# Sustainable potato that resists blight given green light by USDA, but anti-GMO activists remain opposed

You've undoubtedly heard of the Irish Potato Famine. Also known as the Great Famine, it was a period the late 1840s and early 1850s in Ireland of disease and starvation.

By the early 1840s, the Irish rural poor and much of the rest of the country's economically depressed population had come to depend heavily on the potato for their diet. But in 1845, the late blight caused by the water mold *Phytophthora infestans* appeared, destroying the edible roots of the potato plant. Much of that year's potato crop rotted in the fields. This partial crop failure was followed by more devastating failures in 1846 to 49, as each year's potato crop was almost completely ruined by the blight.

The late blight almost certainly was imported accidentally from North America, where it has been a periodic plague for centuries. The same disease destroyed more than half of the tomato crop in the eastern United States in 1946, leading to the establishment of a blight-forecasting service in 1947.

Now modern science has a protection against it: A potato genetically engineered by J.R. Simplot Company to resist the pathogen has cleared its first federal regulatory hurdle. Sold under the company's Innate brand. This is the second genetically engineered potato developed by Simplot to gain approval — In March, the USDA cleared sale of the Innate potato whose DNA has been altered to resist bruising and browning, lower its sugar content and reduce levels of the natural chemical asparagine, which lowers the production of acrylamide in the frying process by as much as 90 percent.

simplot innate potato

Food advocacy groups, long cornered about a suspected acrylamide-cancer link, have vocally campaigned against sales of French fries and potato chips. Their advocacy efforts, however, suddenly fell to a murmur after the introduction of the first Innate potato, as many of these same groups actively lobby against GMOs.

In a typical diatribe, GM Watch, a weathervane for anti-GMO movement, called the innovation, widely hailed by scientists and consumer groups, as "superfluous," mocking health, consumer and farmer benefits. Besides falsely claiming that the potato is transgenic — which, it is not — GMO Watch asserted that "this GM potato appears to be yet another GMO white elephant. Not only does nobody want to buy it (e.g. McDonald's and Frito-Lay), but nobody needs it either."

The first generation GE potato, marketed as White Russets, has been eased into test markets this summer. Doug Cole, the company's director of marketing and communications, said about 400 acres' worth sold out in 10 states in the Midwest and Southeast. The company plans to market about 2,000 acres of potatoes next summer.

Like the first generation Innate potato, version two is not transgenic — it's cisgenic. No "foreign genes" from other species were inserted — a major sticking point for some critics of GMO innovation. The modifications were made by silencing existing genes or adding genes from other types of potatoes, not

from other plants or animals.

“It’s potato genes in the potato,” said Haven Baker, vice president of plant sciences at Simplot. “There are clear benefits for everybody, and it’s just a potato.”

**[For an analysis of the genetic engineering process, see this GLP article by scientist Layla Katiraee ]**

This Innate potato has two unique characteristics not available in version one. It includes an additional trait the company says will allow potatoes to be stored at colder temperatures longer to reduce food waste. And it contains blight resistance, which will come as a relief to potato farmers in the U.S., and for those in other countries, Ireland included, if anti-GMO activists do not mount scare campaigns to scuttle government approvals.

“For historical reasons and current agriculture reasons, this is an important milestone,” said Baker. “The Irish potato famine did change a lot of Western history. Even today – 160 years later – late blight is a $5 billion problem for the global potato industry.”

According to a report in the Associated Press, the company said it expects FDA and EPA approvals within a year. Commercial planting would likely begin in 2017, with the second-generation potatoes available to consumers that fall. Simplot is working on a third generation, which Baker said will have a resistance to a type of virus that can make potatoes unmarketable. He said the company hopes eventually to have potatoes that require less water and can better survive heat and drought. That could be important as climates appear to be growing more volatile.

The Genetic Expert News Service (GENeS) — an independent NGO started with seed funding from the Genetic Literacy Project that provides journalists analysis from independent scientists on breaking biotechnology and genetic stories — was provided extended quotes from two of the country’s top potato scientists in the United States:

**Dr. David Douches, Professor and Director of MSU Potato Breeding and Genetics Program, Michigan State University (website):**

*Expertise: Potato breeding and genetics. Dr. Douches has conducted independent field trials of the genetically engineered Simplot potatoes.*

> Most U.S. potato varieties have no resistance to late blight so this is a major enhancement for the potato community. Late blight is caused by a pathogen which can rot the tubers. Before the disease moves in during the summer, farmers are required to protect their crop so that they are in a position to manage the disease when it hits. That requires a weekly spray schedule to protect the crop, which accelerates if and when the disease hits. Having some resistance in the potatoes allows the farmer to cut back on their fungicide needs and still have some crop

protection.

The invertase silencing, besides reducing the sugars available in the tuber, lowers the temperature at which the potatoes can be stored. It's a real bonus because having to store potatoes at a warmer temperature cuts the maximum storage time, increases the probability of rotting and reduces shrinkage caused by the potato losing moisture. So you are able to store the crop longer with better quality and less disease.

**Dr. Richard Veilleux, interim head, Department of Horticulture, Virginia Tech University (website):**

*Expertise: Plant breeding and genetics using modern tools of genomics, transgenics, molecular marker analysis and plant cell and tissue culture to augment traditional breeding and selection.*

USDA's determination of nonregulated status for the Simplot GMO potatoes will allow them to be grown commercially as they have been deemed not to pose a threat to agriculture or the environment.

Growing potatoes with improved late blight resistance should result in considerable reduction in fungicide use by potato farmers, thus lowering the possibility of pesticide residue in the edible crop.

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