapevine Physiology and Metabolism in a Mature Vineyard in San Joaquin Valley. **Oral presentation.** *American Society for Horticultural Science annual conference*
6. Zumkeller, M., Torres, N., **Yu, R.**, & Kurtural, S. K. (Jun 2021). No-Till Systems and Permanent Cover Cropping Mitigate Plant Available Water in Vineyards. **Poster.** *72nd American Society of Enology and Viticulture annual conference*
7. Marigliano, L., **Yu, R.**, Torres, N., Battany, M., & Kurtural, S. K. (Jun 2021). Solar radiation exclusion reduced evapotranspiration and improved skin flavonoid content of wine grape. **Poster.** *72nd American Society of Enology and Viticulture annual conference*
8. **Yu, R.**, Zaccaria, D., & Kurtural, S. K. (Mar 2021). Soil apparent electrical conductivity and must carbon isotope ratio provide indication of plant water status in wine grape vineyards. **Poster.** *EGU21*
9. **Yu, R.**, Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (Jan 2020). Spatial Variability of Soil and Plant Water Status and their Cascading Effects on Grapevine Physiology are linked to Berry and Wine Chemistry, **Poster.** *California Irrigation Institute (CII) 2020 Annual Conference*
10. **Yu, R.**, & Kurtural, S. K. (Aug 2019). $\delta^{13}C$ of Grape Must Is a Reliable Predictor of Water Stress in Precision Viticulture. **Poster.** *American Society for Horticultural Science annual conference*
11. **Yu, R.**, Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (Jun 2019). Soil Proximal Sensing Provides Direction in Delineating Plant Water Status of 'Crimson Seedless' (*Vitis vinifera* L.) Vineyards. **Poster.** *21st Group of international Experts for Cooperation on Vitivincultural Systems (GiESCO) conference*
12. **Yu, R.**, Brillante, L., Martínez-Lüscher, J., Sanchez, L., & Kurtural, S. K. (Jun 2019). From Plant Water Status to Wine Flavonoid Composition: A Precision Viticulture Approach in a Sonoma County Vineyard. **Poster.** *21st Group of international Experts for Cooperation on Vitivincultural Systems (GiESCO) conference*
13. **Yu, R.**, & Kurtural, S. K. (Jun 2019). Site Delineation by Plant Water Status and Sugar $\delta^{13}C$ Analysis in a Fully Mechanized Vineyard in Napa County. **Poster.** *70th American Society of Enology and Viticulture annual conference*
14. **Yu, R.**, Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (Jun 2018). Proximal Soil Sensing for Vineyard Management in 'Crimson Seedless' Table Grape. **Poster.** *69th American Society of Enology and Viticulture annual conference*

15. **Yu, R.,** Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (**Jun 2018**). From Plant Water Status to Wine Flavonoid Composition: A Precision Viticulture Approach in a Sonoma County Vineyard. **Poster. 69th American Society of Enology and Viticulture annual conference**
16. Brillante, L., Martínez-Lüscher, J., **Yu, R.,** & Kurtural, S. K. (**Jun 2018**). $\delta^{13}\text{C}$ in Sugars as a Proxy for Photosynthesis and Water Stress in Precision Viticulture: A Statewide Study in California. **Poster. 69th American Society of Enology and Viticulture annual conference**
17. Brillante, L., Martínez-Lüscher, J., **Yu, R.,** & Kurtural, S. K. (**Jun 2018**). Assessing Spatial Variability of Grape Skin Flavonoids at the Vineyard Scale Based on Plant Water Status Mapping. **Poster. 69th American Society of Enology and Viticulture annual conference**
18. **Yu, R.,** & Kurtural, S. K. (**Jun 2017**). Proanthocyanidin Compositional Shifts Are Modulated by Canopy Gaps and Applied Water in Wine Grape. **Oral presentation. 68th American Society of Enology and Viticulture annual conference**
19. **Yu, R.,** Brillante, L., Martínez-Lüscher, J., & Kurtural, S. K. (**Jun 2017**). Proximal Sensing and Stratified Sampling in Vineyards Provide Direction in Coalescing Vineyard Variability. **Poster. 68th American Society of Enology and Viticulture annual conference**
20. Chen, C. C. L., Martínez-Lüscher, J., **Yu, R.,** Brillante, L., & Kurtural, S. K. (**Jun 2017**). Shifts in Proanthocyanidin Composition of Cabernet Sauvignon is Modulated by Selective Cluster Shading and Water Deficits. **Poster. 68th American Society of Enology and Viticulture annual conference**
21. Brillante, L., Martínez-Lüscher, J., **Yu, R.,** & Kurtural, S. K. (**Jun 2017**). Assessing Variability in the Vineyard through a Spatially Explicit Selective-Harvest Approach. **Poster. 68th American Society of Enology and Viticulture annual conference**
22. **Yu, R.,** & Kurtural, S. K. (**Jun 2017**). Effects of Leaf Removal and Applied Water on Flavonoid Accumulation in Merlot Berries. *Wine & Viticulture Journal*, 32 (3), 46-50
23. **Yu, R.,** Yacco, R., Watrelot, A. A., Kennedy, J. A., & Kurtural, S. K. (**Jun 2017**). Managing Astringency and Stickiness of Grapevine and Wine Tannins of Merlot Grapevine in the Hot Climate. **Poster. 66th American Society of Enology and Viticulture annual conference**
24. Letaief, H., **Yu, R.,** Cook, M. G., Watrelot, A. A., & Kurtural, S. K. (**Jun 2015**). Leaf Removal and Deficit Irrigation Effect on Grape Texture and Phenolic Composition., **Poster. 66th American Society of Enology and Viticulture annual conference**

