

**Submission on the Strategy Unit's Report:
Field Work: Weighing up the costs and benefits of GM crops¹**

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Scenario Analysis

The Report's testing of scenarios based on the 'variables' of public opinion and regulation is a useful tool for examining possible costs and benefits as it is based on two main factors that would determine those costs and benefits.

However, it should be noted that:

- Although public opinion is flexible, the government should generally have no role in seeking to manipulate it. Governments may and do legitimately influence the public on matters of public interest, for example, warning of hazards such as smoking or climate change. However, with GM food, it is not clear to whom any benefits or costs might accrue and the government should therefore not seek to influence public opinion.
- Regulations must be set at an appropriate level to address known or potential hazards. Where long-term threats to the environment or human health may exist, weakening regulation on purely economic grounds is unacceptable.

Thus, although the scenario analysis is useful for suggesting what the costs and benefits of GM crops might be, it should not be used by the government to 'choose' one of the scenarios. The appropriate course of action chosen must be based on given public opinion, combined with the necessary regulation.

It must also be said that costs and benefits should not be looked at in purely economic terms or even in terms of achieving policy objectives alone. Many people attach value to the natural world and to wholesome food. A threat to either of these is just as real as any other cost or benefit.

GM 'Fait Accompli'?

Genetic modification is presented as a mature science that has already been widely accepted and is more or less unstoppable - ie if we don't do it, somebody else will be doing it.

¹ Cabinet Office Strategy Unit, *Field Work: Weighing up the costs and benefits of GM crops*: <http://www.pm.gov.uk/output/Page3673.asp>

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For instance, in Margaret Beckett's forward:

Herbicide-tolerant and insect-resistant crops have proved very popular with farmers where they are available... (p3)

Yet no evidence to back up this claim is presented. As the analysis shows, the economic benefit to farmers (where there is one) is generally marginal. Unmentioned are the several failures of GM crops, such as the *bT* cotton crop in India, which not only proved to be vulnerable to boll worm (which it was supposed to resist) but also produced dramatically lower yields in many cases.

Whilst GM crops and food have been particularly controversial in Europe, their take-up in other parts of the world has been rising rapidly. (p22)

Yet 99% of GM crops are grown in just 4 countries (The US, Canada, Argentina and China). Nowhere does the Report mention the number of countries that have decided not to grow GM crops or the number that have rejected GM imports.

There is no evidence that tourism would be affected by the growing of GM crops. Canada, for instance, still promotes its environmental image strongly in attracting tourists, whilst also growing GM crops. (p68)

Yet there is no evidence presented to back up the claim that tourism has not been affected by the growing of GM crops either. It could be argued that Canada *has to* promote its environmental image strongly to avoid impacts on tourism. A search on the Canadian Tourism Commission's website⁴ yielded no mentions at all of the following keywords: GM, GE, GMO, GMOs, genetic modification, genetic engineering. Is Canada not proud to be one of the four leaders in the field?

Benefits of Genetic Modification

Throughout the Report, the *potential* benefits of GM have been reiterated while the potential costs and hazards have been ignored or brushed aside.

It is also possible that GM crops could help to achieve some of the UK's environmental and human health objectives, such as those set out in Defra's recent Strategy for Sustainable Food and Farming, and in similar documents in the Devolved Administrations. (p69)

This looks like pure speculation. GM technology is strongly tied into the sort of industrialised agriculture - large-scale monocultures with high use of agrochemicals - that should play no part in a strategy for sustainable food and farming. By contrast, organic farming is already contributing to environmental sustainability as well as providing safe, healthy and nutritious food.

⁴ <http://www.travelcanada.ca>

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Box 3.6: Possible human health benefits:

- Nutritional benefits, such as reduced fat absorption in potatoes.
- Disease prevention, through the overexpression of substances which are beneficial to human health.
- Reduced allergenicity, such as wheat with a low gluten content.
- Longer shelf life, which could maintain a food's nutritional content for longer, and perhaps encourage the consumption of fruit and vegetables.
- Pharmaceutical crops, which could produce pharmaceuticals at a lower cost.

