GRAPE

INTRODUCTION

Florida is the nation's second-largest consumer of grape products, including wine. The state's grape industry has been expanding thanks to increased appreciation of wines made from the native muscadine grape, known scientifically as *Vitis rotundifolia*. These wines tend to be sweet and have gained a substantial following over the years. Although they're increasingly distributed by grocery chains, muscadine wines fill only a narrow niche in a large market. However, the UF/IFAS breeding program has helped Florida expand its presence in the wine market with bunch grape hybrids representing the *Vitis vinifera* species, which produce drier, more conventional wines. In particular, the Blanc du Bois wine, made with a UF/IFAS hybrid grape variety of the same name, has come to be considered one of our premium domestic white wines. Interestingly, the grape is grown far more in Texas than in Florida.

FROM THE BEGINNING

The UF/IFAS grape breeding program was launched in the 1920s in response to ongoing interest in Florida grape production. Florida actually had a large grape industry in the 1920s but plantings of *V. vinifera* and existing hybrids failed, due to a disease that was initially known as vine degeneration, later renamed Pierce's disease, or PD. This bacterial disease killed *V. vinifera* grapes and hybrids but was relatively harmless to muscadines. At the time, muscadines were not popular for winemaking or the fresh-fruit market. Continued interest in viticulture by Florida farmers led to the formal establishment of a UF/IFAS grape breeding program, led initially by Loren Stover and then by John Mortensen, both of whom spent their professional lives breeding grapes at the Central Florida Research and Education Center.

The 'Blanc du Bois' grape, the most significant of the released varieties, was developed in 1968 when Mortensen crossed PD-resistant native Florida grapes with susceptible *V. vinifera* selections, resulting in a wine grape resistant to PD. When Mortensen retired in 1990, the formal breeding program ended.

However, UF/IFAS grape research continues. In 1984 we began applying emerging biotechnological methods to grape improvement. Three muscadine cultivars were released; 'Eudora' (2006), 'Delicious' (2007) and 'Southern Jewel' (2007), all of which were developed via conventional breeding. We are also preparing a disease-resistant *V. vinifera* hybrid for release.

TODAY AND TOMORROW

Pierce's disease and various fungal diseases continue to be the primary challenges for Florida grape production. The bacterium responsible for PD, *Xylella fastidiosa*, thrives in hot, humid climates and is transmitted by native leafhopper insects such as the glassy-winged sharpshooter. Thus far, PD has proven resistant to all control strategies except genetic improvement.

Our primary strategy for combatting PD and other maladies is a technique called cisgenic engineering or intragenic engineering, also termed precision breeding. With it, researchers insert genes from one grape variety into another, to boost desirable traits. This approach results in modified plants that contain only grape genes. Such plants are more acceptable to consumers than plants produced via interspecies gene transfers, and may be easier for federal agencies to approve.

In one recent study, we found it was possible to dramatically enhance the fungal disease resistance of 'Thompson Seedless' grapes by inserting a gene from the 'Chardonnay' grape. Other studies have aimed to enhance the resistance to PD in *V. vinifera* grapes and their hybrids. Another project focuses on development of seedless muscadine cultivars resistant to fruit rot.

The exact methods used to genetically engineer grape were developed at the Mid-Florida Research and Education Center in Apopka. Our methods and the supporting science are used throughout the world, but the Apopka center remains the most active and advanced site for grape genetic engineering technology.

The UF/IFAS viticulture program is supported by a website, http://www.mrec.ifas.ufl.edu/grapes, which provides help for growers, information on all UF/IFAS grape cultivars and current information concerning grape research programs.



G	R	A	P	E

Grape Varieties Released from 2002					
Cultivar					
'Eudora' (Muscadine)					
'Delicious' (Muscadine)					
'Southern Jewel' (Muscadine)					

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