

# Submission from VOICE to Department of Environment, Heritage and Local Government Consultation Document on Socio-economic Implications of the placing on the market of GMOs for cultivation, March 2010

## Consultation on the Socio-economic Implications of the placing on the market of GMOs for cultivation



Comhshaol, Oidhreachta agus Rialtas Áitiúil  
Environment, Heritage and Local Government

### Extracts from Department of Environment, Heritage and Local Government Consultation Document

#### Introduction:

EU legislation on Genetically Modified Organisms provides for an assessment of the socio-economic implications of deliberate releases and placing on the market of GMOs through direct reference (Directive 2001/18/EC) and indirectly by reference to "other legitimate factors relevant to the matter under consideration" (EU Regulation 1829/2003).

The European Commission noted in 2004 that there was insufficient experience to make such an assessment. However, the Commission has now deemed it an appropriate time to look at the need for such an assessment and particularly so in light of fact that the consideration of socio-economic factors in the authorisation of GMOs for cultivation has been raised by several EU Member States in recent months<sup>1</sup>. The Commission has

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<sup>1</sup> Environment Council of 2 March 2009, Agriculture Council of 23 March 2009 and Environment Council of 25 June 2009

therefore invited Member States to submit all information they would consider relevant so as to initiate an analysis of socio-economic implications.

With a view to framing an appropriate response the Department of the Environment, Heritage and Local Government is now seeking observations on the socio-economic impacts of the placing on the market of Genetically Modified Organisms for cultivation.

Information received in response to this consultation process will help in formulating the report from Ireland to the European Commission on this subject.

This document contains an overview of GMOs and the relevant legislation. A questionnaire is included to focus and facilitate commentary on socio-economic topics of particular importance. However respondents can also include their observations on additional topics they consider relevant.

Comments should be submitted by email or by post to the address below by 24<sup>th</sup> February 2010. Comments received may be made available publicly on the Department's website.

by email: [environmentpolicy@environ.ie](mailto:environmentpolicy@environ.ie)

by post: Environment Policy Section,  
Department of the Environment, Heritage and Local Government,  
Custom House,  
Dublin 1.

### **What are GMOs?**

GMO is an acronym for Genetically Modified Organisms.

An organism is any living animal or plant including a bacterium or virus that is capable of reproduction. Plants and animals are composed of many different cell types and each cell contains within it, copies of all its genes. Genes are made of DNA (deoxyribonucleic acid) and hold the information that determines the organism's particular form and function. Certain characteristics of an organism may be linked to a particular gene or combination of genes, for example flower colour.

For centuries, crop plants and livestock have been cross-bred such that the genetic make-up of offspring has been altered to select for desired traits and/or qualities. Traditional plant and animal breeding techniques require that the individual species involved are the same or closely related and such conventional plant breeding employs natural genetic variations to improve crops. Further development took place with the introduction of mutation breeding involving the artificial increase of mutation rates for subsequent selection. The development of genetic engineering techniques has meant it is possible to insert genes from another organism, or otherwise alter its genetic makeup, with a goal of introducing, deleting or enhancing particular traits in an organism.

Genetically Modified Organisms are defined in EU Legislation as 'those in which the genetic material is altered in a way that does not occur naturally by mating or natural recombination'.

Where GMOs comprise bacteria, viruses, viroids and animal and plant cells in culture they are referred to as Genetically Modified Micro-Organisms or GMMs.

Where GMOs comprise GM plants or GM animals otherwise known as transgenic plants or transgenic animals, they are referred to as GMOs.

## Legislation on GMOs

Legislation on GMOs is made taking account of the common framework for assessment and control of GMOs by which Ireland, in common with all Member States, is bound. EU legislation on GMOs has been in place since the early 1990's, and is focused on two main objectives:

- To protect human health and the environment.
- To ensure the free movement of safe genetically modified products in the European Union.

