

GM spuds beat blight

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(Phys.org) —In a three-year GM research trial, scientists boosted resistance of potatoes to late blight, their most important disease, without deploying fungicides.

The findings, funded by the Biotechnology and Biological Sciences Research Council and The Gatsby Foundation, will be published in *Philosophical Transactions of the Royal Society B* on 17 February.

In 2012, the third year of the trial, the [potatoes](#) experienced ideal conditions for [late blight](#). The scientists did not inoculate any plants but waited for races circulating in the UK to blow in.

Non-transgenic Desiree plants were 100% infected by early August while all GM plants remained fully resistant to the end of the experiment. There was also a difference in yield, with tubers from each block of 16 plants weighing 6-13 kg while the non-GM tubers weighed 1.6-5 kg per block.

The trial was conducted with Desiree potatoes to address the challenge of building [resistance](#) to blight in [potato varieties](#) with popular consumer and processing characteristics.

The introduced gene, from a South American wild relative of potato, triggers the plant's natural defence mechanisms by enabling it to recognise the pathogen. Cultivated potatoes possess around 750 resistance genes but in most varieties, late blight is able to elude them.

"Breeding from wild relatives is laborious and slow and by the time a gene is successfully introduced into a cultivated variety, the late blight pathogen may already have evolved the ability to overcome it," said Professor Jonathan Jones from The Sainsbury Laboratory.

"With new insights into both the pathogen and its potato host, we can use GM technology to tip the evolutionary balance in favour of potatoes and against late blight."

In northern Europe, farmers typically spray a potato crop 10-15 times, or up to 25 times in a bad year. Scientists hope to replace chemical control with genetic control, though farmers might be advised to spray even resistant varieties at the end of a season, depending on conditions.

The Sainsbury Laboratory is continuing to identify multiple blight resistance genes that will be difficult for blight to simultaneously overcome. Their research will also allow resistance genes to be prioritized that will be more difficult for the pathogen to evade.

In a new BBSRC-funded industrial partnership award with American company Simplot and the James Hutton Institute, the TSL researchers will continue to identify and experiment with multiple resistance genes. By combining understanding of [resistance genes](#) with knowledge of the pathogen, they hope to develop Desiree and Maris Piper varieties that can completely thwart attacks from late blight.

Provided by John Innes Centre

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