

**Virginia Wine Board Grant  
Year Three (FY24-25)**

06/25/2025

Project Lead: Emily Hodson

Organization: Winemaker's Research Exchange- Grape Breeding Program (ViRV)

Address: 325 Winding River Lane, Charlottesville, VA 22911

*Title:* Groundwork for Development and Management of a Virginia Focused Wine Grapevine Breeding Initiative

*Proposal Number:* 301-23-153

*Project Type:* ☒ Research ☐ Education ☐ Marketing

Is this a multi-year grant? ☒ Yes ☐ No

If yes, which year does this report address? This addresses (FY24-25) in year three of five.

*Original FY24-25 Funding Amount:* \$209,407.46

*Amended FY24-25 Funding Amount:* \$243,383.36

*Remaining FY24-25 Balance:* \$0

***Objectives and Results:***

**Project Goal:** Breed vinifera-style wine grapes adapted to the Mid-Atlantic US with a specific focus on combining vinifera fruit quality with downy mildew resistance, with a goal of commercializing the resulting varieties within 10-15 years.

**Objectives:** Define breeding goals precisely, including the highest priority traits and target wine quality. Identify advanced germplasm with downy mildew resistance, preferably introgressed into a high percentage vinifera background, and establish an evaluation/breeding block. Use marker assisted breeding for early selection of seedlings with multiple resistance loci and participatory breeding for evaluation of fruit for wine quality.

These portions of the research project objectives have been reached:

- Guided development of industry-driven breeding goals to be precisely defined and achievable over near term given existing germplasm and DNA markers.
- Defined the breeding goals precisely, including the highest priority traits, including examples of existing varieties with the desired quality characteristics.
- Identified advanced germplasm with downy mildew resistance, introgressed into a high percentage vinifera background, and established an evaluation/breeding block and nursery block.
- ARS has provided land, infrastructure, greenhouses, growth chambers and resources necessary for the genotyping, phenotyping and evaluation of breeding lines for the project.

These objectives are ongoing:

- Made crosses to generate seed representing modified BC2 (Backcross Two-second generation backcross to vinifera) and BC3, targeting commercial fruit quality in BC3 or BC4. Current BC2 should produce fruit for evaluation in FY25-26.
- Used a combination of DNA markers and phenotypic selection to eliminate undesirable seedlings that lack either the desired resistance alleles or necessary viticultural characteristics.
- Share improved germplasm among Agricultural Resource Services breeding and research programs.
- Seed selection for third generation of crossings (BC4)
- Phase 4 planting of fourth generation of crosses (BC4)
- Acquired a phytopathobot robot
- Vineyard labeling with QR codes

These objectives have not yet been completed due to the long term nature of this project:

- Select two to four varieties to be patented and licensed
- File invention disclosures for two to four varieties selected by the Winemaker's Research Exchange.
- Establish multi-location replicated plantings of elite breeding lines and evaluate viticultural characteristics and fruit quality, including microvinification for wine quality evaluation.

Key Takeaways and Accomplishments:

- This project is progressing as planned despite internal USDA challenges.
- Expecting first crop to evaluate in FY25-26 and are currently planning microvinification protocols.
- Initial development and pursuit of a MidAtlantic Grapevine Improvement strategy to sustain the initiative.

### ***Overall Benefit for Virginia Wine Industry:***

No other grape breeding program in the U.S. is developing vinifera-style wine grapes with resistance to downy mildew, nor other humid-climate diseases of economic importance to the Mid-Atlantic. ARS-Parlier, ARS-Geneva, and VitisGen partners have developed resistant germplasm with initial backcross generations into *V. vinifera* tracked by DNA markers, and have elucidated the genetic basis of host resistance via Quantitative Trait Locus (QTL) mapping and genome editing. ARS and the Virginia Wine Board share a long-term interest in studying the genetics of downy mildew resistance in germplasm. Thus, this project is designed to make rapid and targeted progress for the Virginia wine industry.

The goal of this program is to develop two to four new grape varieties appropriate for Virginia and the Mid-Atlantic. A successful variety would be one with high vinifera parentage (> 90%) that correlates to high wine quality and consumer acceptance. Its genetic makeup would also offer resistance to the primary challenges of our regions, specifically the fungal pathogen Downy Mildew. These regional "brand name" grape varieties will gain popularity as competitive pricing and high wine quality will allow the industry to grow and evolve steadily with the rest of the winegrowing regions of the world, while minimizing environmental impacts.