Addressing these projected health benefits:

A balanced diet of fresh food with low levels of refined and processed foods provides an abundance of all nutrients needed for health. It is very unlikely GM crops with enhanced nutrient content could offset the wide range of nutrient deficiencies that occur with unhealthy diets and lifestyles. The government must promote organic, fresh and local food as well as healthy lifestyles.

Low gluten wheat, such as spelt, already exist and there could be hidden dangers to promoting 'allergy free' foods. 'Longer shelf life' is a characteristic that appeals to wholesalers and retailers relying on long distance transport and large-scale storage – it is not a priority of consumers. The cost of raw materials for pharmaceuticals is seldom a significant part of the eventual price, so the potential for cost reduction seems remote.

Impact on the Environment and Human Health

While many benefits of GM food have been set out, possible drawbacks and hazards have been ignored or have been treated in a cursory manner. For instance, there is no discussion of

- Long term ecological impacts
- The possibility of an ecological catastrophe occurring, such as a virulent disease emerging or an acceleration in horizontal gene flow
- The undermining of organic agriculture and the difficulty (or indeed impossibility) of returning to a GM-free status
- The possibility of a major health hazard emerging, such as impacts on immune function

Although (most surprisingly) there has been no epidemiological monitoring of populations consuming GM food, there is at least some strong evidence of possible health effects that needs further examination: Scientists at the Centers for Disease Control in the United States found that between 1994 (about the time that GM food was first introduced) and 1999, food borne illnesses in the United States have increased two to ten-fold.

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Public Opposition

Throughout the Report, the degree of public opposition to GM food has been downplayed and regarded as transient:

Surveys over the past few years have generally revealed negative public attitudes towards GM food. However, public attitudes are complex and can evolve. (p6)

In the short term, negative consumer attitudes can be expected to limit the demand for products containing GM foods, and therefore the economic value of the current generation of GM crops... (p15, p82 and p102)

The main message coming from the opinion poll data is that public attitudes are complex, though there does seem to be some evidence that attitudes towards GM crops and foods are generally negative. (p41)

However, there is strong evidence that support for GM food has fallen since 1996, while opposition has remained relatively constant, for example from MORI polls: "Tracking public opinion through time, MORI research shows that support for GM has fallen since the issue first emerged in the media spotlight in 1996. Then, close to one in three (31%) supported GM food, but by 1998 it had weakened to 22%. Support then steadily declined still further, reaching 14% in 2003, its lowest level."⁵

Role of Regulatory System

Regulations are required because the costs of harm would generally not be borne by those causing the damage. (p36)

We are reassured in many parts of the report that the risks of unexpected damage occurring is very low, due to a rigorous regulatory system. Yet in other places it is suggested that the regulatory system is very flexible and might even be weakened to achieve other ends:

If the regulatory system imposes few restrictions on developing GM technology, then technological developments may be encouraged and there could be a wider range of this type of crop. (p72)

The regulatory system must address known and potential hazards. It should not be guided by how desirable it is to encourage technological developments

[In scenario 3] ...There would be mixed signals from the UK, with the signal from Government being that GM crops can be grown but only subject to regulatory approval, while the signal from UK consumers is negative. (p90)

This statement is astonishing in its disregard for public opinion in influencing other countries (ie 'negative') and in its suggestion that GM crops might be grown *without* regulatory approval.

⁵ MORI, *GM Food Opposition Continues* (June 2003): <http://www.mori.com/polls/2003/gmfood.shtml>

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Within such overall agreement, two distinct approaches have emerged: regulations based on the safety of the *product*, versus regulations based on the *process* by which the product is produced. Essentially, this splits regulations into ones which assess GMOs and their products because they are novel (US, Argentina, Canada, China, Japan) and those that assess GMOs and their products because they have been created using genetic modification (EU, Australia).

It is of great concern that the 'case-by-case' approach and principle of 'substantive equivalence' promoted by the GM Science Review appears to be more of a product based approach (ie the approach adopted by the main GM countries), than a process based approach.

Labelling, Testing and Traceability

Keeping GM crops and foods separate from non-GM crops and foods is currently considered important for economic reasons, both in order to provide choice for farmers and consumers, and to maintain price differentials for products that are valued differently by consumers. There are also legal obligations on the labelling of GM products under European regulations. However, segregation is not a safety issue, as the GM crops in question would all have been judged to be safe under the approvals system. (p63)

This is dismissive of the very real concerns that consumers - and many farmers - have on the safety of GM food. It could be used to justify passing the costs of segregation, traceability, testing and mitigating any contamination incidents onto non-GM producers - an approach that the Green Party totally rejects.

