# UF researcher's work takes Florida a step closer to disease-resistant grapes

April 27 2011, by Mickie Anderson

Dennis Gray may not be able to control Florida's humidity, but he wants to help popular grape varieties shrug off fungal diseases that thrive in muggy weather, and open up new markets for the state's growers and winemakers.

Gray, a professor with the University of Florida's Institute of Food and Agricultural Sciences, is the first researcher to boost fungal-disease resistance in grapes by giving them an extra helping of protective genes that occur naturally in grapes.

The process, known as cisgenic engineering or precision breeding, could be a major asset to Florida's $20 million-a-year grape industry, he said. Nationwide, the Sunshine State is traditionally the second- or third-largest market for table grapes and wine. The study appears in the online version of the journal In Vitro Cellular and Developmental Biology (Plant).

"In creating these kinds of new versions of existing varieties, we think we can energize the Florida viticulture industry," said Gray, at UF's Mid-Florida Research and Education Center in Apopka.

Many popular grape varieties are susceptible to disease in Florida, especially the bacterial malady called Pierce's disease, because the state's weather is hot and humid during much of the growing season, Gray said.

Consequently, growers have mostly been limited to producing muscadine

grapes, a large, thick-skinned variety developed from native grapes.

In the current study, Gray found that he could dramatically enhance the disease resistance of Thompson Seedless grapes by inserting a gene from the Chardonnay grape.

When grown under greenhouse conditions, the cisgenic Thompsons fended off powdery mildew disease seven to 10 days longer than unmodified counterparts.

In the field, the grapes showed a 42 percent reduction in sour-bunch rot disease, compared with control grapes, and the incidence of black rot was reduced by about half.

Gray is using the technology in hopes of creating cisgenic Thompson grape varieties and hopes to produce similarly disease-resistant varieties of Chenin Blanc, a traditional wine grape he believes could also work well in Florida.

Creating more disease-resistant grapevines isn't just good for Florida, it may enable UF to license patented varieties to growers in other parts of the world, Gray said.

Many grape-growing regions of the world have fungal-disease issues, and growers spray fungicides more than a dozen times in a season, he said.

"If this resistance can break the spray cycle, we could not only save a lot of money, but there would be a lot less pollution for the environment," Gray said.

Provided by University of Florida