

Improving papaya varieties for Guam's fresh markets



UOG undergraduate Tristan V. Paulino learns how to produce directed out-crosses and self-crosses in papaya for breeding and seed production programs.

Papaya is a popular fruit in Guam and can be found in many residential gardens and roadside scrub forests. Papaya fruit is highly nutritious, and the trees can start producing fruits in as little as nine months given optimal conditions. Many nutrition education and sustainable agriculture programs in Guam include papaya for these reasons. Therefore, the number of local residents who want to grow their own papayas is increasing. Almost all backyard growers purchase seeds or seedlings from local nurseries and hardware stores, but these are papaya varieties imported from Taiwan and are not specifically adapted to Guam's environment and consumer preferences. As a result, many of these young papaya trees soon succumb to diseases such as papaya ringspot and Erwinia rot, reducing the tree's fruit production, fruit quality, and eventually killing the tree.

Dr. Andrea L. Blas has re-started Dr. George Wall's (WPTRC, retired) program to create improved varieties of papaya targeted for Guam's environment and consumer preferences. Erwinia rot and papaya ringspot diseases are endemic in Guam, meaning they are always present at low levels but some years their incidence increases when environmental conditions are optimal for disease development or spread. These are two diseases for which the Taiwanese papaya varieties do not have genetic resistance or tolerance, however, our local Guam landraces of papaya do. Landraces are



Above left, a papaya crown killed by an infection of Erwinia rot. At right, a developing stem canker from Erwinia rot. This papaya tree may survive the initial infection but the integrity of the tree in strong winds is compromised.

varieties of domesticated animal or plant species that have adapted to their local, natural environment over a long period of time. But the local landraces lack the fruit quality traits that the Taiwanese papaya varieties offer. Since 2016, Dr. Blas has produced directed crosses resulting in about a dozen new hybrid lines that are now under evaluation for uniformity, disease tolerance, and fruit quality. These hybrids between local landraces and imported varieties from Malaysia, Indonesia, Thailand and Hawaii will eventually lead to new commercial varieties that possess the fruit quality traits preferred by our local papaya consumers, the disease tolerance/resistance needed for our local environment, and true-to-seed reproduction for sustainable agriculture.

The first of these hybrid papaya trees is planned for release at the 2019 University of Guam Charter Day. Dr. Blas is now planning with the Research Corporation of UOG and the Small Business Development Center to create a student-run, seed-production company to allow UOG Agriculture & Life Sciences students to produce, market and distribute seeds for these new hybrids and varieties.

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