

This Cornell scientist saved an \$11-million industry — and ignited the GMO wars

The Problem

It started with rotting flesh. Slicing into the green skin of a Hawaiian papaya ordinarily yields juicy, salmon-colored fruit that's almost custard-like in its consistency and sweetness. But in the early 1990s, one Hawaiian farmer instead found bits of whitish, dried-out flesh in his recently harvested fruit. On the skin were discolored spots resembling tiny rings. The culprit was an incurable virus called Papaya Ring Spot Virus (PRSV).

The Solution

In 1992, Dennis Gonsalves, a plant pathologist at Cornell University who grew up in the region most acutely affected by the virus, came up with a wild idea to stop it. He wanted to vaccinate the papaya crop from the virus using genetic engineering. To do it, Gonsalves and two other scientists (his wife Carol Gonsalves and David R. Lee) opened up the papaya genome and carefully inserted [a gene from the ring spot virus](#) into its genetic code.

After nearly a decade of work, Gonsalves and his team created a papaya plant that was genetically resistant to ring spot. The Gonsalves' crops blossomed across farms that had been decimated by the virus. Today, their fruit, which they named the Rainbow papaya, [dominates Hawaii's papaya exports](#).

"We saved the papaya industry," Gonsalves says in a [new film narrated by Neil de Grasse Tyson called "Food Evolution"](#), which is set to premier on June 23. "That's it."

The Opposition

"Food Evolution" dives into the controversy surrounding genetic modification, and opens with a 2013 scene of the Maui County Council floor. At the time, council member Margaret Wille was introducing a bill to ban GMOs from the Big Island.

"We are at a pivotal time in the history of this island," Wille told the Maui County Council in September 2013. "We have an opportunity to act, to do something. We would make history on this island. Let's make this island a model for the rest of the world."

Wille's proposed ban received [more vocal support](#) than any bill the council had previously considered — even more than its "perennially popular bids to decriminalize marijuana," according to a 2014 [New York Times story](#) by Amy Harmon.

Anti-GMO activists from around the world were video-conferenced in to the hearing to speak in support of the ban. Scientists, on the other hand, were not given as much time to speak.

Papaya farmers voiced staunch opposition to the bill, which forced Wille to amend it to "grandfather in" the fruit. Essentially, that meant the Rainbow papaya was exempted from the ban, so long as farmers registered with the county and paid a \$100 yearly fee.

The ban was approved and signed into law in 2014 but subsequently entered a kind of legislative limbo. In 2015, the federal government suggested it might [overturn the ban](#), and sent to the US Court of Appeals for further debate. The following year, a federal judge killed the legislation, ruling that Hawaiian counties could not enact their own GMO bans.