Submission on the First Report of the GM Science Review[1]

Green Party of England and Wales

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Introduction

We acknowledge that the Report has presented a large body of research evidence. We are pleased that, in many areas, the panel has:

- Attempted to cover the subject matter in a thorough and consistent way
- Identified gaps in scientific research
- Identified gaps in knowledge and understanding
- Acknowledged uncertainties and the unpredictable nature of outcomes
- Assessed various options, risks and outcomes

However, the Report has serious shortcomings, some of which we address here.

Risk and Precaution

On the concept of risk, the Report says that:

> Risk is the product of two components: the likelihood that the hazard will take place and (in the event that it does) the consequence. (44)
>
> As risk is a product of hazard and exposure, both *must be quantified* in order to classify risks to the environment as high, medium, low or negligible. (124)

Risk, properly understood, is a product of two magnitudes, only one of which is quantitative (the likelihood or probability), the other of which is qualitative (the undesirability of the outcome should it occasion). The Report makes the mistake of underestimating the negative weight associated with the qualitative dimension. It has become *de rigueur* amongst scientists to emphasise only the quantitative dimension of risk to the exclusion of the latter. However, the public is apprehensive not just about the probability of accident, however small (human intervention properly understood), but also of the undesirability of environmental and health impacts that rationally informs perception of risk.[4]

On the application of the precautionary principle:

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[1] First Report of the Government's GM Science Review published on 21 July 2003 at http://www.gmsciencedebate.org.uk/ Key references are to the 298 page document. This Submission 15 October 2003.

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[4] Shahrar Ali, "Everyday Risk and the Deliberate Release of Genetically Modified Crops", in *Ethical Issues and the New Genetics: Are Genes Us?*, eds. Brenda Almond & Michael Parker (Ashgate, 2003), pp. 153-165. For validation of risk perception in risk assessment.

> "Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation." (UNCED, 1992) (46)

considers a hazard from an existing process where there are measures possible to eliminate the hazard. The Panel may have taken the precautionary principle to imply that, post-commercialisation, the regulation and monitoring of GM crops must be thorough. This is strictly outside of the Report's remit: the purpose of the Report was to address the question of whether GM crops should be grown in the first place. In the case of GM crops that have not yet been grown in this country, one obvious way to avoid potential hazards is simply not to grow them.

A more robust version of the precautionary principle proposed by the Wingspread Conference (1999) reads:

> When an activity raises threats of harm to human health, or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.

The Green Party believes that GM crops pose major long-term threats and that the precautionary principle must be applied rigorously from the outset. With lack of knowledge on the long-term effects of GM crops, the safe approach is to reject their commercialisation.

The box on page 47 sets out a much more thorough approach to the precautionary principle than the quote on page 46 and we are pleased that the Report has adopted some of these principles. However, there are further slips in reference to the precautionary principle, such as:

> "*Recourse to the precautionary principle presupposes that potentially dangerous effects deriving from a phenomenon, product or process have been identified, and that scientific evaluation does not allow the risk to be determined with sufficient certainty*." (Brussels, 02.02.2000 COM (2000) Communication from the Commission on the precautionary principle). However, our scientific review in this report of the environmental issues associated with proposed GM crops have not identified 'potentially dangerous effects'. (191)

As the Report acknowledges, there are huge gaps in research. At the same time, a majority of the public and many scientists continue to have concerns about the wider and long term ecological and health impacts of GM crops. Science has clearly not proven that these concerns are unjustified so the precautionary principle *must* be applied in a robust way.

Substantive Equivalence, Absence of Evidence and Cases Approach

The principle of substantive equivalence does not have a scientific basis: all it can show is that a GM crop is equivalent to a non-GM crop in the ways that have been tested. It cannot be used to properly inform further research, since it does not look for other ways in which the crops may differ. The Report says that substantive equivalence should not be used as an end point in regulation - but neither should it be used as a starting point since the fundamental differences of GM crops must first be considered.

The Report tells us that 'substantive equivalence' is a practical approach because animal testing is not reliable when testing whole foods. But animal testing is also known to be an unreliable judge of how humans (or other animals) will react to specific compounds. (Thalidomide, for example, was considered not to have any adverse effects on laboratory animals but is toxic to human beings.) Why have virtually no epidemiological studies been carried out on the US population who are the largest set of human 'guinea pigs' to have consumed GM food?

