

GM Food:

“It is time to embrace the commercial planting of GM food crops”

In recent years the issue of whether to pursue the commercial planting of genetically modified (GM) crops has resurfaced. In the context of concerns over a future ‘global food crisis’ [Ref: [Telegraph](#)], a number of GM advocates and government ministers the world over have said that GM has the capacity to facilitate a second ‘green revolution’ [Ref: [Guardian](#)] and help feed the world’s poor. Some have gone so far as to criticise ‘European GM Myths’ for hindering Africa’s escape from poverty and creating a situation where most African countries shun GM crops and food [Ref: [The National](#)]. In India, supporters of GM argue that anti-GM activism has become too prominent, and that a rational debate guided by scientific evidence and realities now needs to take place. But anti-GM campaigners across the world argue that claims that GM can alleviate poverty are disingenuous and misrepresent the real political problems behind food shortages across the world [Ref: [Global Issues](#)]. They further suggest that there are sufficient unknown risks to justify a freeze on commercialisation. In the UK Prince Charles flamed the debate when he called GM a ‘gigantic experiment with nature and the whole of humanity’ [Ref: [Farmers Guardian](#)]; in India a consumer group against GM launched a campaign called ‘I am no lab rat’ [Ref: [Tehelka](#)] echoing much the same sentiment. Whilst some countries such as the United States, Brazil, Argentina and Canada already grow GM crops extensively, many others have been more hesitant especially when it comes to food crops [Ref: [Reuters](#)]. The debate involves an interconnected set of issues, ranging from the environmental impact, economic costs and benefits of GM to wider concerns about food production, human health and the environment.

In Context

What’s new about GM technology?

For thousands of years farmers and plant breeders have been changing the genetic makeup of crops to improve characteristics like size, resistance to disease, and taste. They started simply by sowing only those seeds that came from plants with desirable traits. Later, knowledge about plant reproduction enabled crossbreeding of plants to create new crops. Throughout the 20th Century scientists also successfully used chemicals and radiation to introduce favourable mutations in crops. Now genetic engineering makes it possible to overcome natural reproductive barriers, as a single gene with a desired function can be transferred into an existing crop variety. At the centre of the debate is the question of whether GM is simply the next stage in the development of agricultural technologies or whether it represents a new departure with risky and irreversible consequences?

Does GM create new risks?

Many plant scientists claim that because genetic modification is more precise than crossbreeding it involves the transfer of less genetic material and is therefore more predictable [Ref: [BBC News](#)]. However, environmentalists have expressed concern about the introduction of genes not previously found in the food supply, like a [human liver gene](#) inserted into rice by researchers to allow it to break down herbicides and pollutants. They argue that the transfer of genes is a haphazard process, breaking up the natural sequencing of genes and leading to unforeseen consequences [Ref: [Independent](#)]. In response, it has been argued that these risks must be put into context. Non-GM agriculture is not risk free and we accept some risks from foods like peanuts which were not tested when first sold in this country but are now known to cause severe allergic reactions. There is also some evidence that GM could damage farmland biodiversity, which environmentalists argue should signal the end of GM both in India and in the UK [Ref: [The Hindu](#)]. But supporters of GM say that threats to biodiversity are exaggerated. Changing farming practices will create winners and losers, but the impact on wildlife will not be uniformly negative.

What does food biotechnology have to offer?

Critics complain that most GM technologies focus on developing characteristics valuable to rich farmers, such as herbicide and insect resistance [Ref: [Independent](#)]. They claim that GM offers no answer to the problem of global hunger and will further strengthen the hold of multi-national corporations over the world's poorest farmers. [Ref: [Hindu](#)] Others point out how research funded by public bodies and philanthropic organisations is leading to important breakthroughs that will benefit the poor. A key example being the creation of crops such as Golden Rice, which is modified to contain a precursor of Vitamin A and mitigates against blindness [Ref: [Golden Rice](#)]. When touring India on work related to his philanthropic foundation that emphasises the role science and technology have to play in improving the lives of people in need, Bill gates argued strongly in favour of GM technology [Ref: [Indian Express](#)]. Proponents of biotechnology also argue that it can deliver direct benefits to human health with developments in the pipeline including GM tomatoes that contain antioxidants to improve diet [Ref: [Times Online](#)]; and GM soya beans containing omega3 acids, which, it is said, could help 'prevent heart attacks' [Ref: [Times Online](#)].

What's the current situation in the UK and India?

