



## Rainbow Papaya

Papaya / Red Fleshed Sun UP (from Sunset) and Yellow fleshed UH Rainbow (from Kopoho)

### What?

In Hawaii, the papaya industry was at risk of being lost because of the papaya ringspot virus (PRSV). The disease is spread by aphids moving from infected trees to healthy trees. Once infected, a tree never recovers. The GMO papaya is resistant to PRSV.

### How?

The coat protein gene isolated from a mild strain of PRSV was used to ‘inoculate’ the papaya, providing resistance against a severe strain.

### Original Research

Researchers from Cornell University and the University of Hawaii initiated the development of PRSV-resistant papaya by gene technology.

### Commercial Development

As of 2010, 80% of Hawaiian papaya plants were genetically modified. The modifications were made by University of Hawaii scientists and the modified seeds were made available to farmers without charge.

### Registration

The success of field trials led to the 1995 submission for regulatory approval to commercially produce GM papaya. American regulatory agencies approved GM papaya in 1998. Canadian regulatory agencies approved GM papaya for import in 2003. GM papayas were submitted for Japanese regulatory approval in 1999 with approval was granted in 2011. The first GM papayas were commercially grown in Hawaii in 1998 and the “Rainbow” GM papayas were first imported to Canada in 2003.

### Consumer concerns and responses

#### Can the GMO papaya get into the environment and affect non-GMO plants?

Transgenic papayas were found to have no effect on the surrounding ecology such as non-transgenic papaya trees, microbial flora, beneficial insects, or soil microbial community. Gene flow is quite low among papaya as most of the papaya in Hawaii was hermaphrodite (one plant has both sexes).

#### Is there a risk of toxins or allergens in Rainbow Papaya?

As with all crops developed through genetic engineering, Rainbow Papaya underwent stringent testing by regulatory bodies in the US and Canada before being approved. It was determined that the transgenic papaya does not pose any risk of food allergies and the fruit is an equivalent substitute for traditional papaya.

## Commercialization challenges

Thailand and Philippines have ongoing research to adapt GM Papaya from Hawaii but neither has approved the crop.

Greenpeace stopped field trials in Thailand.

## References

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