

Land of the GM-Free?

How the American public are starting to turn against GM food



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Executive summary

Despite the fact that 87 per cent of Americans believe that their food should carry a label telling them whether Genetically Modified (GM) products have been used in it or not, almost none do. As a result GM food has been sold widely and for many years in the USA – without consumers being aware of what they are buying. The powerful pro-GM lobby in the USA has used this as evidence that the public accept, or are at least neutral, on the issue of GM food. But given a choice, over 50 per cent of Americans say they would not eat GM.

The GM industry has managed to keep US consumers in the dark about the food they are eating for more than a decade, through lobbying the US Food and Drug Administration (FDA) and state governments to ensure that foods do not legally have to be labelled as GM. But some major new developments in the US market suggest that the tide may finally be turning against the GM lobby. This briefing is not intended to be comprehensive, but it highlights some significant developments that are being ignored in the current UK debate about GM.

In 1994 Monsanto produced a genetically engineered bovine growth hormone (rBGH) that is injected into dairy cows to increase the yield of milk. This GM hormone has faced criticism internationally since its launch on the grounds of both human health risks and animal welfare concerns. While the EU and Canada rejected it, it was deemed safe by the US Food and Drug Administration and the World Trade Organisation (WTO), and has been used widely in the US dairy industry, without any labelling of the milk as 'GM-produced'. Monsanto worked very hard to ensure that consumers have no way to make a choice – getting some US states to ban dairies from selling their milk with 'no artificial growth hormone' labels. But increasing consumer awareness of rBGH in the US has caused sales of the milk to plummet. Between 2002 and 2007 use of the hormone fell by 23% and the proportion of US cows being injected with rBGH fell from 25% to below 17%.

Understanding their customers wishes, many major retailers, processors and producers have recently moved to ban rBGH from their products, with Walmart, Safeway, Starbucks, Kraft and many more ensuring that their customers can buy GMO free dairy products for themselves and their families. Opposition to the use of this hormone has grown so much that Monsanto announced last



month that they would be selling off the failing product.

As well as this growing consumer rejection of GM food in America, GM companies have had to face opposition by US farmers and regulatory authorities to a series of new



GM products. Both GM rice and GM wheat faced such strong opposition from farmers that they never made it out of field trials, and have never been grown commercially in the USA. Hardly any GM sweet corn¹ for human consumption is grown either (as opposed to maize grown for animal feed), for the simple reason that it tastes so bad that consumers won't buy it.

Attempts to launch GM alfalfa, America's fourth most widely grown crop, have also fallen flat. Farmers took legal action against the release of the crop and won. In 2007 the USDA was ordered to withdraw its approval of the GM alfalfa, a ban was placed on all planting of the crop and the sale of GM alfalfa seeds has now been prohibited throughout the USA. There is also evidence that US plant breeders are rejecting GM technology in favour of more reliable and effective methods such as marker assisted selection. Despite soya being one of the most widely grown GM crops, the newest high-yielding soya strains are non-GM.

For the first time in the USA, a major labelling initiative is underway that will finally provide consumers with the option of choosing a wide range of non-GM foods. The biggest companies in the natural and organic industry have united to develop a non-GMO label scheme that offers consumers the choice they clearly wish for, backed up by a robust verification system to ensure that it is a claim they can trust. This new 'Non-GMO Project' will be launched next year. It is led by a group of companies with combined annual sales of at least \$12 billion – equivalent to almost 10% of the entire UK food and drink industry. Around four hundred companies across the US and Canada have pledged their support, and at the outset around 28,000 different products are likely to be covered by the scheme.

With US consumers, farmers and politicians losing their enthusiasm for GM crops, it is not surprising that the GM industry has scaled up its efforts to find a new market in the EU. But in Europe, over 175 regions and over 4,500 municipalities and local areas have declared themselves GMO-free. Major countries that once supported GM, like France and Germany, no longer do so, and the Republic of Ireland, Northern Ireland, Scotland and Wales are all committed to GM-free policies. It is just the strongly pro-GM English Government that looks increasingly out of touch with what consumers really want.