Following the lifting, in 2004, of a moratorium banning GM food from countries within the European Union (EU) [Ref: [BBC News](#)] and a series of farm-scale evaluations (FSEs) [Ref: [BBC News](#)], permission to plant one variety of GM maize was granted in the UK [Ref: [BBC News](#)]. However, the maize was never planted as the company involved pulled out [Ref: [BBC News](#)]. More recently, in what is being seen as paving the way for a ban on GM crops, the EU has allowed member states to decide their own GM policy [Ref: [Guardian](#)]. Some argue that the delay in embracing GM has exacted heavy costs; not only has agribusiness been undermined, but research in to biotechnology has been driven out of the UK [Ref: [Prospect](#)]. But critics counter that the commercial planting of GM is unnecessary and dangerous. Some suggest that a system of sustainable agriculture offers better results – higher yield and more jobs – that also protect the environment and benefit producers over corporations [Ref: [Soil Association](#)].

In India, GM crops are already big business, and moves are underway to make them bigger. After a controversial start [Ref: [India Resources](#)], India's Genetic Engineering and Approval Committee (GEAC) approved the commercial growth of Bt (bacillus thuringiensis) cotton in 2002 [Ref: [Agbio forum](#)]. A major problem for Indian crop yields has been the damage caused by insects, in particular *Helicoverpa armigera* (American Bollworm). Bt cotton contains the *Cry1Ac* gene, which confers resistance to the bollworm complex. There has been a [31% increase](#) in India's Bt cotton yield since 2001-2. [Ref: [Commodity online](#)]

The big recent debate in India has taken place over Bt brinjal [Ref: [Wiki](#)]. In February 2010, India deferred the commercial cultivation of what would have been its first genetically modified (GM) vegetable crop [Ref: [BBC News](#)]. Bt brinjal has undergone field trials since 2008 and received approval from GEAC in 2009 [Ref: [The Hindu](#)]. But Environment Minister Jairam Ramesh called a moratorium on approving commercial trials of Mahyco's Bt brinjal variety using the *Cry1Ac* gene, saying that more studies were needed to ensure that the crops would be safe for consumers and the environment [Ref: [Economic Times](#)]. Campaigners have welcomed the decision [ref: [The Hindu](#)], but continue to challenge 'industry' science [Ref: [Asia News net](#)] and warn of the [risks](#) in growing GM crops at all [Ref: [Deccan Herald](#)]. Critics of the decision warn that the government's decision was swayed by activists and 'the voices that were the loudest rather than the ones that were most reasonable', [Ref: [Financial Express](#)] when it should have been guided by scientific evidence and the economic realities.

Is it science that's at stake, or the profits of big business?

Despite the national particularities of the GM debate in India and the UK, the intellectual and political background to the discussion makes it an important global issue. Across the world, GM supporters accuse

their opponents of an anti-scientific attitude that feeds public fears and jeopardises scientific research. They emphasise the importance of the biotechnology industry in underpinning scientific progress. Environmentalists retort that all this talk about science is simply a way of distracting attention from corporations' hunger for profit.

Essentials

Passing Judgment on Genetically Modified Foods

David Katz *Huffington Post* 29 July 2011

Where genetically modified crops are grown

Economist 23 February 2011

The war over GM is back. Is the truth any clearer?

Jay Rayner *Guardian* 5 October 2008

Eggplant of doom?

Saritha Rai *GlobalPost* 30 November 2009

GM food: How safe is it?

Amarnath K. Menon *India Today* 2 November 2009

For

The cost of spurning GM crops is too high

Jonathan DG Jones *Guardian* 21 July 2011

Tomatoes with Viagra: how to get consumers to love GM crops

John Krebs *Times The Times* 12 November 2008

The Prince is entitled to his views – but not his ignorance

Dominic Lawson *Independent* 15 August 2008

Meat of the Bt brinjal matter

Renuka Bisht *Financial Express* 8 March 2010

Bt brinjal: A lost cause?

Harish Damodaran *The Hindu Business Line* 30 October 2009

Commentary: Hopes of millions ride on India's second Green Revolution

Hari Sud. *UPI Asia* 27 March 2007

Against

GM regulators chose ignorance over science

Jonathan Latham *Guardian* 15 June 2011

Who can we trust on GM food?

Peter Melchett *Guardian* 9 December 2008

No compromise on bio-safety

Girijaa Upadhyay *The Hindu Business Line* 19 March 2010

Care for some Bt with your brinjal?

Vandana Shiva *Deccan Chronicle* 10 February 2010

Merchants of Deceit

Bharat Dogra *The Statesman* 26 March 2010

Sowing trouble: India's 'second green revolution'

Suman Sahai *SciDev.Net* 9 May 2006

In Depth

The truth about genetically modified crops

Business Matters 2011

Food Prices: How high will they go by 2020

Simon Rodgers *Guardian* 17 June 2011

Immoral advances: Is science out of control?

