Categories

- **Agriculture**
  - Aquaculture
  - Citrus
  - Crops
  - Cultivars
  - Economics
  - Forestry
  - Livestock
  - New Technology
  - Pests
  - Safety
  - Weather
- **Environment**
  - Biocontrols
  - Biofuels
  - Conservation
  - Green Living
  - Invasive Species
  - Pollution
- **Families and Consumers**
  - 4-H
  - Disaster Preparedness
  - Finances
  - Food Safety
  - Household Pests
  - Nutrition
- **IFAS**
  - Announcements
  - CALS
  - Departments
  - Entomology and Nematology
  - Extension
  - Honors and Appointments
  - RECs
  - Research
- **Lawn & Garden**
  - Florida Friendly Landscaping
  - Vegetables
- **Stand-Alone Photos**
- **Uncategorized**

Archives

Archives

Select Month

UF/IFAS researcher using "precision breeding" to create disease-resistant grapes

May 20, 2015

Topic(s): Agriculture, Cultivars, IFAS, Research

see caption below

Apopka, Fla. — Powdery mildew and black rot are two scourges of grape growers, but University of Florida researcher Dennis Gray is developing disease-resistant grapes, using what he calls "precision breeding" to create these super varieties.

Gray, a developmental biologist with UF's Institute of Food and Agricultural Sciences, has successfully bred Thompson Seedless, Seyval Blanc and Syrah that resist mildew and fungus. Those are just three of only 35 grape varieties that accounted for 66 percent of the world grape acreage in 2014, he said.

"The importance of improving grape varieties cannot be overstated," Gray said. "A majority of these are centuries old and maintained primarily through a stringently managed system of vegetative propagation. However, these varieties lack other very important traits, particularly durable disease and pest resistance, that are demanded by today's intensive agricultural conditions."

Producers currently rely on frequent use of pesticides and fungicides to control diseases of grape, particularly in areas of high humidity, such as northern Italy and northern California or Florida. However, the public is interested in alternatives that can decrease pesticide use, limiting its potential effects on health and environment.

Gray says that "precision breeding" is the answer to this by creating varieties that don't need to be sprayed or sprayed less frequently, thus reducing the amount of pesticides and fungicides needed.

Now Gray hopes to develop a grape that is resistant to Pierce's Disease, which needs "unsustainable mass spraying of pesticides" to stop the insect that carries it. Federal and state governments, mainly in California, have spent more than $50 million in the last 15 years to fight it with little to no success.

When a vine becomes infected with Pierce's Disease, the bacterium causes a gel to form in the tissue of the vine, preventing water from being drawn through the vine. Leaves on vines will turn yellow and brown, and eventually drop off the vine. Shoots will also die. After one to five years, the vine itself will die.

Gray also wants to move away from what he calls the scientifically inaccurate and illogical term "genetic modification" to the more accurate "precision breeding," and inform the public that it is less disruptive than conventional breeding and will finally allow the 35 ancient cultivars grown in

most of the world to be genetically improved.

"Without exception, all crops used for food and fiber have been intentionally genetically modified by humankind," Gray said. "It is a fact that *every* fruit, vegetable and grain, including all produce labeled 'organic,' that we purchase from the grocery store or farmers market are significantly and purposely genetically modified.

He points to earlier studies, showing that humans began choosing seeds from the best plants as early as the Neolithic period, some 12,000 years ago.

Soon after, people began crossing one plant with another to create a new plant. This technique uses half of the genes from one plant and half from the other plant. That is what is known as "conventional plant breeding." Precision breeding, Gray says, simply takes one or two desirable traits from one plant and inserts that DNA into another plant to create the new, improved varieties.

"Precision breeding is significantly more 'precise,' accurate, and much less likely to produce unintended consequences," Gray said.

A study on Gray's precision breeding research was recently published in the journal Acta Horticulturae. Other researchers on the study include: Zhijian Li, a molecular biologist and researcher, Trudi Grant, a post-doctoral research associate, and Deborah Dean, a post-doctoral research associate – all with UF's Mid-Florida Research and Education Center; Robert Trigiano, a professor and plant pathologist with the University of Tennessee's Department of Entomology and Plant Pathology; and Sadanand Dhekney, an assistant professor and horticulturalist with the University of Wyoming-Sheridan's Department of Plant Sciences at the Sheridan Research Center.

By Kimberly Moore Wilmoth, 352-294-3302, k.moore.wilmoth@ufl.edu

Source: Dennis Gray, 407-884-2034, ext. 126, djg@ufl.edu

For additional information on grapes, see: http://edis.ifas.ufl.edu/topic_grape

Photo caption: UF/IFAS developmental biologist Dennis Gray looks at the progress of grapevines in a vineyard. Photo by UF/IFAS

-30-

Comments are closed.

« Previous Article Next Article »

Back to Top

P.O. Box 110180 Gainesville, FL 32611-0180 | Phone: (352) 392-1971