¹ This report uses English terminology for crop names. We use 'maize' not 'corn' (for the crop used as animal feed), and 'sweet corn' for the maize people eat. 'Oilseed rape' is used instead of the North American 'canola'. Note that 'alfalfa' is also called 'lucerne' in the UK.

Monsanto's GM bovine growth hormone

What is it and what does it do?

In 1994 Monsanto released a new GM product onto the market: recombinant Bovine Growth Hormone (rBGH), trade name Posilac (also known as rBST). It is an artificial, genetically modified version of bovine somatotropin, a hormone produced in the pituitary gland of cattle that stimulates growth in young cattle and lactation in adult cows. When the GM protein is injected into dairy cows (they have to be repeatedly injected every two weeks), it has the effect of increasing milk production by 7-15%.

Health

The use of rBGH has been controversial primarily due to its negative effects on animal health and concern has also been expressed by scientists over its potential effects on human health.

Meta-analyses of the scientific evidence published by the Canadian Veterinary Medical Association and the EU Scientific Committee for Animal Health and Animal Welfare have concluded that the use of rBGH causes 'substantially and very significantly poorer welfare in cows'. Their findings indicated that cattle receiving rBGH injections suffer from:

- 50% increased incidence of lameness
- 25% increased incidence of mastitis, a painful infection of the udder
- 18% increased incidence of infertility, an indicator of overall poor health
- infection at the site of injection, with lesions exacerbated by repeat injections
- substantial increase in multiple births which can lead to welfare problems

As well as these serious negative impacts on the welfare of cows, there are risks to human and animal health:

- the routine use of antibiotics to combat the elevated levels of disease in cows contributes to the development of resistant disease strains and thus reducing the available drugs for both human and animal use
- veterinary drugs found in milk
- elevated levels of pus in the milk from infected udders

Scientists have raised the possibility of several other human health risks resulting from consumption of milk produced with rBGH. While there does not appear to be a higher level of bovine growth hormone in milk from treated cows, levels of insulin-like growth factor 1 (IGF-1) are significantly elevated to at least 5 times the



normal level. This substance is identical in both cattle and humans, and increased levels of IGF-1 in humans have been linked to cancer of the prostate, breast and colon. Indeed, an inquiry by the UK Veterinary Products Committee in 1999 stated that the likely increase of IGF-1 in the gut lumen following consumption of rBGH treated milk raised concerns about enhanced cell proliferation of the gut mucosa and therefore increased risk of cancer of the colon.

Regulation

The drug was approved for full distribution in the United States in 1993 by the US Food and Drug Administration (FDA), on the basis of one 90 day study on 30 rats that had been carried out by Monsanto.

Regulators in the EU and Canada were not convinced. Health Canada (the Canadian equivalent of the US FDA) stated that the results of Monsanto's rat trial showed cause for concern, and, following a detailed safety review, made the decision to ban the use of rBGH on the basis of unacceptable risks to animal health. EU regulators also refused approval for the drug, and launched an in-depth scientific study on the risks of using artificial hormones in farm animals. Their research led to a ban on rBGH use in the EU in 1989, made permanent in 2000, and the additional decision to ban imports of hormone-treated beef, which effectively blocked the majority of imports of beef from North America. In 1996 the USA complained to the World Trade Organisation, which eventually ruled in its favour, stating that the EU had not provided enough significant proof of danger. In contrast to its position on GM crops, the EU stated that it was the product's safety that should be conclusively proven, not its risks. The EU stood firm on its health concerns, and rather than allow synthetic hormones into the European food supply, it endured US trade sanctions amounting to 116.8 million USD per year on such items as Roquefort cheese and Dijon mustard. These sanctions are still in effect today.