Dan Jones *New Scientist* 9 January 2009

The real GM food scandal

Dick Taverne *Prospect* 1 November 2007

Bt Brinjal: Need to Refocus the Debate

Prabir Purkayastha, Satyajit Rath *Economic & Political Weekly* 15 May 2010

All you wanted to know about Bt Brinjal

Rediff.com 27 January 2010

Green Revolution: Curse or Blessing?

2002 International Food Policy Research Institute, 2002

Key Terms

Bt cotton

Farm-Scale Evaluations (FSEs)

Genetic modification

Plant breeding

BT brinjal

Precautionary principle
Green revolution

Backgrounders:

Ask the expert: GM crops

Financial Times 3 July 2008

Genetically Modified Foods: Harmful or Helpful?

Deborah B Whitman *ProQuest* April 2000

Genetically modified crops: the ethical and social issues

Nuffield Council on Bioethics

Global Status of Commercialized Biotech/GM Crops: 2010

ISAAA

Introduction: GM Organisms

New Scientist 4 September 2006

GM crops ten years on: Hope, hype and reality

Ian Scoones ESRC 26 January 2011

Public sector should develop GM crops for seed companies, says leading researcher

Ecologist 1 August 2011

GM Foods: The Health Effects

The Soil Association

GM crops: good or bad?

Sue Mayer & Andy Stirling *Nature*

Who benefits from GM crops?

Friends of the Earth

Organisations

Cropgen

Friends of the Earth

Golden Rice

Gene Watch

GM Freeze

International Service for the Acquisition of Agri-biotech Applications (ISAAA)

Monsanto

STEPS (Social, Technological and Environmental Pathways to Sustainability)

Soil Association

In the News

In India:

[Food security: GM crops' role stressed](#)

The Hindu 17 September 2011,

[Approvals for GM crop field-trials run into delays](#)

The Hindu 3 September 2011

[GM crops save 18 bn kg of CO2 emissions](#)

Indian Express 3 July 2011

<http://www.indianexpress.com/news/false-claims-on-gm-crops/812196/>

[Gene alarm on GM crops](#)

Calcutta Telegraph 3 June 2011

[Toxin from GM crops found in human blood](#)

India Today 11 May 2011

[Kerala Left split over GM crop, Pillai sees no harm](#)

Indian Express 3 January 2011

[Bt brinjal row in India catches S-E Asian farmers' attention](#)

Times of India 4 April 2010

['Developers of Bt brinjal violated laws'](#)

India Today 28 February 2010,

[Experts caution on the introduction of GM crops](#)

DNA India 13 February 2010

[Decision on BT Brinjal in 10 days: Jairam Ramesh](#)

Sify News 31 January 2010

[Gates backs GM crops: tech must help farmers, feed rising population](#)

Indian Express 16 May 2010

In the UK:



Topic Guide



[GM food needed to avert global crisis says Government adviser](#)

Telegraph 3 August 2011

[Food prices could double without GM foods, scientists warn](#)

Telegraph 24 January 2011

[Report advocates GM crops in food supply measures](#)

Telegraph 24 January 2011

[Worldwide increase in GM crops, report shows](#)

Guardian 13 February 2008

[ESRC: What farmers think about GM crops](#)

Politics.co.uk 25 February 2008

[U.S. farmers grow world's first ethanol producing GM corn used to fill gas tanks](#)

Daily Mail 16 August 2011

[Foreign aid could fund UK-based research into GM crops that can grow in drought-ridden Africa](#)

Farming UK 16 August 2011

[Scientists condemn 'ill-informed, negative' Prince over GM crops warning](#)

The Times 14 August 2008

[EU to let states rule on GM crops](#)

BBC News 13 July 2010

[GM crops must be grown in Britain, Royal Society says](#)

Telegraph 21 October 2009

[Europe warms to GM crops as possible solution to food crisis](#)

Independent 21 June 2008

[GM crops hold key to our future food supply, says Benn](#)

Evening Standard 10 August 2010

[GM crops not the answer campaigners warn](#)

Telegraph 19 June 2008

[Government wants GM crops debate](#)

BBC News 19 June 2008

[GM crops being grown in Britain](#)

Telegraph 27 July 2009

[It pays not to cultivate GM crops, survey finds](#)

Independent 8 October 2010



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[GM potato cleared for EU farming](#)

BBC News 2 March 2010

[GM fears as human liver gene is put into rice](#)

Telegraph 25 April 2005

Audio/Visual

[Can genetically modified crops save the world?](#)

Battle of Ideas debate 1 November 2008

[Genetically Modified Foods](#)

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