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Cassava Crop Poised to Be Next GM Success

By Nicholas Staropoli — October 27, 2015

[1]
Cassava fields via Shutterstock
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Bangladesh [3] announced last month that it was moving ahead with field trials of Golden Rice, which in itself represents a big step forward in fighting vitamin-A deficiency, a condition that kills hundreds of thousands globally each year. But perhaps the biggest impact of that decision is that it paves the way for production of other Genetically Modified Organisms, such as an enhanced cassava root crop in Africa.

Despite its life-saving potential, Golden Rice has faced an onerous battle for both public and political support. This struggle, however, was never just about the rice itself; it was about gaining acceptance for GM crops in general. In particular, those created not to enhance profit margins, but instead to better society.

Golden Rice was the trailblazing crop, but others were always destined to follow particularly because they could follow such a successful formula. Pick a nutrient deficiency, then find a food that's already consumed in high numbers by an affected population. For Golden Rice that meant Asia, where vitamin-A deficiency affects as many as 90 percent of its population -- and where rice is a cultural staple.

Now, scientists, publishing [4] in the journal *Nature Biotechnology*, announced they have genetically engineered cassava roots and leaves to produce higher levels of vitamin B6. The cassava plant is a staple crop of many African cultures affected by a significant B6 deficiency.

Currently, the cassava root produces a minute amount of B6, but in order for an individual to receive their recommended daily amount this way it would be necessary to consume roughly 1.3 kilograms (three pounds) per day. Compare that to the GM version, which would require consumption of just 500 grams of roots (boiled, in order suppress naturally occurring cyanide compounds) or 50 grams of leaves -- about the amount in a salad.

Vitamin B6 is used as a co-enzyme in as many as 100 different cellular reactions, many of which involve protein metabolism. It's also involved in cognitive development, immune function and sugar

metabolism. Deficiency of this vitamin is associated with anemia, EEG abnormalities, glossitis (swollen tongue), depression, cognitive impairment and weakened immune function.

The genes used to successfully make this GMO were from the model organism *Arabidopsis thaliana.* Researchers inserted two genes that coded for the enzymes, PDX1 and PDX2, which are involved in vitamin B6 synthesis in *A. thaliana.* The changes did not affect yield of the cassava plant in both field and greenhouse test.

It's unclear when commercial growing of this crop will begin.