Manufacturers and processors may also wish to carry out testing to check the integrity of non-GM products....

The likely extension of GM technology to new types of crop internationally will add to these costs, whether the UK grows such crops or not. It is therefore possible that commercial cultivation in the UK would not create many additional costs. (p67)

This fails to make sense. If a food processor or retailer obtains a crop from a UK farmer, knowing that the UK is GM-free, then they don't need to test it (and a large part of our food still comes from the UK). If, however, GM crops are grown in the UK, then the processor or retailer will potentially have to check (for contamination), every crop from a UK farmer.

Comparison with Intensive Farming

Attitudes to risk and regulatory approaches need to be put in context. Non-GM agriculture is not risk-free – indeed there is strong evidence that past changes to agricultural practice have had some negative environmental impacts. The risks associated with GM crops, therefore, need to be seen alongside the risks involved in any type of agriculture. (p7)

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There is no exploration of the special risks that arise from genetic modification, or of impacts that could be widespread and irreversible. As with the GM Science Review⁶, comparisons have only been made with conventional intensive farming, using high inputs of agrochemicals. Comparison has not been made with organic farming and other low impact agricultural systems that are successfully used throughout the UK and are widely regarded as being safe and sustainable.

Impact on Organic and non-GM Agriculture

The nature of the rules on the growing of GM crops will determine how effectively they can be kept separate from non-GM crops at the farm level, and to what extent non-GM and organic farmers may have to incur costs themselves in ensuring the integrity of their products. Whether they could pass on any such costs would depend on the relative demand for their goods, which would be higher in scenarios where the public has negative views about GM produce. (p14)

The Green Party rejects the position where organic and non-GM farms incur *any* costs as a result of commercialisation of GM crops. There is a clear public preference for non-GM food and therefore no justification for extra costs to fall on producers of that food (or ultimately on the consumer). If it did, those producers and consumers would in effect be subsidising GM producers.

Non-GM farmers might decide to take out insurance to cover possible costs, as a way of reducing the risks they face. Currently, however, such insurance is not available. Were a workable co-existence system to be in place, a market would be likely to develop. However, in situations where co-existence proved to be problematic, then insurance might remain unavailable, or be prohibitively expensive. (p68)

To suggest that non-GM farmers should take out insurance (rather than GM farmers) is an extraordinary twist. In the event of contamination from a GM crop threatening the livelihood of an organic or non-GM farmer, it would be the non-GM farmer who might bring legal action against the GM farmer (or possibly the biotech company supplying the seed); therefore it is the GM farmer who should have to take out insurance in this unwanted scenario.

We are, however, pleased that serious note has been made of the possible impact on organic farming.

Finally, it is possible that the introduction of GM crops could, whilst opening up some options, also limit others. In particular, if co-existence measures prove to be less effective than is currently expected, then organic farming may become a more expensive and less attractive option, because of the risk of the accidental presence of GM material. This could make the aims to expand organic farming set out in the Organic Action Plan for England harder to achieve, and reduce consumer choice.

However, introduction of GM crops could in time threaten all organic production and would, in effect, signal abandonment of the Organic Action Plan.

⁶ See S. Ali & T. Turner, Green Party Submission to First Report of GM Science Review (2003)

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Research and Development

One area of concern is the UK's lower-than-average expenditure on R&D. (p49)

This is no reason for the government to channel R&D expenditure into GM technology. One area where the UK is lagging well behind other European countries is in R&D spending on 'alternative technologies' such as renewable energy. There is potential not just to get positive economic benefit from such investment but also to lead the way in truly sustainable technology.

Crop developments could also come from conventional and organic techniques... The ability of these methods to deliver improvements would depend both on the science and on the amount of money devoted to such research. (p8)

The government's Organic Action Plan has allocated just £5 million over 5 years to research on organic farming, with only £1.1m in the first two years to 2005.⁷ This is a tiny figure compared with the funding for agricultural biotechnology research:

The main public sector sponsor of GM crop development, the BBSRC, invests about £55 million [per year] on agricultural biotechnology research, of which nearly £18 million is in GM crop research. (p50)

Scientific Context

GM microbes, plants, fish, insects, amphibians and mammals have all been created for research purposes to understand gene function. (p32)

This ignores the inherent cruelty involved in the process and the high failure rate (typically 99% are deformed or survive only a short time). Cruelty to other species, as well as potentially catastrophic ecological outcomes, should not be ignored in any cost benefit analysis.