### ***Publications and Activities Associated with Project:***

**Presentations to the Virginia Wine Board**

August 20th, 2024 [VWB Update 8.20.24](#)  
December 9th, 2024 [VWB Update 12.9.24](#)  
March 19th, 2025 [VWB Update 3.19.26](#)

#### Activities Associated with the Project:

##### Meetings/Presentations/Publications

In FY 24-25 this work was presented 8 times (3 to the Virginia Wine Board) , and 2 industry grape breeding events were attended (Vitis Gen and Unified). Work from this grant resulted in 12 meetings and 4 ViRV board meetings as well as meetings with government representatives and bodies, and had one article published. Total reach of this work in FY24-25 would be 630 people at in person presentations.

- Presented/Hosted the USDA-ARS wine grape research open house (Aug 22- 60 people)
- Presented Grape Breeding to the USDA at King Family [USDA Information Session](#) (20 people)
- <https://www.goodfruit.com/a-vinifera-for-virginia/> Article in Good Fruit Grower and NGRA website- national and international attention to the breeding program
- Presented at the VWA Meeting [VWA Meeting Presentation](#) (Nov 11-200 people)
- Presented at Maryland Growers Association (Jan 16-100 people)
- Attended Vitis Gen and Unified Wine Symposium Meetings in January 2025
- Presented at VVA technical meeting (February 2025-250 people) [VVA Meeting Presentation](#)

##### Other Considerations

- Developing a plan for microvinification of single vine fruit.
- Working with USDA-ARS leadership to develop strategic partners in other mid-Atlantic states for groundwork for a permanent position at Kearneysville.

#### Final FY24-25 Budget and Justification:

Item Type	Original Awarded Amount	Amended Awarded Amount (12/12/23)	Final Amount Spent
Personnel	[\$0.00]		[\$0.00]
Fringe	[\$0.00]		[\$0.00]
Travel	[\$0.00]		[\$0.00]
Supplies & Materials	[\$0.00]		[\$0.00]
Contractual	\$209,407.46	\$243,383.36	\$182,537.52
Other	[\$0.00]		[\$0.00]
Total	\$209,407.46	\$243,383.36	\$182,537.52*

The original budget is in line with the final five year CRADA budget as the payments were made quarterly to the USDA to fulfill the terms of the CRADA. Due to the fact that the final invoice for this

fiscal year (24-25) listed as payment #12 is dated June 3 of 2025 and has a 90 day payment term, the last payment for FY 24-25 of \$60,845.84 is out of cycle with the fiscal year. As of July 11, 2025 this payment has been submitted, making the final amount spent to date \*\$243,383.36.

### **Detailed Progress Updates:**

#### Second Quarter 2024

- Meeting about Mid Atlantic Grape Breeding (May)
- Presented to the VWB (June)
- Meeting with stakeholders about nonprofit structure/private funding (June)
- Met with Congresswoman Abigail Spanberger (June)
- Met with Bryan Robinson- Legislative Assistant to Spanberger specializing in Agriculture (June)
- Met with VitisGen social scientist Changyan Yue regarding the future of marketing new varieties as they are released
- Met with Ganyuan Zhong, research leader, grape genetics unit at USDA in an effort to acquire more resources from his unit
- Meeting with leaders at USDA grapevine summit

#### Third Quarter 2024

- Planted 2023 Crosses
- Presented at the USDA-ARS Wine Grape open house (Aug 22)
- Presented Grape Breeding to the USDA at King Family
- First in Person Board meeting at Kearneysville ARS: Two new board members: Dr. Drew Harner and Lee Campbell
- Met with Micah Barbour, Senior Policy Advisor Office of Senator Mark Warner (August)
- ARS Midatlantic grapevine improvement research plan- Composed a white paper to structure a request for long term ARS-base program funding for a dedicated grapevine winegrape breeder and long term access to additional land and supporting staff for evaluation of promising breeding material.
- Seed extraction from crosses made from 2024 crosses (~9,000 seeds)

#### Fourth Quarter 2024

- Presented at the VWA
- Met with Tracy Lesky and Chris Dardick (ARS leaders) to develop strategic Mid Atlantic Grapevine Improvement Strategy
- Met with Wayne Clark- WV State Delegate (Dec) (house of delegates)

#### First Quarter 2025

- Attended Vitis Gen 3 meeting and Unified Wine Symposium
- Dr. Surya Sapkota presented at the Maryland Grape Growers meeting
- Met with Jim Poulous, Technology Transfer Coordinator at the USDA to determine the correct path for Mid-Atlantic partnership and the existing CRADA.
- Presented at the Virginia Vineyards Association meeting

#### Second Quarter 2025

- Met with Kent Leonhardt West Virginia Commissioner of Agriculture, Joe Guthrie Virginia Commissioner of Agriculture, Matt Lohr Virginia Secretary of Agriculture to align a strategy.
- Planted 2024 crosses (BC3 as well as novel crosses)