FDA states:
No significant difference
in milk from cows
treated with artificial
growth hormone.

Currently, rBGH is not approved for use in Japan, New Zealand, Australia, Canada or the European Union.

Use in US – widespread and unlabelled but not without controversy

Despite the international controversy, Monsanto's GM hormone was launched in 1994 in the US, and by 2002, around a quarter of cows in the country were being treated with rBGH.

The FDA stated that since the recombinant, or genetically engineered form of BGH looks virtually identical to a cow's natural somatotropin, there is no significant difference between milk from treated and untreated cows. The FDA also concluded that it did not have the authority to require special labelling for milk and dairy products from rBGH-treated cows. While permitting dairies to label milk as 'from cows not treated with rBGH/artificial growth hormone', they stated that producers have no basis for claiming that milk from cows not treated with rBGH is safer than milk from rBGH-treated cows.

Despite these assurances, the American public were not as easily pacified as Monsanto might have hoped. Consumer groups were active in raising awareness of the risks of rBGH and while hormone-treated dairy products had become the norm in supermarkets and the food service sector, increasing numbers of smaller dairies chose to advertise their non-use of rBGH to their customers. Monsanto went on the offensive and sued a number of these dairies, alleging that they were illegally suggesting that non-rBGH milk was superior. In several cases, dairies were forced to add text to their labels echoing the FDA's statement of rBGH's safety.

This didn't fool the American public. The campaign against rBGH continued, scientists and doctors spoke out in the media about their concerns, and at their annual conference in June 2008 the American Nurses Association voted to work to "eliminate the use of rBGH in the US by appealing to those who make purchasing decisions within the institutions where we work".

Since Monsanto introduced rBGH to the dairy industry in 1994, demand for milk produced without synthetic hormones has increased by 500%. Many consumers switched to organic milk as, in the absence of reliable information, it was the only label they trust enough to give to their children. Between 2002 and 2007 use of the hormone fell by 23% and the proportion of US cows being injected with rBGH fell below 17%.

Desperate measures

Last year, Monsanto appealed to the FDA to block all labelling that refers to production without rBGH, and to the Federal Trade Commission to block any advertising of milk that mentioned non-use of the synthetic hormone. Both bodies dismissed Monsanto's complaint, stating that they would only intervene where fraudulent claims were made.

Since Monsanto failed to get federal support to impose a blanket ban on references to rBGH-free production, it started to campaign to restrict labelling information on a state-by-state basis. With the backing of a few of the most intensive dairy farming companies, Monsanto have been exerting pressure on state governments but have faced strong opposition from consumer groups and farmers.

In both Ohio and Utah laws are being considered that would ban 'rBGH-free' labels as 'misleading' on the basis that this couldn't be verified by a simple compositional test of the milk. Utah are proposing to ban all statements about production methods, while in Ohio any mention of rBGH on a label would have to be accompanied by the statement "FDA says no significant difference has been shown between milk derived from rBST-supplemented and non-rBST supplemented cows" in a specified font, size and package location. Both the International Dairy Foods Association and the Organic Trade Association are currently pursuing legal challenges against this.

Another attempt to limit consumer information was made in Pennsylvania last year. The Secretary of Agriculture proposed a law in October 2007 that banned non-rBGH labelling. Following an outcry by consumers and the dairy industry, this was overturned by the Governor in January 2008.

Monsanto have tried to push similar labelling restrictions through in Indiana, Missouri, Kansas, Vermont and New Jersey, but in each case the ban has so far failed to make it through the state legislature.

A further last ditch move to save the drug's image was the attempt to rebrand rBGH as environmentally friendly. Jumping on the green bandwagon, the company saw an opportunity to trivialise the drug's welfare issues by presenting them as a necessary sacrifice to be made in a time of climate change crisis, where global food shortages and carbon emissions could only be solved by the production efficiencies rBGH provided.

A study led by a former Monsanto-employed consultant and co-authored by the company's rBGH technical project manager proposed that rBGH use provides a way to reduce greenhouse gases, as the same quantity of milk can be produced by fewer cows. But as the journal Scientific American pointed out, the study hinged on the assumption that the cows injected with the GM hormone produced more milk for a given amount of feed – a claim specifically disallowed by the FDA when the drug was approved in 1993. In fact an rBGH herd would be consuming the same amount of feed – land, oil-based fertiliser and fuel for intensive cereal production – as a slightly larger non-rBGH herd producing the same amount of milk. The rBGH cows would need more veterinary drugs and produce lower quality milk. Both the US National Academy of Sciences and the US Environmental Protection agency have dismissed claims that rBGH could have any environment benefits.

Market defeat

2007 represented a turning point in consumer rejection of Monsanto's GM hormone. Demand for clean milk reached a critical mass, and major American brands paid attention. Knowing the importance of meeting their customers' demands, the country's biggest supermarket chains rushed to ban rBGH from their milk. By 2008 Costco, Kroger, Publix, Safeway and, most significantly, Wal-Mart have all removed rBGH from their own-brand milk. This has had a major impact all the way down the supply chain, ultimately pushing the nation's biggest dairy, Deans Foods, and their near-exclusive supplier Dairy Farmers of America, to phase out use of the drug. Starbucks announced in January 2008 that they had gone entirely rBGH-free, as did Chipotle, a national restaurant chain. Manufacturing giant Kraft is now producing an rBGH-free version of its cheese products. At the end of July this year, in what has been hailed as a major victory for consumers, Monsanto announced that it would be selling off the failing product.

First major GM labelling initiative in USA: the Non-GMO Project

In a recent poll, 53% of Americans said that they would not eat GM foods. This shows a significant disparity between what consumers in the US want from their food system and what that food system is actually delivering. It also demonstrates a lack of consumer knowledge about the proportion of food in America that contains GM. The majority of this 53% will already be unwittingly consuming GM food every day against their wishes, because GM food is currently not labelled in the US, despite the fact that 87% of Americans believe that it should be.

The US Government's opposition to telling American consumers that some of their food is GM stems from the greatest coup by the GM companies, which was to ensure no GM food had to be tested for safety. The concept of "substantial equivalence" means that if a GM crop looks like its non-GM equivalent and grows like it, then it is assumed to be the same, and no safety testing is needed before people eat it. GM maize may have added virus and antibiotic resistance genes, and a gene that makes it express an insecticide in every leaf, stem and root – but to the US government it looks and grows like maize, so it is safe to eat.

"I think that consumer rejection of GMOs is growing, and that giving the public here a choice will be a significant catalyst for continuing that trend"

Megan Thompson,
Executive Director, the
Non-GMO Project

This has meant that GM foods don't have to be labelled, and has resulted in widespread ignorance among consumers about the presence of GM in their food. Keeping consumers in the dark has prevented them from making real choices about the food they eat. Without labels the principles of supply and demand are no longer in effect as consumers can't send a message to farmers and manufacturers about what they do, and don't, want to eat.

Barriers to non-GM status for companies

Even though general consumer knowledge of GMOs is low in the US, there are still consumers who are well-informed and want to feed themselves and their families non-GM foods. North America has a thriving natural products industry and many organic and natural food companies. These companies have made a number of attempts to maintain non-GM status, however:

- companies can only control their own operating systems, with limited influence over others in the supply chain
- working in isolation companies do not have the market clout to secure clean supplies of ingredients, in some cases having to discontinue some product lines

- as they could no longer secure guaranteed non-GM ingredients
- it is costly to devise and regulate a GMO traceability system, maintain a testing regime, market non-GM status, and educate and inform consumers
- the lack of one recognised label that guarantees non-GM status led to distrust of non-GM claims among consumers, exacerbated by a number of high profile incidents in which foods labelled GM-free were found to contain GMOs after all.

