

Biotech

In focus

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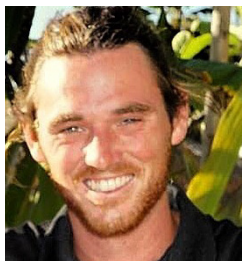
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Is the New Spud Crud?

This week's **Biotech in Focus** came from a paper written by Arthur Nash, a University of Hawaii at Manoa student who recently enrolled in TPSS 416 (Introduction to Social, Ethical, and Political Issues Associated with Biotechnology). Designed for non-majors, this class is offered by the Department of Tropical Plant and Soil Sciences in UH Manoa's College of Tropical Agriculture and Human Resources.



The Innate™ potato is a new cultivar developed by the J. R. Simplot Company for human consumption. This genetically engineered (GE) or modified (GM) potato was recently approved for commercial production by the U.S. Department of Agriculture and the Food and Drug Administration. It has taken over ten years for Simplot to bring this potato to market.

The Innate cultivar was created using a relatively new approach for genetic engineering. Instead of adding genes from other organisms, the Innate potato contains genes from wild potatoes and cultivated varieties of potato. These extra potato genes trigger a natural cellular process called RNA interference, that is used by many living organisms to change levels of gene expression.

Innate potatoes have traits that can benefit growers, food processors, and consumers. They develop fewer black spots from bruising, and they brown less after being cut. As a result, the potato will be less damaged during harvesting, postharvest processing, and transportation. The potato's shelf life is improved postharvest and growers are able to ship produce greater distances while maintaining quality and minimizing product losses.

Innate potatoes also produce less asparagine, which when cooked at high temperatures can degrade to an undesirable, potentially harmful chemical regarded as a potential carcinogen, called acrylamide. This reduction in asparagine can result in potato products that are healthier for consumers and could make the Innate potato more appealing to the public.



Image from: www.wellnesswarrior.org



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Pest & Virus Resistant Potatoes A No Go

Innate is not the first GM potato developed for human consumption. From 1995 to 2001 the NewLeaf potato variety, modified to express a bacterial protein that made the plants resistant to the Colorado potato beetle, was available. NewLeaf Plus incorporated potato leafroll virus resistance. The control of these two pests accounted for ~80% of insecticide used on potatoes. This control meant that growers significantly reduced their pesticide usage. NewLeaf is no longer on the market because of controversy and commercial resistance by large users of processed potato products such as McDonalds who were afraid of vocal anti-GE opposition and the difficulty of segregating non-GE from GE potatoes. Growers in the absence of these varieties have had to revert to greater pesticide usage.



Wider Acceptance?



Unlike NewLeaf and NewLeaf Plus, all of the added genes in the Innate potato come from other potato cultivars. Innate does not cause the potato to produce any proteins not typically produced by potatoes. As a result, this new GM potato may find wider acceptance. A frequent argument against GM crops is that the transferred genes are from very different organisms.

GM Concerns

Still, many of the concerns facing any GM crop are relevant for this new potato cultivar. Concerns include the issue of whether it is moral to alter the genetic code of an organism, as well as questions about the potential health effects or environmental impacts of GM organisms. In addition, acceptance of the Innate potato depends on the daunting task of breaking into the current potato market and being purchased by farmers for production.



Future Success



Despite the new potato's traits, farmers may be afraid that they will not be able to sell the product because of the negative stigma attached to GM technology. The future success or failure of the Innate potato remains to be determined.