2023 AWSEF Scholarship Awards

The 2023 AWSEF Scholarship Recipients:

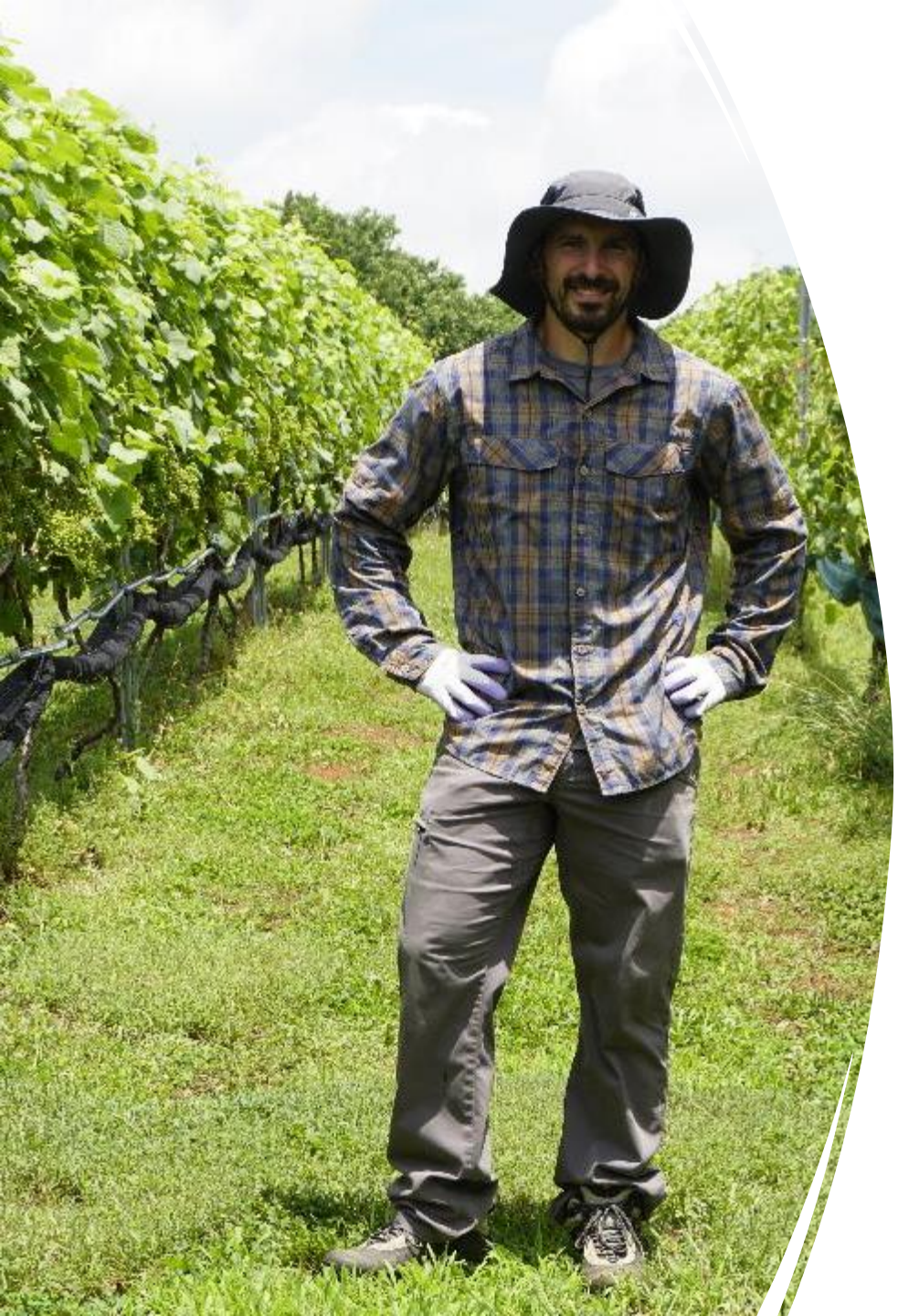
- **Michael Cook, PhD Candidate at Texas A&M University**
  North Alabama Chapter
- **Kyle Freedman, PhD Candidate at North Carolina State University**
  Ocean Isle Beach, North Carolina Chapter
- **Alex Gapinski, Masters Candidate at Iowa State University**
  Meadowlands New Jersey Chapter
- **Elia Cristina Casellanos Lopez, Masters Candidate at University of British Columbia**
  Virginia Wylder
- **Megan Mershon, Masters Candidate at Virginia Polytechnic Institute and State University**
  W. J. Rachele Endowment
- **Nadine Ott-Peon, Masters Candidate at Brock University, Ontario**
  No Name Alabama Chapter
- **Meredith Persico, PhD Candidate at Pennsylvania State University**
  Carroll County Chapter, G. Hamilton Mowbray Memorial Scholarship
- **Minh Vu, Masters Candidate at Brock University, Ontario**
  Banfi Vintners Scholarship

Michael Cook, PhD Candidate

Texas A&M University

North Alabama Chapter

I am the Viticulture Program Specialist for the 55 counties of North Texas with the Texas A&M AgriLife Extension Service. My primary function is to provide educational support for the nearly 120 commercial vineyards, which grow vinifera, hybrids, and muscadines, in the region by providing workshops, programs, educational materials, and one on one site visits with growers. He also collaborates with colleagues on applied research initiatives across the state. I am a Dallas native and studied Horticulture at Texas A&M University and was then awarded a fellowship to California State University - Fresno where I earned a MSc. in Viticulture & Enology and am now pursuing a PhD in the Department of Horticultural Sciences at Texas A&M University evaluating the effects of irrigation strategy and cover cropping on wine stability, wine quality, and grapevine resiliency.



Kyle Freedman, PhD Candidate

North Carolina State University

Ocean Isle Beach, NC Chapter

Like many horticultural crops, climate change coupled with disease pressure makes grape growing challenging. Combined with needing five years before new grapevines produce a full crop and it is no wonder why many vineyards are not profitable. Our research at North Carolina State University is working to change this. By conditioning young grapevines using supplemental light during nursery production, we can increase root development as well as fruiting capacity allowing growers to transplant these grapevines and harvest fruit in the same year. This can have a transformational impact in not only reducing the time it takes for growers to see yields, thus increasing their net returns, but it also mitigates challenges growers face like frost damage and disease pressure. This is particularly important for many parts of North America that experience cold winters and unique pests and diseases. Our research is still in its infancy, but such a system could enable vineyards to transplant, crop and remove vines in the same year, similar to how we treat many of our annual vegetable crops like tomatoes. Our goal is to improve profitability and sustainability for vineyards globally by applying advances in controlled environment production such as more efficient lighting systems and better knowledge of fundamental grapevine physiology.

Alex Gapinski, Masters Candidate

Iowa State University

Meadowlands, NJ Chapter

Grape breeders in North America have developed adapted cultivars by crossing *V. vinifera* with native American grape species such as *V. riparia*, *V. labrusca*, *V. rotundafolia*, and others to select for cold and disease tolerance. Red cultivars, such as Marquette, Frontenac, and Petite Pearl, are the foundation for the wine industry in some regions especially in the Upper Midwest region of the U.S. However, these grapes and their resulting wines have lower tannin concentrations than their *V. vinifera* counterparts leading to several challenges related to overall red wine quality and consumer acceptance.

My research addresses these challenges by focusing on chemical properties of red wines that are correlated with higher red wine quality. The properties I study relate to the polyphenols present in grapes and wines. Although many people associate polyphenols with health properties such as dietary antioxidants, these chemical compounds are responsible for color, body, and astringency properties in red wines. The antioxidant properties of polyphenolic compounds protect wine from oxygen-related faults and premature color change.

In an effort to increase the tannin concentration and therefore improve red wine quality made from the Marquette grape, I am studying the effect of two plant growth nutrients on tannin production in Marquette grapes throughout the growing season and whether they will promote tannin biosynthesis in the Marquette vines during development and assist extracting those tannins into the wines. I hope that my research will provide another tool for winegrowers to improve tannin concentration in Marquette wines thus increasing quality and consumer acceptance of red wines made in the Midwest.

Elia Cristina Casellanos Lopez, Masters Candidate

University of British Columbia
Virginia Wylder

My research project involves a collaboration with Okanagan Crush Pad (OCP) winery in the Okanagan Valley, British Columbia, Canada, as part of a long-term partnership. OCP is focused on producing small lot "terroir expressive wines" with minimal intervention. The objective of my graduate research is to test the potential of indigenous *Saccharomyces cerevisiae* (*S. cerevisiae*) yeast strains, isolated from spontaneous fermentations at OCP, as starter cultures for wine fermentation.

The research includes conducting lab-scale fermentations using six genetically distinct OCP *S. cerevisiae* strains to evaluate their performance in both Pinot Gris and Pinot Noir grape juice. Two of these strains, deemed to have suitable wine metabolites and aroma characteristics, were selected for pilot scale fermentations at the winery.

The importance of this research to the North American wine industry lies in the potential to create wines with distinct and desirable characteristics by utilizing indigenous yeast strains. This differentiation can help winemakers stand out in the international market. OCP aims to develop their own indigenous yeast strains as winery starter cultures, ensuring consistency, preventing spoilage, and highlighting the unique terroir of Okanagan wines. By using well-adapted yeast starter cultures, the Canadian wine industry can enhance its position in the global market, benefitting from the environmental conditions specific to its wine regions.

Megan Mershon, Masters Candidate

Virginia Polytechnic Institute and State University

W. J. Rachele Endowment

My research, at its core, is designed to help grape growers and wine producers create the best possible product. We are evaluating how varying nitrogen applications to vines effect the wine produced. Nitrogen is an essential nutrient for vines and fruit to grow and is also necessary for yeast during the fermentation process. With variable nitrogen fertilizer application, it is possible that we see differences in chemistry and sensory qualities in finished wines due to different nitrogen levels in the grapes. Our research is evaluating different nitrogen fertilizer levels in Virginia Chardonel and how those field treatments impact fermentation in the winery. The goal of this research is to understand if there are differences in product quality based on nitrogen levels and, if so, what they are. In the end, we want to help farms across North America maintain, or improve, final product quality and crop management while reducing vineyard costs.

Nadine Ott-Peon, Masters Candidate

Brock University

No Name Chapter

My project focus is bioengineering Icewine yeast to explore the roles of the five forms aldehyde dehydrogenase (*ALD*) proteins in acetic acid production. Research on acetic acid is important as it is a volatile acid, and when its concentration is too high, it will negatively impact the quality of the wine. Icewine juice has high levels of both acid and sugar as the juice is pressed from grapes that are naturally frozen on the vine. The high sugar environment of this juice causes hyperosmotic stress to the yeast, causing water loss, and triggers glycerol production to act as an osmolyte to draw water back into cells, creating an NAD+ redox imbalance. Icewine has significantly higher acetic acid in comparison to table wine, and it is thought acetic acid production is used to reduce NAD+ to NADH via an NAD+ dependent aldehyde dehydrogenase. Individual knockout deletion mutants for each *Ald* will be created using CRISPR/Cas9 technology on K1 V1116 an industry yeast strain. These mutated yeasts will be used to ferment Icewine juice at 40°Brix and juice diluted to 20°Brix. There will be regular sampling before, during, and after fermentation so it can be observed how the *Ald* knockouts affect the biochemical and redox balance of the fermentation pathways. My research is very future-focused as it lays down the foundation for certain wine styles that cause hyperosmotic stress on the yeast. It is essential preliminary research that will help researchers and winemakers better understand the mechanism of how the hyperosmotic stress of yeast increases acetic acid in the final wine.

Meredith Persico, PhD Candidate

Pennsylvania State University

Carroll County Chapter, G. Hamilton Mowbray Memorial Scholarship in Honor of Richard Blosveren

I am a fifth-year PhD candidate in the Department of Plant Science at Penn State University focusing on grapevine cold acclimation and spring frost avoidance. My goal is to help North American wine producers mitigate crop losses due to freeze damage. I am currently investigating how heatwaves in late summer and fall affect the environmental cues necessary for grapevine dormancy induction and winter cold tolerance. Previously, I researched two methods to delay grapevine budburst for spring frost avoidance, and evaluated the effects of delayed budburst on vine health and finished wine quality. My research results on delaying budburst for freeze avoidance has been published in the American Journal of Enology and Viticulture and OENO One. I recently wrote and recorded an extension video series on spring freeze damage and viticultural methods to mitigate spring freeze damage aimed at industry stakeholders. Prior to graduate school, I received her B.S. in Viticulture & Enology from Cornell University.

Minh Vu, Masters Candidate

Brock University

Banfi Vintners Scholarship

Grapevine can be affected by more than 80 viruses, many of which are economically important and could cause significant loss of yield as well as shorten the vine's lifespan. Grapevine red blotch virus (GRBV) and grapevine Pinot gris virus (GPGV) are two of the most detrimental grapevine viruses. In Canada and the USA, both viruses have been reported in numerous provinces, posing a serious threat to the profitability and sustainability. My research on GRBV focuses on its dissemination as well as potential alternative hosts in the Niagara Region's flora. This study has significant indications on vineyard management in the Niagara Region as well as other regions with similar flora and insect populations, especially if those vineyards have, or at the risk of contracting, GRBV. Concerning GPGV, I investigate the genetic diversity of this virus across 4 provinces of Canada and compare them with GPGV from other countries. The result of this study suggests that the majority of GPGV in North America is asymptomatic, implying that the expected damage is minimal. Furthermore, this research also found that the most likely source of GPGV in North America is from France and that we should pay closer attention to grapevine materials imported from other countries."