



Genetic engineering - the key issues

The Soil Association believes that the risk of using genetic engineering in agriculture is too great and genetic modification has no place in the production of safe and healthy food. Organic farming systems have been designed to produce food with care for human health, the environment and animal welfare. The use of genetically engineered crops is not compatible with this aim. This position is shared by the organic movement worldwide and the majority of the public.

Contrary to the statements made by the biotechnology companies, genetic engineering is not like traditional cross breeding. There are many safety concerns associated with it. The process of genetic engineering (GE) is completely different to the natural biological processes used in traditional breeding which rely on natural plant reproductive methods.

No one really knows what the outcome of the widespread use of genetic engineering will be. We do know, however, that this process can produce unforeseen side effects and that it is virtually impossible to prevent the spread of genetically modified organisms (GMO's) once introduced into the environment. This substantial risk must be weighed against the possible benefits that the technology could bring. Great claims have been made for the benefits that this technology will deliver, however, there is serious doubt as to whether GE will actually fulfill this promise. It is also apparent that for those problems it is claimed to address there are already far more sustainable solutions available. The only clear beneficiaries will be the patent holders and the biotechnology companies.

The British Medical Association has warned that there is not enough evidence that GMOs are safe. They have stated that the precautionary principle should be applied in developing genetically modified crops or foodstuffs, as we cannot at present know whether there are any serious risks to the environment or to human health involved in producing GM crops or consuming GM food products. Adverse effects are likely to be irreversible; once GMOs are released into the environment they cannot be subject to control.

Genetic engineering the basics

Genetic engineering is a process which attempts to transfer a desired characteristic from one organism (living thing) to another. This is achieved by inserting the gene which controls this function in its natural environment, into the genetic code of the host. This process has some serious flaws.

Genes do not operate in isolation, as a result no-one can predict how the transgene (the gene that is being inserted) will affect and be affected by its new environment. In nature, genes are regulated by neighbouring genes, for example, to say when or where in the plant the gene should operate. However, these relationships are not fully understood and are ignored in current agricultural genetic engineering. This means that those involved in developing GMO's have no way of knowing what the side effects of inserting the gene will be.

In addition, there is no means of inserting the gene into a specific place, so its eventual

location is random. As a result of these unknown factors, unpredicted side effects occur routinely with genetic engineering; many of these side effects have been recorded even in commercialised varieties.

For more information on this subject see the briefing sheet entitled 'Genetic engineering - the science behind the technology.'

A precise technique?

The process of genetic engineering is very imprecise and many attempts have to be made before an apparently normal functioning plant is produced. Over 90% of attempts to genetically modify an organism fail. Even when an apparently normal functioning organism is obtained, side effects may appear in trials or after the variety is marketed. GMOs can also be unstable from generation to generation, resulting in unforeseen side effects.

Genetically modified foods and human health

Biotechnology companies claimed that genetic engineering methods are not significantly different from traditional methods, as a result no rigorous testing was required for food produced using this technology. Very little research has been published which assesses the health and safety implications to humans from ingesting GMO's.

Genetic engineering may result in the creation of new toxins (examples already exist). Unexpected allergic reactions can be triggered (scientists proved that a brazil nut gene inserted into soya would result in people allergic to nuts suffering from an allergic reaction if they consumed the GM soya). Genetically modified plants often carry antibiotic resistant genes, or 'marker genes', to indicate to the scientists where the foreign gene has positioned itself in the plant genome. The use of antibiotic genes as 'markers' means that there is a risk of increasing the incidence of resistance to antibiotics among bacteria that can cause human illness.

For more information on this subject see the briefing sheet entitled 'Genetic engineering and human health.'

GE crops and the environment

- Genetically engineered material can be transferred to other related crops and wild plants via cross-pollination. Once released it is impossible to 'clean up' any unforeseen consequences.
- Genetically engineered plants which are designed to kill pests, can kill beneficial insects as well, thereby having a knock-on effect on levels of biodiversity generally.
- Some plants engineered to be herbicide resistant have resulted in an increased use of herbicides, adding to the already devastating effects of intensive farming on biodiversity.
- Genetic engineering to develop insect resistant crops is likely to encourage the faster development of resistance in insect populations to pest control, thereby leading to the use of more or stronger pesticides.

GE foods and consumer choice

- Due to the current labelling legislation consumers will lose their right to choose whether or not to eat products that are free of genetically engineered ingredients.
- It is estimated that 90% of products containing genetically engineered ingredients will

not need to be labelled under current labelling directives.

- No legislation exists to protect the crops of farmers who want to stay free from contamination.

For more information on this subject see the briefing sheet entitled 'Genetic engineering and consumer choice.'

America and Canada - the reality of GMO's

The evidence we have gathered in our 'Seeds of Doubt' report demonstrates that GM food crops are far from a success story. In complete contrast to the impression given by the biotechnology industry, it is clear that they have not realised most of the claimed benefits and have been a practical and economic disaster. Widespread GM contamination has severely disrupted GM-free production including organic farming, destroyed trade and undermined the competitiveness of North American agriculture overall. GM crops have also increased the reliance of farmers on herbicides and led to many legal problems.

For more information on this subject see the briefing sheet entitled 'Seeds of doubt - executive summary.'

Take action

If you would like to take action on this issue and take part in the public debate being organised by the government, here are just some of the ways you can get involved;

Keep up to date with the public debate's progress and find out how you can contribute by calling Alissa Cook on T: 0117 914 2433 or email action@soilassociation.org

Contact the Soil Association for leaflets to distribute, Tel; 0117 914 2447.

Ring the customer care line of your local supermarket (list of numbers below), telling them;

1/ that you buy organic food from them and would like to be able to buy UK produced organic food whenever possible.

2/ that you are worried that if commercial planting of GM crops goes ahead in the UK, all farms will be contaminated by GM and you will not be able to buy uncontaminated British food even if it is organic food.

3/ ask the supermarket what they are going to do to make sure that this doesn't happen (please let our policy department know what they say in response).

ASDA	0500 100 055
Co-op (CWS)	0800 317 827
Iceland Foods	01244 842 842
Marks & Spencer	0207 268 1234
Safeway	0208 848 8744
Sainsbury's	0800 636 262
Somerfield	0117 935 6669
Tesco	0800 50 55 55
Waitrose	0800 188 884

For more information on GE contact the Soil Association and order a full set of briefing sheets free of charge T: 0117 914 2444

How can I support the work of the Soil Association?

The Soil Association is a membership charity, we urgently need your support to continue our work. As public support for the Soil Association continues to grow, our ability to influence the thinking and policies of government and big business grows with it. In this way we help to develop a truly healthy and sustainable future. Join us today and help us to continue campaigning for sustainable agriculture and organic food. You can join the Soil Association on our website, over the phone or by writing to us.

Further Reading

Please see the Soil Association website library, <http://www.soilassociation.org/library>, for more information

Soil Association Campaigning for organic food and farming and sustainable forestry
Bristol House, 40-56 Victoria Street, Bristol BS1 6BY
T: 0117 929 0661 F: 0117 925 2504 E: info@soilassociation.org
www.soilassociation.org

Version.1 Approved: