

# CROPS IN CRISIS: PAPAYA

## ORIGIN OF THE PAPAYA

Papaya plants are thought to have started growing in southern Mexico and Central America. Spanish explorers took seeds from the papaya plants of Mexico and transported them to the Philippines, Malacca, India, and other South and Central American countries, including Panama. In 1626, seeds were sent from India to Naples. The papaya was then introduced to nearly all tropical regions.

Due to its widespread prevalence, the papaya has many different names. It is called pawpaw in Europe and Australia, fruta bomba in Cuba, papaye in France, and mamao in Brazil.

## WHY IS PAPAYA A “CROP IN CRISIS”?

Currently, papaya ringspot virus (PRSV) is the most serious threat to papaya production worldwide. There is no cure for the disease at this time. The only method of control is cutting down infected trees or cultivating genetically engineered varieties resistant to the virus.

Though PRSV was a limiting factor in the production of papaya on the Hawaiian island of Oahu for decades, in 1992 it was discovered in the district of Puna on Hawaii island, where 95% of Hawaii's papaya was grown. Within two years, PRSV was widespread and causing severe damage to the papaya in that area. In anticipation of the virus' spread, a field trial to test a PRSV-resistant transgenic papaya had started in 1992. By 1995 the Rainbow and SunUp transgenic cultivars had been developed. These cultivars were commercialized in 1998.

The transgenic varieties are now widely planted in Hawaii and have helped to save the papaya industry from devastation by PRSV. Transgenic papaya have also been developed for other countries, such as Thailand, Jamaica, Brazil and Venezuela, though activists have destroyed some test fields. Efforts are under way to have transgenic papaya deregulated in these countries.



# NUTRITIONAL INFORMATION ABOUT PAPAYA

Vitamin C, which is a great infection-fighter and free radical-scavenging antioxidant, is one of the strong points of papaya, providing a whopping 144% of the daily recommended value (DRV) per serving. Other vitamins include 31% of the daily value of vitamin A, which is required for healthy skin, mucous membranes, and vision, and especially effective against macular degeneration. Papaya provides 13% of the DRV of folate, and good amounts of fiber and potassium, a cell and body fluid component that helps control heart rate and blood pressure.

The B vitamins in papaya, such as folic acid, pyridoxine (vitamin B6), riboflavin, and thiamin (vitamin B1), are called “essential” because the body requires these vitamins, but does not produce them, and instead depends on metabolizing them from an outside source. That’s why foods like papaya are part of a healthy diet.

Papayas contain 212 amino acids and several enzymes, including papain, a proteolytic enzyme that has an anti-inflammatory effect on the stomach, reducing the swelling and fever that can develop post-surgery. Papain helps proteins digest faster, which discourages acid reflux, and has demonstrated effectiveness in treating ulcers and even relieving irritable bowel syndrome. Papaya seeds have been used in folk medicine to treat parasite and ringworm infections.

## PAPAYA PRODUCTION

Papaya thrives in warm, humid conditions. It is generally intolerant of strong winds and cold weather. Temperatures just below freezing can kill small plants to the ground; larger plants that are not killed outright will normally produce suckers to regenerate the plant and bear fruit within a year.



Hawaii is the major producer of papaya in the United States, with 2410 acres under cultivation in 2009. It is also estimated that there were 350 acres of papaya grown in Dade County, Florida, in 1987-1988. A Federal Marketing Order sets fruit size and quality requirements for papayas marketed in or exported from Hawaii.

The United States also imports papaya from foreign countries. In 1989, the United States imported 6 million pounds of fresh papaya at a CIF (cost, insurance, and freight) value of \$1.1 million. Mexico was by far the largest supplier, providing 76% of the total. Other major suppliers were the Bahamas (9.7%) and the Dominican Republic (7.5%).

## FUN FACTS

- The papaya is actually classified as a berry.
- The black seeds in the center of a papaya are edible and have a spicy, peppery taste.
- Papaya plants are not trees, but giant herbs.
- Papaya plants can grow 6-10 feet in just 10-12 months.
- Papaya seeds and leaves have been used for medicine in tropical cultures.
- Papaya contains an enzyme, papain, that can be used as a meat tenderizer.

## CROPS IN CRISIS: A ROLE FOR BIOTECHNOLOGY?

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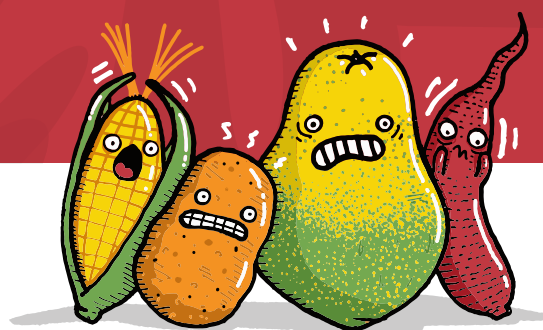
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