



COMMENTARY

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Rothamsted's aphid-resistant wheat – a turning point for GMOs?

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Abstract

Rothamsted Research mounted a successful counter-campaign in response to a threat by environmental protesters to destroy their research project examining aphid-resistant genetically modified (GM) wheat. This involved the use of online media, petitions, and other tools, by which researchers engaged directly with media and the general public in defense of their work. Lessons are suggested for other researchers in the controversial field of GM plant breeding.

Keywords: GMOs, Agrochemicals, Communications

Main text

Since the rise of the anti-genetically modified (GM) foods movement in the UK and elsewhere in the mid 1990s, public opinion has been largely against GM foods, while a hard core of activists has destroyed trial crops and sites over many years, thereby preventing the technology from being developed further by agricultural researchers. Activists who have been arrested during or after vandalism of GM crop sites have been treated leniently by the UK legal system [1], probably because of public sympathy for their cause, despite the lack of scientific justification for such sympathy.

Although the rate of activist attacks against UK trial sites peaked in the early 2000s, the reduction in incidents since then seems likely to have more to do with the near-total cessation of GM crop development in the UK rather than any change in attitudes among environmental activists or the wider public. In recent years, attempts to develop a blight-resistant GM potato by the Sainsbury Laboratory at The John Innes Centre have been the focus of rallies and protests; in July 2011, campaigners dumped 20 kg of organic potatoes at the John Innes Centre as a symbolic protest [2]. Three years earlier, in 2008, environmentalists destroyed 400 GM potatoes modified to be nematode-resistant by Professor Howard Atkinson at the University of Leeds [3].

However, the conditions for a shift in the debate were already becoming apparent. First, the initial hysteria

about 'Frankenfoods', based on the fear of negative health effects from GM foods, had faded somewhat with the passage of a decade and the fact that tens of millions of people around the world have consumed GM crops without any apparent ill effects. Second, the environmental movement was changing course: most of the big non-governmental organizations had downgraded their anti-GM campaigns to near-dormant status (although without any explicit change in policy) while some environmentalists were becoming advocates for the technology (including me (a former anti-GM activist), and Stewart Brand, one of the most prominent 'greens' in the USA [4]).

Third, and perhaps most importantly, GM crop trials were being carried out in the UK with explicitly environmental aims in mind, and by public-sector research institutes rather than by profit-seeking corporations such as the much-pilloried Monsanto. For example, conventional potato crops are sprayed upwards of 15 times per season with anti-blight fungicides, so a GM blight-resistant variety (also now being developed by Teagasc in Ireland and by researchers in Holland and Belgium) has the potential to reduce dramatically the application of agrochemicals, resulting in an obvious environmental benefit [5].

The aphid-resistant wheat that Rothamsted Research was developing at this time also fell into the category of 'green' GM. The pheromone expressed by the GM wheat had been shown in greenhouse trials to repel aphids and attract their predators, and so could plausibly reduce agricultural pesticides aimed at combating

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aphid infestation on the farm [6]. However, anti-GM protesters showed little appreciation of this potential, and an *ad hoc* group called 'Take the Flour Back' was organized with the express purpose of destroying the wheat crop in a manner it termed 'decontamination' (<http://taketheflourback.org/>). This was planned for the 27 May, 2012; 2 months warning were given in order to organize what was intended as a legally accountable 'open' action rather than a night-time vandalism exercise.

This breathing space before the date of the scheduled 'Take the Flour Back' action enabled the researchers at Rothamsted to mount a strikingly successful counter-campaign against the protesters. The scientists succeeded in presenting themselves in their true light as individuals trying to prevent their work from being destroyed by misguided activists, thus giving a real human face to an issue usually represented in the public mind by corporate public relations and a scary-looking 'genetically engineered' plant with fangs. The scientists penned a sincere, emotional open letter to the public, and recorded a YouTube video that showed several of the Rothamsted team pleading for the protest not to go ahead, while correcting various misconceptions held by the activists (the letter and video can be viewed on <http://www.senseaboutscience.org/pages/rothamsted-appeal.html>). With support from the science advocacy group 'Sense About Science', a petition was started, which gathered over 6,000 signatures in a little over a fortnight, with pro-science comments from members of the public representing all walks of life, from housewives to air-traffic controllers (signatories and comments can be viewed on <http://www.senseaboutscience.org/petition.php>).

Especially important in the eventual success of Rothamsted's campaign was a generally supportive media environment. With the issue framed not as pro-GM or anti-GM in principle, but rather around whether or not it is ethically acceptable to destroy scientific experiments, many commentators were supportive. Despite initial timidity from government, the relevant UK minister eventually issued a supportive quote, while the funding body, Biotechnology and Biological Sciences Research Council (BBSRC) also contributed. In the run-up to the 27 May, the issue achieved significant media prominence, with the researchers making appearances on news programs across broadcast networks, including the BBC's flagship *Newsnight* (television) and *Today* (BBC Radio 4) programs.

Rothamsted also invited 'Take the Flour Back' to meet its scientists in a public debate, even booking a London-based venue for the purpose. However, the activist group declined to participate, although a Dorset-based hobby farmer and alternative-lifestyle campaigner

called Jyoti Fernandez did appear on *Newsnight* opposite Rothamsted's Professor John Pickett. On the day of 27 May 'Take the Flour Back' were able to mobilize barely 150 protesters, more than a dozen of whom were brought from France on buses. Their attempts to reach the site were easily rebuffed by Hertfordshire police deployed around the perimeter of Rothamsted Park, where the protest was held.

Also of note was a smaller counter-protest (which I helped to organize), largely mobilized via social networks like Twitter under the hashtag #GeeksInThePark. 'Geeks' in the modern term are those who value the scientific method and celebrate empiricism over ideology, with prominent 'geek celebrities' including Simon Singh, the comedian Robin Ince, and the 'Bad Science' commentator Ben Goldacre. The counter-protest was perhaps reminiscent of the successful 'Pro-Test' movement in Oxford, which took on animal-rights extremists trying to stop a new research laboratory at Oxford University, and helped spark a wider change in public attitudes in a direction more favorable to scientific research. This may have been the first time that concerned members of the public organized and attended a protest to defend a GM test site against attempts by environmental activists to destroy it. It is important to note that 'Geeks in the Park' was organized with no contribution whatsoever from Rothamsted.

Although these matters are necessarily subjective, many of those interested in the GM debate in the UK will agree that the failure of 'Take the Flour Back', and Rothamsted's success in communicating the value of its biotechnology work, felt like a turning point. This has yet to be tested in terms of the public acceptability of actually eating GM wheat should it be commercialized, and it is also the case that the regulatory environment in the EU as a whole now makes it extremely difficult and expensive to deploy GM technologies outside the laboratory. To this extent, the successes of the early anti-GM movement and the plethora of regulatory responses it provoked still weigh heavy on the work of scientists to use this technology in a wider way for the benefit of the environment and food security more generally.

Rolling back this suffocating burden of over-regulation will doubtless take years, as will changing public attitudes to GM at a deeper level. However, Rothamsted has opened the door, and if other researchers in the area take communications equally seriously, and notch up equal successes as a result, then Professor Pickett's GM wheat may have much wider benefits for the world than simply repelling aphids.

Competing interests

ML assisted Rothamsted in strategic planning and communications for the GM wheat campaign on an occasional and informal basis. No payment was

sought or received. In the late 1990s, ML was involved in anti-GM actions, which involved damaging and destroying test sites.

Authors' contribution

ML wrote the paper and conducted all the necessary research.

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