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ENVIRONMENTAL POLICY DIVISION

Environmental Policy Division



Consultation on Proposals for Managing the Coexistence of GM, Conventional and Organic Crops

January 2007



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EXECUTIVE SUMMARY

1. Under European Union (EU) legislation, a GM crop can only be approved for commercial use if a specific risk assessment confirms that it is safe for human health and the environment. No commercial GM cultivation is expected in Northern Ireland for several years, but if authorised GM crops are grown here, in due course, this may result in non-GM crops having a small GM presence (for example - through cross-pollination or the dispersal of GM seed). To facilitate choice between conventional, organic and GM crops, coexistence measures will be needed to minimise unwanted mixing of GM and non-GM material. From a regulatory standpoint, the key benchmark for distinguishing GM and non-GM produce is the 0.9% threshold for GM presence adopted by the EU. (Products with a presence above this level must be labelled and sold as GM). In this paper the Department of the Environment (hereafter, the Department) is seeking comments on a proposed coexistence regime for Northern Ireland that would aim to minimise any unwanted GM presence in non-GM crops (both conventional and organic) so that it is below 0.9%.
2. At the Agriculture and Fisheries Council meeting (19-21 December 2006) general agreement was reached by Member States on the proposal to amend the EU organic regulation including GM provisions. This in effect means that the permitted threshold for GM presence in organic production has been fixed at 0.9%, subject to a review by 2011 on the basis of a Commission report. Formal adoption of the proposal will follow receipt of the European Parliament opinion (expected in March 2007).
3. A full explanation of the technical background and rationale for the Department's proposals is given in the consultation paper. In summary, the main elements are:
 - the proposals relate to managing coexistence between farms and between ordinary crops (*not* certified seed production); and they focus on the specific coexistence measures needed for crops of maize, potato, oilseed rape and beet (though little of the latter is grown in Northern Ireland).
 - farmers growing GM maize or oilseed rape crops would be required to:
 - observe a separation distance in relation to any crops of the same species grown by neighbouring producers, where these crops are intended for sale as non-GM or organic; and
 - notify their intention to sow a GM crop to neighbouring producers, if neighbouring land falls within the relevant separation distance.
 - these key measures would be specified in a statutory rule made under section 2(2) of the European Communities Act 1972.

- other desirable but less significant measures would be set out in a voluntary (non-statutory) code of practice. This code would be agreed between the Department and the industry, with the Department consulting all stakeholders on its proposed content.
 - these non-statutory measures would cover the control of volunteers (including weed beet and potato groundkeepers), the control of beet bolters, and the cleaning of combine harvesters used on GM oilseed rape crops before they are used on non-GM farms.
4. The Department proposes to monitor the effectiveness of the coexistence regime (both the statutory and non-statutory elements) and review it in consultation with stakeholders after an introductory period of about two or three years. Compliance with the statutory measures would be checked and enforced via the Department of Agriculture and Rural Development's (DARD's) on-farm inspections on behalf of the Department.
 5. A draft Regulatory Impact Assessment is included with the paper for stakeholder comment. This compares options for achieving the policy objective and analyses the potential costs and benefits, including the burden on farmers.
 6. In addition to the proposed coexistence regime, the consultation paper also covers the following related issues:
 - possible options for redressing any financial losses that non-GM farmers might face, if their crops have a GM presence above the EU 0.9% threshold through no fault of their own; this discusses the possibility of leaving claims for redress to be resolved under existing law, having an industry-led (voluntary) redress mechanism, or establishing a statutory redress scheme.
 - the pros and cons of establishing a detailed public register giving the precise location of all commercial GM crops.
 - possible guidance to farmers who may be interested in establishing a voluntary GM-free zone.
 7. Where relevant, the Department has indicated its current thinking on the desirability or otherwise of the ideas being considered. But in each case, the Department wants to hear from stakeholders before reaching final decisions. The Department will consult stakeholders further when it produces draft regulations to give effect to its proposed statutory measures.
 8. The deadline for responses to this consultation paper is **Monday 30 April 2007**.

INTRODUCTION

9. This consultation paper seeks views on the following issues relating to the coexistence of GM and non-GM¹ crops:
 - the Department's plans for coexistence measures to apply in Northern Ireland;
 - options for providing redress for possible financial losses by non-GM farmers due to GM crop cultivation;
 - the arguments for and against a public GM crop register; and
 - guidance on voluntary GM-free zones.
10. Apart from the first item on this list where specific proposals are made, the Department is not taking a definite view at this stage on the issues raised or what specific action, if any, is required on them. All these issues are open for discussion, although the Department's current thinking is indicated where relevant. The paper should therefore be read as a mix of proposals and ideas for consideration.
11. This paper relates to Northern Ireland only. Coexistence is a devolved matter and the authorities in England, Wales and Scotland are responsible for developing the policy to apply in their areas.
12. With regard to the development of measures for coexistence, difficulties may arise at the borders between states, especially where farm boundaries do not coincide with national borders. Therefore the Department, and the Department of Agriculture and Rural Development (DARD), have worked closely with their counterparts in the Republic of Ireland to overcome potential conflicts in the approaches to the coexistence measures introduced North and South. One of the primary objectives of this collaboration was to ensure compatibility of measures for farmers on both sides of the border. However, some additional work is still necessary in this area.
13. A number of specific questions are raised in this paper. It would be helpful if you could address these in addition to making any other points that you may wish to make. Where appropriate, please provide evidence to support your views. All the consultation responses will be considered and inform the further development of the Department's coexistence strategy. The Department will announce what further decisions it has reached following this consultation process, and the next steps it will take to ensure that effective coexistence measures are in place before any commercial GM cropping. No GM cultivation is expected in Northern Ireland before 2009 at the earliest.

¹ 'Non-GM' refers collectively to both conventional and organic crops. Where appropriate, a specific distinction is made between 'conventional (non-GM)' and 'organic'.

How to respond to this consultation

14. The commencement date of this consultation is 29 January 2007 and the closing date is 30 April 2007.

Responses can be sent in the following ways:

E-mail: noel.mcgininity@doeni.gov.uk

Fax: 028 902 57300

Textphone: 028 905 40642

Or alternatively in writing to:

Noel McGinnity
Department of the Environment
Environmental Policy Division
River House
48 High Street
BELFAST
BT1 2 AW

15. When responding, please state whether you do so as an individual or on behalf of an organisation. If the latter, please make it clear who the organisation represents and, where applicable, how the views of the membership were determined.

Freedom of Information Act 2000 – confidentiality of consultations

16. The Department will publish a summary of responses following completion of the consultation process. Your response, and all other responses to the consultation, may be disclosed on request. The Department can only refuse to disclose information in exceptional circumstances. **Before** you submit your response, please read the paragraphs below on the confidentiality of consultations and they will give you guidance on the legal position about any information given by you in response to this consultation.
17. The Freedom of Information Act gives the public a right of access to any information held by a public authority, in this case the Department. This right of access to information includes information provided in response to a consultation. The Department cannot automatically consider as confidential information supplied to it in response to a consultation. However, it does have the responsibility to decide whether any information provided by you in response to this consultation, including information about your identity, should be made public or be treated as confidential.

18. This means that information provided by you in response to the consultation is unlikely to be treated as confidential, except in very particular circumstances. The Lord Chancellor's Code of Practice on the Freedom of Information Act provides that

- the Department should only accept information from third parties in confidence if it is necessary to obtain that information in connection with the exercise of any of the Department's functions and it would not otherwise be provided;
- the Department should not agree to hold information received from third parties in confidence which is not confidential in nature; and
- acceptance by the Department of confidentiality provisions must be for good reasons, capable of being justified to the Information Commissioner.

For further information about confidentiality of responses please contact the Information Commissioner's Office at:

Information Commissioner's Office – Northern Ireland
Room 101
Regus House
33 Clarendon Dock
Laganside
Belfast
BT1 3BG
Tel. (028)90511270
Email to ni@ico.gsi.gov.uk
or see its web site at:
<http://www.informationcommissioner.gov.uk/>.

Consultees

19. The Department is specifically inviting the organisations listed in Annex A to respond to this consultation, but would like to hear from anyone who feels they have something to contribute. If you know of others who would be interested in receiving this consultation document please inform the Department.

GENERAL BACKGROUND

What does coexistence mean?

20. In this paper coexistence refers to the range of measures that farmers will need to take to minimise unwanted mixing of GM and non-GM crops. Such mixing can occur via normal processes such as cross-pollination between crops of the same species. If a GM crop cross-pollinates a non-GM variety the seed of the latter will have a 'GM presence' of GM DNA or protein (i.e. the novel genes in the GM plant will have been transferred into the non-GM plant).
21. More generally, coexistence is about maintaining choice for producers and consumers. The transfer of a GM presence into what is meant to be a non-GM crop could prevent it being sold into a non-GM production chain. The affected farmer might lose out financially as a result of this, and it would reduce the supply of non-GM products to consumers. The aim of coexistence measures is to minimise unwanted GM presence in non-GM crops so that these problems are avoided as far as possible.
22. If GM crops are grown in Northern Ireland they could either be processed with conventional (non-GM) crops in an undifferentiated production chain, or there may be distinct GM and non-GM chains. The extent to which GM and conventional (non-GM) crops are segregated will be determined by the prevailing market forces. Organic crops are required by legislation² to be processed separately from all other forms of non-organic production whether conventional or GM (to allow the use of the organic label).

Legislative Context

23. The approval and use of GM products is already heavily regulated by European Union (EU) legislation³. Under a collective EU-wide consent procedure, no GM crop can be grown commercially unless it passes a detailed case-by-case assessment of possible risks to health and the environment. This considers the impact of the dispersal of pollen or seed from the GM crop, and of cross-pollination with non-GM crops or related wild plants. Only crops assessed as having no harmful impact will be approved for release, and therefore coexistence measures are not required for safety reasons.
24. There are also strict EU rules to allow people to make an informed choice between GM and non-GM products⁴. These are directly relevant to the coexistence issue. They require GM products or GM ingredients in

² Regulation (EEC) No. 2092/91 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.

³ The approval procedure for food and animal feed products is set out in Regulation (EC) No. 1829/2003 on genetically modified food and feed. The approval of other GM products is covered by Directive 2001/18/EC on the deliberate release into the environment of genetically modified organisms.

⁴ Regulation (EC) 1830/2003 covers the traceability and labelling of genetically modified organisms (GMOs) and the traceability of food and feed products produced from GMOs. Regulation (EC) 1829/2003 has specific rules on the labelling of GM food and feed.

composite products to be traced and labelled through the production chain, so that they can be clearly distinguished. The EU legislation on tracing and labelling defines a GM product/ingredient as one which:

- contains, consists of or is produced from genetically modified organisms (GMOs)
- *except where* the GM content is adventitious or technically unavoidable and no higher than a threshold of 0.9%

25. This means that any statutory coexistence measures must aim to minimise unwanted GM transfer into non-GM crops so that they do not exceed the EU 0.9% threshold. This threshold will apply to farmers and others as follows:

(i) under the rules on the tracing of GM products, if a crop produced by a non-GM grower has a GM presence above 0.9% he or she will have to inform the buyer in writing that the material has a GM content. And at each subsequent stage in the production chain operators will have to inform each recipient of the material that it is classed as GM.

(ii) under the parallel labelling rules, GM products, food ingredients or animal feeds as sold to the final consumer or user must be labelled as GM if they have a GM presence above 0.9% (per ingredient).

26. As noted, the 0.9% threshold only applies in respect of a GM presence that is “adventitious or technically unavoidable”. This means that farmers and other operators must take reasonable steps to avoid having a GM presence, if they want to avoid the need for their produce to be traced and labelled as GM. The Department is aware that some stakeholders interpret the EU legislation as requiring coexistence measures to aim to prevent any detectable GM presence in non-GM crops. However, the Department is clear that the EU rules recognise in effect that it would be unrealistic for producers to strive to avoid GM presence completely. The 0.9% figure is a level that food and feed supply chains should in general be able to observe with measures that do not impose an excessive burden. Coexistence can only work on the basis of a pragmatic threshold.

27. It should be noted that in this paper the term ‘non-GM’ does not mean the same as ‘GM-free’. ‘Non-GM’ means a crop or product that may have an adventitious GM presence below the EU 0.9% threshold, and which therefore can be sold without a GM label. ‘GM-free’ implies that a product does not have any GM presence.

Economic Context

28. Northern Ireland farmers will only consider cultivating GM crops if it offers them an economic benefit of some sort (a price premium, yield advantage or lower production cost), and if there is a market for the crops. The normal operation of the market will decide whether any approved GM

crops are commercially successful. They could be grown here for either food or non-food uses.

29. The market conditions that pertain to GM cultivation throughout the UK will dictate the extent to which coexistence measures need to operate, and this could depend on the type of GM crop involved. The following scenarios are possible in relation to coexistence between GM and conventional (non-GM) production:

- the GM crop trades at a premium price relative to the equivalent conventional crop as it has a novel quality trait. Farmers growing the GM crop may therefore need to minimise 'contamination' from non-GM crop impurities because it reduces the desired quality.
- the non-GM conventional crop trades at a premium price as the GM crop has a production trait like herbicide-tolerance.
- there is no price differential between GM and non-GM crops and the economic position of non-GM producers is not adversely affected if their crops have a GM presence above the EU 0.9% threshold.

Policy Context

30. The EU has decided that coexistence arrangements should be determined at national level, adopting a legislative provision which provides that: "*Member States may take appropriate measures to avoid the unintended presence of GMOs in other products*"⁵. To assist Member States the European Commission has issued coexistence guidelines⁶.

31. The Government has also received a report⁷ on coexistence issues from the independent Agriculture and Environment Biotechnology Commission (AEBC), a former advisory body. In developing policy on coexistence the Department has taken account of both the European Commission guidelines and the AEBC recommendations.

32. The Government's general policy on GM crops was outlined in a Parliamentary statement on 9 March 2004⁸. The Department also issued a statement on 12 March 2004⁹. In relation to coexistence, the statements confirmed the Government's view that:

- farmers growing GM crops should implement measures to enable non-GM producers to operate within the 0.9% EU threshold, and that this might be achieved via a code of practice with statutory backing;

⁵ Article 26a of Directive 2001/18/EC.

⁶ Commission Recommendation 2003/556/EC on guidelines for the development of national strategies and best practices to ensure the coexistence of genetically modified crops with conventional and organic farming (available at http://ec.europa.eu/agriculture/publi/reports/coexistence2/guide_en.pdf).

⁷ *GM Crops? Coexistence and Liability* (www.aebc.gov.uk/aebc/reports/coexistence_liability.shtml).

⁸ Available at <http://www.defra.gov.uk/corporate/ministers/statements/mb040309.htm>.

⁹ Available at <http://www.nics.gov.uk/press/env/040312c-env.htm>

and that Government would undertake the following:

- consult on options for compensating non-GM farmers who suffer financial losses due to excessive GM presence; and
- provide guidance to farmers on voluntary GM-free zones.

General Principles

33. The European Commission guidelines set out a number of principles to be observed when developing coexistence policy. The Department agrees with these principles, and would highlight in particular that measures should or must:

(i) *balance the interests of all farmers*. Farmers have a legitimate interest in growing their preferred crops (conventional, organic or GM), and a coexistence regime must be fair and reasonable to all parties.

Coexistence should be seen as a co-operative rather than adversarial process, and it is a general principle of EU law that any action taken by Member States at national level must be non-discriminatory in its effects.

(ii) *be determined crop-by-crop*. Different crops may need different coexistence measures to take account of their specific characteristics.

(iii) *be practical and effective*. Regard must be had to what is achievable in practice, both in terms of what farmers might reasonably undertake and having rules that it is possible to enforce. There should also be confidence that measures will actually achieve the stated objective.

(iv) *be proportionate*. Measures should not exceed what is necessary to achieve the aim, which itself must be consistent with EU law. The 0.9% threshold is central in this respect. Measures must not be too prescriptive and should allow farmers to pursue the most cost-effective solution that meets the objective, thereby avoiding a disproportionate burden.

(v) *build on existing experience as far as possible*. Coexistence is not a new idea in agriculture. There are precedents for measures to minimise cross-contamination between different types of crop, and it makes sense to consider what can be learnt from these. Examples are the segregation of industrial and food-grade oilseed rape and also different types of maize (for example - waxy and non-waxy). In liaison with the Department, the farming and industry group SCIMAC¹⁰ has developed guidelines¹¹ for managing GM crops that include coexistence provisions. These were applied during the Government-sponsored Farm Scale Evaluation (FSE) GM trials, carried out in England, Scotland and Wales.

¹⁰ Supply Chain Initiative on Modified Agricultural Crops. This comprises the National Farmers Union, British Society of Plant Breeders, Crop Protection Association, Agricultural Industries Confederation and the British Sugar Beet Seed Producers Association.

¹¹ Available at www.scimac.org.uk.

COEXISTENCE MEASURES: INITIAL CONSIDERATIONS

34. To develop a coexistence regime it is necessary to consider and make a judgement on the following elements:

- the overall scope of the regime (what it will cover);
- the various ways that a GM presence can arise in a non-GM crop, and what can be done to minimise this; and
- what each potential source of GM presence might contribute to a cumulative total, allowing for the application of reasonable minimisation measures

35. These issues are explained in the following paragraphs. The paper will then set out and discuss the specific coexistence measures that the Department proposes should apply on a statutory basis to farms in Northern Ireland.

Overall Scope

36. The coexistence regime that the Department is proposing focuses on managing coexistence:

- (i) at farm level. Coexistence is an issue for the whole supply chain, but beyond the farm gate the industry will implement its own arrangements to ensure that conventional (non-GM) and organic chains can function effectively, based on normal contractual relationships and operating in line with the EU rules on the tracing and labelling of GM products.
- (ii) between neighbouring farms – the situation where one farmer intends to grow a GM crop and his neighbours could be affected by the transfer of a GM presence into their conventional or organic crops.¹²
- (iii) for maize, beet, potato and oilseed rape crops. It is not certain what crop species might be cultivated first in the UK in GM form. However some of these crops are not widely grown in NI. This paper focuses on species where GM varieties already exist or are in development. If other species of GM crop are proposed for commercial use the Department will consider the coexistence requirements for them as necessary.
- (iv) for crops other than those produced for certified seed. The European Commission is due to propose specific labelling thresholds for GM presence in non-GM seed stocks. Once adopted, these will govern the relationship between GM crops and certified seed production. Certified

¹² Coexistence may also be an issue within a farm – where someone intends to grow both GM and non-GM crops of the same species on a single production unit. In this case, the farmer may need to minimise GM cross-contamination because it could affect his own non-GM production. This is a different scenario on which the Government does not intend to legislate. SCIMAC will be developing appropriate guidance for farmers on within-farm coexistence and Defra on behalf of the UK will assist with that process.

seed crops are a specialised and limited area of production where it is already usual to apply coexistence measures to achieve statutory levels of seed purity.

(v) for crops that are placed on the market. The EU 0.9% labelling threshold for GM presence relates to crop material that is marketed. In general, therefore, it is not necessary from a regulatory standpoint to apply measures to minimise GM presence where someone produces a crop for their own use.

Potential Sources of GM Presence

37. The most likely sources of GM presence in a non-GM crop are from:

- unintended GM presence in non-GM seed
- crop-to-crop cross-pollination
- GM volunteer plants
- GM seed transfer via machinery

Non-GM seed

38. The seed used by non-GM farmers may itself have a GM presence. As noted, it is planned to establish specific EU labelling thresholds for GM presence in non-GM certified seeds. Values in the range 0.3%-0.5% have previously been considered in EU discussions. It is expected that a GM presence above the threshold will have to be declared on the seed label (i.e. it would have to be sold as GM), but a presence below the threshold will not need to be indicated. This means that non-GM certified seed may have a very small, unlabelled GM content. Seed companies will decide how they want to produce and market their seeds taking account of the EU requirements. Farmers wanting to produce non-GM crops will use non-GM seed, and the intention is that seed thresholds will be set sufficiently low to allow this. No labelling thresholds will apply for GM presence in farm-saved seeds as these are not marketed.

Crop-to-crop cross-pollination

39. GM and non-GM crops of oilseed rape or maize grown in proximity to each other are liable to cross-pollinate. This could result in a significant level of GM transfer unless farmers take specific action to avoid it. Whilst beet or potato crops might also cross-pollinate each other, this is not a significant issue for coexistence because:

- cross-pollination does not affect the composition of the harvested crop material (the roots or tubers). So if a GM beet or potato crosses with a non-GM variety, the product of the latter will not have any GM presence. The recipient plant will, however, produce GM seed, which means that GM volunteers may be created (see below). It is possible that over time there could be some limited GM transfer between farms via the development and persistence of GM volunteers.

- in the case of beet, moreover, it is a biennial plant that usually flowers and produces pollen in the second year of growth, whereas commercial crops are harvested at the end of the first growing season. In general, therefore, beet crops do not flower and cross-pollinate, although this may still occur on an unwanted basis due to the phenomenon known as bolting (plants that develop flowers prematurely). It is already good practice for farmers to destroy bolters before they flower.

40. Cross-pollination between sexually compatible crops can be minimised by various means:

- crop separation distances: these are used in certified seed production and information is available to identify the distances that should minimise cross-pollination frequency to specified levels. The general pattern is that most cross-pollination occurs at close range, and therefore relatively modest separation distances should ensure that it is reduced to a low level. However, it is also known that it may occur infrequently over very long distances (up to a kilometre or more), depending on the weather, local topography and insect movements¹³.
- border or barrier rows: a GM farmer might grow a strip of non-GM plants of the same species as his GM crop, between the GM crop and his neighbour's non-GM crop. It would absorb pollen from the GM crop, extend the distance between the GM and non-GM crops and produce non-GM pollen that will compete with the GM pollen, all of which will minimise the level of crop-to-crop cross-pollination.
- non-synchronous flowering: crops can only cross-pollinate if they are flowering at the same time. Different varieties of the same species may have different flowering periods, and it is possible to alter flowering times by delaying crop planting. In principle, therefore, cross-pollination between crops can be minimised through measures that achieve non-synchronous flowering. However, this is not seen as a realistic option in the UK because the varieties normally grown here have flowering periods that largely overlap, and the scope for altering this is small. A specific point to note here is that winter oilseed rape has normally completed flowering well before spring rape begins, so there should not be a significant coexistence issue between autumn and spring-sown crops.

41. Unlike with separation distances, there has been little practical experience with, or studies of, the application of barrier rows/strips. Therefore, information is lacking with which to assess their possible application. They may be an attractive option if it is difficult to observe a separation distance, and especially so if the GM crop is destined for an undifferentiated market (mixed GM and non-GM), because then the GM crop and the non-GM strip

¹³ Insects can play a significant role in cross-pollination between oilseed rape crops but not in relation to maize, which is largely wind-pollinated.

might be harvested and sold together. At the same time, however, it could in practice be difficult for GM growers to apply a barrier row because:

- in the case of herbicide-tolerant GM crops, it would be awkward to manage the non-GM barrier alongside the GM crop given their different herbicide requirements, and the GM herbicide could damage the barrier plants.
- in the case of a GM crop with a quality trait, cross-pollination from an immediately adjacent non-GM barrier could prejudice achieving the desired quality specification.

42. Nevertheless, there may be situations where a barrier is preferable to a separation distance. The Department is considering the evidence needed to stipulate a barrier option and may provide further information to stakeholders in due course. For the time being, it is envisaged that separation distances will be the key coexistence measure to limit cross-pollination between GM and non-GM maize or oilseed rape crops. For the reason indicated, it is not proposed that separation distances, other than required for the physical identification of crop boundaries, will apply for beet and potato crops. For beet, it will be desirable for farmers to minimise the already limited scope for cross-pollination by controlling bolters in line with normal practice.

43. Cross-pollination can be influenced by the physical barriers between fields. If there is a particularly high hedge or dense stand of trees between two crops this may lessen cross-pollination, compared to a situation where there is just a low hedge. As individual circumstances can vary greatly, it is not possible to advise on how a particular physical barrier will influence the level of cross-pollination. Recommended crop separation distances assume the presence of field boundaries that do not have any specific effect on the degree of cross-pollination.

Volunteers

44. These are plants that develop from shed seed or potato tubers that are not harvested from the soil. If GM oilseed rape is grown it will drop seed at harvest that could result in GM rape plants appearing for a number of years amongst the subsequent crops in that field. If a subsequent crop is non-GM rape any GM volunteers will mix and cross-pollinate with it, transferring a GM presence. GM volunteers may also cross-pollinate non-GM crops grown in the vicinity. Beet crops can have volunteers (weed beet) but maize will not because spilt maize seed does not remain viable over winter in UK soils. Potato volunteers are known as groundkeepers.

45. Volunteers are effectively weeds in the crop field and conventional farmers normally control them by applying a suitable herbicide. The frequency and persistence of volunteers can also be influenced by the cropping interval between crops of the same species. It is not possible to guarantee the complete elimination of volunteers, but they will not be a significant source of potential GM transfer between farms.

Seed transfer via farm machinery

46. Machinery that has been used on a GM crop may have some GM seed lodged within it, and if it is taken to another farm this could provide a pathway for the seed to be transferred into a non-GM crop. This could arise in particular with combine harvesters used on oilseed rape crops, although even this would not be expected to result in a significant GM transfer. It is not standard practice to clean combine harvesters between operations on separate farms (where machinery is shared), and it would be disproportionate to expect a total clean-down to try and remove every last seed that might be present. However, farmers or machinery contractors could minimise the scope for unwanted GM transfer by making sure that those parts of a combine that are readily accessible are cleaned reasonably-free of any lodged seed.

Allowing for different sources of GM presence within a 0.9% threshold.

47. Table 1 is taken from a report by the EU Scientific Committee on Plants. It illustrates the point that a non-GM crop may acquire a GM presence at various stages in the production process on farm. To determine coexistence measures an assumption must be made of what each source of GM presence may contribute, after reasonable measures have been applied. This gives rise to the questions in the following paragraphs.

Table 1: Estimated average potential rates of adventitious presence occurring at various stages during on-farm production¹⁴

	Oilseed rape (fully fertile)	Maize	Sugar Beet
Seed	0.3%	0.3%	0.5%
Drilling	0%	0%	0%
Cultivation	0%	0%	0%
Cross pollination	0.2%	0.2%	0%
Volunteers	0.2%	0%	0.05%
Harvesting	0.01%	0.01%	0.01%
Transport	0.05%	0.01%	0.01%
Storage	0.05%	0.05%	0.1%
% achieved	0.81%	0.57%	0.67%

What assumption should be made about GM presence in non-GM seed?

48. This will be influenced by the thresholds that the EU eventually adopts for labelling GM presence in conventional seed. At this stage it is not certain what those thresholds will be, as they have yet to be formally proposed and negotiated. However, for the purpose of this consultation, and as a basis for discussion only that is without prejudice to further developments, the Department is asking stakeholders to consider a hypothetical scenario where the EU has adopted the thresholds of 0.3-0.5% previously

¹⁴ Scientific Committee of Plants (SCP) March 2001 Opinion on possible seed thresholds. The accompanying text says: 'These figures are mean values and assume good agricultural practice including reasonable attempts to isolate crops and segregate products.' (the full SCP report is available at http://europa.eu.int/comm/food/fs/sc/scp/out93_gmo_en.pdf).

canvassed by the European Commission. In this context there are two different assumptions that could be made about the level of GM presence in non-GM seed. That it is either:

- up to or just within the EU seed labelling threshold; or
- at some distinct point well below the EU threshold. This possibility arises because seed companies will seek to ensure that their seed is comfortably within whatever legal standard is established, and for the foreseeable future it is likely that in practice most non-GM seed will not have any detectable GM presence. The Department would expect this to be the case at least in the early years of any commercial GM cropping in the UK.

49. The first option is more straightforward and cautious, in that it covers possible worst-case eventualities and should mean that in practice actual levels of GM presence are well within the assumed level. The Department is therefore inclined towards this option, but would appreciate stakeholders' views on this question.

What level of GM presence is expected to arise from sources other than seed impurity and crop-to-crop cross-pollination?

50. Table 1 refers to the GM admixture expected to result from volunteers and at the harvesting, transport and storage stages. However, Table 1 is based on GM and non-GM crops being grown within an individual farm¹⁵. The Department's proposals address the situation where GM and non-GM crops are grown on adjacent farms, and where the non-GM crop belongs to an exclusively non-GM producer. In this *farm-to-farm* context Table 1 gives too high or unnecessary values for the GM presence that could arise via volunteers (in the case of oilseed rape), harvesting, transport and storage. Adjusting for that, the Department is planning on the basis that the total GM presence that might result from these sources should conservatively be no more than 0.1%, assuming good practice where this is relevant (for example - if combine harvesters are shared between farms, an effort is made to minimise the presence of lodged seed). This is based on a general assessment rather than direct empirical evidence (which is lacking and would be difficult to obtain), but Defra on behalf of all the UK Administrations has put this issue to independent experts who have agreed that a 0.1% value is reasonable.

What allowance should be made for GM presence arising from crop-to-crop cross-pollination (in oilseed rape and maize)?

51. It is planned that cross-pollination between GM and non-GM oilseed rape or maize crops will be limited principally by using separation distances. Unlike the other potential sources of GM presence, where a fixed value is

¹⁵ This means that GM and non-GM varieties of the same species would be cultivated in the same field over successive crop rotations. Footnote 12 confirms that it is intended to address separately the issue of *within-farm* coexistence.

assigned for the potential level that may arise, in the case of cross-pollination it is possible within reason to vary the level that occurs (i.e. by applying longer or shorter separation distances). Therefore, having determined the GM presence that might arise from all other sources, a specific figure must be derived for the level to which cross-pollination is to be minimised, bearing in mind the overall 0.9% threshold. Table 2 illustrates this.