The potential environmental impact of genetically modified organisms (GMOs) is regulated under the following pieces of legislation;

- EU Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms and repealing Council Directive 90/220/EC transposed into Irish law under the Genetically Modified Organisms (Deliberate Release) Regulations 2003 (S.I. No. 500 of 2003);
- EU Directive 2003/29/EC on genetically modified food and feed;
- EU Regulation 1830/2003 concerning the traceability and labelling of food and feed products produced from genetically modified organisms and amending Directive 2001/18/EC;
- EU Directive 98/81/EC amending Directive 90/219/EEC on the contained use of genetically modified micro-organisms transposed into Irish law under the Genetically Modified (Contained Use) Regulations 2001 (S.I. No. 73 of 2001);
- Regulation 1946/2003 on the transboundary movement of GMOs, transposed into Irish law under the Genetically Modified Organisms (Transboundary Movement) Regulations 2004 (S.I. No. 54 of 2004).

Further information on the EU regulatory framework on GMOs is available from the European Union website <http://www.europa.eu.int/>: or by visiting the GMO section of this site.

## Government Role

The Minister for the Environment, Heritage and Local Government has responsibility for policy matters in relation to Directives on the deliberate release of GMOs into the environment and the contained use of GMOs.

The Department of the Environment, Heritage and Local Government is also responsible for certain functions under Directive 2001/18/EC, e.g., decisions to place GMOs on the market under Article 18 of this Directive.

The Environmental Protection Agency is the authority in Ireland that implements GMO Regulations on:

- The contained use of Genetically Modified Organisms
- The deliberate release of Genetically Modified Organisms into the environment

- The transboundary movement of Genetically Modified Organisms

The Department of Health and Children has responsibility for policy matters concerning genetically modified food. The Food Safety Authority of Ireland is responsible for the enforcement of GM food regulations, ensuring that only EU authorised products are on the market and that such products are appropriately labelled.

The Department of Agriculture and Food is responsible for:

- Regulating seed for cultivation
- Regulating animal feed that contains or is derived from GMO
- Developing a national strategy to ensure the co-existence of GM crops with other crops
- Licensing of pesticides for use on crops including GM crops.

### **Questionnaire Instructions:**

This consultation document utilizes a questionnaire format to focus and facilitate commentary on the potential socio-economic implications of the placing on the market of GMOs. However, space is given to allow respondents to include observations on additional topics they consider relevant.

Respondents will potentially find some sections of the questionnaire more relevant than others, depending on the nature of their interest in this subject. It is therefore not necessary to complete all sections of the questionnaire. Respondents can omit sections which do not apply and can also expand on areas of relevance.

The questionnaire is broken down into three sections.

1. Economic and social implications of the placing on the market of GMOs for cultivation.
2. Agronomic sustainability.
3. Submission of additional comments.

Respondents are asked to include contact details and to indicate the nature of their interest in this consultation process.

## Submission from VOICE March 2010

### 1 - Economic and social implications:

In your view, would GMO cultivation have economic and/or social impacts? Please explain your view. (Note that included impacts can be positive or negative. A list of potential topics, broken down by sector, is included in the Appendix of this document for consideration. However the list is not definitive or exhaustive.)

It is difficult to detail all the issues in a short consultation paper, but there are many likely impacts of genetically engineered crops. VOICE notes that there was a consultation process held 11 years ago. One of the recommendations of this report was that research should be conducted into the environmental impacts of genetically engineered crops, and notes with regret that the intervening 11 years do not seem to have been used to conduct this research and advance the debate. A recent editorial in Scientific American pointed to the difficulties with investigating environmental effects of genetically engineered crops, and indicated that the industry itself was blocking research attempts, with researchers either not permitted to use genetically engineered crops in research, which as they are patented are under the control of corporations, or would retain the right to suppress unfavourable results. Indeed one researcher in Germany commented that those with the money were not interested in the research, and those who were interested did not have the funding. It is regrettable that 11 years on there is still little research to inform this consultation.

Cultivation of genetically engineered crops will have significant economic and social impacts, not least of which is the patenting of genetically engineered crops, which give a 20 year monopoly to corporations on genetically engineered crops. Given the variety of seed collections held as mentioned below, and that conventional breeding techniques are capable of generating the varieties needed to face coming changes, it is the patenting of genetically engineered crops which is the economic drive behind genetically engineered crops.

