



## VIRUS RESISTANT PAPAYA: THE PHILIPPINES

### LESSONS FROM HAWAII

Papaya is one of the most important crops in the Philippines from both an economical and a nutritional perspective. Most of the papaya is grown by Filipino small-scale farmers and around 98% is consumed locally, adding antioxidants, vitamins and minerals to the Filipino diet. Most of the papaya is grown on the main island of Luzon which is under quarantine because of the severe impact of the destructive Papaya Ringspot Virus (PRSV) disease. When a similar infestation appeared in Hawaii, the industry was saved through introduction of PRSV resistance into papayas through advanced GM technology. Encouraged by this success, this same strategy is being applied in the Philippines where crops resistant to the local variety of PRSV are being studied in cooperation with local entities and Monsanto.



Source: ABSPII

**Healthy Papaya Plants**

### BIOTECHNOLOGY

Because no natural resistance exists to the PRSV, GM techniques have been explored as a means to “vaccinate” papayas from this virus. Genes of PRSV isolated from infected local varieties of papaya have been cloned and used to transform the papaya genome to produce virus resistant plants.

### REGIONAL IMPACT

Approximately 9,000 hectares in the Philippines are cultivated with papaya, grown by mostly small farmers with less than 1 hectare. Papaya production varies from 77-132 thousand tons in the Philippines with an estimated price of \$130 per metric ton. Combining increased yield, production and price, the anticipated total benefits from the GM PRSV papaya are approximately US\$70M over a 16 year window.



Source: ISAAA

**Papaya Ring Spot Virus**

### PROJECT STATUS

Promising resistant bioengineered papaya lines have been created and verified under laboratory and greenhouse testing. Confined and multi-location field trials will be performed to assess safety and success of this new variety. Much like other USAID projects, this could be the first public sector crop developed for small holder farmers in the Philippines that can serve as a model project for future crops.

For more information on USAID Biotechnology programs, visit

[http://www.usaid.gov/our\\_work/agriculture/biotechnology/](http://www.usaid.gov/our_work/agriculture/biotechnology/)

**USAID Partner Organizations:** Cornell University (USA), University of the Philippines, Los Baños (UPLB) - Institute of Plant Breeding (IPB), Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (Philippines), International Service for the Acquisition of Agribiotech Applications (Philippines), Malaysian Agricultural Research and Development Institute (Malaysia), Monsanto (USA), Virginia Polytechnic Institute (USA)