On the relation of absence of evidence to evidence of absence:

> Some [people] reason that the absence of evidence of harm should not be treated as evidence of the absence of harm. (10)

Makes a claim about how some people reason, not whether they are right or wrong to do so.

> Absence of evidence of harm is not evidence of absence of harm. (22)

Makes an unequivocal claim independent of whether or not some people reason.

> The fact that GM food crops have now been grown on over 230 millions [sic] cumulative hectares worldwide over the past seven years (ISAAA, 2003) does provide evidence for the lack of harmful human health effects from the consumption of GM food products. (73)

This claim contradicts the previous two claims about the consequences to be drawn from an absence of evidence. Nor, however, does the claim follow even were the opposite hypothesis about absence of evidence true. That is, if absence of evidence of harm *did demonstrate* evidence of absence of harm, nothing about the health effects on humans could be learned from the fact that GM had been grown as such. A category mistake has been committed.

> In addition, the lack of successful litigation that would demonstrate a causal link between adverse effects and the consumption of GM crops and food products is a form of societal evidence for lack of harm. (73)

Makes the absurd claim, by analogy, that if a court case has not been won then there can be no case to answer. This also contradicts the earlier hypothesis, by assuming that absence of evidence equals evidence of absence. Moreover, the claim presupposes that causes may be *demonstrated*. However, science advances on the presumption of the balance of probability and conclusive falsifiability, not infallibilism. In the words of one of your own checklist items: “In considering different hypotheses, have false negatives been treated the same as false positives?” (39)

> Most of the possible negative impacts of GM crops on biodiversity are likely to be reversible, so small-scale field trials to test for impacts on relevant ecosystems are unlikely to pose any long-term environmental risks. (14)

Either the claim is tautologous, namely, by *reversibility* is meant that long-term negative impact is foreclosed; hardly the true meaning of the term. Or the claim is empirically absurd on its own terms; for how can a negative impact, once occasioned, be retracted? Negative impacts are irreversible, and, in the nature of genetics, at risk of replication and regeneration.

> However, some of these effects may have been caused by a reduction in the quality or quantity of herbivorous prey rather than as a direct effect of the toxin itself - effects that would be a natural and inevitable consequence of any pest-resistant crop whether GM or not. (128)

This is bad science and bad reasoning. If A causes B and B causes C and C would not have come about were it not for B and B would not have come about were it not for A, a human intervention, then A is directly responsible for C. An imaginary world may also exist in which A is not a human intervention but a naturally occurring one. But that is not equivalent to a controlled experiment in the actual world.

The Report’s endorsement of the case-by-case approach is inadequate, as it does not consider the overall dangers of genetic modification. The case-by-case approach could easily be manipulated to allow ‘creeping commercialisation’ of GM crops and could set a dangerous precedent for approval of an increasing number of GM crops.[5]

[5] See also ISIS submission to the Science Review, 6 Sept 2003

Presentation of Evidence and Word Bias

We are concerned that:

- Much of the published evidence appears to be based on limited studies
- In many areas there have been no studies or so few studies that conclusions drawn appear to be highly speculative
- Assumptions and generalisations have been made that are not scientifically established
- Much evidence tests the null hypothesis that there is no noticeable difference between GM and non-GM crops. When based on small samples, there is a tendency towards reaching the conclusion that there is no difference[6]

In many parts of the Report, the language shows bias towards the pro-GM position. These lapses of objectivity may not be conscious, but they are no less real for that. Italics ours:

> As with *many* new technologies, people are keen to *embrace many benefits* but are concerned about *the potential risks* (27)

Why not say: as with *some* technologies, people are keen to embrace *potential benefits* but concerned about *many* risks?

> The aim of this review is to consider the evidence for both the *real and perceived risks* and benefits of GM crops from a scientific perspective. (27)

Talk of real and perceived risks implies that perceived risks are not as credible, i.e. merely perceived or artificial. Why not equally speak of real and perceived benefits then?

> *In a sense*, people have been genetically modifying plants (and many other living things) for thousands of years by breeding and selecting improved plants and by the domestication of crops. (27)

And what sense might that be? A scientific sense or a purely anecdotal, and we would argue misleading, comparison?

> However, evidence for the absence of *readily observable and relatively adverse effects* in any food does not mean that *milder, less widespread* or longer-term effects can be completely ruled out. (62)

Why not say that absence of readily observable and *mild effects* in any food does not mean that *relatively adverse, more widespread* or longer-term effects might not occur?

