

In 1988, the Honduran Foundation for Agricultural Research (FHIA) finalized the development of a Gros Michel hybrid banana that was resistant to Panama disease, but by that time the Cavendish had long been the key export variety. The hybrid, known as FHIA 17, has proven its worth in the Central American country and elsewhere in Latin America, but the foundation is yet to receive a single lempira in licensing fees from abroad. At www.freshfruitportal.com we speak with a researcher who is testing the hybrid at higher altitudes, as well a foundation scientist whose current goal is to breed a Cavendish that is resistant to the global industry's biggest threat - Panama Tropical Race 4.



FHIA banana and plantain program leader Juan Fernando Aguilar says more growers are requesting to plant the hybrid, while in his travels throughout South America and the Caribbean he has seen it pop up in various places.

"The FHIA 17 has been around for 24 years and only now are we really starting to see its value," he tells www.freshfruitportal.com.

"Gros Michel is a very appreciated for local consumption in all Latin American banana-producing countries, and in all of these countries Cavendish is produced as well for exports to countries outside the region.

"It is a good source of income for growers exporting to places like El Salvador, and if their farms are Panama disease-free they can keep doing so, but when there is a problem that's when they look to FHIA 17 as an option."

He says growers in other countries such as Colombia can control Panama disease and at the same time have higher yields by utilizing the FHIA 17 strain, which is currently done using a Gros Michel mutation called Cocos.

He adds while the banana is popular in the region, it is unlikely to take Northern Hemisphere markets by storm.

"The problem with exporting Gros Michel or FHIA 17 to the U.S. or Europe is that those markets have a defined taste and expected appearance, with a certain size and number of banana fingers per bunch."

Further testing

To analyze the way FHIA 17 performs at different altitudes, the Honduran Coffee Institute (IHCAFE) and Bioversity International are conducting trials to adapt it to different areas.

Two experiments are underway - one in Jesús Aguilar Paz in Santa Bárbara at 950 meters (3,116ft) above sea level, and another in Las Lagunas in La Paz at 1,400 meters (4,593ft).

Napoleón Matute heads up the research team at Las Lagunas which has been working on the project for the last two years, testing the banana in-vitro with plant tissues and evaluating how it copes at a higher altitude.

"We have tested the flowering, how long it takes after it is planted, how the bunches form, etcetera - we have conducted most of our testing but we still haven't assessed the brix level," he says.

"In my area there are about 500 growers and initially these plantations had about 10% infected with Panama Disease, but now it is present in about 20% of the Gros Michel crops.

"The problem with Panama disease is that it's spreading into more zones and it's difficult to detect, so in conjunction with helping implement this resistant variety in higher areas we are also helping growers train in the technical skills needed to identify and also contain the spread of Panama disease.

He says the Gros Michel is sweeter than the Cavendish and is also more resistant to bruising.

"FHIA 17 may not be as sweet as the Gros Michel but it has a very sweet taste and good texture, unlike the Cavendish which tastes tougher.

He highlights that the variety is popular in El Salvador and Guatemala, which are export destinations for the growers in his region. But growers are looking for alternatives as Panama disease spreads.

"You have to adapt because if you don't you lose your market. You just can't keep simply doing the same thing."

A stronger strain, a stronger banana

Breeding a banana that is resistant to the original Panama disease is one issue, but developing one that can withstand the threat of strain Panama Tropical Race 4 that destroys Cavendish crops is perhaps the global industry's greatest challenge.

The strain has devastated plantations in China, the Philippines, Indonesia, and in some parts of Australia and the African continent.

Aguilar says while many scientific studies have deemed the female Cavendish plants as sterile, which impedes the possibility of traditional breeding techniques to develop new varieties, FHIA's banana and plantain program has sought to use conventional techniques to make Black Sigatoka and Panama Tropical Race 4-resistant varieties.

The project began in 2002 with the pollination of 20,000 Williams (also known as the Giant Cavendish) cultivar bunches with the pollen of 10 parents to develop female tetraploids. As a result of this effort the team came up with 40 viable embryos and developed 20 hybrid plants.

An FHIA report says these results show Cavendish bananas are not quite sterile but just have low fertility.

Aguilar says the fact they are not 100% sterile has enormous implications for the application of classic breeding techniques to create new banana progenies, which hopefully will go towards resistant varieties.

The FHIA report said varieties have been selected from the project that have shown resistance to Panama disease Race 1 and Black Sigatoka.

"These plants have the same height, growth cycle, smell and flavor as the Cavendish, however the pseudostem and the structure of the leaves and form of the fingers is different," says Aguilar.

"It is imperative, again, not to depend on one variety for the production of export bananas.

"That makes it necessary to develop a higher number of possible tetraploid females through which can be produced a minimum of 2,000 experimental hybrid triploids, which gives us an opportunity to pre-select 200 hybrid triploids that are resistant to BS and FOC 1 [Fusarium oxysporum f. sp. cubense, which is a cause of Fusarium Wilt or Panama disease]."

Photo: FHIA

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