GMO Taro
Research must continue

by Susan C. Miyasaka

Our article "Patents on Life" was a sincere attempt to discuss a very complex, controversial topic. However, you had several errors or gaps in your information.

As the lead scientist on the now-ended research project to improve disease resistance in Chinese taro through genetic engineering (GE), I can write with authority about GE Chinese taro. First, my team made no effort to insert disease resistant genes into Hawaiian or Samoan taro varieties. The first step in genetic engineering is to develop a callus (undifferentiated tissue) capable of regenerating into a whole plant: the plant equivalent of a stem cell. We were unable to obtain a regenerable callus through manipulation of plant hormones from the Hawaiian variety Maui Lehua, but were successful with the Chinese taro Bun long, so we focused our genetic engineering research efforts on Chinese taro.

Second, we successfully inserted a disease resistance gene from grape into Chinese taro, resulting in complete tolerance to Taro Leaf Blight under laboratory conditions. However, there are no plans at this time to continue this promising research into the field-testing stage in Hawai‘i due to lack of funding.

Third, GE Chinese taro could co-exist easily with Hawaiian taro varieties without much risk of accidental movement of foreign genes, because: a) Bun long rarely flowers under the environmental conditions in Hawai‘i; b) Hawaiian taro varieties flower but rarely produce viable seed (without hand pollination); and c) the insect capable of pollinating taro flowers is absent from Hawai‘i.

Fourth, Dean Andrew Hashimoto of CTAHR signed an agreement in 2005 for a moratorium against genetic engineering of Hawaiian taro varieties until a dialog is established with native Hawaiian community groups. Senate Bill 958 is not needed to protect Hawaiian taro varieties from genetic engineering research in Hawai‘i.

Fifth, the former UH-patented taro varieties resulted from conventional breeding in which hand pollination was used to cross Maui Lehua with Paluan taro. Ancient Hawaiians probably practiced conventional breeding to develop their 300+ taro varieties and it is considered acceptable by most native Hawaiians today. What was not considered acceptable was the patenting and the need to pay for these conventional hybrids. The university decided to respect the native Hawaiians' intellectual property rights and, in 2006, turned over these patents to activists, who tore them up.

Sixth, all Hawaiian taro varieties have been found to be susceptible to a South Pacific viral complex called Alomae-Bobone. After its accidental introduction to the island of Makira in the Solomon, Alomae-Bobone needed only 15-20 years to wipe out taro production in several large areas. Think about all the invasive pests that have reached Hawai‘i recently: coquis, nettle caterpillars, Erythrina gall wasps, Varoa mites on honeybees, etc. What are the guarantees that Alomae-Bobone will not reach Hawai‘i?

Genetic engineering has been most successful in increasing crops' viral disease resistance, as with papayas engineered for resistance to ringspot virus. This new technology might be used to engineer resistance in Chinese taro to Alomae-Bobone viral complex; however, such research will not be allowed if Senate Bill 958 is passed. Yes, there are risks to this new biotechnology, but as with stem cell research, many problems can be solved only if research can continue.

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