2022 AWSEF Scholarship Awards

The 2022 AWSEF Scholarship Recipients:

Hannah Charnock, PhD Candidate at Brock University, Ontario

Cleveland, OH Chapter

Amanda Fleming, Masters Candidate at University of Arkansas

AWSEF/Banfi Auction

Bernadette Gagnier, PhD Candidate at Washington State University

Carroll County Chapter, G. Hamilton Mowbray Memorial Scholarship

Alex Gunn, Masters Candidate at Brock University, Ontario

North Alabama Chapter

Jared Hrycan, PhD Candidate at University of British Columbia Okanagan

Central Pennsylvania Region

April Mahovlic, Masters Candidate at University of British Columbia Okanagan

AWSEF

Meredith Persico, PhD Candidate at Pennsylvania State University

Bucks County, PA Chapter

Hannah Charnock, PhD Candidate
Brock University, Ontario
Cleveland Chapter in memory of Bill Davey

My research is focused on understanding a series of chemical reactions called the Maillard reaction which contribute to flavour development during sparkling wine aging. The Maillard reaction is a cornerstone of food chemistry and is defined by the interaction between sugars and amino acids, resulting in a multi-step reaction with hundreds of flavour-active components. In aged sparkling wines, several Maillard-associated products have been identified, and contribute desirable roasted, caramel, and nutty aromas. Prior research related to this reaction primarily addresses thermally processed products which undergo the Maillard reaction over a short period of time (minutes to hours); whereas only limited studies have evaluated low-temperature and acidic systems such as sparkling wines, where the reaction rate is significantly reduced (months to years).

My research aims to characterize the formation and stability of Maillard reaction-associated compounds during sparkling wine production and aging. To monitor and quantify the formation of volatile Maillard reaction products, I use headspace solid-phase microextraction coupled with gas chromatography -mass spectrometry (HS-SPME-GC-MS). This research will contribute to an improved understanding of the chemical and kinetic pathways leading to the formation of Maillard-associated aromas in sparkling wine.

This research has the potential to benefit sparkling wine quality and innovation in the North American wine industry by informing potential strategies for enhanced sparkling wine aroma, and filling an important gap in our understanding of wine aging chemistry.

Amanda Fleming, Masters Candidate
University of Arkansas
AWSEF/Banfi Wine Auction Scholarship

My graduate research focuses on improving the quality of wines made from grapes grown in warm climates, such as Arkansas, where I have previously worked as a commercial winemaker.

I am evaluating the use of the non-Saccharomyces yeast, *Lachancea thermotolerans*, to modify acidity in wines made from the French-American hybrid grape varieties, Enchantment and Chambourcin, both grown commercially in Arkansas. W arm growing climates can have a negative impact on pH and acidity of resulting wines, compromising color and microbial stability during cellar aging and bottle storage. This research investigates the use of *L. thermotolerans*, in addition to malolactic co-fermentations, to achieve proper pH and acidity to enhance quality and complexity of wines produced from grapes grown in warmer regions. Evaluation of the treatment wines include analysis of composition, color, phenolics and sensory attributes at different stages of production.

In 2020, I helped establish the Arkansas Quality Wine (AQW) program designed to advance the Arkansas grape and wine industry. The AQW program is the first quality program developed for Arkansas, with a focus on advancing the quality of grape and wine characteristics unique to a particular growing region by setting quality standards for wines. In 2021 and 2022, the AQW held its annual wine judging competition for commercial wines made from at least 90% Arkansas-grown grapes. Wines that passed sensory and chemical evaluation earned AQW status, with the goal to help increase sales and visibility of Arkansas-made wines.

Bernadette Gagnier, PhD Candidate

Washington State University

Carroll County Chapter, G. Hamilton Mowbray Memorial Scholarship in memory of Max and Ann White

I am a first-generation college graduate and Marine Corps veteran. I have been in the wine industry since 2017 when I began attending Washington State University Tri-Cities in the Undergraduate Viticulture and Enology Program. I quickly fell in love with the viticulture side of the wine industry and continued my education pursuing a Ph.D. focused on sustainable viticulture practices.

I am working on alternative practices for the management of a soilborne pest called the northern root-knot nematode. This microscopic roundworm threatens wine grape vineyards in North America. Chemical applications are the traditional method for management of the northern root-knot nematode but there are concerns for both effectiveness and environmental impacts. I am working towards plant-based solutions such as resistant rootstock cultivars, cover crops and fallow periods that can be used in an integrated pest management system for better control of a harmful pest without some of the undesirable effects of chemical applications.

