NYWGF RESEARCH - FINAL REPORT TEMPLATE

Funding for fiscal year: April 1st, 2025 – March 31st 2026

SECTION 1:

Project title: Evaluation of Cabernet Franc Clone and Rootstock Viticulture and Wine Attributes suitable for the Hudson Valley AVA.

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New Research ☐ **Continued Research** ☒

Amount Funded **$** 14,990

SECTION 2: (This section should be in depth and akin to an academic report)

Project Summary Impact Statement:

This project seeks to continue the research started in 2019 to investigate the different viticulture attributes of different Cabernet Franc clone-rootstock combinations. Furthermore, this work intends to evaluate wine characteristics from the Cabernet Franc clone-rootstock combinations. The expected outcome of this work is to determine which clone-rootstock combinations for Cabernet Franc excel in the Hudson Valley AVA, both in the vineyard and the winery. The results from this research will allow growers to make an informed decision about which clones and rootstocks to use when developing a new vineyard.

Objectives:
The objectives of this proposed research would be to continue the evaluation of all clone–rootstock combinations to characterize the phenological development, vigor potential, and crop load of different clone-rootstock combinations. Additionally, this project aims to provide insight into the potential wine quality of different clones by measuring berry composition and size. Lastly, this project will evaluate the cold hardiness of different clones during dormancy.

The prospective information gained from this study will contribute to the larger body of literature by defining the growth characteristics of clones where information is limited. This will also give growers crucial information to help them make informed decisions while planting a new vineyard.

Materials & Methods:

A 0.66-acre Cabernet Franc clonal and rootstock trial was planted in 2018. The trial was developed with a spacing of 1.83 m x 2.74 m (6 ft x 9 ft) and was trained using a vertical shoot positioned (VSP) training system. The trial included four Cabernet Franc clones (clone FPS 01, FPS 11, FPS 13.1, and 623) on three rootstocks (3309C, 101-14 Mgt, and Riparia Gloire). Clones were selected for suitability to the cool climate found in the Hudson Valley region, and rootstocks were selected based on what is commonly used by the New York wine industry.

Viticulture assessment:
This trial reached full production in 2021, when initial data would have been collected. Due to changes in staff, data was collected in 2021 and the latter half of 2023. This trial will be evaluated to account for vintage variation and data collected through the 2026 growing season; however, this proposal is only for the 2025 fiscal year. The data to be collected from this trial included:

- Phenological Growth Stages (Budbreak, 50% bloom, berry set, pea-size berries, version, and harvest) Stages will be recorded in accordance with the modified E-L system (Coombe 1995).
- Disease incidence and severity (black rot and botrytis) will be estimated at harvest if present.
- Yield parameters, including cluster count, average cluster weight, and total yield.
- Berry size (100-berry sample) and berry composition (TSS, pH, TA)
- Cold Hardiness, this will be evaluated using an environmental chamber.
- Dormant season pruning weight will be recorded in the following year's spring.

Wine assessment:

Fruit harvested from this trial will be made into wine for further analysis using a standardized winemaking process for red wine. Fruit will be made into unfinished wines at the Cornell Teaching Winery in Geneva, NY, following standard winemaking processes. A standard juice analysis will measure total soluble solids, pH, titratable acidity, and nitrogen content. Post-fermentation, phenolic compounds, and malic acid will also be analyzed. Finished wines will be subject to a blind wine tasting by Cabernet franc Coalition members.

Results/Outcomes/Next Steps:

RESULTS

During the 2025 growing season, defined as April 1st to October 31st, the vineyard accumulated 3190 growing degree days (base 50 ˚F) and received 27.74 inches of precipitation. Approximately 80 GDDs less and 6 inches of precipitation more than in 2024. Phenological data were collected at critical development stages, including bud break, bloom, and véraison. There were no significant differences observed between the clones, rootstocks, or their combinations.

Bud break, calculated using the modified E.L. system, occurred on April 27th. Bloom, defined as 50% cap fall, was observed on June 25th. Similarly, véraison, indicated by 50% color, was reached on August 24th. The research project was harvested on October 14th.

At harvest, yield and cluster counts were collected per panel. There were no differences between clones, rootstocks, or clone-rootstock combinations for yield. The average yield (lb/ft) for clones 01, 11, 13.1, and 623 was 1.34, 1.33, 1.20, and 1.11, respectively. Vines grafted on RIP had an average of 1.39 pounds per ft (lb/ft), while vines grafted on 101-14 Mgt and 3309C had an average of 1.206 and 1.208 lb/ft, respectively. There were no notable differences between clones, rootstocks, or clone-rootstocks combinations for cluster counts. Clones 01, 11, 13.1, and 623 had an average cluster count 126, 147, 131, and 115, respectively. Vines grafted to rootstock 3309C had an average cluster count of 138, while 101-14 Mgt averaged 125 clusters, and RIP averaged 131 clusters. There were no differences between clones for cluster weights, with clones 01, 11, and 623 having clusters averaging 107, 108, and 105 grams, respectively. Clone 13.1 clusters averaged 135 grams. There was a difference between rootstocks, with vines grafted to 101-14 Mgt average cluster weight of 136.9 grams. While vines grafted to 3309C and RIP had lower average cluster weights at 94.9 grams and 111.5 grams, respectively. There were no differences for clone-rootstock interactions.