Research Experiences

1. Three cover crops and tillage/no-tillage and their influences on soil water penetration rate and actual evapotranspiration assessed by surface renewal system on Ruby Cabernet in San Joaquin Valley, California. **Feb 2021-Present**
2. The use of multispectral aerial imaging and its potential integration with soil electromagnetic sensing to direct vineyard water management in specific California climate and soil condition. **Jun 2020-Present**
3. Estimation of actual evapotranspiration by combining surface renewal measurement and aerial imaging, and its potential use in governing water management in hot climate in Napa Valley, California. **Jun 2020-Present**
4. Application of various irrigation regimes based on crop evapotranspiration and its effects on carbon partitioning in different grapevine tissues, flavonoid accumulation in berry and wine in hot climate in Napa Valley, California. **Jun 2020-Present**
5. Six common trellis paired with different irrigation regimes and their effects on Cabernet Sauvignon yield and berry flavonoid concentration at harvest in Napa Valley, California. **Jun 2020-Present**
6. Various cover crops and tillage/no-tillage and their influences on greenhouse gas emission from vineyard surface soil and young grapevine physiological responses in Napa Valley and San Joaquin Valley, California. **Jun 2020-Present**

7. Arbuscular mycorrhizal fungi inoculation paired with different irrigation regimes and their effects on young Merlot physiology and berry chemistry in semi-arid climate of California viticulture regions. **Jun 2020-Present**
8. Investigation of the impact of grapevine virus ‘Red Blotch’ on both new propagated vines in pots and infected in fields on their physiological development, berry flavonoid accumulation, and wine chemical profile in Oregon and California. **Jun 2020-Present**
9. The usage of ultra-violet exclusion shade film and its impact on under-the-film actual evapotranspiration, canopy temperature/light intensity, photosynthesis, berry flavonoid gene expression and accumulation, and wine chemical profile in warm/hot climate in California. **Jun 2020-Present**
10. Potential usage of mechanical management with the assistance of soil electromagnetic sensing and time-domain reflectometry in a single high-wire trellis vineyard in Napa County, California. Ground-truthing soil electromagnetic sensing and its application to predict plant water status in California north-coast vineyard configuration. **Jun 2018-Present**
11. Precision vineyard management: collecting and interpreting spatial data for variable vineyard management in both wine and table grapes in different sites in California. **Jun 2016-Jun 2018**
12. Synergetic effects of mechanical leaf removal and irrigation restriction on flavonoid accumulation of proanthocyanidins of Merlot berries in San Joaquin Valley, California. **Aug 2014-Jun 2016**
13. Impact of different rootstock variety combinations towards budding rate and photosynthesis daily variation of grapes in Yangling, Shaanxi Province, China. **Sep 2013-Jun 2014**
14. A design of a laboratory-use temperature-controlled Brandy distillation device to manipulate distillable flavor compounds into end product. **Apr 2011-Oct 2012**
15. Chromatographic and sensory fingerprinting on wine aromas of various grapevine cultivars from major Chinese producing regions. **Dec 2011-Dec 2012**

Extension and Teaching

Teaching:

Department of Viticulture and Enology, CSU-Fresno

VIT 106: Winegrape Production

Aug 2021-Present

VIT 15: Introduction to Viticulture

Aug 2021-Present

Extension:

