



## Feed the Future Country Fact Sheet

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# Drought-Tolerant, Disease-Resistant Fruit Helps Farmers and Forests in Ecuador



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In Ecuador, an improved variety of the naranjilla fruit is both climate-smart and resistant to disease.

Few consumers in the United States have ever eaten *Solanum quitoense*, more commonly known as the naranjilla, a small orange citrus fruit that looks like a cross between a tomato and a persimmon. But in Ecuador, naranjillas are a common and nutritious food crop rich in vitamins A, C and K.

Unfortunately, naranjillas are also susceptible to a pernicious plant disease called *Fusarium* wilt, which lives in soil season after season and cannot be controlled by standard chemical fungicides. As a result, smallholder farmers who grow naranjillas for a living have to relocate their plots after every single growing season, clearing ever greater tracts of forest land in the process.

To address the dual challenges of crop disease and natural resource depletion, two Feed the Future Innovation Labs joined forces to help smallholder farmers in Ecuador improve cultivation of this marketable crop without causing long-term damage to their land. Working with local farmers about 50 miles from Quito, the Feed the Future Innovation Labs for Collaborative Research on [Integrated Pest Management](#) (IPM) and [Sustainable Agriculture and Natural Resource Management](#) (SANREM) teamed up to help farmers grow healthier, more resilient crops.

For many countries where a large percentage of the workforce is employed in farming activities, conserving ecologically vital forests while also supporting growth in the agriculture sector can be a complex balancing act. In Ecuador, which has one of the world's highest rates of deforestation, the clearing of steep slopes for farming purposes has resulted in increased erosion that leaves the land vulnerable to heavy rainfall and can have serious consequences on the local soil, water and forest resources.

Jeff Alwang, principal investigator for the Feed the Future project, notes that the impacts of these farming practices are widespread and long-lasting. "Once you have changed the eco-scape in this fashion, you can't quickly reverse the negative effects. The damage has been done," he says.

Fortunately, a new plant variety introduced by the IPM and SANREM Innovation Labs has helped create a viable solution for both farmers and forests. Feed the Future partners at Ecuador's national institute for agricultural research found that a wild plant species similar to the naranjilla, called *Solanum hirtum*, is resistant not only to *Fusarium* wilt, but also to an infesting roundworm that is another common threat to plants.

*Solanum hirtum* is also more tolerant to drought than *Solanum quitoense* (naranjilla). By genetically grafting *Solanum quitoense* onto *Solanum hirtum*, scientists have been able to create a climate-smart “superplant” that can withstand various climate, pest and disease threats to crop yields and whose fruit sells for a higher price than the traditional naranjilla fruit.

While the upfront costs of growing the genetically improved plants are higher than growing traditional naranjillas, researchers have found that the improved fruit increases economic returns by 40 to 60 percent compared with commonly grown varieties. Now that they can earn more and use the same farming plot over several seasons with the new, more resilient variety, naranjilla farmers in Ecuador are cutting down fewer trees in the region and pursuing more sustainable livelihoods.

Learn more about the Feed the Future’s work on [integrated pest management](#) and [sustainable agriculture](#).