

Bioscience researchers defeating potato blight

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Researchers funded by the BBSRC Crop Science Initiative have made a discovery that could instigate a paradigm shift in breeding resistance to late blight – a devastating disease of potatoes and tomatoes costing the industry \$5-6 billion a year worldwide. They will share this research with industry at an event in London later today (18 November).

Professor Paul Birch of the University of Dundee and his team at the Scottish Crop Research Institute (SCRI), the University of Dundee, and the University of Aberdeen have developed a new approach to breeding resistance to the mould-like organism *Phytophthora infestans* (*P. infestans*) that causes late blight.

Through their work on the interactions between potato plants and *P. infestans* Professor Birch and his team have come up with a completely new approach to breeding resistance to late blight in potatoes. This approach will be taken forward in a new project working with colleagues at The Sainsbury Laboratory in Norwich to identify resistance in potato plants that could then be used for breeding new resistant varieties. It is also hoped that it will be possible to combine resistance to late blight with resistance to nematodes (another serious problem for potato farming in the UK) in a single GM variety.

Professor Birch said "In the past we have tried to breed resistance to late blight by identifying plants that survive a period infection and could, in future generations, potentially give rise to resistant varieties. This approach is slow, resource intensive and requires a degree of luck that

the resistance will last for any prolonged period. So far, all such resistances have been defeated because of the broad extent of variation in the population of *P. infestans* in the environment. With our discovery, we can use genetic analysis to identify plants for breeding that are inherently resistant to infection. When introduced into cultivated varieties, such disease resistance should be far more durable."

By studying the interactions between *P. infestans* and potato plants the team has identified proteins that are secreted by the invading pathogen and are essential for infection.

Professor Birch continued "We now know a lot more about how *P. infestans* gets round the potato plant's natural defences and therefore what it takes for the plant to resist infection. We can actually look at a potato plant's genetic makeup and say whether it will be sustainably resistant to late blight, which is a huge step forward. Whilst our approaches are suitable for breeding, in future we also hope to use a GM approach to produce a variety that is resistant to both blight and potato cyst nematode."

Dr Mike Storey, Head of Research and Development, AHDB - Potato Council said "Blight is a serious problem for the potato industry in the UK. We are working hard to raise grower awareness and ensure best practice to control the disease but we have the challenge of a continually changing pathogen population. What we need now is the application of this new research to improve variety resistance and identify new crop protection targets and integrate these approaches for sustainable control and to reduce the impact when blight does occur. This will be of great benefit to UK farmers and the economy."

Professor Janet Allen, BBSRC Director of Research and chair of the Global Food Security programme development board said "We know that high quality bioscience research is required if we are to have a

sustainable supply of safe, affordable, healthy food to feed a growing world population. Late blight is a significant problem in the UK and elsewhere and so it is particularly good news that the fundamental research carried out under BBSRC's crop science initiative is providing opportunities to move towards application in new varieties."

Provided by Biotechnology and Biological Sciences Research Council

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