Table 2: Potential rates of GM presence in non-GM crops from various sources (in context of 0.9% threshold and farm-to-farm coexistence):			
	Oilseed rape	Maize	Beet
Seed impurity (if taken to be present up to assumed EU threshold of 0.3-0.5%)	0.3%	0.3%	0.5%
All other sources apart from cross-pollination (assumes reasonable volunteer control, bolter control, machinery cleaning)	0.1%	0.1%	0.1%
Crop-to-crop cross-pollination (assumes this is minimised by an appropriate separation distance)	0.1%-0.5%	0.1%-0.5%	(not applicable)
Total %	0.5%-0.9%	0.5%-0.9%	0.6%

52. To stay within a threshold it is normal to aim below it, to ensure as far as possible that it is met even in worst-case situations. At the same time, it would be disproportionate to apply measures to try and rule out GM transfer completely. The Department is proposing that separation distances should be chosen for oilseed rape and maize that aim to limit cross-pollination to a maximum of 0.3%. This is consistent with the general principle of minimising unwanted GM presence in line with the 0.9% benchmark. This point will be discussed further in a later section of the paper where separation distances are covered in more detail (paragraph 64).

GM admixture after produce has left the farm

53. GM and non-GM material may also be mixed in the supply chain beyond the farm gate. However, if all non-GM crops leave the farm within the 0.9% threshold, any further mixing of crop material should not result in a GM presence above 0.9%, and generally speaking subsequent mixing will tend to dilute rather than enhance any GM content. The exception to this would be if non-GM produce is mixed with material that is wholly GM (or material that is a deliberate blend of GM and non-GM with a GM presence well above 0.9%). It is expected that processors and others in the supply chain who do not want to mix GM and non-GM produce will apply their own measures to segregate material and prevent admixture failures.

Do stakeholders accept the above analysis of the potential sources of GM presence and the assumptions that the Department is proposing should underpin the coexistence regime?

PROPOSED COEXISTENCE MEASURES

What measures will be given statutory backing?

54. Based on the preceding analysis, a distinction can be made between those measures that are essential for effective coexistence and those that, whilst desirable, are of much less significance. The first category includes separation distances for oilseed rape and maize, without which there could be a significant level of GM transfer into non-GM crops. To apply a separation distance neighbouring farmers may have to liaise over their respective cropping plans. Therefore, the Department envisages that it will be necessary to require GM farmers to inform neighbouring producers of their intention to sow a GM crop, where neighbouring farmland is within the required separation distance.
55. The other measures that have been mentioned (controlling volunteers and beet bolters, cleaning farm machinery) would fall into the second category of being generally desirable but not essential. They are measures or practices that:
- are of marginal significance in terms of the potential level of GM transfer between farms¹⁶ (in the context of a 0.9% threshold)
 - are already normal farm practice (in the case of volunteer and bolter control)
 - would be very difficult to specify unambiguously in legislation¹⁷ and very difficult to enforce¹⁸
56. Because of this, the Department is proposing that crop separation distances for oilseed rape and maize combined with a notification rule should be statutory requirements, whereas the other non-essential measures will be set out as advice in a non-statutory code of practice. It is envisaged that this will take the form of an updated version of the existing SCIMAC code noted previously. Defra on behalf of all the UK Administrations will liaise with SCIMAC to develop the proposed content of the code, and the Department will then consult other stakeholders before agreeing a final version with SCIMAC. Table 3 below summarises the proposed situation.

¹⁶ Factors like volunteer control and machinery cleaning would be of more significance if a farmer wants to grow both GM and non-GM crops on the same farm, as indicated in Table 1.

¹⁷ For example, it would be hard to define precisely what is meant by 'good' volunteer control, or the specific process by which a combine harvester is to be cleaned reasonably-free of lodged seed. A number of different practices might be equally effective in achieving the desired result.

¹⁸ Compliance would have to be checked in real-time as the farmers are undertaking the measures or shortly thereafter. This would require a bureaucratic and disproportionate enforcement effort.

Table 3: Overview of Proposed Coexistence Measures		
<i>Crop</i>	<i>Measures to apply on a statutory basis</i>	<i>Measures to apply on a voluntary basis</i>
<u>Oilseed rape</u>	Separation distance Farmer-to-farmer notification	Volunteer control Cleaning of shared combine harvesters (before machinery goes from GM to non-GM farm)
<u>Maize</u>	Separation distance Farmer-to-farmer notification	(not applicable)
<u>Beet</u>	(not applicable)	Bolter control Weed beet (volunteer) control
<u>Potato</u>	(not applicable)	Groundkeeper (volunteer) control

Who will be responsible for implementing the measures?

57. The Department is proposing that farmers growing GM crops should bear the primary responsibility for applying coexistence measures. It would fall to them, therefore, to make sure that a crop separation distance is observed where necessary, and to initiate any required liaison with neighbouring producers by notifying their intention to sow a GM crop.
58. But non-GM farmers will also have a role to play in ensuring successful coexistence. They will be expected to provide relevant cropping information to GM growers in response to their notifications, and they should also undertake routine control of volunteers and bolters in their own crops, to help minimise the potential for GM transfer via these routes.
59. Where contractors are involved in crop production they should help to implement relevant coexistence measures. For example, cleaning a combine harvester after it has been used on a GM oilseed rape crop is something that might fall to a machinery contractor to undertake.

How will measures be given statutory backing?

60. It is proposed that the separation distance and notification requirements would be specified in a Statutory Rule made under Section 2(2) of the European Communities Act 1972. The Department will consult separately on a draft Statutory Rule as a further stage in developing the coexistence regime.

Do stakeholders accept the Department's proposed overall basis for the coexistence regime as outlined above?

Regulatory Impact Assessment - considering other options.

61. The Department's firm preference is to give statutory backing to the key measures required for a successful coexistence regime. However, in line with the Government's general commitment to avoid excessive regulatory

burdens, any proposed new statutory controls have to be accompanied by a Regulatory Impact Assessment (RIA). This must analyse and compare options for achieving the policy aim, and in particular test whether statutory controls are necessarily the right solution. A draft RIA on the Department's coexistence proposals is at Annex B. This repeats some of the material in the main paper because the RIA is a self-contained document. It does, however, set out fully for consideration:

- the option of a wholly non-statutory coexistence regime (SCIMAC is developing an industry scheme going beyond its existing code of practice, where effective coexistence might be ensured via a link with farm assurance arrangements);
- the arguments on whether a statutory or non-statutory approach should be preferred;
- the equity arguments around making GM growers primarily responsible for statutory coexistence measures;
- an analysis of the possible costs and benefits and effect on competition of a coexistence regime.

Enforcement and Monitoring

62. The RIA also sets out the Department's plans for enforcing statutory coexistence measures and for monitoring the overall regime (both statutory and voluntary elements). It is proposed that compliance with statutory requirements will be checked via farm inspections, and that there will be a range of monitoring activities to enable a proper assessment of whether the regime is meeting its objectives.

Reviewing the coexistence regime

63. Another important point fully explained in the RIA is that the Department will review the performance of the coexistence regime and propose any necessary changes after a monitored introductory period. This will be done in consultation with stakeholders. The fact that a review is planned is particularly relevant to the next two sections of the paper on the envisaged separation distance and notification requirements. The review is expected to take place around two or three years after the start of commercial GM cropping in Northern Ireland (the precise timing will depend on the rate of GM uptake).

Do stakeholders have particular comments on the analysis in the draft Regulatory Impact Assessment (at Annex B), and on what it says about the Department's plans to enforce, monitor and review the coexistence regime?

STATUTORY SEPARATION DISTANCES

64. This section explains the Department's detailed thinking on the crop separation distances that it proposes should apply for oilseed rape and maize on a statutory basis.

NIAB Report

65. There is a large volume of scientific information available from the UK and abroad on cross-pollination between crops and the setting of crop separation distances to minimise cross-pollination to specified levels. To provide a specific and up-to-date basis for informing this consultation, Defra, on behalf of all the UK Administrations, commissioned a report from NIAB (formerly the National Institute of Agricultural Botany) which considers the situation from a UK standpoint. This report has been published and is available at :
http://www2.defra.gov.uk/research/project_data/More.asp?I=CB02039&M=KWS&V=CB02039&SCOPE=0

66. To produce recommended separation distances for oilseed rape and maize, NIAB have modelled data on actual levels of cross-pollination derived from the Farm Scale Evaluation (FSE) GM trials in the UK¹⁹. Annex C summarises the distances NIAB recommend to minimise cross-pollination to levels between 0.1-0.6%²⁰. There are several points to note about the NIAB report and these are explained in the following paragraphs.

Crop-specific distances

67. NIAB have calculated specific separation distances for spring oilseed rape, winter oilseed rape, grain maize and forage (silage) maize. As noted above (paragraph 52), the Department is proposing that separation distances should be chosen that aim to minimise cross-pollination to a maximum of 0.3%. At this level, the NIAB figures for spring and winter rape are broadly similar. For simplicity, therefore, the Department proposes that a single distance for both types of rape should be specified.

68. The NIAB figures for grain and forage maize are more distinct. Cross-pollination in maize only affects the cobs, not the rest of the plant (i.e. only the kernels on the cob would have a GM presence where GM cross-pollination occurs). In the case of forage maize, the cobs are chopped and mixed with the leaves and other parts of the plant²¹, so any GM presence would be diluted relative to the situation where just the cob kernels are used, which is the case with grain maize. This is why longer separation

¹⁹ As part of a separate Defra-funded research project, measurements were taken of cross-pollination between the GM and comparison non-GM crops in the FSE trials. The results for maize are available on the Defra website at www.Defra.gov.uk/environment/gm/research/pdf/epg_1-5-138.pdf. A report on the oilseed rape results has been published in the journal Transgenic Research (available at www.ingentaconnect.com/content/klu/trag).

²⁰ For completeness NIAB actually calculated values between 0.1-0.9%, but values above 0.6% are not relevant given the need to allow for other sources of GM presence within the overall 0.9% threshold.

²¹ Based on an earlier assessment, NIAB have assumed that cobs are about 50% or half the total content of the forage maize product.

distances are needed for grain maize to achieve a given level of GM presence in the final product. If at all possible, the Department would favour having a single separation distance for both types of maize (grain and forage), as this would make the coexistence rules particularly straightforward and easy to follow. However, having a single distance would be a compromise solution and would imply that instances will arise where GM farmers have to observe a longer distance than is strictly necessary in the circumstances. On a precautionary basis, a single distance would need to be set towards that needed for grain maize, whereas in fact the vast majority of the maize grown in Northern Ireland is for use as forage. On balance, the Department is proposing that separate distances should be specified for grain and forage maize, although it would appreciate stakeholders' views on this specific point²².

69. NIAB did not have data to produce recommended distances for sweetcorn maize. Up to date scientific information on sweetcorn is expected to be available in due course (see paragraph 80 below). The Department will consult stakeholders on proposed sweetcorn separation distances at that time.

70. The NIAB figures for oilseed rape are for fully-fertile varieties. Previously in other parts of the UK a small percentage of the rape grown has been of a type known as Varietal Associations (VA). This is up to 80% male-sterile, making it more likely to be cross-pollinated than ordinary, fully-fertile varieties. It would therefore need a proportionately longer separation distance to achieve a given level of cross-pollination frequency. The use of VA rape has stopped as it seems generally to have fallen out of favour. If it or another form of partially-sterile oilseed rape is proposed for cultivation, the Department will propose specific separation distances for coexistence purposes.

Whole field/crop assessment

71. NIAB's figures are based on calculating the average level of cross-pollination across the recipient crop as a whole, as this is how the 0.9% threshold would be measured and applied for the crop types that NIAB have considered. Generally speaking, the highest levels of cross-pollination will be found at the edge of the recipient field facing the donor (GM) crop, with declining levels thereafter moving across the field away from the donor crop.

72. A specific point to note with sweetcorn is that where this is to be sold as individual non-GM corn-on-the-cob, it will be necessary to minimise GM cross-pollination so that each cob is within the overall 0.9% threshold (allowing for other possible sources of GM presence). This means that a longer field-to-field separation distance will be needed for crops of

²² Note that, as explained at paragraph 22(v), the application of a separation distance will not be required where a conventional (non-GM) maize crop is to be fed to animals owned by the same farmer, as opposed to being sold off the farm.

sweetcorn cobs, compared to the other types of maize where cross-pollination is measured on a whole crop/field basis²³.

GM Index

73. For each type of crop they have assessed, NIAB have differentiated their recommended distances according to a so-called 'GM Index' of 1 or 2. This is because GM crops of the same species may contain a different number of GM events per genome²⁴, and this in turn influences the level of GM presence that will be transferred into a non-GM crop through cross-pollination. A crop which is Index 2 will transfer more GM presence than a crop which is Index 1, so it will need a proportionately longer separation distance to achieve a given cross-pollination threshold.

74. The NIAB figures for oilseed rape at Index 1 and 2 are broadly similar whereas the respective maize figures are more distinct. For operational simplicity the Department would favour having a single distance per crop, rather than differentiating according to the specific GM Index in each case. For reference, the type of GM oilseed rape in the FSE trials was Index 1.5 and the GM maize was Index 1.16. This might suggest that if a single distance per crop were to be adopted, it should be a figure somewhere between those indicated for Index 1 or 2, but the Department would propose erring towards the figures for Index 2 as this is more precautionary.

Varying distances by field depth

75. NIAB have also given different recommended distances according to the depth of the recipient field (i.e. the non-GM crop that is receiving the GM pollen). This is because field size is an important factor in determining expected levels of cross-pollination. The question then is whether statutory separation distances should vary by field depth, or whether a one-size-fits-all approach should be followed, where just a single distance is specified per type of crop. The relevant considerations, on which the Department would appreciate views, are

- specifying a range of distances by field depth is a more refined approach that will ensure that any regulatory burden is kept to a minimum (with larger fields it is more likely that no specific action would be required to observe a separation distance)
- it could, however, make it more likely that the wrong distance is applied, because it would depend on the non-GM farmer reporting the correct field size to his GM-growing neighbour
- the scientific model assumes that neighbouring GM and non-GM fields are of equal size and shape, which is unlikely in practice and raises a doubt about how far a more refined approach could be trusted to ensure the right outcome

²³ If sweetcorn is intended for processing (i.e. as tinned or frozen kernels), cross-pollination would be assessed on a whole field/crop basis, and therefore the same separation distances would be required as for grain maize.

²⁴ Put simply this means the extent to which the plant's genetic makeup is GM. Genome means the complete set of genetic material (DNA) of an organism.

- having a single distance per crop is more straightforward and less prone to error, but could oblige GM farmers to take action that is not strictly necessary

76. The Department would propose adopting the NIAB recommended distances that are based on a field depth of 200m for rape and 100m for maize (broadly equivalent to fields of 4ha and 1ha respectively). This should ensure that the specified distance is more than adequate in the vast majority of cases. The Department would see this as a reasonable compromise between taking account of smaller possible field sizes and avoiding a disproportionate burden.

77. In the introductory phase of the coexistence regime there could be particular merit in keeping the arrangements as simple as possible. On balance, the Department is inclined towards starting with a single distance per crop, but with the intention of reconsidering this as part of the proposed review, in the light of increasing scientific knowledge and practical experience.

Taking account of the overall level of GM cropping (Scale Effect)

78. NIAB's figures assume that non-GM crops will be liable to cross-pollination from just one nearby GM crop. This is the most likely scenario in the introductory phase of GM cropping in the UK. The number of GM crops is expected to be relatively small to begin with but may build up over time subject to market conditions. When and if GM cropping becomes widespread, there will be a stronger possibility of non-GM crops being cross-pollinated by more than one GM crop in the vicinity. In this situation longer separation distances are likely to be needed than those in the NIAB report. The Department will take stock of this situation as part of the proposed review after the introductory phase. This will take account of the scale and rate of growth of GM cropping at that time, and the latest scientific information that is available on separation distances. As necessary, the Department will propose the use of increased separation distances.

Confidence Rate

79. The results of statistical modelling are expressed in terms of a specific confidence factor which denotes the probability of the real-world outcome being within the calculated value. It is normal for scientists to use a 95% confidence interval, but Defra on behalf of all the UK Administrations, asked NIAB to calculate their recommended distances on the basis of a more precautionary 98% interval. This means that applying the figures in the NIAB report should ensure that cross-pollination is within the specified threshold at least 98 times out of 100.

Expected new scientific information

80. Research on cross-pollination is ongoing with various projects underway at UK and EU level that will provide further information that is relevant for setting separation distances. Most of this is likely to be published before any commercial GM cropping in the UK, given that this is not expected

before 2009 at the very earliest. As and when new scientific evidence becomes available the Department will consider it and, if necessary, propose revised separation distances. The distances being proposed now should therefore be seen as the Department's best assessment based on current information.

The Department's proposed statutory separation distances

81. Reflecting the preceding analysis, the Department is suggesting adoption of the following distances based on the NIAB report:

- oilseed rape (fully-fertile varieties): 35m
- forage maize: 80m
- grain maize: 110m

Do stakeholders agree with these proposed distances? If not, which aspect(s) of the supporting analysis and proposed assumptions made by the Department are thought to need further consideration? What do stakeholders think of the Department's proposal not to differentiate separation distances by GM Index or field depth?

82. The statutory requirement would be for GM growers to ensure that these distances are observed in relation to any crop of the same species grown by a neighbouring producer that is intended to be sold as non-GM or organic. The specified distance would be measured as the shortest distance between the two relevant crops. If the GM farmer is unable to ensure the distance is met then he must not sow the GM crop (i.e. it would be an offence to fail to observe the distance). The Department intends that the legislation may also provide for the use of a barrier row/strip instead of the separation distance, although as explained at paragraph 41 it is not possible to offer specific details for this at present.

83. Another issue for consideration is whether the legislation should allow the application of measures other than the specified crop separation distance (and/or barrier row), *where this is agreed by both farmers*. The idea is that neighbouring producers might be happy to apply their own novel coexistence solutions or perhaps agree to derogate from the specified separation distances²⁵, and that in principle the legislation should perhaps allow for this. The Department can see some merit in having this option, but there is a question as to whether neighbouring farmers should be completely free to implement their own arrangements or should have to check their proposed alternative measures with the Department, to ensure they are sufficient to minimise GM presence to the required level.

Do stakeholders accept how the proposed separation distance requirement would apply? What do stakeholders think of the idea at paragraph 83 that some local discretion might be allowed?

²⁵ For example, because the actual size of the non-GM field is much bigger than the assumed field-depth that underpins the single separation distance.

84. The distances at paragraph 81 above are only likely to be an issue for coexistence between immediately adjacent farms. And in practice, the Department expects that in many instances GM growers will find that they do not need to take any specific action to observe a separation distance because:

- they can accommodate the distance within their own land (i.e. measured from the intended position of the GM crop, all neighbouring land is beyond the distance)
- the nearest neighbour is not intending to grow a non-GM crop of the same species or, if he is, it is planned for a field that is already beyond the required distance.

85. In the case where neighbouring farmers intend regularly to produce sexually compatible GM and non-GM crops, ideally they will co-operate and maintain close liaison on their forward cropping plans. This may make it possible for them to organise their respective crop rotations so that they consistently avoid a situation where compatible crops are due to be grown within the specified distance of each other.

STATUTORY NOTIFICATION AND LIAISON REQUIREMENT

86. To facilitate effective application of the proposed separation distances, the Department is also proposing a statutory notification/liaison requirement. This will require GM growers to notify neighbouring producers of their intention to sow a GM crop of maize or oilseed rape, if neighbouring land falls within the relevant separation distance (if it does not, then no notification will be necessary). This will enable the GM grower to be informed in return of his neighbour's cropping plans, and thereby to clarify what further action, if any, the GM grower must take to observe the specified separation distance.

87. Where it is necessary for a GM grower to make a notification, it would be advisable for this to take place as soon as possible, stating the type of crop involved. The proposed statutory requirement would be for the notification to take place no later than:

- 1 March in the case of spring-sown crops; and
- 1 August in the case of autumn-sown crops

88. The above dates are the same as those in the SCIMAC guidelines that were applied in the context of the Farm Scale Evaluation GM trials. The Department believes that having a single notification deadline for spring and autumn-sown crops would be a pragmatic way forward. It is the case, however, that spring rape is normally sown in March/April, whereas maize is normally sown in May/June. There is a basis for arguing, therefore, that separate notification deadlines might apply for spring rape and maize respectively. The Department would appreciate stakeholders views on this specific point.

89. Where the intended GM crop is maize, it is proposed that the separation distance for notification purposes will be the 110m specified for grain maize (the longest possible distance for maize would have to apply on the assumption that the GM grower will not know what type of maize his neighbour might plan to cultivate²⁶).

90. The neighbour will be expected to respond to the notification as soon as possible and no later than 14 calendar days after receiving it, confirming back to the GM grower the following information:

- whether he plans to grow a crop to be sold as non-GM of the same species as the intended GM crop; and if so
- where he plans to grow the non-GM crop (at what distance from the GM growers land)

²⁶ If the GM grower did know that his neighbour intended to grow forage maize rather than grain maize, e.g. because they had already discussed this prior to a formal notification being made, then the shorter separation distance for forage maize could apply for notification purposes.

91. The Department envisages that neighbouring farmers will exchange a standard form (with simple tick-box format) in which they record the information required for the notification/liaison process. This could be done face-to-face or by email, fax or post. Where relevant, the same form would also be used to confirm a mutual agreement between neighbouring farmers to apply their own coexistence solution (as outlined in paragraph 83). Both the GM and non-GM farmer will be expected to keep a copy of the form for reference.
92. The Department's current thinking is that it will not be a direct statutory obligation for non-GM neighbours to respond to notifications they receive, but that the legislation would be framed so that if they do not respond within the time allowed the GM farmer will then not be legally bound to take any further action to safeguard the neighbour's interests. It is also part of the Department's current thinking that to encourage fair play in the notification/liaison process there should be an offence of giving false information.
93. Where a neighbour confirms in response to a notification that he intends to grow a compatible non-GM crop within the separation distance, the GM grower will be expected either to change the intended position of his crop so that the separation distance is observed or apply a barrier row/strip (if there is sufficient scientific information to include this option as part of the statutory regime).
94. If the regime does provide for the use of barrier rows/strips, the Department envisages that GM growers would not be required to make a notification to neighbours where they intend to apply a row/strip of the appropriate dimension instead of a separation distance.
95. The Department expects that in nearly every case farmers will know who their immediate neighbours are who might be growing a commercial crop of oilseed rape or maize. If a GM grower is unable to identify a neighbour and therefore cannot make a required notification, he will not be able to grow the intended GM crop within the separation distance of neighbouring land (i.e. it would be an offence to do so).

Do stakeholders have any comments on how the proposed notification and liaison requirement would operate? What do stakeholders think about having a single notification deadline for spring-sown crops, rather than separate deadlines for spring rape and maize respectively (paragraphs 87/88)?

96. The following table gives an overall summary of the coexistence regime that the Department is proposing.

TABLE 5: SUMMARY OF PROPOSED COEXISTENCE REGIME

Measure	Points to note on measures
<p><u>Statutory crop separation distances</u> GM grower must observe following distances:</p> <p><i>Where non-GM crop is:</i> Oilseed rape - 35m Forage maize - 80m Grain maize - 110m</p>	<p>Measured as shortest distance between GM and non-GM crop.</p> <p>Only applies in relation to crops to be sold as non-GM or organic.</p> <p>Observing the specified distance is not required where: (i) GM grower applies barrier strip (if scientific evidence allows the Department to specify one), or (ii) both farmers agree instead to alternative arrangements (if this option is provided).</p>
<p><u>Statutory notification/liaison requirement</u> Using a standard form, GM grower must notify neighbouring producer of intention to sow GM crop by:</p> <p>1 March where GM crop is spring-sown 1 August where GM crop is autumn-sown</p> <p>if neighbouring land is within separation distance of intended position of GM crop.</p>	<p>Where intended GM crop is maize, relevant separation distance for notification purposes is the longest specified (i.e. 110m).</p> <p>Notification is not required if GM grower intends to apply a barrier strip (if scientific evidence allows the Department to specify one). GM grower will not have to observe a separation distance if neighbour does not return notification form within 14 calendar days confirming: (i) whether he plans to grow a crop for sale as non-GM or organic of the same species as the intended GM crop and, if so, (ii) at what distance from the GM grower's land he plans to grow the crop.</p>

TABLE 5 (continued)

Measure	Points to note on measures
<p><i>Non-statutory measures (to be included in an industry code of practice agreed with the Department)</i></p> <p>Minimise presence of volunteers (including weed beet and potato groundkeepers) and beet bolters.</p> <p>Clean combine harvesters used on GM oilseed rape crops to minimise presence of lodged GM seed, if combine is to be used on a non-GM farm.</p>	<p>These measures should be applied by both GM and non-GM growers.</p> <p>GM grower to take lead in ensuring combine is cleaned before it goes to a non-GM farm. Where machinery is contracted, GM grower should ensure that contractor undertakes cleaning.</p>

Other Key points:

- Statutory measures will be specified in a Statutory Rule made under Section 2(2) of the European Communities Act 1972.
- The Department will monitor the effectiveness of the coexistence regime (both statutory and non-statutory elements) and review it in consultation with stakeholders. The review is expected to take place after an introductory period of about two or three years.
- Compliance with the statutory measures will be checked and enforced via Department of Agriculture and Rural Development's (DARD's) farm inspections. It will be an offence to fail to implement a specified measure. It is envisaged that penalties for breaches would be equivalent to those specified for the GM traceability and labelling regulations.

OTHER COEXISTENCE ISSUES

97. This section of the paper covers various issues that need to be discussed but which the Department believes do not require statutory action as part of the coexistence regime.

Non-GM oilseed rape produced from farm-saved seed

98. Many oilseed rape crops are grown from farm-saved seed (seed the farmer produces himself by retaining a proportion of the harvest from a previous crop, as opposed to using a fresh supply of bought-in certified seed). This has implications for coexistence because non-GM oilseed rape seed may contain an undeclared GM presence up to the labelling threshold for seed, and if this is grown near to a field of GM oilseed rape the resulting saved seed may have an increased GM presence which takes it over the seed threshold (i.e. before the saved seed is then used to produce a final crop). In fact this should not be a problem if non-GM farmers follow existing good practice for saving seed and:

- take saved seed from the middle of the field/crop (this should ensure that the saved seed has no more than a very low GM presence, well below the 0.3% level that the separation distance proposed by the Department should ensure, at worst, arises in the field/crop as a whole²⁷);
- does not use saved seed produced over more than one generation²⁸ (if this were to occur there might be a coexistence problem, because any GM presence in the seed could be increased over successive generations to a level that prejudices staying within the 0.9% threshold²⁹).

99. The Department therefore considers that observing the proposed statutory separation distance for oilseed rape crops (paragraph 81) combined with existing good practice for saved seed will be sufficient for effective coexistence. It is envisaged that guidance on the use of saved seed will be included in the planned non-statutory code of practice for coexistence.

Do stakeholders think this is a reasonable way forward on farm-saved seed?

Coexistence training for GM farmers

100. The Department has considered whether there should be a formal training requirement for farmers planning to grow GM crops. The Department expects that:

²⁷ The area of the field from which the seed is saved is likely to be well beyond the specified separation distance, and the oilseed rape in that part of the field between the GM crop and the saved seed area will act like a pollen sink or barrier, taking most of the GM pollen that comes into the field.

²⁸ i.e. the farmer should not save seed from a crop which itself was grown from saved seed.

²⁹ For example, the original certified seed sown by the farmer may have an adventitious GM presence of, say, 0.3%. The seed saved from this crop might have an additional 0.1% GM presence as a result of cross-pollination from a nearby GM crop, giving it a total GM content of 0.4%. The crop sown from this saved seed may in turn acquire an additional GM presence via local cross-pollination, so that if seed were saved from this crop it may have a GM content of, say, 0.5%. If this cycle were repeated often enough the 0.9% threshold would be breached.

- farmers should not have any problem with the proposed statutory notification and separation distance requirements – these are clear and therefore should be relatively straightforward to understand and implement;
 - clear guidance on the non-statutory elements of the coexistence regime will be included in the accompanying code of practice (for example - this will advise on best practice for volunteer and bolter control, and on machinery cleaning);
 - appropriate advisory messages to growers on coexistence will be given and/or reinforced on the GM seed label, and more generally the GM seed suppliers will take their own steps to educate farmers on how best to use the new technology, including in respect of coexistence measures; and
 - if GM cropping become widespread the normal avenues for agricultural training (i.e. college courses) will cover specific requirements for GM crop management, including coexistence provisions.
101. In this context the Department believes that a statutory training requirement is unnecessary, and that to impose one would therefore be a disproportionate burden. This will be reconsidered as part of the review of the coexistence regime after the introductory period. Monitoring and enforcement activity will provide evidence on how well farmers have applied the rules.

Do stakeholders agree that a formal training requirement is unnecessary?

Honey production

102. If bees forage on GM crops the honey they make is likely to contain some GM pollen (of the crops considered in this paper, this would be the case for oilseed rape in particular). However, from the regulatory standpoint this is not an issue because:
- the European Commission has advised that any GM pollen in honey can be regarded as adventitious and unavoidable; and
 - research has indicated that any GM presence in honey should always be well below the 0.9% labelling threshold³⁰.
103. Therefore, the Department does not propose any specific action in relation to the coexistence of GM crops and commercial honey production.

³⁰ A study for Defra by the Laboratory of the Government Chemist in [1999] measured typical pollen levels in jars of ordinary honey and assessed the DNA/protein content of pollen. From this it was deduced that even if the pollen came just from GM crops, the GM presence in the honey would be much less than 0.1%.

Do stakeholders accept this conclusion on honey production?

