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GMO Answers Contributor

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Why It's Time We Find Common Ground In Genetic Engineering

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Asian Citrus Psyllids feeding on a Florida citrus sapling. Asian Citrus Psyllids transfer the pathogenic bacteria Candidatus Liberibacter into the plant during feeding, leading to the Citrus Greening disease. (Photo Credit: UF/IFAS)

There is a canyon widening between scientists and public perception – a mistrust of science that has manifested prominently in disciplines like climate change and vaccinations. And it's happening with genetic engineering. As a graduate student researching plant genetics, I am constantly in the unpopular position of justifying genetic engineering to my own generation. Today's crops made with this technology are safe to eat, advantageous for the environment, and more profitable to the farmer. The EPA, USDA,

FDA, WHO, the EU and other world-agencies all support these claims. How is it possible that these facts fail to match public perception?

While the public discussion is mired in non-scientific internet memes and conflated arguments about multinational corporations, concerned people miss the compelling truths of genetic engineering's great achievements.

How Genetic Engineering Revolutionized Insulin Production

If you were a diabetic before the 1980's, to stay alive you needed injections of insulin processed from the pancreases of slaughtered livestock. These insulin preparations were expensive, and sometimes didn't work well or caused allergic reactions due to impurity. The first-ever FDA approval of a genetically engineered organism solved all of these problems. Using essentially the same techniques we use to improve crops, the human insulin gene was installed in yeast. These genetically engineered yeast produce huge amounts of 100% human insulin that are easily purified, both increasing safety and reducing cost to the patient. Today, we've even improved on medicinal insulin by engineering small mutations that tailor its effects to different kinds of people. Personalized medicines like this hold the potential to vastly improve human health.

How Genetic Engineering Saved the Hawaiian Papaya

The earliest introductions of GM technology in crops were similarly successful. In 1995, the Hawaiian papaya was under existential threat from a new and ferocious virus, which had recently jumped islands to reach the production capitol of the state. Within a few years, production had been cut in half, devastating the local traditional farmers. A Hawaiian public scientist saw the imminent collapse of this family-run industry, and quickly developed a genetically modified papaya immune to the virus. Seeds were distributed to farmers at-cost. The Rainbow Papaya rescued an entire region of small farmers from bankruptcy, and ensured continued production of this traditional crop. Today, Rainbow Papaya is regarded as the savior of the industry in Hawaii, and remains the most cultivated variety.

How Genetic Engineering *Could* Save Florida's Citrus Groves

Over the last twenty years, scientists have created a tremendous toolbox and devised countless solutions to real human problems. Yet, many of these technologies are not deployed because we have let misguided fears shape a system where the best solution is often legally and practically impossible. At the University of Florida, I am surrounded by a citrus industry that has collapsed due to a disease called Citrus Greening, with 90% of Florida citrus groves now infected and yields down by 40% and falling. If genetic engineering solutions had been embraced ten years ago, we might have saved regional family economies and ensured production of an affordable and nutritious food.

Why We Need to Have Every Tool On The Table.

We all agree that better medicine and successful farmers are a positive force for the world. There is no fundamental reason to feel opposed to recombinant DNA in agriculture. For over twenty-five years, genetically engineered crops have proven their utility, and continue to do so without a single substantiated case of harm to people.

Now at the onset of my career, I am frequently asked what I intend for my future to look like. Solving a problem like papaya doesn't need to be too much to ask for. But to solve a problem like papaya, citrus disease or foods destined to serve the malnourished, we need to have all of the tools on the table. In order to be that citizen-scientist hero, I need the best utility belt. Our challenge is to create new, safe and powerful technologies that can solve problems for people, and by being better messengers of science we can ensure that all have access to the best agricultural innovation.

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