This has been a particular threat to organic businesses. In the US, the Government's organic standards say that certified foods should not be produced with GM ingredients, but a certain level of 'unavoidable' GM contamination is tolerated. This is seen by some as the thin end of the wedge, and as the GM crop acreage rises, organic companies have decided to take action to safeguard the future against the possibility of losing non-GM supplies of corn and soy in the next few years.

The Non-GMO Project

In 2005, two natural food retailers started the 'Non-GMO Project', to develop a robust, industry-wide non-GMO verification system that would provide consumers with a trustworthy and recognisable non-GMO label to look for on products. The project would provide efficiencies of scale and would enable certification to be done in a simple low-cost way. The companies' united front could send a message to suppliers about non-GMO demand. They ensured the project would have robust scientific backing, and by 2007 the project expanded its board of directors to include representatives from all stakeholder groups in the natural products industry.

"By giving people here an informed choice, the Non-GMO Project is going to help align the food production in North America with what people here really want."

Megan Thompson,
Executive Director, the
Non-GMO Project

The project is now supported by the biggest companies in the North American natural and organic sector, an industry worth over \$62 billion in the US alone. Well-known brands such as Whole Foods, Seeds of Change and Nature's Way are supporting the campaign, along with around 400 companies across the US and Canada, representing annual sales of around \$12 billion.

The Non-GMO verification scheme has just opened (summer 2008) for product registration. Already several hundred products have been enrolled and it is anticipated that several thousand will be registered in the coming months. The project has also set up an ingredient supplier database to help manufacturers find uncontaminated ingredients through access to a list of verified non-GM suppliers. As increasing numbers of processors and distributors get their products verified, the database of trusted sources is growing.

The Non-GMO seal will be launched on labels in October 2009 in conjunction with a major consumer awareness campaign. Several things indicate that the US market is ready for this sort of initiative. Greater interest in healthy food

among consumers is reflected by the steady growth in sales of natural and organic food. In 2007, the US natural products industry was worth \$62 billion and growing at 10%, while the organic sector was worth \$20 billion and growing at 21%. With the uproar over rBGH dairy products finally making GM a prominent consumer issue, American consumers are beginning to ask more questions about where their food comes from.

The project is anticipating registration of around 28,000 unique products from the organic and natural industry in the verification scheme over the next few years, representing 70% of the sector. By implementing the non-GMO standard, the project aims to keep new GM crops from gaining dominance and build a resilient non-GM food sector within the United States.

"The industry is fairly integrated as far as production facilities and ingredient supplies, and by gaining agreement about what "non-GMO" means we finally have the opportunity to really change things and take a united stand against unwanted GM contamination."

Megan Thompson,
Executive Director, the
Non-GMO Project



Good Earth Natural Foods

www.goodearthnaturalfoods.net



Above: the founding leaders of the Non-GMO Project

Rejection of new GM crops by farmers, regulators and plant breeders

On top of the growing consumer rejection of existing GM food in America, GM companies have faced rejection of a series of new products by US farmers and regulatory authorities. GM wheat, rice and alfalfa have all failed to get off the ground,



as has GM sweet corn, which consumers simply refused to eat because it tastes so bad. In fact, after the first handful of GM crops were introduced in America in the late 1990s, US farmers and consumers have stopped any more commercialisation of GM crops. This suggests that the claim from the pro-GM lobby that GM crops have been welcomed by US farmers deserves scrutiny.

The US regulatory approval process is also increasingly questioned. Proposed field trials of several new GM crops, such as drug-producing maize and sugar cane and herbicide tolerant bentgrass, have been subject to federal court cases. In each case the court ruled that the United States Department of

Agriculture (USDA) had broken the law in granting the trials approval without adequate safety data. In 2007 a federal district judge ruled that the USDA must halt approval of all new GM field trials until more rigorous environmental reviews are conducted.

GM Wheat

Following the widespread introduction of Monsanto's Roundup Ready GM maize, soybeans and oilseed rape (all engineered to be resistant to the weed-killer Roundup, which usually kills all plants), the company soon produced a Roundup Ready GM wheat variety. Monsanto expected their new wheat to get the same easy ride that greeted the first GM crops. However, several years experience of the first GM crops resulted in enormous opposition to GM wheat from the food and farming industries. American farmers had learned the hard way that their export markets did not want GM food, and the benefits for farmers that GM companies claim were obviously not enough to make the risk worth running. As GM varieties of maize, soybeans and oilseed rape gained in dominance, initially through deliberate plantings but accelerated by cross-contamination, US farmers had watched helplessly as huge international customers from Europe, Japan and other countries rejected their grain in preference to non-GM crops.

Studies predicted that GM wheat would fare no better. An economic report by Iowa State University produced in 2003, and updated in 2005, estimated that the commercial introduction of a GM variety of wheat could result in the loss of one third to one half of the US export market and that the price of spring wheat would plunge by a third. In part there was heightened opposition to GM wheat both within the US and internationally because, while existing GM crops are primarily grown for animal feed, wheat is used both for animal feed and for human food. The idea of GM daily bread

was a step too far for consumers. The mainstream farming industry in the US lobbied against this new GM crop, saying that the introduction of GM wheat would be a serious threat to the economy, and the Canadian Wheat Board produced a damning report showing that, based on their country's experience of herbicide tolerant GM crops thus far, Monsanto's GM wheat should also be banned on environmental grounds.

In the face of such categorical rejection, Monsanto abandoned its field trials of Roundup-Ready wheat in 2004, stating that it was more profitable for the company to concentrate its efforts on soya, maize and oilseed rape.

GM Alfalfa

Alfalfa, a grass used for animal feed, is the fourth most widely grown crop in the USA, behind corn, soybeans and wheat, and it is the third most economically valuable. More than 20 million acres of alfalfa are grown in the United States and it is the most important forage crop, providing feed for the nation's beef and dairy cattle in particular.

In 2005, a GM strain of alfalfa was approved by United States Department of Agriculture (USDA). It had been developed by Monsanto in partnership with America's largest alfalfa seed company, Forage Genetics International. This alfalfa was engineered to withstand Monsanto's trademark glyphosate herbicide 'Roundup'. However, despite regulatory approval, a large number of American farmers also rejected the introduction of this new GM crop.

Alfalfa is an open-pollinated crop and pollen grains can travel long distances in the wind or via pollinating insects. This poses a serious contamination risk for conventional and organic growers, and cross-pollination could quickly reduce and even wipe out the US supply of non-GM alfalfa. Not only are those growing non-GM alfalfa unprotected from the economic damage that GM contamination causes, but they are also vulnerable to harassment and lawsuits from Monsanto if GM alfalfa is found on their land. Monsanto sues farmers with GM crops growing on their farms for patent violation, even if they have never actually planted any GM seeds themselves. In addition, many farmers currently produce normal alfalfa with minimal, if any, use of weed-killers. The introduction of a GM herbicide tolerant variety would not only encourage the use of far greater quantities of glyphosate, but also speed the growing development of glyphosate resistance in weeds, meaning that ever more toxic herbicides would need to be applied to all alfalfa crops to control them.



In February 2006, a coalition of alfalfa producers filed a lawsuit against the USDA claiming that GM alfalfa was a threat to both the environment and to farmers' livelihoods. The case was heard a year later, and in a landmark decision, the court ruled in their favour, declaring that the USDA had violated the law and had been "cavalier" in deciding that a full environmental impact statement was not necessary. The judge stated that "A federal action that eliminates a farmer's choice to grow non-genetically engineered crops, or a consumer's choice to eat non-genetically engineered food, is an undesirable consequence". The USDA was ordered to withdraw its approval of the GM alfalfa, a ban was placed on all planting of the crop and the sale of GM alfalfa seeds has now been prohibited throughout the USA. Despite an appeal by Monsanto, their GM alfalfa remains illegal until they can prove through a full environmental review that farmers and consumers will be protected, and non-GM crops will not be affected by their product.

GM Rice

Despite the development and USDA approval of several strains of GM rice, not one type is grown commercially in the United States. The US rice industry has consistently opposed the growing of GM rice, aware that there is no market for it. A number of key events have ensured that they are in no hurry to change their minds. In the last two years, catastrophic GM contamination incidents have put the entire US long-grain rice industry in crisis and cost the sector over \$1 billion. In 2006 it was discovered that Bayer CropScience, a giant biotechnology firm, had accidentally contaminated over 30% of the entire US long-grain rice supply with three of their GM varieties, two of which had not been approved for cultivation or consumption anywhere in the world. None of the contaminant strains had ever been grown commercially, and the only possible source of contamination was traced to field trials carried out years earlier, between 1998 and 2002. It has not been established whether the contamination occurred through cross-pollination or through a post-harvest mix-up, but there should have been no route to the food supply for these experimental crops. The incident had powerful global consequences. The EU, Japan, Korea and the Philippines imposed strict testing requirements and effectively shut down rice trade with the US, halting shipments, cancelling orders and recalling rice from supermarket shelves. Several other countries imposed bans on US rice or demanded non-GM certification before purchase, and soon the major rice-importing countries had switched to suppliers such as Thailand or Vietnam, who quickly pledged to remain GM-free. Furious US rice farmers and traders filed multi-million dollar class action lawsuits against Bayer CropScience, but even compensation for their harvests will not undo the serious and continuing damage to the US rice industry.

A second serious contamination incident occurred just one year later, in early 2007. It was announced that 'Clearfield 131', one of the most popular non-GM long-grain rice seeds had become contaminated with an unapproved GM

strain, again from Bayer CropScience. Sale of the seed was quickly banned by the USDA, and some farmers were forced to destroy crops already sown. Combined with the ban on rice seed that had been contaminated in the Bayer incident of 2006, this new discovery had the effect of seriously cutting the amount of available rice seed for farmers to plant, and led to reduced harvests with some farmers abandoning rice growing altogether. BASF, who produce Clearfield 131 lost up to \$9 million dollars in the incident.

Bayer's clear inability to control contamination has led to rice producers calling for a ban on all experimental outdoor plantings of GM rice, and it seems that the commercialisation of any GM rice varieties is unlikely to happen in America in the foreseeable future.

Highest yielding soya strains are non-GM

With pressure to develop higher yielding varieties of food crops, US plant breeders are rejecting GM technology in favour of more reliable and effective methods. Soya farmers have been frustrated for years by the slow pace of increases in soya yields. This has been due in part to the dominance of Monsanto's Roundup Ready soya over the last decade. This GM soya has been shown to yield less than non-GM varieties. However, Pioneer, a branch of biotech giant DuPont, have finally had some success. Ignoring unreliable GM techniques that disrupt the plant's biology, Pioneer have instead used marker-assisted selection (MAS) breeding. MAS uses knowledge of the genome to speed up the selection process, but uses conventional cross-breeding that allows the plant to maintain its own safe-guards on gene expression. MAS is a technique long supported by environmentalists and organic farmers. Results of crop trials demonstrate a 5-10% yield advantage for this MAS soya over competitive varieties. This approach echoes the latest rice breeding research taking place in South East Asia, as scientists pursuing the ideal of flood and drought resistant varieties have left GM techniques behind and are concentrating on the more successful application of MAS methods to meet these goals.

Conclusion

Since the introduction of GM food, probably the biggest selling GM food product bought by consumers in the US has been GM hormone-treated milk. Dairy products produced with Monsanto's GM growth hormone achieved huge market penetration following their launch in 1994, but are now on their way out due to consumer resistance. This resistance to GM-produced milk started when consumers began to see non-GM labelled milk in their shops.