Coexistence regimes in other EU Member States

104. As further background, consultees may want to be aware of the co-existence measures being planned in other EU countries. A report on this by the European Commission is available at:

http://ec.europa.eu/agriculture/coexistence/com104_en.pdf

REDRESS FOR ECONOMIC LOSSES

105. The Government's GM policy statement confirmed that it would consult stakeholders on "options for providing compensation to non-GM farmers who suffer financial loss through no fault of their own", making it clear that any compensation would need to be funded by the GM sector itself, rather than by Government or non-GM producers. This section explores the issues at stake and sets out potential models for a mechanism to redress potential economic losses.
106. The basic issue is that crops grown as non-GM (conventional or organic) could be worth less if they must be sold as GM, because they have a GM presence above the EU 0.9% labelling threshold. This outcome would be unfair to the farmers affected, so there is a need to consider possible redress mechanisms should this occur. Existing means of seeking redress are unproven in this area. The application of the common law of negligence or private nuisance to GM cross-pollination is untested and uncertain. It may also be difficult for a non-GM farmer to establish who is the proper defendant for a case. This background creates uncertainty for both non-GM and potential GM farmers.

General Assumptions

107. The Department's view is that redress for economic loss should only be available to farmers if the GM presence in a non-GM crop exceeds the 0.9% EU threshold. It would be a disproportionate burden on the GM sector to make it liable for redress on the basis of a threshold stricter than the relevant legal standard. The general coexistence regime will aim to keep GM presence below 0.9%, and it would not be appropriate for a redress mechanism to operate at a different threshold to that used for statutory coexistence measures.
108. In considering a redress mechanism a number of further assumptions underpin the Department's approach:
- GM crops will only be grown in Northern Ireland if there is a market for them, and it should generally follow that a non-GM grower with an affected crop (GM presence >0.9%) will have a market in which to sell it.
 - the potential need for a redress mechanism is predicated on non-GM crops (conventional or organic) trading at a premium. If the market does not distinguish between GM and non-GM (or if GM crops are grown which offer consumer benefits and themselves trade at a premium) no economic loss would occur to non-GM farmers and therefore redress would not be required.
 - if effective coexistence measures are in place, then the instances where non-GM growers might face a loss due to a GM presence above 0.9% should be very infrequent; in addition, the value of any redress claim is likely to be relatively low (details on costs are given in the

Regulatory Impact Assessment at Annex B). The possible implications of this are explored later on.

- the redress scheme should only cover direct financial loss from individual incidents.

What claims for economic loss should be considered?

109. In establishing any redress mechanism the specific economic losses for which redress is available need to be clearly identified. The general or default position will be that the loss is the difference in crop value where a crop has to be sold as GM instead of non-GM or organic. However, a number of additional losses can be envisaged which need consideration.

Loss in Crop Value

110. If a farmer grows a crop for sale as non-GM but can then only sell it as GM, there may be circumstances in which there is no market for the GM equivalent (for example - the non-GM farmer may be growing sweetcorn maize while GM maize is only being grown as a forage crop and there is no market in which it is traded). The loss in this case would be the whole of the non-GM or organic price that has to be foregone, as there is no GM market to sell into to mitigate the loss.

111. The EU 0.9% labelling threshold applies at the point where crops are sold off the farm. For crops like oilseed rape, beet or sweetcorn maize for processed food use, the Department expects that in all normal circumstances the relevant unit of production when considering possible redress will be the crop obtained from a whole field. This is because farmers will trade these crops, as a minimum, on a whole field basis. Therefore the issue of whether a non-GM crop has a GM presence above 0.9% would be assessed on a whole-field basis, and calculations of possible economic loss would be based on the value of the crop in the whole field.

112. The situation is less straightforward for sweetcorn maize intended for sale as individual corn-on-the-cob. The cobs in the nearest row of plants facing the GM field might have a GM presence above 0.9%, but the remainder of the field could be within 0.9% and therefore still be saleable as non-GM. It would be impractical to undertake widespread spot testing in the field to determine the precise extent of any excessive GM presence. At the same time it would be unreasonable to deem that the whole field must be treated as GM because the leading row of cobs has tested above 0.9%. Therefore, where tests for GM presence are undertaken in this context, the Department proposes a standardised approach broadly as follows:

- a first test is done on a sample of cobs in the first row nearest the GM crop; if this shows a GM presence above 0.9% a further test should be done on a sample of cobs halfway into the field.
- if the second test shows a GM presence above 0.9% the whole field must be treated as GM; if the result is below 0.9%, the second half

of the field can be sold as non-GM and only the first half is deemed GM.

113. If a conventional (non-GM) forage crop has a GM presence above 0.9%, the EU rules still allow the farmer to feed this to his own animals and the associated products (meat, milk or eggs) do not have to be labelled as GM. Therefore from a regulatory standpoint there is no reason why an economic loss should occur and no need to consider redress. An economic loss might arise because the farmer is subject to a supply contract which stipulates the use of non-GM feed. But this would be a market-led rather than regulatory requirement, and as such the Department does not think it would be appropriate for the Government to provide a specific redress solution (the Government's general stance is to facilitate the coexistence arrangements that can be regarded as necessary because of the EU 0.9% labelling requirement).
114. However, if an organic forage crop has a GM presence above 0.9% the EU organic standards regulation 2092/91 is likely to prevent the organic producer from feeding this to his own animals. In this case, therefore, an economic loss could arise due to a regulatory constraint, and the Department would see a redress solution applying in these circumstances.

Have we correctly identified the range of losses that might occur in crop values? What are your views on the proposed approach for dealing with the corn-on-the-cob scenario?

On additional losses

115. A non-GM farmer with an affected crop (GM presence >0.9%) may face additional losses to that in crop value. Costs that may flow directly would include those incurred in testing the affected crop for GM presence; the cost of storing the crop separately, or longer than intended, as a result of being unable to sell as originally intended; or extra transport costs as a result of having to treat the crop as GM rather than non-GM. The Department is open to arguments on this point, but to decide the scope of any redress mechanism a clear rationale will be required for determining those losses which are covered and those which are not.
116. A general point to bear in mind is that the more types of loss that are covered by a redress scheme, the more complicated and bureaucratic it may be to operate. Determining a loss in crop value should be relatively straightforward, but establishing the level of additional losses would entail further effort that could be disproportionate to the sum of money involved. If additional losses were to be covered, to minimise bureaucracy the best approach might be to adopt a system of fixed or standard costs (for example - for crop storage per day), avoiding the need to assess actual costs in detail. An effective scheme would ensure that claims for redress are settled fairly promptly, the general idea being to avoid or improve upon the cost, bureaucracy and uncertainty that would arise if cases were left to be resolved through legal proceedings.

117. Other types of loss can be envisaged which the Department does not think should be part of a redress mechanism. For example, a farmer may lose subsequent business from a buyer as a result of being unable to fulfil a previous supply contract. A potential purchaser may decide not to buy a particular non-GM crop, or pay a reduced price, if it has been grown in the general locality of a GM crop, even though GM presence is below the required threshold. Alternatively, a farmer may take a precautionary decision not to grow a particular crop, to avoid the possibility of it being unacceptable because of its proximity to GM crops. An organic certifying body may decide to decertify or remove accreditation from either a field or an entire farm. The Department's view is that losses resulting from voluntary standards or market-led decisions should not be covered by the redress mechanism, although compensation for these losses could still be sought through legal proceedings.

118. It is conceivable that losses may occur further up the supply chain. For example, a processing business may suffer a loss if it cannot meet its commitments because it is not supplied with a non-GM crop. However, the Department expects that normal contractual arrangements will govern the relationship between the farmer and the purchaser of his crop, and relationships further up the supply chain, and in these circumstances it may be unnecessary for a formal redress mechanism to operate.

Should consequential or additional losses be covered by any redress mechanism? If so, which should be covered and why? How likely are these to occur? Are there any other types of losses that should be considered?

Who should be entitled to claim redress and what eligibility criteria should they satisfy?

119. Strict eligibility criteria would need to be agreed to ensure that any scheme operates fairly and is not open to abuse. Redress should be limited to non-GM farmers who can demonstrate that there is a GM presence above 0.9% in their crop through no fault of their own. In order to demonstrate no fault and a just claim on their part, non-GM farmers may need to produce evidence, for example to confirm that:

- non-GM seed was used (i.e. below the relevant seed labelling threshold adopted by the EU).
- the affected crop was destined for a premium non-GM or organic market.
- any obligations arising from the coexistence regime had been complied with (for example - accurate information was given in response to a GM neighbour's notification, and cropping plans were not subsequently altered in a way that compromised the required separation distance).
- the finding of a GM presence above 0.9% was based on samples taken in accordance with a recognised protocol and tested at a suitable accredited laboratory.

120. This is not meant to be a definitive list but indicates the sort of criteria likely to be appropriate. The Department expects that there would need to be an adjudication process to determine the eligibility of redress claims, including an appeal or arbitration mechanism (see paragraph 137).

121. If eligibility criteria were to be applied as set out above, a further issue for consideration is whether a failure to meet one of these criteria in some minor way by a non-GM farmer, which it can be demonstrated would have had no meaningful effect, should necessarily invalidate a claim for redress, or the extent to which the principle of contributory negligence should apply to reduce the compensation awarded under the scheme. In addition, it would also be necessary to consider whether eligibility for compensation is dependent upon the excessive GM presence being identified before the affected crop leaves the farm, after which there may be other sources of GM presence.

What should the eligibility requirements be for non-GM farmers to seek redress? Are there particular criteria that have not been highlighted?

Who should pay any compensation?

122. The Government's policy statement made clear that any compensation should be funded by the GM sector. But this could take a number of forms.

GM farmers who do not comply with the specified coexistence measures

123. This would have the advantage of placing the burden on those farmers most likely to be the cause of an excessive GM presence in neighbouring crops. The GM farmer would pay for the economic loss direct to the non-GM farmer affected. This would provide a strong incentive for GM farmers to comply with coexistence measures. However, it would not cover the situation where an excessive GM presence arises through no fault of a GM farmer, or where fault cannot be specifically attributed.

All farmers growing GM crops.

124. This would spread the burden evenly among all GM growers. However, it does not have the advantage of the first option of providing a direct incentive for GM growers to comply with coexistence measures, and it could be said to penalise unfairly those farmers who do comply.

GM seed companies.

125. If GM seed companies were to fund a redress mechanism this is likely to involve the entire GM sector in the process. It would be a commercial matter between the companies and GM farmers to determine through their market relationship the precise allocation of the burden. For example, the seed companies could recover their costs through increased seed prices. It would also be open to them to recover some costs from GM farmers who have not complied with coexistence rules, by making compliance a condition of the GM seed contract. Making GM seed companies responsible would give them a clear incentive to ensure an effective

coexistence regime. This in turn should increase confidence in the potential effectiveness of the regime and the degree of compliance with it.

126. The burden could be applied equally on all GM seed companies, but a potentially fairer approach might be to distinguish between the companies in some manner. For example, the burden could be distributed according to market share - the companies selling more GM seed would bear more of the burden. Alternatively, it may be possible in many cases to identify the company whose GM seed has given rise to the redress claim. But a desire to target the redress burden must be weighed against the simplicity and cost of running the scheme.

Are there any alternative ways of distributing the burden on the GM sector? Are there any strong arguments or pros/cons to each approach that have not been covered?

Possible options for seeking redress

127. Having set out the relevant considerations above, the Department has identified three basic options by which affected non-GM farmers could seek and be given redress for economic losses. As noted earlier, it is expected that both the number of claims and their value will be small. The aim is to provide a mechanism that is clear, simple and proportionate, and which minimises the burden on both the non-GM farmer making the claim, and the GM sector in providing redress.

Option 1: Seeking compensation under existing law

128. In principle, non-GM farmers who suffer a loss would be able to seek redress through the civil courts under the current law. The non-GM farmer could seek an injunction and/or damages under the common law of tort, claiming negligence or private nuisance. However, the application of the common law of negligence or private nuisance to GM contamination is untested and uncertain. To recover economic loss, the non-GM farmer would need to show either damage to his property and the loss derived from that damage or, where there was no such damage (i.e. pure economic loss), that the defendant had a duty of care to the non-GM farmer such that recovery of that loss would be fair. It is not certain whether a GM presence in a non-GM crop would be regarded as damage by the courts. A GM crop will only be grown commercially if it passes the legal risk assessment process, so it may be a contradiction to treat as a form of damage the presence of a legally-approved GMO.

129. It may also be difficult for a non-GM farmer to establish who is the proper defendant. This background creates uncertainty for non-GM and GM farmers alike. Any GM presence may have a number of sources, and accordingly it may be impossible for a non-GM farmer to identify and seek redress directly from a given GM grower, for example by proving that he had not complied with the coexistence requirements.

130. In its report on coexistence and liability the AEBC also expressed concern that pursuing a legal case could be disproportionately time-

consuming and costly for farmers. It could also impact on general relations within rural communities. Accordingly, this does not provide either clarity or simplicity, and the Department shares the AEBC view that it would be preferable if coexistence disputes were settled without recourse to litigation. Litigation would, however, remain an option if the claimant did not want to use the redress scheme or was unsatisfied with the settlement offered.

Option 2: A voluntary industry-led scheme

131. An alternative would be for the GM sector to set up and fund a voluntary redress mechanism. To be effective, responsibility for this would need to rest with the GM seed companies, rather than farmers growing GM crops. It could be seen as a confidence-building measure. A voluntary scheme may offer a number of advantages. It could be established more quickly and would be more flexible than a compulsory scheme. It is likely to provide a strong incentive for the industry to ensure that GM growers comply with the coexistence rules.