> The Deliberate Release Directive (2001/18/EC). The release and marketing of genetically modified organisms (GMOs) in the EU are controlled under a [sic] EU-wide regime. (290)

No mention is made of the importance of the legislative framework in force since 1990 which formed the basis of the 2001 Directive. We recommend that the full title of the 2001 Directive be given: 'repealing Council Directive 1990/220/EC'.[7]

[6] See also British Trust for Ornithology submission to the Science Review, Annexes 1 & 2, 15 Sept 2003

[7] M. S. Ali, *Risk Assessment in EU Policy: Quantitative and Qualitative Aspects.* European Parliament, Brussels, Luxembourg & Strasbourg, 1999. PE 168.197, CIP 2283.958044. For a summary of EU legislation with specific reference to GM releases.

Conventional Agriculture, Organic and Intensive Farming

The Report *only* compares GM crop cultivation with conventional agriculture that might be described as 'industrialised' because it is both high input and based on large monocultures or reliant on continuous applications of artificial pesticides and fertilisers.

The Review has not made any comparison with organic farming or any other systems of low input, small scale or diversified agriculture, which is surprising considering that the government has adopted targets to increase organic production in this country.

The Report fails to take seriouisly the threat to organic farming:

The Review has not considered the particular threat that commercialisation of GM crops would pose to organic production, where the threshold of allowable contamination would be much lower than for conventional non-GM crops. The threat of contamination from nearby GM crops would not just be a threat to individual crops but to the whole viability and survival of organic agriculture.

Given the high demand for organic food and the government targets for more organic production, these risks are very significant and must be addressed.

The Report makes poor projections of intensive farming:

> A wide range of plant breeding methods has been used to contribute to a substantial increase in crop yields and food production, quality and safety across the world (e.g. the Green Revolution of the 1960s and 1970s in India which has been estimated to have fed over 1 billion extra people from the same area of land). (27)

The 'Green Revolution' did boost crop yields in many cases but relied on high chemicals inputs and has failed in the objective of eliminating hunger and rural poverty - particularly in failing to meet the needs of small farmers.[8]

> Both traditional plant breeding and GM techniques are being employed to produce animal feeds with enhanced value. The aim is to meet an increasing world demand for animal protein and to substitute high protein plant materials, since feeds of animal origin have been banned. (100)
>
> IFPRI have shown that this change in population and demography may require a doubling of animal protein production with a corresponding doubling of demand for feed grain. (101)

A doubling of world production of animal protein would be impossible and any increase will be unsustainable as a large part of the land area that can sustainably support arable crops is already used for arable crops. Increasing yields from arable land inevitably requires inputs of chemical fertilisers and results in soil erosion and long term loss of fertility. Producing animal protein is at least 5 to 10 times as inefficient as producing plant protein for direct human consumption.

Changing agricultural patterns and consumption patterns away from intensive livestock production will require governmental action but it is imperative if we are to avoid further soil erosion, pollution and food insecurity. The developed countries, in particular the G8, including the UK, must take a lead here.

[8] Five Year Freeze, *Feeding or fooling the world* (2002)

Specific Issues

Chapter 4. How Reliable is GM Plant Breeding?

> By comparison with the 'non-GM' plant breeding methods [GM allows] *a greater degree of precision* than for genetic changes made by most non-GM plant breeding methods. (51)

> GM breeding [unlike non-GM] cannot be used to make polypoids, or recombine thousands of genes (pollution), or cause large-scale random unpredictable genetic changes (mutation breeding). (52)

These comparisons do not compare like with like. GM engineered seeds involve a highly specialised, invasive procedure. The difference is not just a matter of degree but of kind. The fact that greater control over genetic constitution is achievable is not necessarily an argument for exercising that control, but may be an argument for constraint (given the imperfect policeability of human motivations).

The actual process of genetic modification makes future mutations more likely - even if these mutations do not occur for several generations. The fact that genetic modification exploits weaknesses in the target DNA to insert the transgene suggests that the modified DNA is inherently less stable than before and that the transgene could relatively easily break away and recombine either with the same DNA or by horizontal gene transfer with another organism.