Genetically engineered crops also have real implications on consumer choice. Consumers who are concerned about the lack of research into genetically engineered crops and the methods used to produce the food they eat could well find that choice increasingly unavailable, particularly as co-existence of genetically engineered crops with conventionally bred crops or organic crops may well be impossible.

In your view, could the marketing of GM seeds have an impact on the seed industry and its structure in the EU (size of companies, business concentration, competition policy)? Please specify per sector;

- for plant breeders;
- for seed multiplication;
- for seed producers;
- for the availability of conventional and organic seeds;

- creation/suppression of barriers for new suppliers;
- market segmentation.

Genetically engineered seeds are fundamentally different from conventionally bred crops from the perspective of intellectual property protection. Intellectual property protection is a “societal bargain”; in return for sharing inventions with society via publication, an inventor is awarded a period of monopoly on the invention, often 20 years, a balancing of the benefit to society from the disclosure of the invention with the monopolistic benefit to the inventor. Until the 1980s, living organisms, particularly crops, were not considered patentable for a range of reasons, not least of which was the centrality of crops to food security, but also for other reasons such as their capacity to reproduce, not a feature of industrial inventions such as novel electronic components, which to date have not been found to reproduce themselves. Clearly, given that while the consumer can avoid buying expensive electronics, eating food cannot be avoided, granting a 20 year patent monopoly to essential crops will grant a far more powerful monopoly than a similar patent monopoly granted to electronics.

Conventionally grown crops are covered by Plant Breeders Rights systems, which VOICE considers represent a relatively fair balance between the need to reward innovation with the need of society to ensure food security and flexibility in developing improved crops. Generally Plant Breeders Rights will include a licensing system for plant breeders to develop the existing variety. Also recognised under this system are Farmers Rights, that is *“rights arising from the past, present and future contribution of farmers in conserving, improving and making available plant genetic resources, particularly those in the centres of origin/diversity.”* The purpose of these rights is stated to be *“ensuring full benefits to farmers and supporting the continuation of their contributions”*. For thousands of years farmers have selected and bred plants with characteristics adapted to local conditions, resulting in the development of hundreds of thousands of “landraces”, or local crop varieties. Farmers Rights are in recognition of the fact that all modern agricultural crops are only the most recent step of accumulative knowledge and inventions that have been carried out over millennia by generations of men and women in different parts of the world. Farmers Rights give a right for farmers to save and replant seed, in recognition of this contribution.

Genetically engineered seeds are covered by the patenting system, designed for industrial inventions and not for living organisms.

There has been extensive consolidation of the seed industry over the last decade, a particular feature being acquisitions of seed companies by chemical companies such as Monsanto and DuPont such that the norm today is a company which owns the crop seeds, the pesticides and herbicides used in cultivation of crops, and the genetic engineering that engineers plants to be resistant to the chemicals produced by the company. From over 7,000 seed companies 25 years ago, none of whom had more than 1% of the market, today just 10 companies control almost 70% of the market.

The implications for plant breeders using conventional breeding techniques are that they are legally barred from developing new varieties of seed if that seed has been genetically modified and is subject to a patent. This will lead to further monopolisation of the food chain by a small number of corporations.

## **2. - Agronomic sustainability**

### **2.1 Agricultural inputs**

In your view, would the cultivation of GMOs which are approved for cultivation in the EU have an impact (positive or negative) regarding the use of pesticides against target insect pests?

Although some genetically engineered crops are engineered to produce pesticides will inevitably lead to pesticide resistance, which has been seen many times with conventional pesticide use. As the pesticide is expressed directly by the plant, there will be a continual and strong selection pressure towards pesticide resistance emergence. There will be little incentive to make use of integrated pest management approaches, which although they require more forward planning, have much less impact on the environment.

Also, ultimately pests will develop resistance to the pesticides, as history has shown that repeated or continual exposure to a pesticide leads to the emergence of pesticide resistance. Pesticide resistance is far less likely to emerge with integrated pest managements systems, as pesticides are used more sparingly and in conjunction with other control methods.

In your view, could the placing on the market of GMOs have an impact (positive or negative) regarding the use of pesticides or/and on the patterns of use of chemical herbicides?