132. A voluntary redress charter is being developed by the farming and industry group SCIMAC, as part of its wider proposals for an industry-led coexistence regime. The SCIMAC plan involves the GM seed companies committing to a charter whose aim is to restore the market position of any non-GM farmer whose crop exceeds the 0.9% threshold through no fault of their own. It envisages a number of ways that redress could be provided, including:

- direct replacement of affected produce (i.e. crop substitution)
- indirect replacement of affected produce (for example - virtual crop substitution, where affected produce is directed to an outlet and the claimant paid as if the crop were as originally intended)
- direct cash compensation
- compensation in kind

133. In terms of a delivery framework, SCIMAC favours a system for redress which mirrors or builds on existing supply chain arrangements as far as possible, and which recognises that a single prescriptive approach may not be the most effective in all circumstances. With this in mind, SCIMAC has given the following examples to illustrate potential delivery mechanisms:

- *conditions of sale on GM seed*: the sale of certified seed is governed by a licence between the relevant plant breeding company and seed merchants. The licence could specify that the merchants are signatories to the redress charter, and that sales of GM seed could only take place under specified conditions relating to coexistence and redress
- *inter-professional agreements (IPA)*: it could be a condition of GM seed sales that farmers enter into an IPA that commits them to comply with

coexistence requirements, in return for being covered by the industry redress charter

- *farm assurance scheme*: Existing crop assurance schemes have confirmed to SCIMAC that they could readily incorporate coexistence provisions. It could be a condition of GM seed sales that the farmer is a fully accredited member of a relevant assurance scheme, in return for being covered by the redress charter

Option 3: A statutory redress mechanism

134. If industry does not set up a voluntary scheme, or a proposed scheme is deemed unacceptable, then the Government would need to consider establishing a compulsory redress mechanism to be funded by the GM sector. This would probably require new primary legislation to make the GM sector strictly liable for compensation and to provide for:

- a requirement to pay compensation on the terms specified
- the establishment of a body to receive and adjudicate on redress claims (with the power to order payment), and an appeal mechanism
- the costs of the process to be charged to the GM sector

135. If a compulsory scheme made GM seed companies strictly liable it would also have to establish the mechanism by which a non-GM farmer could recover any economic loss. Possible models are:

- a) Establishing a specific body with the power to require GM seed companies to pay redress directly to non-GM growers. On the face of it this is an attractive option as it should be administratively straightforward. Redress would be payable on a case-by-case basis once the claim had been established.
- b) A variation on the above would be for the Government to act as a buffer. As above, a specific body would adjudicate on claims and if a claim is confirmed the non-GM grower would receive redress from the Government. This would prevent any undue delay in the non-GM farmer obtaining redress once the claim has been established. The Government would then have the power separately to recover the necessary funds from the relevant GM seed company (or companies).
- c) Establishing a specific fund from which redress claims are paid. The Department's initial view is that this could be financed through charges on the GM seed companies, possibly through a levy on all GM seed sold. This would spread the burden across the GM sector according to market share. The money collected would be directly related to the amount of GM seed sold and hence the extent of GM cultivation. If the amount raised exceeded claims, the charge could be reduced or suspended, or the excess funds returned. However, requiring pre-payment into a fund may create a sizeable pot of money waiting inefficiently for claims to be made against it. Administrating the levy to

achieve the desired level of funding would be an added level of complexity.

136. If a compulsory redress mechanism is preferred the practical arrangements would need to be set out in detail, but it is not proposed to do that at this stage. The Department would seek to make the arrangements as simple as possible, to minimise the burden on farmers wishing to make a claim, to ensure that redress can be paid without undue delay, and to minimise bureaucracy and costs. The Department would consult on the detailed arrangements before they were put in place.
137. In establishing a body to administer the system and assess claims there would be various factors to consider, such as cost (relevant to individual claims and overall level of use), the level of expertise necessary (including legal expertise) and independence. It would have to inspire confidence and work in a clear and transparent manner. There would need to be an appeals mechanism and, possibly, arbitration procedures. It is envisaged that administration costs would be met from the GM sector.
138. It would also be necessary to set out the criteria by which the level of economic loss is set. The Department has set out the principle that in the first instance this should be the difference in value between selling a crop as GM instead of non-GM. If a pre-existing contract specifying a price for the non-GM crop was in place that would have been met except for the level of GM presence, then the value of the redress should be the difference between the value of that contract and the price achieved for the GM crop. If no pre-existing contract is in place the Department would propose that redress is paid on the basis of a rolling one-year average of any price difference between the GM crop and its non-GM counterpart. This is on the basis that while the price of commodity crops varies quite significantly during the year, it is expected that any differential which exists between the price of GM and non-GM crops would remain fairly constant. For an organic forage crop the loss recoverable would be the cost of sourcing suitable replacement forage. As the number of redress claims is expected to be small and the sums involved relatively small, the Department would favour establishing a simple administrative process for establishing the level of economic loss. Thus for additional losses such as the cost of testing, the Department would favour establishing standard rates if practical and equitable.

General consideration

139. In assessing options for a possible redress mechanism, the likely scale of the issue needs to be borne in mind so that any arrangements entered into are realistic and proportionate. As noted at paragraph 108, the Department expects that in practice there would be very few claims for redress, and any such claims would be for relatively small amounts. If this is the case, it may be disproportionate to incur more than minor costs to set up and administer a redress scheme, which might indicate a marked preference for a solution that keeps bureaucracy to an absolute minimum.

Comparing possible voluntary (industry-led) and compulsory (statutory) schemes, the former is likely to be cheaper and more straightforward to establish and operate. And in particular, the cost of setting up a statutory scheme could be relatively significant, given that in the first instance it may require new primary legislation to be adopted.

Insurance

140. In its report the AEBC suggested that insurance products may become available over the longer term that would provide cover for possible GM-related economic losses. Whilst the Department remains open to the idea of an insurance market developing, it does not see this as a solution in the short-to-medium term. Therefore, the issues around a possible insurance market have not been explored in this paper.

Which redress mechanism do you favour and why? If a compulsory redress mechanism is your preferred option, which of the models at paragraph 135 should it employ?

A PUBLIC REGISTER OF GM CROPS

141. The cultivation of any GM non-food/feed crops will continue to be approved under Directive 2001/18/EC. Article 31(3)(b) of this Directive does require Member States to establish a form of public register to record the location of commercial GM crops. This provision was introduced specifically in connection with post-market monitoring arrangements. When a GM crop is approved for commercial release a monitoring plan must be implemented to test the assumptions made in the risk assessment and to identify any unanticipated effects. The details of each plan will be determined on a case-by-case basis, but in this context it is important to note that monitoring will not necessarily be carried out at every site where a given GM crop is grown. The level of detail and comprehensiveness of the register required under Directive 2001/18 is up to each Member State to decide.

142. Notwithstanding the legal position, the coexistence guidelines issued by the European Commission refer to a public register as a potentially useful instrument and a factor which should therefore be considered by Member States when developing their national plans.

How would a GM register help?

143. A register could include any or all of the following:

- where each specific type of GM crop *is due to be* grown (a system of advance notification)
- where GM crops *are being* grown
- where GM crops *have been* grown (i.e. as a long-term historic record of all land planted with GM crops)

144. The arguments in favour of having a detailed GM public register are that it would:

- a) facilitate coexistence between farmers, by providing a clear source of information on proposed GM plantings around which arrangements can operate.
- b) be a clear and transparent system for confirming the location of GM crops (or land on which they have been grown).
- c) enable others with an interest to have ready access to information they may want (for example - people growing plants in private gardens or allotments who might be concerned about GM cross-pollination, organic farmers, farmers thinking about setting up or maintaining a voluntary GM-free zone, or people buying land who may want to know if it has been used to grow GM crops)

145. The counter-arguments against establishing a detailed GM register are as follows:

- a) it is not needed to support the Department's coexistence plans if, as proposed, GM growers are required to notify neighbouring farmers as necessary of their intention to sow a GM crop.
- b) moreover, it is unlikely to be particularly helpful or practical for coexistence. Instead of the proposed notification requirement, GM farmers would need to register their cropping plans on the system and then neighbouring farmers growing non-GM crops would have to register any compatible crops. The GM farmer would then have to check to see whether this was within the separation distance and take action accordingly. This may be a more burdensome approach than direct communication between farmers.
- c) in relation to garden or allotment plants, there are no formal rules in respect of these being cross-pollinated by ordinary commercial crops, and it is important to remember that GM crops will only be approved for release if they are considered safe for health and the environment. Rules are needed to protect the interests of non-GM farmers because they must label their crops as GM if they have a GM presence above 0.9%, but people growing plants for their own use or consumption are not affected by this legal requirement³¹. In these circumstances it would be difficult to justify introducing a statutory requirement for a GM register in relation to plants that are not for sale.
- d) if prospective purchasers of land want to know if it has been used to grow GM crops they can ask the vendor for appropriate details. The EU traceability and labelling Regulation 1831/2003 facilitates this by requiring farmers to keep records of where GM crops have been grown for five years. It would be difficult to justify setting up a detailed crop register for this purpose.
- e) a public register may be misused. The Government's policy of disclosing the location of GM trials has been abused by a small minority intent on trashing the crops. There is clearly the potential for a similar situation to arise with commercial GM crops, and the Department is aware of one organisation that was set up with the specific intention of removing commercial GM crops from the ground. There has to be a concern, therefore, that a legitimate activity may be hindered if details of GM crop sites are made freely available.
- f) a register will cost money to operate.

³¹ Of the crop types being considered in this consultation, it is perhaps only in relation to maize that there may be an issue as regards sweetcorn grown in gardens or allotments. Oilseed rape is not normally grown for personal use, and if privately-grown potato or beet plants were cross-pollinated by GM varieties, the harvested part of the plant (the tuber or root) would not have any GM presence. Even in the case of privately-grown sweetcorn plants, these are normally cultivated in a tight block to encourage cross-pollination between the immediately adjacent plants, and it is unlikely that they would be cross-pollinated by a nearby commercial crop (although this cannot be ruled out completely).

146. It is the view of the Department that, for transparency and information reasons, the public should be kept informed of the nature and extent of GM crop cultivation. Consequently, the Department is considering whether a register of the GM crop species proposed to be grown in Northern Ireland should be made available through a dedicated website.

147. The Department considers that developing a register of GM cultivation as a mandatory-based measure would actively address the main requirements of all stake holders and would allow the Department to compile, in a more effective manner, relevant and timely statistics to be used for the following:

- Collating regional information as specified under Article 2.2.6 of the Commission Guidelines i.e. the crop-specific GMO share and the number and type of crop varieties that coexist in a region.
- Developing a register of GM cultivation.
- Monitoring and evaluating the effectiveness of coexistence measures for fine-tuning over time.

How could a GM public register aid coexistence? Are there other reasons to justify the establishment of a register? How should any register relate to a notification requirement? If a register is established should the information be available to everyone? How would a register be funded?

VOLUNTARY GM-FREE ZONES

148. The Government's GM policy statement confirmed that it would offer farmers guidance on voluntary GM-free zones. The Department is not advocating these and does not see them as necessary - the coexistence regime that the Department has proposed in this paper aims to safeguard the interests of all farmers. Nevertheless, it is accepted that some people may be interested in establishing a GM-free zone in their area, and that in the interests of choice the Department should provide relevant information for their consideration. The following is the Department's initial thinking on the guidance that might be provided, but the Department would like to review this in the light of comments from stakeholders.

Legal position on GM-free zones

149. If a GM crop is approved for cultivation under EU legislation, it could be a condition of the consent that it is not grown in a particular geographic area. However, this could only be the case if the crop posed a particular risk to human health or the environment in the area in question. In practice, it is unlikely that a risk would arise only in a specific area (as opposed to more generally). In all normal circumstances, therefore, it can be expected that GM approvals will be on an EU-wide basis.

150. Under EU law it is clear that farmers are entitled to grow approved GM crops and that this should not be undermined by disproportionate coexistence measures. Mandatory GM-free zones would not be a proportionate measure, but the European Commission has confirmed that GM-free zones are possible if farmers in a particular area decide voluntarily to adopt one.

Defining the overall aim of voluntary zones

151. The first issue to be resolved when considering setting up a voluntary GM-free zone is to define precisely the objective. If the aim is to be able to sell crops as GM-free then farmers should consider what they mean by this.

152. If the aim is to establish an area in which GM crops are not deliberately grown and/or in which farmers can guarantee not to exceed a level of GM presence lower than the EU 0.9% labelling threshold, then the matters set out below should be considered (rather than a 'GM-free zone' it may be more accurate to describe this scenario as a 'non-GM cultivation zone'):

- (i) how to obtain seed that is as close to GM-free as possible.
- (ii) how to apply separation distances that are greater than those required under the coexistence regime, bearing in mind that with crops like oilseed rape and maize cross-pollination at a detectable level can occur over very long distances (in this context the onus would fall on the non-GM farmers to observe the extended separation distances needed for the zone).

- (iii) liaison with neighbouring farms outside the zone to clarify whether and where GM crops might be due to be grown in the vicinity.
- (iv) the measures needed to control volunteers and bolters (if growing beet) to prevent these acting as a pathway for possible GM transfer; and ensuring that machinery which comes onto farms from outside the zone is cleaned free of possible GM seed.
- (v) whether to have finished crops tested for possible GM presence. This might be needed in particular if crops were to be sold on the basis of having some special status (at or near to GM-free).
- (vi) whether the intention is to forego the use of all types of GM crop that are or might become available, or just to avoid the use of one or more specific types of GM crop.
- (vii) whether it is intended to forego the use of bought-in animal feed that has GM ingredients. This may depend on the claims the farmers wish to make about avoiding GM in their production process.

Possible criteria for creating a Non-GM cultivation zone

153. Farmers planning a zone should also consider the following points:

- (i) how large the zone needs to be to achieve the objective: having a zone may pre-suppose that it covers at least a reasonable area of land and/or number of farms. The precise number of farms (or area of land) that would need to be involved is a matter for individual judgement. If the aim is to establish a trading identity to sell crops on a particular basis (for example - as low GM), the zone would need to be large enough to be a credible entity for marketing purposes.
- (ii) whether it will be a coherent zone: does the envisaged zone cover a coherent, unbroken area, or would there be holes within the boundary where a farmer is growing GM crops? If the latter, it may undermine the purpose for having the zone or its credibility.
- (iii) whether the boundary should follow topographical features: although not essential, it would be ideal if the farms on the boundary of a zone were not immediately adjacent to other cropping farms – i.e. if there were a road, river or other topographical feature between their land and the nearest farm outside the zone. This would help to define the boundary and make it easier to minimise potential GM presence.
- (iv) whether the zone should correspond to a particular geographic area: this may be necessary if the aim is to establish a specific marketing identity.

Formalising the establishment of a zone

154. Farmers will need to obtain their own legal advice on setting out the rights and responsibilities of the participants in a zone (the Department cannot supply legal advice). The relationship may be similar to establishing a local co-operative. The written understanding (or contract) may need to take account of the possibility that farmers who initially sign up to be part of the zone may change their mind and want to withdraw. This points to the use of a time-limited membership period or review clause, unless farmers are happy to be locked into an open-ended commitment.

155. The arrangements may also need to deal with the possibility of group members wanting or being forced to pass on ownership of their land to a successor who may not want to be part of the zone (for example - because of retirement, ill-health, death or insolvency). Otherwise, a situation could arise where GM crops begin to be grown within the zone, undermining its rationale. This suggests that the original participants should ensure that anyone who takes over their land is obliged to continue with the rules they have agreed. Depending on the circumstances, however, this form of conditionality may make their land less attractive to potential buyers.

Setting up a zone

156. It will fall to the individual farmers who are keen on the idea to make the running in establishing a zone. They may need to identify and contact other farmers in the area to explore their possible participation, and take the lead in organising relevant arrangements. Local farmer networks may already exist that will facilitate this, or those farmers proposing a zone may need to take special steps to develop their initiative (for example - consulting the local Land Registry to identify all the relevant farmers in an area or putting an advert in a local paper to attract support for their idea).

Do stakeholders have particular comments on the guidance that the Department could make available on GM-free zones. Are there relevant points that have not been covered in the above?