Alex Gunn, Masters Candidate
Brock University
North Alabama Chapter

My graduate research intersects applied plant biology and sustainable crop management in characterizing and improving *Vitis* sp. cold stress tolerance with abscisic acid (ABA) analogs. Traditional ABA-based plant growth regulators have been shown to improve early cold acclimation and enhance dormancy induction in grapevines. By hastening the metabolism of ABA and increasing its persistence in freeze-sensitive tissue, synthetic analogs extend this response through dormancy release and cold deacclimation. Research has demonstrated ABA analog application improves late-winter hardiness and delays the resumption of spring growth, but specific mechanisms of action have yet to be elucidated.

In my studies, I am investigating how ABA analogs impact physiological and molecular hallmarks of grapevine bud freeze tolerance and dormancy status, using freeze-sensitive *V. vinifera* Merlot and frost-sensitive interspecific hybrid Marquette to probe these responses. This research will help to advance the current understanding of ABA metabolism in the vast processing network of dormant grapevine bud cold tolerance. I aim to deliver an optimized freeze- and frost-mitigation strategy to North American grape growers with ABA analogs and ultimately shed light on one of the many complex challenges cool climate viticulture faces over the course of my graduate studies.

Jared Hrycan, PhD Candidate
The University of British Columbia Okanagan

Central Pennsylvania Region Scholarship in memory of Tom and Jo Chesworth

Grapevine trunk diseases (GTD), caused by a broad range of taxonomically unrelated fungi, are the main biotic factor reducing yields and limiting vineyards' lifespan worldwide. Petri disease (PD), caused primarily by *Phaeomoniella chlamydospora*, is part of the GTD complex, and affects young grapevines (one to five year–old). PD causes different symptoms, including vascular necrosis, stunted growth and eventual death of the vine.

Grape growers rely on vineyard longevity for economic sustainability and thus, PD has a devastating impact as plant mortality occurs before full crop can be harvested, significantly reducing the cash return after the large investment of vineyard establishment. Fungi responsible for PD are commonly found in asymptomatic grapevine nursery material and thus, they can be introduced unnoticed during vineyard establishment.

I am conducting a nursery survey to determine the health status of grapevine material imported into Canada, and several greenhouse and field experiments, to determine what effect, abiotic and/or biotic stress has on fungal growth and consequent disease progression in young grapevines. My research will help gain a better understanding of how abiotic and biotic stressors affect disease development on the early stages of grapevine development, a crucial stage for plants' establishment and long lifespan of vineyards. A reduction in plant mortality in young grapevines will be economically beneficial for grape-growers, particularly in young and emerging grape-growing areas in North America, which have high incidence of PD and other GTD fungi affecting young grapevines. With the effects of climate change becoming more apparent each year, particularly in North America, where extreme heatwaves and droughts have recently occurred, it is imperative we begin to understand how these weather events may affect grapevines.

April Mahovlic, Masters Candidate

The University of British Columbia Okanagan

AWSEF Scholarship

Grapevines host the most viruses of any cultivated crop. Many of these viruses do not have a cure, leaving the vine infected for life. The viruses I study, Grapevine Leafroll-associated virus 3 and Grapevine Red Blotch virus, are responsible for poor fruit quality, low yields, and decreased plant health in North American vineyards.

Current strategies to manage these viruses focus on insect vector control and removal of infected vines, which can be costly and time consuming for growers. My research is focused on testing whether the common viticultural practice of cluster thinning may be able to minimize the negative effects of these viruses.

I am taking a whole-plant approach, and monitoring several vine health and fruit quality parameters, as well as tracking virus titre throughout the season. My hope is that crop thinning virus infected vines will free up resources that the plant can use to improve quality of the remaining fruit and maintain vine health. By providing research to help North American grape growers deepen their understanding of how viruses impact their vines, and giving them tools to minimize virus impacts, we can continue to produce high-quality fruit, and exceptional wines.

Meredith Persico, PhD Candidate
Pennsylvania State University
Bucks County , PA Chapter Scholarship
in memory of Kirby Antrobus

My graduate research has focused on grapevine cold acclimation and spring frost avoidance 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 mid-winter cold tolerance. Previously, Meredith researched two methods to delay grapevine budburst for spring frost avoidance, and she evaluated the effects of delayed budburst on vine health and finished wine quality. Meredith's research results have been published in the American Journal of Enology and Viticulture, and she is summarizing her research on delayed grapevine pruning for spring frost avoidance in an extension video for industry stakeholders. Prior to graduate school, Meredith received her B.S. in Viticulture & Enology from Cornell University.

…and *thank you* to all our donors who made these 2022 scholarships possible:

Banfi Corporation
Central Pennsylvania Region
Carroll County, MD/G. Hamilton Mowbray Memorial Chapters
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