Genome sequence data itself is of little interest, but once the functions of different genes and combinations of genes are identified, the relationships between genetics and (for example) the causes of, and susceptibility to, disease, or the productive yield of an agricultural crop, can start to be explored. (p32)

Just as using animal models to predict human functions can be extremely unreliable, the use of GM technology to insert genes into other organisms can produce very unpredictable results. The expression of transgenes in a recipient host may be completely different to the way that they are expressed in the donor.

⁷ <http://www.defra.gov.uk/science/Link/OrganicLINK/default.asp>

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International Trade

Interest from farmers may be limited to goods destined for export markets, or for the production of animal feed. (p15)

It should be noted that farmers would likely find it much harder to export GM crops than non-GM (as the US has found). There is public demand for animal products produced using GM feed to be labelled as such - if this were included in labelling regulations, the market for GM animal feed could be similarly affected.

Any cost savings or increased yields offered by GM crops could contribute to improved competitiveness in UK agriculture. (p12)

Future crops may, though, bring more important cost savings. If farmers do not have access to these crops, then they could ultimately lose competitiveness in international markets. (p61)

Conversely, growing GM crops could make UK agriculture *less competitive* if worldwide opposition to GM continues and could lead to more imports of non-GM and organic food to satisfy UK consumers who chose GM-free food.

The potential impact of European GMO regulations on trade is significant for developing countries. Current and potential regulations will require importers of GM food and feed into the EU to have approval for the GM variety or varieties and to meet standards of labelling and segregation.

This could increase the costs of exporting to the EU. It could also prevent certain GM crops from being grown in developing countries if getting approval, maintaining separation, and labelling the resulting GM products is too costly or requires greater regulatory capacity than currently exists. (p80)

The converse is closer to the reality: most developing countries are GM-free so would not incur any such costs in exporting to the EU. Since there is generally a premium for non-GM food, the EU regulations will - assuming that consumers continue to favour non-GM crops - tend to favour exports from the 90% or so of developing countries that are GM-free.

An explicit rejection of GM crops could cause tensions within Europe, and with our other major trading partners (p80)

No, in the context of trading relations, deciding not to grow GM crops would help to *lessen* tension. The stance of the US on GM exports has created this tension with countries that have rejected GM imports - if the UK were to grow GM crops, it would *add* to this trade tension. It is hard to see how *not* growing GM crops could add to the existing tension.

Already, the EU's GM crops approvals process has caused tensions with our trading partners, which culminated in the recent filing of a WTO case. This case risks not only generating fresh antipathy over GM crops, but could also have serious knock-on implications for trade relations and international law more generally. (p81)

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The Green Party insists that the WTO reject this case. The EU's moratorium on new imports of GM crops, followed by regulations on traceability and labelling are based on genuine concerns over genetic modification and the strong desire of European consumers to make a choice between GM and non-GM food. It should also be noted that opposition to GM technologies is not just limited to Europe, but has been growing worldwide.

Conclusions

1. Public opposition to GM food has remained strong since 1996, while actual support for GM food has fallen. It is unlikely that this position will change significantly within the 10-15 timeframe of the analysis.
2. There should be no question of modifying the regulatory system to meet economic objectives. The regulatory system must meet environmental, social and health objectives by guarding against known or potential hazards. In addition, the regulatory system must respect the strong public demand for organic and GM-free food.
3. Given the strong public opposition to GM food and the lack of evidence that GM food is safe and poses no threat to the environment, the Green Party recommends that:
 - the government rejects the commercialisation of GM crops in the UK,
 - the EU labelling and traceability regulations are supported,
 - the EU continues the moratorium on GM imports and rejects the complaint by GM exporters to the WTO,
 - liability legislation is introduced to make GM producers and biotech companies liable for contamination and for mitigating any harm to the environment or human health that results from GM crops