LIST OF CONSULTEES

AA Feeds
AB Northern Ireland Ltd
Age Concern Northern Ireland
Agricultural Trading Merchants Ltd
AH Foods Ltd
Aikens Agricultural
All District Councils
All Northern Ireland Party Leaders
Alpha Environmental Systems
Andrews Milling Ltd
Anglo Beef Processors Ltd
Anglo North Irish Fish Producers Organisation
Ardnabannon Outdoor Education Centre
Armagh & Dungannon H&SS Board
Asia Supermarket
Atnagelvin Hospital Health & Social Services Trust
Avondale Foods (Craigavon) Ltd
Ballygarvey Eggs
Ballymoney Foods Ltd
Ballyrashane CA & DS Ltd
Bann Valley Game E49 Wildfowl Club
BASC
Belfast "Hills" and Environmental Project Office
Belfast City Hospital Trust
Belfast Education & Library Board
Belfast Harbour Commissioners
Bio-kinetic Europe
Botanical Society of Britain & Ireland
British Medical Association (NI Branch)
BSBI Committee for Ireland
Business in the Community
Butterfly Conservation
Cantrell & Cochrane (Belfast) Ltd
CCEA
Chartered Institute of Environmental Health
Chartered Institute of Marketing
Clare Glen Seeds
Clarendon Agricare
Colin Glen Trust
Committee on the Administration of Justice
Confederation of British Industry
Conservation Volunteers Northern Ireland (CVNI)
Co-operative Wholesale Society Ltd
Council for Nature Conservation and the Countryside
Country Access and Activities Network
Countryside Alliance NI
Craigavon & Banbridge Community H&SS Trust HQ

Craigavon Area Hospital Group H&SS Trust
Crop Specialists Ltd
CSS
Curley's Supermarket (Belfast) Ltd
Dairy Council for NI
Dairy Produce Packers
Dale Farm Ice Cream Ltd
Department of Health, Social Services and Public Safety
Department of Social Development
Disability Action
Down Lisburn Trust (H&SS)Headquarters
Down Local Strategy Partnership
Du Pont (UK) Limited
Duncrue Food Processors
Dungannon & District Co-op
Dungannon Meats
Dunnes Stores Ltd
Eastern Health and Social Services Board
Environment & Heritage Service
Environmental Contracts
Equality Forum NI
Ernest Kennedy & Son
Evron Foods Ltd
Express Dairies Ltd
Farmview Dairies Ltd
Federation of Small Businesses
Fermanagh Grassland Club
Ferne Foods Ltd
Fisheries Conservancy Board for Northern Ireland
Food Standards Agency Northern Ireland
Forest of Belfast
Forestry & Timber Association
Foyle Basin Council
Foyle H&SS Trust
Foyle Meats
Foyle, Carlingford and Irish Lights Commission
Freeza Meats Ltd
Friends of the Earth Northern Ireland
Fusion Antibodies Ltd
Fyffes Group Ltd
Galen Ltd
GE McLarnon & Sons Ltd
Gendel
General Consumer Council for NI
Germinal Holdings Ltd
Glanbia Cheese Ltd
Glanbia Foods (NI) Ltd
Golden Cow Dairies
Green Park Health Care Trust
Greenmount College of Agriculture & Horticulture

Greenvale Fruit Packers Ltd
Health & Safety Executive NI
Health Promotion Agency for NI
Herbel Restaurants Ltd
Hilton Meat Products Ltd
Holden Agriculture
Homefirst Community HSS Trust
Hood & Co
Howard Allen Seeds
Hughes Frozen Foods
I.A.W.S
Industrial Research and Technology Unit
International Tree Foundation
InterTradeIreland
Invest NI Headquarters
Irish Agricultural Wholesale Society
Irish Biscuits (NI) Ltd
Irish Hunting, Shooting & Fishing
Irish Organic Association
Irish Peatland Conservation Council
James & Michael Watson
John Henderson Ltd
John Thompson & Sons Ltd
Joseph Morton Ltd
Kane Bros
Kilhorne Bay Seafoods Ltd
Killowen Outdoor Centre
Kilwaughter Chemical Co Ltd
KMM Marenco
Knock Fruit Growers Ltd
Leckpatrick Dairies
Linden Foods Ltd
Livestock & Meat Commission for NI
Lough Neagh and Lower Bann Advisory Committees
Lough Neagh Fisherman's Co-Operative Society Ltd
Loughgall Fruit Growers Ltd
Loughvale Fruit Growers Ltd
Magistrates' Court
Maine Soft Drinks Ltd
Marks & Spencer
Mater Hospital Health & Social Services Trust
Mauds Ice-cream
Mayers Milling Ltd
McColgans Quality Foods Ltd
Medevol Clinical Services
Members of the Northern Ireland Assembly.
Millview Fruit Growers Ltd
Moores Animal Feeds
Mothers Pride
Mourne Advisory Council

Mourne Country Meats Ltd
Mourne Countryside Centre
Mourne Heritage Trust
Mourne Mushrooms Marketing Ltd
Moy Park Ltd
MPs and MEPs who are not Party Leaders.
Multi-Cultural Resource Centre
Musgrave Supervalu Centra
N Ireland Fish Producers Organisation Ltd
Nambarrie Tea Co Ltd
National Assembly for Wales
National Assoc. of Shopkeepers
National Trust
Nestle (UK) Ltd
NI Association of Citizens Advice Bureau
NI Council for Ethnic Minorities (NICEM)
NI Court Service
NI Dairy Association
NI Food & Drink Association
NI Fruit and Veg Wholesale Ltd
NI Grain Trade Association
NI Nursery Stock Growers Association
NI Potato Breeders Association
NI Produce Processors
NI Small Woodland Association
Nicobrand
Norbrook Laboratories
North & West Belfast Health & Social Services Trust
North of Ireland Potato Marketing Association
North West Seeds
Northern Beverages
Northern Eastern Education and Library Board
Northern Health and Social Services Board
Northern Ireland Affairs Committee
Northern Ireland Agricultural Producers Association
Northern Ireland Ambulance Service Trust
Northern Ireland Biodiversity Group
Northern Ireland Council for Integrated Education
Northern Ireland Environmental Link
Northern Ireland Food and Drink Association
Northern Ireland Fungus Group
Northern Ireland Local Government Association
Northern Ireland Meat Exporters Association
Northern Ireland Members of the House of Lords.
Northern Ireland Potato Marketing Association
Northern Ireland Seafoods Ltd
Northern Ireland Veterinary Association
Northway Mushrooms Ltd
Nutricia (Ireland) Ltd
O'Kane Poultry Group

O'Kane Supermarkets Ltd
O'Reillys the Sweet People
OFMDFM, Central Management Unit.
OFMDFM, Machinery of Government Division.
Orchard County Enterprises Ltd
Organic Action Plan Group Northern Ireland (OAPGNI)
Ormeau Bakery
Outdoor Education Centre
P & G Family Foods
Penniela Farm
Plant Testing Station Crossnacreevy
Pritchitt Foods
Provita Eurotech
Punjana Ltd
Queen's University of Belfast
Questor Centre,
Quoile Countryside Centre
Radox Laboratories
Rare Breeds Survival Trust
Red Lion Fruit Ltd
Reliant Distributors
Rich Sauces
Robert Morton & Son
Robert W & Robert G Kelso
Robin Walker & Co
Roche Products
Rockall Seafoods Ltd
RUAS
Rural Community Network
Rural Development Council for Northern Ireland
Sainsburys, Forestside
Samuel McCausland Ltd
SB Chemicals Ltd
Scottish Executive
Scotts Feed Ltd
SNIP
Soil Association
South & East Belfast Health & Social Services Trust HQ
South Eastern Education and Library Board
Southern Education & Library Board
Southern Health and Social Services Board
Speleological Union of Ireland
Sperrin Lakeland Health & Social Services Trust
Staff Commission for Education & Library Boards
Strabane Mills Ltd
Strangford Lough Management Committee
Strathroy Dairy Ltd
Taylor Farm Supplies
Tayto (NI) Ltd
Tesco Stores Ltd

The Irish Moiled Cattle Society
The Royal Society for the Protection of Birds
The Ulster Federation of Rambling Clubs
The Wildfowl & Wetlands Trust
Thomas Hutchinson & Sons Ltd
Trouw Nutrition
Ulster Agricultural Organisations Society
Ulster Angling Federation
Ulster Beekeepers Association
Ulster Cancer Foundation
Ulster Chemists Association
Ulster Curers Association
Ulster Farmers Union
Ulster Grassland Society
Ulster Native Trees
Ulster Pork & Bacon Forum
Ulster Society for the Preservation of the Countryside
Ulster Wildlife Trust
Ulster, North Down & Ards Hospital HSS Trust
Unipork Cookstown Limited
United Dairy Farmers
United Feeds Ltd
United Hospitals HSS Trust
United Irish Organics Ltd
Universal Meat Co
University of Ulster - Coleraine Campus
Vanstar Meats
Veterinary Research Laboratory
Victims Groups and Individuals.
W & R Barnett Ltd
WD Meats Ltd
Western Education & Library Board
Western Health & Social Services Board
Woodland Trust
WWF NI
Xenosense

Partial Regulatory Impact Assessment (RIA) of
Proposed Coexistence Measures for GM and Non-
GM Crops

January 2007

Introduction

This partial RIA has been produced to accompany Environmental Policy Division's (EPD) consultation on proposed coexistence measures and related issues as set out in the Government's GM policy statement of March 2004³², and the Department's statement of 12th March 2004³³. It should be seen as a work in progress. The RIA will be developed further and reviewed in the light of the responses to the consultation process and the conclusions which the Government reaches on these. A final RIA will be published in due course.

This RIA relates to Northern Ireland only. Coexistence is a devolved matter and the authorities in England, Wales and Scotland are responsible for developing the policy to apply in their areas.

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³² <http://www.defra.gov.uk/corporate/ministers/statements/mb040309.htm>

³³ <http://www.nics.gov.uk/press/env/040312c-env.htm>

1. Background and Rationale

1.1 Background

- 1.1.1 GM crops are already heavily regulated and cannot be grown commercially without EU-wide agreement that safety requirements for human health and the environment have been met and the crop variety has been authorised. To ensure consumer choice GM products must also be labelled and traced as they move through the food or animal feed supply chain. In this RIA, coexistence refers to the additional measures that farmers will need to take to minimise unintended mixing of GM and non-GM crops, so that a segregated non-GM supply chain can operate.
- 1.1.2 EU legislation already requires food or feed materials with an adventitious or technically unavoidable GM presence above 0.9% to be traced and labelled as GM through the production chain, starting with crops as they leave the farm³⁴. The primary aim of this legislation³⁵ is to ensure consumer choice.
- 1.1.3 When a GM crop is grown it may transfer a GM presence into non-GM crops of the same species, for example via normal cross-pollination. Non-GM farmers may not want a GM presence in their crops which requires them to be sold as GM because it may reduce their market value³⁶. Thus, the activity of one group of producers (GM growers) may unintentionally jeopardise the economic position of another group (non-GM growers), in the absence of a contractual relationship that dictates how farmers should behave towards each other GM growers may have no natural incentive to take action to safeguard their neighbours interests. There is therefore a need for an agreed coexistence regime at farm level³⁷, both to set the parameters for the relationship between GM and non-GM farmers and to ensure the consumer choice implicit in the EU legislation.

³⁴ If a product is intentionally GM it must be labelled as such even if the GM content is less than 0.9%. It should also be noted that the 0.9% threshold relates only to the possible presence of EU-approved GMOs

³⁵ Council Regulation (EC) No. 1831/2003 concerning the traceability and labelling of genetically modified organisms and the traceability and feed products from genetically modified organisms (OJ No. L268, 18.10.03, p24).

³⁶ It is not yet certain what market conditions will prevail for commercial GM cultivation in the UK, and this is likely to depend on the type of GM crop involved. If it has a novel quality trait it may trade at a premium relative to non-GM conventional crops of the same species. If the GM crop has a production trait (e.g. herbicide tolerance) it is more likely that there would be a price premium for non-GM conventional crops. If there is no price differential between GM and non-GM produce there may be no coexistence issue, as the economic position of conventional non-GM producers would not be adversely affected.

³⁷ Coexistence is an issue for the whole of the food supply chain but beyond the farm gate the industry will implement its own measures to ensure that GM, non-GM (conventional) and organic crop materials are segregated as necessary. This will be done within the framework of existing EU traceability and labelling regulations and be governed by normal contract terms. The situation at farm level is different because there will not necessarily be a contractual relationship between neighbouring farmers.

- 1.1.4 The European Commission has issued guidelines on coexistence³⁸, leaving Member States to determine what arrangements they should adopt at national level, subject to these being consistent with EU law. The UK Government has also received formal advice on this issue from the Agriculture and Environment Biotechnology Commission (*GM Crops? Coexistence and Liability*, AEBC, November 2008³⁹).
- 1.1.5 The UK Government's GM policy statement of 9 March 2004 said that farmers growing GM crops should be required to implement measures that enable non-GM producers to stay within the 0.9% threshold. It was envisaged that this could be achieved via a code of practice with statutory backing.
- 1.1.6 It is arguable that developing coexistence proposals and applying most of the costs to GM farmers is a tax on innovation. However, in many respects it is the cost of facilitating the acceptance of GM technology. A coexistence regime will help to reassure consumers that they will have a choice between GM and non-GM UK produce, and it may also help ease concerns over the introduction of GM crops. The apportionment of costs is discussed further in Section 4.

1.2 Timing and Scope of Proposals

- 1.2.1 It takes a long time to secure the regulatory approval needed before a GM crop can be grown commercially in the EU, and none of the GM crops currently going through the EU consent process are of possible interest to UK farmers⁴⁰. The specific GM traits bred into maize, beet and oilseed rape varieties in the late 1990s and grown in the UK farm-scale evaluation trials have now been withdrawn by the companies involved. In view of this, we do not expect any GM crop to be grown here before 2009 at the earliest. The Government's intention is that coexistence measures should be in place before any commercial GM cultivation, so that farmers know what controls they face and can make decisions accordingly.
- 1.2.2 The crop species most likely to be introduced first into the UK in GM form are maize, beet, oilseed rape or potatoes. The development of coexistence proposals is therefore focusing on these species. If other GM crops are proposed for commercial use in due course there will be a need to consider appropriate coexistence measures for them at that time.
- 1.2.3 Coexistence measures need to be determined on a crop-by-crop basis. Depending on the species, there may be various pathways for a GM presence to be transferred into a non-GM crop. For beet and potatoes,

³⁸ Commission Recommendation 2003/556/EC on guidelines for the development of national strategies and best practices to ensure the coexistence of genetically modified crops with conventional and organic farming (OJ No. L189,29.07.03, p36)

³⁹ http://www.aebc.gov.uk/aebc/reports/coexistence_liability.shtml

⁴⁰ Because, for example, they confer resistance to a crop pest that is not a problem in the UK, or relate to a type of production such as potato starch for which there is no UK processing facility.

the scope for transfer is limited (because the harvested roots or tubers are unaffected by cross-pollination) and coexistence can be achieved by farmers following existing good husbandry practice. For oilseed rape and maize, crop-to-crop cross-pollination could lead to a significant level of GM transfer in the absence of farmers taking specific action to avoid this (something they would not do ordinarily). Observing a crop separation distance will minimise cross-pollination, and it is envisaged that this will be the key coexistence measure for oilseed rape and maize⁴¹. The application of separation distances may require neighbouring farmers to liaise with each other over their respective cropping plans. Therefore, it is also envisaged that a notification rule will apply, whereby a GM farmer would inform neighbouring farms of his intention to sow a GM crop, if neighbouring farmland fell within the relevant separation distance (as measured from the field planned for GM cultivation).