Genetically engineered crops which are engineered to be tolerant of herbicide application will inevitably lead to increased herbicide use, particularly as it is in the interest of the company producing the seed to promote herbicide use as generally the same company also manufactures the requisite herbicide.

This will lead and is leading to the emergence of herbicide resistance, which is already been seen with glyphosate. Normally resistance to glyphosate is a rare occurrence, but there are now at least 3 types of glyphosate resistance which are known to have emerged. As with pesticides, the extensive use of glyphosate with crops that have been engineered to be resistant to glyphosate will only speed up the emergence of resistance.

### **2.2. Biodiversity, flora, fauna and landscapes (other impacts than the ones considered in the environmental risk assessment carried out under Directive 2001/18 and Regulation (EC) No 1829/2003)**

In your view, would the cultivation of EU approved GMOs have an impact (positive or negative) regarding the number of non agriculture species/varieties?

As most genetically engineered crops are designed to be used with pesticides and herbicides, insofar as genetically engineered crops will lead to ongoing use and proliferation of the use of pesticides and herbicides, the cultivations of EU approved genetically engineered crops will have deleterious effect on non-agricultural species and varieties, as there will be no incentive to use more sustainable approaches to pest management.

In your view, could GMO cultivation have an impact (positive or negative) on agriculture diversity (number of plant varieties available, agriculture species, etc?)

There has been considerable consolidation within the seed industry in the last decade as mentioned above. Genetic engineering techniques are such they that favour monoculture and drive out the use of local varieties adapted to local conditions. Genetically engineered crops are expensive to produce, and only way to recoup development costs is to patent the crops and market the seeds so that they are sown extensively over large areas. This reduces agricultural diversity, and also will ultimately leave crop production vulnerable to diseases, as is the difficulty with extensive monocultures.

The Consultative Group on International Agricultural Research (CGIAR) has seed collections of agricultural varieties which number over 650,000. These have been freely donated by farmers the world over, and contain enormous variation in agricultural crops.

The variety that we need in crops to deal with the changing conditions over the next decades already exist in these collections, which contain varieties that are drought resistant, or have very high levels of vitamin A, are salt tolerant and so on. We do not need to genetically engineered crops with traits taken from unrelated species in order to deal with changing conditions, they already exist in these extensive collections held in trust by the CGIAR.

In your view, could GMO cultivation have an impact (positive or negative), regarding:

- protected or endangered species;
- their habitats;
- ecologically sensitive areas;

It is difficult to envisage how the use of genetically engineered crops, with extensive monocultures resulting from the reduction of seed choice associated with seed industry consolidation, using increased levels of biocides, could have a positive impact on the above. Europe, and in particular Ireland, are not like the US, where large wilderness areas can be separated from factory farms. In Ireland our wildlife lives in and around our farms, and farming practices must be sensitive to biodiversity and habitats.

In your view, could GMO cultivation have an impact (positive or negative) regarding:

- migration routes;
- ecological corridors;
- buffer zones.

See above

In your view, could GMO cultivation have an impact (positive or negative) on native plants that may be affected by pesticides and/or on the patterns of use of chemical herbicides?

As stated above, use of genetically engineered crops will most likely lead to increased herbicide use. Given that herbicides tend to act against a range of plants, increased use will inevitably impact on adjacent native plants.

In addition, there are some crop species that are highly invasive and displace native plants by self seeding, such as rapeseed which can now be regularly seen along hedgerows and was seen by this writer advancing rapidly towards the protected dune systems on Bull Island in Dublin.

Given this example of the capacity of a commercial crop to invade surrounding lands and require manual removal due to its invasiveness and herbicide resistance, it is inevitable that others will follow.

In your view, could GMO cultivation have an impact (positive or negative) on honey bees?

Honeybees are clearly under considerable pressure, with colony collapse disorder (CCD) widely reported across the US and Eurasia, sometimes with almost total loss of of the honeybee population. As honeybees pollinate over 70% of agricultural crops, the loss of honeybees would be catastrophic for food production, as the loss of pollination would leave only those crops pollinated by wind, such as wheat, barley and rice, among other grass-like crops. To date the cause of CCD has not been pinned down, although it has been linked to multifactorial causes, including neonicotinoids (which act on the nervous system and impair learning, vital in an insect that navigates by learned landscape features), and the toxin Bt which is engineered into some genetically engineered crops, (where it is thought it may have had the effect of altering the surface of the bee's intestines such that they are susceptible to infection by the deadly varroa mite).

