

2021 Report

Expanding Capacity for Evaluation of Promising Grape Genotypes in Mississippi

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Abstract:

The grape industry is expanding acreage and products used to produce wine, juice, and other products throughout the United States. Recent estimates have shown the grape and wine industries in nearby states to have a significant economic impact. Mississippi has factors in place that make establishment of a viable bunch grape industry possible, including a sizable population near the Gulf Coast, heavily traveled highways, and tourist destinations (e.g. casinos, beaches, national parks, etc.). In order to prepare for a potential expansion of the grape industry in Mississippi, underappreciated cultivars and breeding selections were grown, harvested, and processed to determine suitability. OK392 vines grown at the Mississippi State University (MSU) Beaumont Horticultural Research Unit and 'MidSouth' vines grown at the MSU McNeill Experiment Station were assessed in 2021. In 2021 OK392 compared favorably to 'MidSouth' in many measured categories. It did, however, have higher loads of Pierce's disease (PD), although this was not unexpected. Even with the higher detected PD, vines are still surviving in South Mississippi and producing grapes. Difficulties with weather in 2021 limited data collection but wine was made from fruit collected and appears to be promising.

Objectives:

The overall objective of the project is to improve the experimental capacity to analyze grape and wine quality in Mississippi, especially underappreciated cultivars and breeding selections. The goal is to select the best bunch grapevines for southern Mississippi and surrounding areas.

Activities:

A small electric crusher destemmer to process the fruit into juice ((Enoitalia) Adjustable Painted Motorized Crusher/Destemmer), a stand to place the crusher onto (Stainless Steel Stand for Enoitalia Adjustable Crushers/Destemmers), lugs, a TA/pH meter, and consumables for TA/pH meter were purchased to process the fruit collected in 2021. Vines were grown at the Mississippi State University Beaumont Horticultural Unit in Beaumont, MS and the Oklahoma State University Cimarron Valley Research Station in Perkins, OK (Fig. 1).

Due to excessive rainfall in 2021 total yields of OK392 were not able to be harvested. Diseases, including bunch rots and black rot, resulted in minimal harvest (Fig. 2). We were able to harvest enough fruit for other measurements and to make a small batch of wine. ‘MidSouth’, a more disease tolerant cultivar, did have harvestable yields, although less than if the weather was not as wet. Berries of OK392 were slightly smaller than those of ‘MidSouth’, both considered medium-sized berries. Clusters were similar in weight in 2021, as were pruning weights. These pruning weights were taken in late winter 2021 from 2020 vine growth (Table 1).

Table 1. Comparison of vine characteristics and fruit quality of OK392 and ‘MidSouth’, both PD-tolerant, interspecific, red-fruited hybrids grown in south Mississippi in 2021.

Measured variable	OK392	MidSouth
Yield (kg/vine)	N/A	3.2
Berry wt (g)	2.2	2.7
Cluster wt (g)	77.8	74.2
Pruning wt (kg)	1.4	1.5
Soluble Solids (%)	16.8	14.7
Titrateable Acidity (mg/L ⁻¹)	8.7	10.6
Juice pH	3.7	3.5
Pierce’s disease (Log CFU)	5.85	0.00

Fruit quality measures included soluble solids (SS), titrateable acidity (TA), and juice pH. The SS content for OK392 was higher than ‘MidSouth’, but still on the low side for wine grapes (Table 1). This is not unusual for south Mississippi where high day and nighttime temperatures limit sugar accumulation in the fruit. ‘MidSouth’ grows well, but has low sugars and higher than desirable TA. OK392 has lower TA values, more in-line with commercial wine production limits. Juice pH of OK392 was slightly higher than ‘MidSouth’ but still within the recommended range (Table 1). One of its desirable traits is a strong red color, which many red grape cultivars lack in the South (Fig. 3).