A sub-sample of five clusters from each panel was collected at harvest for berry analysis. Berry metrics, including berry weight, TSS, pH, and TA were collected using these samples. The average berry weights varied among different rootstocks, with vines grafted to RIPG producing the highest average berry weight of 1.44 grams per berry. In comparison, vines grafted to 3309C and 101-14 Mgt had average berry weights of 1.29 and 1.30 grams, respectively. Additionally, there were differences in berry weights among clones; clone 623 had a lower average berry weight of 1.26 grams, while clones 01 and 11 had average weights of 1.37 and 1.29 grams, respectively. Clone 13.1 had the heaviest average berry weight at 1.42 grams. The combination of clone and rootstock did not influence berry weight.

For TSS, differences were observed between clones and rootstocks, but not between the two. Clone 623 and 11 had TSS measured at 21.75 and 21.59, respectively, compared to clone 1 having only 20.5 TSS. When examining pH levels, no significant differences were observed between the clones or rootstocks; the average pH across all samples was 3.2. Additionally, there were no notable differences in Titratable Acidity (TA) between the clones or rootstocks, with an overall average of 0.75 g/L across all treatments.

A portion of the leftover fruit not used for sub-samples was sent to Cornell Teaching Wine in Geneva for analysis. The fruit was organized by clone for the winemaking process, using the yeast strain GRE for all clones. Measurements were taken after crushing, before malic acid fermentation, and after malic acid fermentation. At the time of writing, the results of the wine analysis are still in progress.

The vegetative vigor of the clones and rootstocks was evaluated through pruning wood and cane weights. Pruning wood weights were collected using a digital hanging scale. Clones did not affect pruning weight; however, rootstocks did. Vines grafted to RIP had lower pruning weights than vines grafted to 3309C and 101-14 Mgt with an average of 0.34 lb/ft compared to 0.41 kg/m, respectively. Across all clones, the average pruning weight was 0.389 lbs/ft.

Cane weights were calculated by taking the pruning weights collected and dividing them by the shoot counts recorded during the dormant season. There were no differences observed between clones or rootstocks, with the overall average weight being 48.6 grams.

During the dormant season, monthly readings of cold hardiness would have been collected for all clones grafted onto the 101-14 Mgt rootstock from November through February. Due to logistical limitations, it was decided to assess the cold hardiness of the clones on only this rootstock. However, there were several equipment failures due to aging equipment that prevented this data from being collected. No cold-hardiness monitoring data was collected during this project.

OUTCOMES

The start of the 2025 season was challenging for much of the Hudson Valley AVA and Eastern New York, with almost 12 inches of precipitation accumulating between April 1st and June 1st. Those conditions lead to severe Phomopsis and Anthracnose outbreaks during the early season. Fortunately, the disease incidence at harvest was negligible and was not reported. The Hudson Valley AVA received roughly 7.5 inches of precipitation from August 1st to October 31st, thus avoiding drought conditions that affected other growing regions around the state. There were limited differences between clones, with the only differences being in berry weights and TSS between clones 11 and 623, having higher TSS than clones 01 and 13.1, likely due to those clones having heavier berries with more water, thus diluting the TSS. There were no differences in pruning weights or cane weight, suggesting that all clones were appropriately cropped. No crop was thinned in 2025, so the yield capacity of the clones and rootstocks could be observed. Differences between rootstocks were observed for cluster weights, berry weights, brix, and pruning weights. Vines grafted to 3309C had noticeably lighter clusters than vines grafted to 101-14 Mgt, even though the berry weights were the same. This difference is likely due to a lower berry count for vines grafted to 3309C. Vines grafted to RIPG had lower pruning weights and cane weights, suggesting more of the vines' resources were put into the fruit.

The vineyard was completely netted using over-the-row apple tree netting. This reduced the amount of bird feeding pressure but was not as effective as preventing raccoon feeding. Harvest date was determined by a combination of factors, including forecasted precipitation, labor availability, and maximizing TSS accumulation.

Next Steps

Should this project be selected for funding, the objectives of this project for the 2025-2026 season will remain the same: to assess the viticulture characteristics of the clones, rootstocks, and clone-rootstock interactions. In addition to evaluating the wine characteristics of each clone.

Technology Transfer Plan:

Results from this project will be distributed to the grape growing industry through monthly newsletters sent out to the Eastern New York Commercial Horticultural Program’s (ENYCHP) grape list serv and presented at the ENYCHP winter conference, held on February 25th and 26th, 2026. Results from each previous season were presented to the

Cabernet franc Coalition during a blind tasting on May 21st, 2025. Additionally, awareness of this project and its findings will be promoted through the ENYCHP quarterly reports, the ENY viticulture social media accounts, and periodically during the weekly updates in the Véraison to Harvest newsletter and accompanying podcast.

SECTION 3:

Project summary and objectives:

This project aims to continue research started in 2019 on the viticulture attributes of various Cabernet Franc clone-rootstock combinations and evaluate their impact on wine characteristics. The goal is to identify the best-performing combinations in the Hudson Valley AVA, aiding growers in making informed decisions for new vineyards.

Key objectives include assessing phenological development, vigor potential, and crop load of the combinations, as well as measuring berry composition and size to gauge potential wine quality. Additionally, the project will evaluate the cold hardiness of different clones during dormancy.

The findings will enhance existing literature on clone characteristics and provide growers with essential insights for vineyard planting decisions.

Importance of research to the NY wine industry:

Cabernet franc accounts for 638 acres of vineyards in New York State, according to the 2024 NYWGF Vineyard Survey, and is the most planted red *Vitis vinifera* in New York. However, there is limited information available on the performance of different Cabernet franc clones, and even less information is available on the cold hardiness of different Cabernet franc clones, a characteristic that is critical to the longevity of a vineyard, depending on the site. This research will provide results that could be directly applicable to New York vineyards.

Project Results/next steps:

The 2025 growing season, defined as April 1st to October 31st, started out as a wet one, receiving 12 inches of precipitation between April and June with the vineyard accumulating a total of 27.74 inches for the season. The vineyard accumulated 3190 growing degree days (base 50 ˚F). Phenological data were collected at critical development stages, including bud break, bloom, and véraison. There were no significant differences observed between the clones, rootstocks, or their combinations.

The project was harvested on October 14th, with no differences being observed between clones, rootstocks, or clone rootstock combinations for yield. With the overall average yield per foot being 1.26 lbs/ft. Additionally, cluster counts were also not affected by either clone or rootstock, with the overall average being 131 clusters. There was no difference between clones in cluster weights; however, vines grafted to 101-14 Mgt had heavier clusters than vines grafted to 3309C, with average cluster weights of 136.93 grams and 94.91 grams, respectively. Berry weights were influenced by both the clones and the rootstocks used. Clones 11 and 623 had lower berry weights, measuring 1.29 and 1.31 grams, respectively,

while clones 01 and 13.1 had higher berry weights of 1.37 and 1.42 grams, respectively. Vines grafted onto the RIPG rootstock produced heavier berries, averaging 1.46 grams, compared to those grafted onto the 101-14 Mgt and 3309C rootstocks, which weighed 1.30 and 1.29 grams, respectively.

A sub-sample of five clusters from each panel was collected at harvest for berry analysis, measuring various metrics such as berry weight, total soluble solids (TSS), pH, and titratable acidity (TA). Differences in TSS were observed between clone 11 (21.6 TSS) and clone 623 (21.9 TSS) when compared to clone 01 (20.5 TSS) and clone 13.1 (20.8 TSS). Vines grafted to RIPG exhibited lower TSS at 20.5 compared to those grafted to 101-14 Mgt and 3309C, which had TSS values of 21.4 and 21.3, respectively. There were no differences among clones or rootstocks for pH or TA.

After the harvest fruit was organized by clone, and a portion was sent to the Cornell Teaching Winery to undergo the winemaking process and analysis. Results are still in progress.

There were limited differences between clones, with the only differences being in berry weights and TSS between clones 11 and 623, having higher TSS than clones 01 and 13.1, likely due to those clones having heavier berries with more water, thus diluting the TSS. There were no differences in pruning weights or cane weight, suggesting that all clones were appropriately cropped. No crop was thinned in 2025, so the yield capacity of the clones and rootstocks could be observed. Differences between rootstocks were observed for cluster weights, berry weights, brix, and pruning weights. Vines grafted to 3309C had noticeably lighter clusters than vines grafted to 101-14 Mgt, even though the berry weights were the same. This difference is likely due to a lower berry count for vines grafted to 3309C. Vines grafted to RIPG had lower pruning weights and cane weights, suggesting more of the vines' resources were put into the fruit.

The objectives of this project for the 2025-2026 season will remain unchanged: to assess the viticulture characteristics of clones, rootstocks, and clone-rootstock interactions, as well as to evaluate the wine characteristics of each clone.