> There is extensive field testing and agronomic evaluation for non-GM breeding. GM crops are exposed to similar testing, but in addition include further testing on safety for animal and human health and for environmental impact under the European Union regulatory system. (56)

So why then is almost no scientific evidence presented on analysis of potential impacts on animal and human health (such as epidemiological studies), despite GM feed and food having been consumed in the EU for many years? Is it because no tests have been carried out beyond those to show 'substantive equivalence'?

> A major strand of scientific opinion considers the testing currently carried out in the EU to be robust and sufficiently comprehensive to provide GM crops that are at least as safe as conventional crops. This analysis is supported by practical experience in the cultivation and consumption of many millions of tonnes of GM crops internationally over eight years. Another strand in scientific opinion considers that GM crops need to be grown, consumed and analysed for a longer period in order to justify drawing such a conclusion. (56)

This is a dangerous and alarming abrogation of the precautionary principle because whichever 'strand' you accept, you have to accept more growing and consumption of GM food. This might not have been so if all the animals and people and who have consumed GM crops had been monitored systematically for ill-health effects.

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.

Chapter 5. GM Derived Food and Animal Feed Safety

> In summary, the risks may be toxicological/allergenic or nutritional in nature or may relate to the potential for gene transfer. In consequence, the available scientific evidence indicates that any potential effects are not different in nature from those created by conventional breeding practices and are already familiar to toxicologists and nutritionists. (61)

This does not follow. Toxicologists and nutritionists will most likely not have previously dealt with the issues of gene transfer or with the potential effects of further genetic mutations or 'gene silencing' occurring in the transgenic plant.

> The process of GM does not, in itself, create new classes of hazard different from the types identified above. And the same hazards are inherent in conventional breeding methods. (72)

Again, this ignores the potential hazards unique to genetic modification such as a greater chance of gene flow or genetic mutation. In addition, any extra hazards could be compounded in those eating mostly GM foods.

> Until now a major beneficial dietary factor for certain types of cardiac disease has been omega 3 fatty acid. Typically, the only source has been from oily fish. Recent research has shown a plant source in algae and the application of GM technology has now led to the trialling of crops rich in omega 3 fatty acid which has a potent cardio-protective effects. (76)

This is not true: seeds such as flax and hemp are an excellent source of omega 3 fatty acids and their oils are already produced and available at supermarkets. The key to health is a balanced diet, with plenty of fresh, unprocessed food. Diets high in refined, over-processed food and saturated fats are a major factor in cardio vascular diseases. Even if GM food had increased content of specific nutrients, it would be unlikely to correct serious dietary deficiencies or offset unhealthy lifestyles.

> Nearly one sixth of the global population of six billion people do not have adequate diets…. GM technology has been used to enhance the nutrient quality of staple crops…. A recent example is 'Golden Rice' which has been modified to increase the content of pro-vitamin A (beta-carotene). (76)

Golden rice is widely reported to have been a failure: for example, an adult would need to consume 9kg of cooked rice daily to get their Vitamin A requirement.[9] The problem is one of resource distribution - poorer people do not have access to vegetables or fruit that would supply the balance of nutrients needed - and it is extremely unlikely a single GM crop could supply all nutrients needed. The answer is better resource distribution: for example, making green vegetables (or just the seeds) more widely available at low cost.

A GM crop such as golden rice could induce complacency in government agencies and put control of the health of the poorest people in the hands of multinational corporations, whose main motive is financial gain.

> In the hypothetical case, where a GM allergen was not recognised in regulatory screening, and its effects only emerged in the longer term, avoidance of the allergenic protein by the consumer could be difficult, because they would not be able to recognise its presence in the foodstuffs. The likelihood of this scenario is very low for a number of reasons. (79)

Yet on the same page:

> It is difficult to predict the allergenic characteristics of a given protein. The interaction with the gut immune system that is involved in generating an allergic response is not well understood. Absolute predictability never exists in this or other regulatory arenas. (79)

It seems entirely plausible that genetic engineering will give rise to proteins that have not been encountered before in allergy testing.

> Efforts to remove the allergen from peanuts would be beneficial to a substantial fraction of the population whose sensitivity to the protein can expose them to life threatening situations and work to this end is underway. (88)

But there are dangers in presenting GM foods as 'allergy free'. For example, the allergenic food in question (assume peanut) may be accidentally eaten from a source that does not have the allergenic gene 'silenced' or which has lost the GM characteristic (a possibility acknowledged on page 55).