Pierce’s disease (PD) detection was done in 2020. While MidSouth had no detectable PD, this was not the case for OK392. Levels were higher than ‘MidSouth’, ‘Miss Blanc’ (0.68), and ‘Blanc du bois’ (1.79). While concerning, OK392 has shown resiliency in tolerating PD. Some vines have declined in the past 6 years (Fig. 4), but many are still alive and producing fruit. The reality is that south Mississippi, where PD pressure is extreme, may be too far south for OK392. Beaumont, Mississippi is roughly 60 miles northeast of the USDA-ARS Thad Cochran Horticultural Laboratory where vines were first tested in Mississippi. Those vines died within 3 years, but the vines in Beaumont have continued to live. We believe vines planted farther north in areas that have less PD pressure would survive better and produce more fruit. That being said, the level of PD-tolerance is better than ‘Villard blanc’ which was also tested at Beaumont and all vines perished within 5 years. OK392 does however need a vigorous spray program to deal with fungal diseases and insects in south Mississippi.

A solitary vine in Oklahoma at the Oklahoma State University Cimarron Valley Research Station has grown vigorously and produced fruit, although no data was collected. OK392 was first selected

there by Herman Hinrichs, from a cross of 'America' x SV12-375 ('Villard blanc'). Anecdotal evidence from Arkansas showed that it can be productive in that region on a larger scale and is best suited as a blending wine grape.

Overall, OK392 continues to be a productive vine in both locations despite PD and other disease and insect issues. With intensive management it can be a useful vine for winegrape growers in the South. We will continue to collect data with plans to publish a germplasm release on it in 2022.



Figure 1. Vigorously growing OK392 at the Oklahoma State University Cimarron Valley Research Station in Perkins, OK (above) and at the Mississippi State University Beaumont Horticultural Unit in Beaumont, MS (below).



Figure 2. Strong manifestation of various fungal diseases on OK392 in Beaumont, MS (above) and leaf grape phylloxera on OK392 (below).

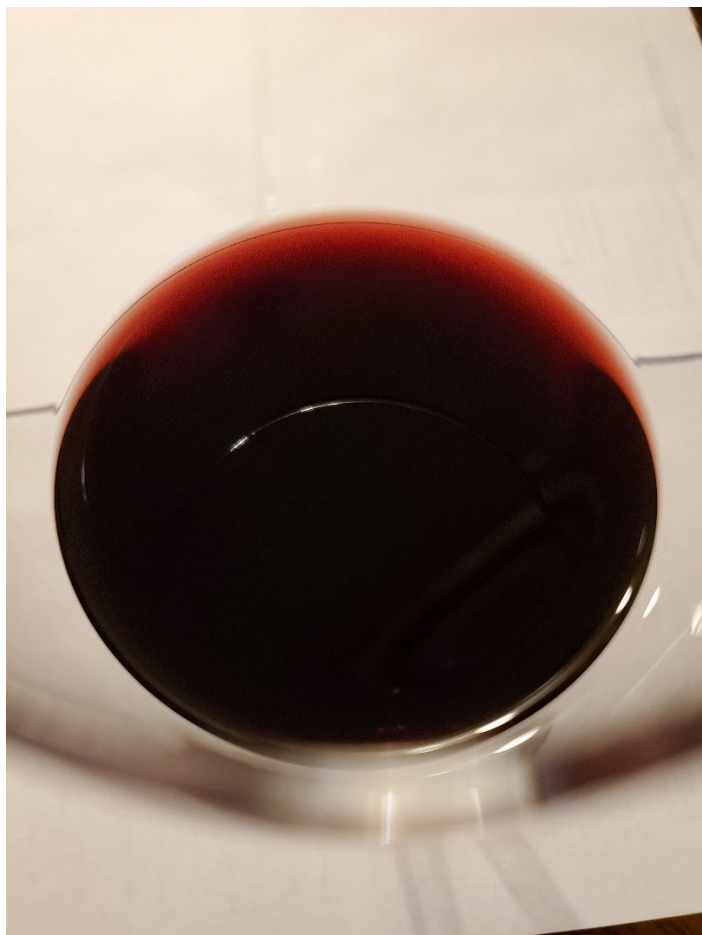


Figure 3. Deep red color of juice produced from OK392.



Figure 4. An OK392 vine in decline from Pierce's disease at the MSU Beaumont Horticultural Unit in Beaumont, MS.