

**Oklahoma State University
2006 Report for SERA014**

Personnel involved:

Eric T. Stafne
Extension Horticulturist and Assistant Professor
Department of Horticulture and Landscape Architecture
Oklahoma State University
Stillwater, OK 74078
405-744-5409
eric.t.stafne@okstate.edu

Phillip G. Mulder, Jr.
Extension Entomologist and Professor
Department of Entomology and Plant Pathology
Oklahoma State University
127 Noble Research Center
Stillwater, OK 74078
phil.mulder@okstate.edu

William G. McGlynn
Extension and Research Food Science Specialist
Department of Horticulture and Landscape Architecture
Oklahoma State University
Stillwater, OK 74078
william.mcglynn@okstate.edu

Becky Carroll
Extension Assistant
Department of Horticulture and Landscape Architecture
Oklahoma State University
Stillwater, OK 74078
becky.carroll@okstate.edu

Vacant
Extension Plant Pathologist and Assistant Professor

Oklahoma Grape Industry Review

As recently as 1997, only 68 ha of grapes were grown in the entire state of Oklahoma; however, that number grew to 151 ha in 2002 and 212 ha in 2005. The number of licensed wineries has increased from 4 in 2001 to 18 in 2003 and 31 in 2005. Recent developments in Oklahoma have led to a burgeoning of the grape growing and wine making industries. These notable winegrape efforts lead to new initiatives by OSU to address the renewed interest throughout the state. The winegrape industry in Oklahoma is primarily dependent upon *V. vinifera* cultivars, although some areas of the state have found hybrids and American cultivars more appropriate. While much of the growing industry is supported by *V. vinifera* cultivars, especially 'Cabernet Sauvignon', 'Merlot', 'Shiraz', and 'Zinfandel', there exists opportunity for high quality hybrids. Hybrids can offer better cold tolerance and disease resistance than *V. Vinifera* cultivars, which is important in the continental climate of Oklahoma where winter temperatures can fluctuate significantly and humidity in the summer can be conducive to high disease pressure situations.

Oklahoma Grape Management Course and other educational programs

Eric T. Stafne and Becky Carroll

Since the inception of the Oklahoma Grape Management Course in 2000, nearly 500 potential growers and county extension educators have participated. In 2006, almost 70 participants were signed up for the course which runs from March through October. The course is designed to meet once a month for 4 hours in the afternoon. A team of specialists at Oklahoma State University along with various guest speakers present teaching points that are relevant to the stages of winegrape development. Topics discussed in the classroom are reinforced in the research and demonstration vineyard at the Oklahoma Pecan and Fruit Research Station in Perkins, OK, as well as visits to other local vineyards and wineries.

So far, three viticulture workshops have been held for grape growers. Two of the workshops have been held at OSU-OKC with the assistance of David Gerken, as well as John Coleman of the OGGWMA. The first workshop was held in March at the OSU Perkins Experiment Station, where the topic was pruning for high curtain and VSP training systems. The second workshop was held in May at OSU-OKC and focused on trellis construction. Four rows of trellis were constructed during the workshop and one row of grapes was planted. The third workshop was held in July at OSU-OKC on grape vine propagation and grafting. So far for the OSU-OKC workshops we have been averaging about 20 participants. Other workshops are also available for wine makers, including two on sanitation and filtration.

In August of 2006, we launched a quarterly newsletter designed for the wine and grape industry of Oklahoma called 'Le Vigneron'. It is available by request from the author or at the OGGWMA website at www.oklahomawines.org.

A survey of the industry has also been conducted through the OGGWMA and also through the OSU county educators in all 77 counties in Oklahoma. The OGGWMA portion of the survey concluded on September 1, 2006 and the OSU county educators have until November 1, 2006 to return all surveys. The surveys include questions on acreage, cultivars, insect and diseases, winery operations, etc.