[9] Five Year Freeze, *Feeding or fooling the world* (2002)

Section 5.4 on the fate of transgenic DNA starts by assuring us that:

> Transgenic DNA is no different from other DNA consumed as part of the normal diet and it will have a similar fate. (90)

It is clear that transgenic DNA *is* different. The transgenic DNA may have never existed in nature, may contain DNA from bacteria and viruses and may have a greater tendency to recombine because it was designed to recombine easily with the original host plant. This apparently obvious possibility / risk has also been largely ignored in chapters 6 and 7.

Chapter 6. Environmental Impacts of GM Crops

> Currently, little information is available on the ecological impacts of GM crops on non-target species obtained from experimental field research under realistic commercial release conditions. Conventional crop management practices, including pesticide applications, already have significant adverse impacts on biodiversity and soil functioning and the impacts of GM crops need to be assessed in this context. (119)

> Studies of the impacts on vertebrates (especially birds known to eat crops) of commonly used GM-derived endotoxins are lacking in the scientific literature. (134)

It seems likely that the reason that so little research has been conducted on non-target species is that they are of little concern to biotech companies who have funded many studies. The lack of research extends to impact on soil organisms and wider ecological effects.

Throughout Chapter 6, comparisons of GM crops with non-GM are limited to comparisons with high input agriculture, which typically uses high doses of dangerous herbicides and pre-emptive pesticides. No comparison has been made with organic farming or other forms of low input/low impact agriculture, which are successfully, employed throughout the country and sustainably support much higher levels of biodiversity.

> The published literature does not seem to contain any references for research on the possible toxicity of GM crops that do not contain pest- or disease-resistance transgenes. The most likely explanation is that such research is carried out as a routine element of GM commercial release applications but would not be reported in the scientific literature unless significant anomalous results were found. (127)

This suggests that the Panel have not consulted the regulatory bodies responsible and leaves a question mark over whether such research has been carried out at all.

> Disease resistant varieties, particularly if grown on large areas, provide a strong selection for *target organisms* (pests or pathogens) that can attack the new variety. (137)

> The development of resistance is not a novel phenomenon confined to agriculture, and certainly not to GM. (138)

This highlights one of the problems with modern intensive farming, which typically relies on large areas of monoculture growing from a limited number of seed varieties with minimal rotations or other barriers to pest and disease transmission. GM crops are potentially *more* vulnerable than non-GM crops in these circumstances.

There are also features of GM that could make development of resistance more problematic. Reliance on a small number of broad spectrum herbicides and reliance on a relatively small number of seed varieties may each require a considerable amount of investment, development and testing.

The Green Party advocates a move towards small-scale, diversified agriculture, using crops and methods adapted to each area. Reducing the long distance transport of crops also helps to reduce the incidence of disease and pest transmission.

The use of refugia (p142) would appear to be no use in controlling epidemics of resistant pests, once they become established, especially in large-scale monocultures. The traditional use of pesticides only when necessary to control epidemics is more likely to be effective, as pesticide susceptible pests would develop alongside resistant pests between applications of pesticides. The use of traditional methods of pest control such as maintaining rotations and diversity of crops are a much better strategy in reducing the impact of development of resistance to pesticides.

> While there may be only modest declines in overall herbicide use, it is nevertheless likely that the more environmentally benign herbicides, glyphosate and glufosinate, could come to replace some of the more damaging herbicides currently in use. Inevitably, however, this benign characteristic does not extend to their impact on target organisms (weeds). (147)

This gives the impression that glyphosate and glufosinate are benign. However, glufosinate has been shown to cause birth defects and brain disorders and glyphosate has been linked to a high incidence of non-Hodgkin's lymphoma.

It should be noted that herbicide tolerant crops start from the position of requiring specific herbicides and that the only point in using them is to make use of their herbicide tolerant nature, thus using them is very unlikely to result in any long term reduction in the use of herbicide.

We suggest that the best strategy is to reduce and eliminate the use of harmful herbicides by supporting alternative methods of weed control such as appropriate rotations.

The section 6.7.3 on Range of Views promotes numerous benefits to follow commercial approval, while mostly ignoring the potential negative effects of GM crops on agricultural systems. It also assumes that the GM crops will achieve what is intended of them and that they will be economically viable.

Given that there have been numerous problems associated with the introduction of GM crops elsewhere and several notable GM crop failures (such as *bT* cotton in India), it seems remarkable than none of these has been noted.