1. Soil apparent electrical conductivity and must carbon isotope ratio provide indication of plant water status in wine grape vineyards. **8 Apr 2021. Workshop: Recent Advances in Viticulture & Enology (RAVE), UC Davis, Virtual seminar**
2. Proximal sensing of vineyard soils and zone creation for variable rate irrigation. **4 Mar 2020. Workshop: Advanced Grapevine Irrigation Scheduling and Management, UC Davis Conference Center**
3. Assessing vineyard variability through proximal sensing of soil water by electrical conductivity. **2 Mar 2020. Seminar: Managing water & fruit quality in vineyards and orchards under climate change, Fresno State Jordan Agricultural Research Center (JARC) Wonderful Conference Room**
4. Proximal sensing of soil electrical conductivity provides a link to soil-plant water relationships and supports the identification of plant water status zones in vineyards. **21 Jan 2020. Workshop: 2020 Winter Grape Day, UC Davis Conference Center**
5. Soil electrical conductivity and on-the-go mapping. **22-23 May 2019. Workshop: UC Davis Grapevine Water Management Short Course, Springhill Suites, Napa Airport and UC Davis Oakville Research Station**

6. Establishing and Managing a Small Vineyard. **May 2019. Oakville Experiment Station, UC extension program**
7. From plant water status to wine flavonoid composition: A precision viticulture approach in a Sonoma County vineyard. **30 Nov 2018. Workshop: Recent Advances in Viticulture & Enology (RAVE), UC Davis ARC Ballroom**
8. Leaf removal and irrigation – concerns for yield and quality and Yield estimation in wine grapes. **7 Dec 2017. Workshop for local growers, Veterans Memorial Building, San Luis Obispo, CA**
9. Demonstration of vineyard yield estimator, soil electrical conductivity sensing (EM38), and Normalized Difference Vegetation Index (NDVI) to Napa Valley Grapegrowers Association. **Aug 2017. Oakville seminar, Oakville Experiment Station, UC extension program**
10. Proanthocyanidin compositional shifts in grape berry skin are modulated by canopy gaps and applied water amounts. **9 Dec 2016. Workshop: Recent Advances in Viticulture & Enology (RAVE), UC Davis ARC Ballroom**

Scholarships and Awards

Total amount: \$ 84,988

Academic year: 2019-2020 External: American Society for Enology and Viticulture Scholarship
UC Davis and V&E Department at UC Davis:

Jastro Research award

The Horace O. Lanza Scholarship

The David E. Gallo Educational Enhancement Fund

The Louis R. Gomberg Scholarship

The Knights of the Vine Scholarship

Horticulture & Agronomy Graduate Fellowship

Academic year: 2018-2019 External: American Society for Enology and Viticulture Scholarship
 National Restaurant Association Educational Foundation Scholarship
UC Davis and V&E Department at UC Davis:

Jastro Research award

The Horace O. Lanza Scholarship

The David E. Gallo Award

The Wine Institute Scholarship

Horticulture & Agronomy Graduate Fellowship

Academic year: 2017-2018 External: American Society for Enology and Viticulture Scholarship
Internal from UC Davis and V&E Department at UC Davis:

Jastro Research award

The Horace O. Lanza Scholarship

The David E. Gallo Award

Horticulture & Agronomy Graduate Fellowship

Academic year: 2016-2017 External: American Society for Enology and Viticulture Scholarship
Internal from UC Davis and V&E Department at UC Davis:
Jastro Research award

Academic year: 2015-2016 External: Rodney A. Foppiano Memorial Scholarship
Internal from Jordan College of Agricultural Sciences and Technology and V&E department at CSU-Fresno:
Jordan and Harvey Graduate Awards
Dean's Scholarship Tuition Waiver
Ag One-James P. & Marjorie N. Wulf Scholarship
AG One-American Vineyard Magazine Viticulture Scholarship
AG One-American Vineyard/Vegetables West Magazines-William Richard Malcolm Irrigation Scholarship

Internships

Winemaking assistant	Château Lagarosse, Bordeaux, France	Sep 2013-Oct 2013
Field intern	Northwest A&F University, Yangling, China	Aug 2013-Sep 2013

Vineyard practices of wine and table grape vineyards, fermentation management, including different yeast varieties and various rates oak chip addition on grape cultivars Marselan (*V. vinifera* L. cv.) and Petit Manseng (*V. vinifera* L. cv.)

Aug. 2021