Research Efforts in Winegrape at OSU

Eric T. Stafne

Cultivar and rootstock evaluations at three Oklahoma locations (Buffalo, Burns Flat, and Stillwater) funded by the Kerr Foundation were wrapped up this year. The research and demonstration vineyard at the Oklahoma Pecan and Fruit Research Station in Perkins, OK is still ongoing. The research there includes a cultivar trial, rootstock trials, pruning studies, and demonstrations of three trellis systems as well as various non-replicated cultivars for observation. A small study on crop load thinning was initiated at Victory Vineyards in Quinton, OK and data collection has only just begun. Another small study comparing fall and spring planting was initiated in conjunction with OSU-OKC. Currently we have roughly 120 vines at OSU-OKC, with hopes to expand to approximately 2 acres. A study on the use of grape pomace as a substrate component for the production of pecan seedlings was also finished recently. It appears that the use of grape pomace does not provide much benefit and is actually detrimental at levels past 30%.

Helping to Grow Oklahoma's Grape and Wine Industry: The OSU Food and Agricultural Products Center Research Winery and Enology Lab

William McGlynn

As part of Oklahoma State University's ongoing efforts in support of Oklahoma's grape and wine industry, the OSU Food and Ag. Products Center (FAPC) has recently begun work on a research winery and enology lab located within the Center's multi-purpose pilot-scale processing facilities. Approximately \$100,000 have been provided by OSU to fund stage one of this project; two thirds of the funds were awarded as the result of a successful proposal submitted to a competitive research initiative grant program sponsored by the OSU Division of Agriculture and Natural Resources. The remaining third of the funding was provided by FAPC matching dollars.

The goal of stage one is to create a fully functional research winery. This involves refurbishing and equipping approximately 800 square feet of pilot plant space to house fermentation tanks, bottling equipment, and specialized analytical equipment. Additional processing equipment will be procured for use in other processing areas. The expected initial processing load will be about 500 gallons/year; grapes will come primarily from the research vineyard in Perkins, Oklahoma. As feasible, equipment will be sized to simulate a 5000 gallon/year commercial winery operation. Equipment will be selected to maintain processing

flexibility.

Juice and wine analysis capabilities will also be expanded as part of this project. When stage one is complete, standard lab analyses will include: pH and titratable acidity, volatile acidity, % soluble solids, free and total SO₂ concentration, alcohol content, color (absorbance @ 420/520nm), formal titration for fermentable nitrogen, total phenols, and anthocyanins. As resources permit, analytical capabilities will be expanded to include more specialized chemical and microbiological tests.

As of August 2006, the refurbishing of the pilot plant room that will serve as the main fermentation, bottling, and analytical lab is nearly complete. We expect to install equipment during the fall of 2006 and fully complete stage one plans by spring of 2007.

This new facility will be used for both research and Extension outreach activities such as workshops. Team members involved in the facility include personnel from the FAPC as well as OSU faculty from the Departments of Horticulture, Entomology and Plant Pathology, Biosystems and Agricultural Engineering, and Agricultural Economics. Research topics that have been discussed by team members include: the influence of cultivar on the quality of Oklahoma wines; the influence of cultural practices and vineyard location on the quality of Oklahoma wines; improving wine quality using Oklahoma-grown native and hybrid grape varieties; the influence of winemaking techniques on the quality of Oklahoma wines; and Incorporating fruits and herbs to create novel value-added wine products.

OSU and the FAPC are excited about the opportunities created by our new Research Winery and Enology Lab. We see it as a valuable investment in the future and fully expect it will greatly strengthen our efforts to assist Oklahoma's grape growing and wine making industry through technical assistance, Extension outreach, applied research projects, and enhanced educational opportunities.

Publications

Stafne, E.T. 2006. 'Rubaiyat' and Oklahoma's winegrape legacy. J. Amer. Pomol. Soc. (In press).

Stafne, E.T., B.D. McCraw, and B.L. Carroll. 2006. Freeze injury on winegrape cultivars in Oklahoma. J. Amer. Pomol. Soc. (In review).

Stafne, E.T., B.D. McCraw, W.G. McGlynn, and R.K. Striegler. 2006. Effect of Rootstock on Yield and Quality of 'Cabernet Franc' (*Vitis vinifera*) in Oklahoma. HortScience 43:512 (abstr.)

Stafne, E.T. 2006. 'Rubaiyat': An old cultivar with new potential. HortScience 41:1068 (abstr.)

Stafne, E.T. and B.L. Carroll. 2006. Grape Rootstocks for Oklahoma. Oklahoma State University Fact Sheet F-6253.

Stafne, E.T. and B.L. Carroll. 2006. Muscadine Grapes for Oklahoma. Oklahoma State University Fact Sheet F-6254.