

2020 SR SFC Project Report

Proposal Category: ☒ Research ☐ Outreach

Proposal Status: ☒ New Proposal ☐ Previously funded by SRSFC

Title:

Investigating the Potential of Disease Resistant *Vitis vinifera* (European Grape) Progeny for the Southeast

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Objectives:

The purpose of this applied research project is to investigate the production potential of newly developed Pierce's Disease (PD) resistant 94% *Vitis vinifera* grape selection in Alabama where the PD pressure is high. Studies will be focused to evaluate vine performance at three planting densities: 605, 519 and 454 vines/acre, where phenological, cropping and vegetative responses will be measured and fruit quality and vine field PD resistance, will be assessed. Vines

are trained to the relatively new, high-cordon divided canopy Watson training system utilized for improved vineyard management practices and enhanced fruit quality. The UC Davis developed advanced PD resistant, predominantly *Vitis vinifera* selection ‘502-20’ is being tested at the Chilton Research and Extension Center (CREC), Clanton, Alabama. The outcomes of this research will serve to promote viticultural diversification and sustainability in Alabama and the southeastern region and can aid in the development of In-service agent training modules in sustainable viticultural production practices in the region.

Activities

To determine the feasibility of sustainable production of newly developed PD resistant 94% *Vitis vinifera* selection ‘502-20’, an experimental site was utilized at the Chilton Research and Extension Center near Clanton, Alabama. The effect of three planting densities of 605, 519, 454 vine/acre corresponding to 6’ X 12’; 7’ X 12’, and 8’ X 12’ planting distances are being evaluated on vine growth, development, productivity, crop efficiency, and fruit quality. The experimental design is a CRD with 3 replications and 3 vines per block. Establishing young vines (planted in 2017) trained to a divided canopy Watson training system are being utilized for this study.

During the early spring of 2020, vines were dormant pruned to 12 spurs per vine (6 spurs/cordon) with two buds per spur retained for a total number of 24 buds per vine. The pruning weights were recorded for each individual plant. In mid-March, Covid-19 related restrictions limited travel to the research station which resulted in missing data on canopy phenological development and vine flowering. Data on the initial fruit development stages were also incomplete. Shoot thinning was conducted to maintain the desirable shoot number. Additionally, cluster thinning was applied to adjust the crop load to one cluster per shoot.

The final stages of berry veraison and fruit maturity were documented during the summer. Fruit was harvested on August 7, 2020. Results for total yield per vine (Table1) suggest similar cropping level regardless of planting distances with the 6’ in-row treatment producing 8.3 kg/vine, and the 7’ and 8’ in-row distance treatments producing 8.8 kg/vine. Mean cluster

weight varied between 367.2 g for vines planted at 6' X 12' to 394.3 g for vines planted at 7' X 12' during the current season, when the number of clusters harvested per vine ranged from 27.7 for plants at 7' X 12' to 31.6 for vines at 8' X 12'. Mean berry weight for all planting distances was slightly above 2.0 g with soluble solids content of 18.4-18.7 %.

Table 1. Effect of planting distance on growth and productivity of '502-20' grape, 2020.

Planting distance	Pruning Weight, kg	Total Yield, kg	Total Number of clusters/ vine, No.	Average cluster weight, g	Mean berry weight, g	Brix, %
6' X 12'	1.1	8.5	28.0	367.2	2.0	18.7
7' X 12'	1.1	8.8	27.7	394.3	2.1	18.5
8' X 12'	1.0	8.8	31.6	377.0	2.2	18.4

In addition to the lack of phenological development data collection in spring and early summer, we were not able to conduct assays to determine the PD infection level as the funding for the project was initially delayed and was made available to Auburn University in mid-July, but it is still not available to the PI for the designated use. That is why a no cost extension of this project was requested and recently granted to complete the work in 2021. Based on the completed results, we will be able to develop extension publications on *V. vinifera* best management practices, including recommendations on proper planting distances.