Labelling milk as 'GM hormone free' has been the only significant move to label any food as 'non-GM' until now. Just open for product registration, the Non-GMO Project is a major new market-led initiative in North America that will provide the sort of labelling that killed GM food in the EU, Japan and other countries. Every attempt to pass laws on GM labelling in the US has been fought fiercely by Monsanto and other GM companies, but there is now strong support from companies with combined sales of \$12 billion to give consumers accurate information about GM in their food.

Even though US consumers are turning against GM, the GM industry has always claimed that US farmers love GM crops. But in fact farmers rejected genetically modified wheat, one of the largest commodity crops in the world, and no GM wheat is grown in North America. Farmers have also rejected GM alfalfa, the fourth most widely grown crop in the US. Following a court victory for farmers, the USDA was ordered to withdraw its approval of the GM alfalfa, a ban was placed on all planting of the crop and the sale of GM alfalfa seeds has now been prohibited throughout the USA. Despite the development of many commercial strains of GM rice, no GM rice is being grown commercially in the US, and even in the case of soya, one of the most widely grown GM crops, the newest high-yielding varieties being developed are non-GM rather than GM.

These developments, combined with the possibility of Democrat Presidential Candidate Barack Obama's pledge to support legislation to label GM food if he should get elected, suggest that GM companies are in for a difficult few years in the USA. The increasing focus on the climate change impacts of farming, to which GM crops offer no solution, and expensive oil driving up the cost of nitrogen fertiliser, on which GM crops are dependent, also suggest the environmental and economic pressures on GM will increase.

With consumers, farmers and politicians in America losing their enthusiasm for GM crops, it is not surprising that the GM industry has scaled up its efforts to find a new market in the EU. Major European farming countries, like the previously enthusiastically pro-GM French and German governments have gone cold. Other EU countries, like Greece, have always resolutely opposed GM crops, and among the newer EU member states, many, such as Poland, have already adopted non-GM policies. Over 175 regions and over 4,500 municipalities and local areas in Europe have declared themselves GMO-free.

The Irish Republic, Northern Ireland, Scotland and Wales are all committed to GM-free policies. This has left just the present English government ministers on an increasingly lonely and desperate pro-GM quest, as consumers in their main pro-GM ally, the United States, increasingly reject this uncertain, risky and unproductive technology.

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Soil Association

The Soil Association is the UK's leading environmental charity campaigning for a global shift to sustainable, organic food and farming practices.

Founded in 1946 by a far-sighted group of farmers, doctors and concerned citizens, the organisation is dedicated to bringing about change by creating a growing body of public opinion that understands the direct link between farming practice and plant, animal, human and environmental health.

Today the Soil Association is an internationally respected authority on sustainable agriculture and recognised champion of healthy food, which uniquely represents and offers practical solutions to everyone involved in the food chain – farmers, food processors, retailers and consumers.

The Soil Association is reliant on the support of its members, donors and the public to carry out its work. You can help grow the organic movement, by joining the Soil Association you will be part of a dynamic organisation pressing to change the predominant food culture in this country. Single UK membership costs just £24 a year.

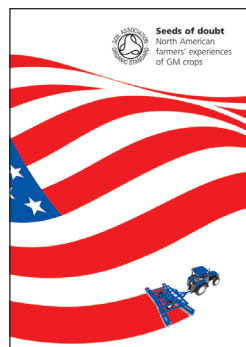
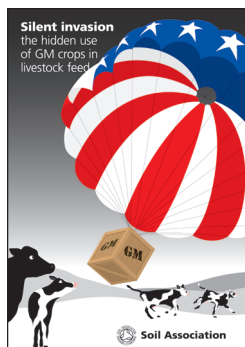
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Influencing policy makers, food companies, farmers, consumers and citizens is an essential part of our work, to create the conditions for a major expansion of organic food and farming. Our other relevant policy reports include:

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