As with other aspects of genetic engineering, little research has been done to

elucidate cause and effect. What it does point to is that in the absence of research on the cause of colony collapse disorder, there should be no research or field trials of genetically engineered crops which incorporate the production of insecticides in crop plants, as these will be foraged by bees for pollen. It is a feature of genetically engineered crops that are engineered to produce a pesticide, that this production is turned on 24 hours a day, in all parts of the plant, including the pollen collected by bees.

### **2.3. Renewable or non-renewable resources**

In your view, could the placing on the market of GMOs have an impact, (positive or negative) regarding the use of non-renewable resources?

Given the scale of population increase, and the consequent requirement to use land for food production, it is not likely that significant areas of land will be given over to production of energy crops.

What GMOs will likely do is increase the demand for use of the herbicides and pesticides that genetically engineered crops have or will have been engineered to resist. Production of herbicides and pesticides is energy intensive, so a farming approach which favours the use of genetically engineered crops, rather than a lower impact approach which utilises several techniques in the control of insects

In your view, could GMO cultivation have an impact (positive or negative) on the health and sustainability of the cultivated soil and whether it would be affected by pesticides and/or on the patterns of use of chemical herbicides?

There are already indications that the engineering of herbicide resistance into plants is finding its way into soil. A recent study found that not only was glyphosate leaching into the soil from plants, it was altering the soil flora and fauna, and negatively affecting the types of soil micro-organisms found in root associations toward the pathogenic. The difficulty is that little research is being done on the impacts of genetically engineered crops.

### **2.4. Climate**

In your view, could GMO cultivation have an impact (positive or negative) regarding our ability to mitigate (other than by possibly reducing CO<sup>2</sup> emissions from fuel combustion – This is covered in section 2.5) and adapt to climate change?

Cultivation of genetically engineered crops is irrelevant to greenhouse gas emissions and climate change. As mentioned above, the seed collections held by the CGIAR already hold an enormous range of crop types, which can be bred using conventional techniques to deal with climate change, salinisation, and so on.

### **3 - Other Implications**

If you wish to submit any additional comments, please use the space below.

There is an issue around the aggressive stance taken by corporations towards the patents they hold on seeds, which has already affected farmers in several countries. For example, rapeseed which is genetically engineered to be herbicide resistant could become very difficult to control, requiring removal by manual means if it is resistant to herbicides. This has already happened in Canada in the case of Percy Schmeiser versus Monsanto, where Mr Schmeiser was successfully sued by Monsanto for having genetically modified rapeseed (known as canola in Canada) found in a crop sown by Mr Schmeiser using seed he had saved from a previous harvest. Opinion is divided as to whether the saving of seed which included genetically engineered herbicide rapeseed was accidental, but the fact remains that Mr Schmeiser was unable to clear his land of the contaminating seed using herbicide application, as it was resistant. Recently farmers in Brazil found themselves facing royalty fees at harvest time, when harvested seeds from crops which had not been planted with GM seed had nonetheless become contaminated by genetically modified material. The evidence is that corporations are taking a very aggressive stance towards their patented seeds and engineered DNA, irrespective of how the material ended up in non-genetically modified crops, even when there are clear cases of accidental contamination. This has serious implications for those farmers who choose not to sow genetically modified seed, and would seem to indicate that co-existence of conventionally bred crops with genetically engineered crops will not be feasible.

Also not included in the structure of this consultation was the health risks of genetically engineered crops. Genetically engineering introduces novel proteins into crops to which we may not have been exposed previously and whose allergenicity is unknown, and a recent feeding trial with rats showed organ damage in rats that had been fed genetically engineered corn. Again as with environmental impacts, there is little research to draw upon, because little research is being funded.

## **Submission from VOICE March 2010**

Thank you for participating in this consultation.