Chapter 7. Gene Flow, Detection and Impact of GM Crops

> The main view of experts in this area is that there are sufficient data available to predict the separation distances required to limit pollen-mediated gene flow to below 1% for most, and below 0.5% for many crop varieties. (201)

Such separation distances would have to be significantly increased to ensure low levels of cross pollination under all conditions and to ensure that less that 1% contamination occurs when other contamination during crop transportation and processing is taken into account. In addition, organic food proponents and many consumers have indicated that levels above 0.1% contamination would be unacceptable - ensuring that would require still greater crop separation. The necessity and impact of crop separation on agricultural systems in not addressed in section 6.7 on Changes in Agricultural Practices.

The lack of research on the overall ecological effects of transgenes persisting in wild relatives (section 7.3) would make it difficult or impossible to take this into account when regulating a particular GM crop. Persistence in wild relatives could render attempts to prevent gene stacking in subsequent crops (for example, through rotations or destruction of volunteers) ineffective.

> Cross-pollination falls off rapidly with distance but the distance at which it is zero is impossible to determine with accuracy. (217)

This ignores the fact that once established in weedy relatives in a natural environment outside the farm, the transgenes could, over time, travel any distance.

> Soils are dynamic systems that are in constant state of flux, for example they are affected by the weather, agrochemicals, what crop and even what variety is grown [. . .] The scientific evidence shows that change is often reversible and soil functioning is robust. (230)

But if soil bacteria modified by GM crops persisted, they would quite possibly persist indefinitely. With agro-chemicals, the soil is usually considered suitable for growing organic crops after a period of several years without application of synthetic chemicals (because the chemicals would have been sufficient degraded or leached). However, it is possible that soil having once grown GM crops could never again be considered 'GM free'.

Perhaps the greatest omission in Chapter 7 on gene flow is that no consideration has been given to the likelihood that horizontal gene flow is more likely to occur from GM crops, or any GM organisms, than from non-GM crops or organisms.[10] Likely causes of a greater tendency towards horizontal gene flow are:

- The transgene will likely have exploited a weak point in the host DNA to recombine so is also more likely to become detached again
- It will likely have been engineered to recombine easily (i.e. it has been specifically designed for horizontal gene flow!)
- It may contain parts of bacteria or virus DNA, whether accidental or deliberate, so would be more likely to recombine with bacteria or viruses than pure plant DNA would.

Unanswered Questions and the Limitations of Science

Although the main remit of the Science Review was to consider published scientific evidence it was expected to address public concerns and it is clear that many of the questions in Annex 1 of the Report remain unanswered.[11] It is a salutary reminder of the significance of the decisions facing governments that public questions go much wider than the relatively narrow question of the scientific basis of genetic modification. For instance:

> Is it right for man to be tampering with nature? . . . What legacy are we leaving future generations? . . . Will GM distract us from looking at proven solutions to farming problems? (288)

The many issues raised at the GM Public Debate include ethical questions of whether we should be tampering with the natural world in this way at all, to questions of who controls and benefits from commercialisation of GM, to questions on the long term impact of genetic modification on the environment and health.

To quote two great thinkers on the limitations of science:

> "Science is meaningless because it gives no answers to our question, the only question important for us, *What shall we do and how shall we live?* " [Tolstoy] That science does not give an answer to this is indisputable. (Max Weber quoting Tolstoy at Lecture to University of Munich, "Science as a Vocation", 1918)

[10] See also ISIS submission to the Science Review, 6 Sept 2003

[11] For an enlightened strategy for dealing with our farming problems, and for answering these questions now and in the future, see Caroline Lucas MEP & Andy Jones, *Local Food: Benefits and Opportunities* (Green Party Report, 2003).

Conclusions

- Even on the basis of it's own terms, the Science Review has serious shortcomings and inconsistencies
- Issues surrounding genetic modification go much wider than the relatively confined areas of scientific research
- The Green Party recommends that in applying the precautionary principle, the UK government rejects commercialisation of GM crops and impresses upon the EU the need for continuation of the moratorium on GM crop growing and imports [12]
- In addition to the new EU regulations on traceability and labelling, the Green Party insists that GM producers and biotech companies must be made liable for any future harm to the environment or human health, in addition to the costs of testing for and mitigating GM contamination of non-GM crops

[12] See emergency motion passed at Green Party autumn conference 2003: http://www.greenparty.org.uk/index.php?oldnav=conferences&b=0&l=12&nav=emergencymotions&n=29