1.2.4 There are other practices that it will be desirable for GM farmers to apply. These include limiting GM volunteers (plants that grow from seed shed at harvest) and cleaning farm machinery to minimise the possible dispersal of lodged GM seed (where machinery is to be used on both GM and non-GM farms). However, these are measures that:

- are not of major significance for coexistence between farms⁴²
- are already part of normal farm practice (i.e. volunteer control)
- would be difficult to specify in legislation and difficult to enforce

1.2.5 It is envisaged that these measures will be set out as advice or guidance in a non-statutory code of practice and therefore that the only measures that might be specified in regulations are separation distances and a notification requirement.

1.3 Rationale for Government Intervention

1.3.1 The specific risk that coexistence measures address is the potential for non-GM crops (conventional or organic) to have an unwanted GM presence above 0.9% which requires them to be sold with a GM label. Although not a safety issue, this could have an adverse effect because:

- if GM crops sell for less than non-GM/organic products, non-GM farmers with an affected crop may lose out economically because they would not gain the expected non-GM or organic premium;

⁴¹ Defra has commissioned a report from the National Institute of Agricultural Botany to inform separation distance proposals. This will be published later this year. As a general indication of the scale of distance that may be involved, 50m for oilseed rape and 80m for forage maize were applied by farmers in the Farm Scale Evaluation GM trials, based on the recommendations in a previous NIAB report.

⁴² Factors like volunteer control and machinery cleaning would be of more significance if a farmer wants to grow both GM and non-GM crops on the same farm.

- without reliable coexistence arrangements, choice for producers and consumers would be undermined;
- the uncontrolled risk of cases of unwanted GM presence above 0.9% may undermine public confidence generally in the whole GM regulatory regime; and
- if there are coexistence problems it may reflect badly on the impact of GM crops, it could make their introduction more problematic, leading to a reduced and/or slower take-up rate than might otherwise be the case. This may in turn jeopardise attainment of the benefits which the GM crops may offer, and unreasonably prejudice the biotechnology seed companies.

1.3.2 There are several variables which will influence the probability of a non-GM crop having a GM presence above 0.9%. It will depend on:

- ***crop species*** – for example, it is very unlikely with beet and potatoes but a real issue for oilseed rape (with the latter it is reproductive material – seed – that is harvested and this is affected by cross-pollination between crops; with beet and potatoes, vegetative material is harvested which is not affected by cross-pollination).
- ***relative cropping areas*** - the overall extent to which a GM crop is being grown relative to its non-GM (conventional or organic) counterpart. The more GM crops there are the more likely it is that non-GM crops of the same species will be cross-contaminated⁴³. It is difficult to predict the possible take-up rate of GM crops in the UK. Elsewhere in the world they have readily gained market acceptance and are grown on a widespread basis. The position in Europe is arguably different because of the controversy which has surrounded the whole GM issue. As a result there might not be strong demand at least for the present generation of GM crops which offer benefits to the producer rather than directly to the consumer. The situation in Europe is characterised by the fact that since 1998 there have been no EU approvals to grow GM crops, and the only EU country with commercial GM cultivation is Spain (limited production of insect-resistant maize). When considering relative cropping areas it is noteworthy that there is little UK organic cultivation of oilseed rape or maize, the two crops being considered for which farmers may need to apply separation distances.
- ***individual farm configurations*** – the likelihood of neighbouring farmers growing GM and non-GM crops of the same species in close proximity. As noted, cross-pollination is a potentially significant route of GM transfer for oilseed rape and maize. Given what is known about the relationship between crop separation and cross-

⁴³ Although it should be noted that if GM crops become widespread it is likely to mean they have gained market and consumer acceptance; in which case there may not be a price differential in favour of conventional non-GM produce and coexistence may not be such a significant issue.

pollination⁴⁴, it is only likely that a 0.9% threshold would be exceeded if GM and non-GM varieties are grown next to each other in adjacent fields. Otherwise, the normal distance between crops should be enough to ensure that observing a 0.9% threshold is not a significant issue.

- **Cross border dimension** – a particular consideration for Northern Ireland is that, because it shares a land border with the Republic of Ireland, then there is the possibility that farmland in the north could lie in close proximity to neighbouring farms in the south. In order to address this issue, discussions have been taking place between the relevant authorities in NI and RoI and a degree of co-operation is planned in terms of the measures which will be introduced.
- **GM presence in seed** – what, if any, GM presence is in the crop seed used by non-GM farmers. The European Commission is due to propose specific thresholds for labelling GM presence in non-GM seed stocks, with values in the range 0.3%-0.5% having previously been considered. Coexistence measures will need to limit any GM transfer into non-GM crops so that, taking account of the possible GM presence in the original seed, the final harvested crops are inside the overall 0.9% EU threshold. If non-GM farmers can and do use seed that has no or very little detectable GM content, then it will be easier to meet the 0.9% threshold. At this stage it is not clear whether seed companies will offer non-GM seed that has a confirmed GM presence lower than any proposed seed labelling thresholds. Again, the situation may change over time depending on the uptake of GM crops. If they become widespread in the UK and Europe it will become more difficult/costly for seed producers to offer non-GM seed with a guaranteed low level of GM presence.

1.3.3 The proposed measures will minimise risk by ensuring that there is a proportionate coexistence regime in place. The measures will be designed to be effective in all normal circumstances, although it is not possible to guarantee that in every case a GM presence will remain within 0.9%. As part of the coexistence consultation, consideration is also being given to a mechanism to redress potential economic losses by non-GM farmers should a GM presence exceed the statutory threshold. Because the Department does not yet have a firm position on a possible redress mechanism it is not covered in detail in this partial RIA, but a general overview of this issue is given in Appendix 1.

1.3.4 The Department proposes to review the coexistence arrangements that are put in place within two or three years of their introduction, and to amend them if necessary.

⁴⁴ As set out, for example, in the report for Defra in 2000 by the National Institute of Agricultural Botany.

2. Objectives

2.1 Objective

2.1.1 The Department's Environment Policy Division is consulting on proposed measures to facilitate the coexistence of GM and non-GM crops, recognising that the former may be grown here commercially in due course. The policy objective is to:

- preserve choice for producers to grow their preferred crops and for consumers to buy conventional, organic or GM products grown in Northern Ireland;
- enable the crops sector in Northern Ireland to operate in a sustainable and efficient manner; and
- ensure there is public confidence in the regulation of GM crops.

2.1.2 The specific aim for coexistence measures is to ensure that unwanted GM presence in non-GM crops is minimised, consistent with the relevant EU labelling threshold of 0.9%.

3. Options

3.1 Identification of Options

3.1.1 At the highest level there are three basic options for managing coexistence:

- (i) **Option A** - do nothing, which assumes that there is no industry or Government-led attempt to manage coexistence;
- (ii) **Option B** – coexistence is managed by an industry-led scheme, in which case GM crops would be managed in line with industry-imposed standards (Government would intervene by making regulations, if the industry approach is ineffective); or
- (iii) **Option C** – the Government introduces statutory coexistence rules.

Option A: do nothing

3.1.2 There are two reasons why this must be seen as a notional option. Firstly, there is already an industry code of practice for managing GM crops that has coexistence provisions. This was established by the farming and industry group SCIMAC⁴⁵ in 1999, endorsed by Defra and applied to the Government-sponsored GM farm-scale trials. The code includes a form of both the key coexistence measures being considered for Government regulations (notification rule + crop separation distance), and the non-essential measures that it is envisaged would be left to apply voluntarily (for example - controlling GM volunteer weeds and cleaning shared farm machinery). As such, the status quo or real-world situation is one in which there is an existing industry-led coexistence regime.

3.1.3 Secondly, it is inconceivable that the farm sector could do without a structured coexistence regime facilitated either by industry or Government. The EU Traceability and Labelling Regulations effectively require coexistence rules, to ensure a proper basis for segregating GM and non-GM crops. In theory individual farmers might be left to make their own arrangements, but in practice this is not credible. It would create uncertainty and this would prevent the supply chain from operating efficiently. As a minimum farmers need direction on the specific measures required for successful coexistence, and the supply chain as a whole needs these to be set out in a coherent and transparent framework.

3.1.4 Nevertheless, it may be helpful to consider a hypothetical situation where an industry code is assumed not to exist, as a basis for comparison with the following two options.

⁴⁵ Supply Chain Initiative on Modified Agricultural Crops: an umbrella group representing the agricultural supply chain, including the National Farmers Union, the Agricultural Industries Confederation and GM seed companies. Further details are available at www.scimac.org.uk.

Option B: An industry led regime

3.1.5 The cross-industry group SCIMAC is now developing its existing code of practice with other industry partners, to provide for a more stringent and comprehensive industry-led coexistence regime. At this stage the outcome of this initiative is not confirmed, but for the purpose of this RIA it is assumed that an enhanced regime will be adopted in due course (before the advent of commercial GM cropping). On this basis, there would be a regime where:

- coexistence measures are set out in an industry code of practice, reflecting the principle that, where necessary, GM growers must take steps to protect their neighbours' economic position; the code would include the same measures that the Government might impose on a statutory basis (i.e. it is expected that industry representatives will discuss and agree with the Department the detailed measures to be applied);
- adherence to the key measures in the code is a requirement of industry farm-assurance schemes (to provide for effective implementation and compliance);
- There is an industry-run mechanism to redress any economic loss that a non-GM farmer might face because a non-GM crop has acquired a GM presence above the EU labelling threshold (for example - a crop substitution arrangement).

Option C: Statutory Rules

3.1.6 As indicated at paragraphs 1.2.3 – 1.2.5, if the Government makes coexistence regulations these will cover the key requirements of a farmer-to-farmer notification rule and the observance of crop separation distances for maize and oilseed rape. Other measures such as volunteer control and machinery cleaning would be left to operate on a voluntary basis via a code of practice. It is envisaged that they would be included in an updated code, discussed and endorsed by the Department of the Environment and the Department of Agriculture and Rural Development (DARD).

3.1.7 The Department believes that, for transparency and information reasons, the public should be kept informed of the nature and extent of GM crop cultivation. Consequently the Department is minded that a register of the GM crop species proposed to be grown in Northern Ireland should be made available through a dedicated website immediately after the Department receives notification to plant the crop.

3.1.8 It is expected that the costs associated with the establishment and upkeep of a GM register would not be significant, especially during the early years of coexistence regulations. A review of the GM register would take place around 2-3 years after the start of commercial GM cropping in Northern Ireland (the precise timing will depend on the rate of GM uptake).

3.2 Differences between the three options

- 3.2.1 Relative to Option A (do nothing), Options B and C are broadly similar in their practical effect and the costs and benefits they would generate. By different means, both would require farmers to implement the two essential coexistence measures (notification and crop separation).
- 3.2.2 In terms of benefits, because Option A would not provide a satisfactory coexistence solution it would not yield the broad range of benefits expected from Options B and C (outlined at 4.6 below). In particular, Option A would require routine testing of non-GM material for possible GM content, the overall cost of which to the supply chain could be very significant. Option A would also be expected to give rise to litigation costs as farmers seek to resolve coexistence disputes. In the absence of a clear coexistence framework these could arise with some frequency. Against this, Option A would avoid the expense inherent in operating the formal coexistence regimes envisaged by Options B and C (as outlined at 4.3 below). A specific but minor distinction in relation to Option A is that under Options B and C farmers would be expected to implement voluntarily desirable but non-essential measures such as volunteer control and machinery cleaning. These are already part of good farm practice or would not generate significant extra costs.
- 3.2.3 As in reality Option A can be considered no more than notional, the real issue is the difference between Options B and C. Accordingly, the remainder of the RIA focuses on a comparative assessment of these two approaches.

3.3 *Differences between main Options B (industry scheme) and C (Government regulations)*

- 3.3.1 With broadly the same measures applied under either option, the main practical difference between the two would be in the area of implementation and enforcement. Under Option B, the industry will be responsible for enforcement checks and the application of sanctions for non-compliance. It is envisaged that the industry code would be implemented via farm assurance schemes. Members are subject to an inspection every 1-2 years. The normal sanction for breaking scheme rules (loss of farm assured status) is generally taken as a strong incentive for farmers to comply. Under Option C, DARD would check GM growers' compliance with the coexistence regulations, and statutory penalties would apply for non-compliance.

3.4 *Flexibility*

- 3.4.1 There would also be a practical difference in terms of the relative flexibility of the two options. Changes may need to be made to coexistence measures in the light of experience, new crops being grown or new information (for example - on crop separation distances). It would also be necessary to specify measures for new types of GM crop as they are introduced. It would be easier to make changes to an

industry-led scheme compared to the more formalised procedures required to amend or extend Government regulations.

3.4.2 Apart from the practical distinction, a judgement has to be made about the relative effectiveness of the two options in achieving the aim of keeping GM presence in non-GM crops below 0.9%, and on the appropriateness of relying on an industry-led regime instead of statutory rules.

3.5 Effectiveness

3.5.1 It is taken as read that statutory coexistence rules would be effective (the Government would seek to ensure that this was so). On the face of it, the envisaged industry regime could be equally effective. Its implementation via farm-assurance schemes should ensure proper oversight and a clear incentive for farmers to comply. The only possible fear might be a general lack of will to apply the arrangements rigorously. However, there is no specific reason to think this might be the case. If, as envisaged, the industry is committed to providing redress for any economic losses that non-GM farmers might face, then there will be an incentive for the relevant industry bodies to make sure that coexistence works effectively.

3.6 Public Confidence

3.6.1 The Government-sponsored GM public debate indicated that there is public unease about GM crops and mistrust of the Government and multi-national companies. In the context of the two main coexistence options, this suggests that any regime which relies on the industry to regulate itself is likely to be criticised as insufficient and not have the support of a wide range of interested stakeholders. This view has already been signaled to Defra by environmental NGOs, consumer and organic groups in particular. In its report to Government the AEBC said that an industry-run scheme would only command the confidence of non-GM farmers if the industry has an economic incentive to make things work, and it recommended a statutory regime as its preferred option. Against this, it should be noted that the AEBC assumed there would not be an industry-funded redress mechanism, whereas the industry has subsequently moved to accept the principle of providing one. Nevertheless, it can be argued that a statutory regime is preferable to maximize public acceptance for the introduction of commercial GM cultivation.

4. Costs and Benefits

4.1 Sectors and Groups Affected

4.1.1 There is no difference between Options B (industry scheme) and C (government regulations) as regards their equity or fairness – both will

require farmers growing GM crops to bear the main burden of implementing coexistence measures, rather than non-GM producers⁴⁶.

4.1.2 Both Options B and C will directly affect those farmers who choose to grow crops from GM seed. The number of farms affected will depend on the extent to which GM crops are grown, and the following table illustrates the potential number based on a range of possible adoption rates:

		Number of farmers growing GM crops at different rates of adoption (expressed as a percentage of the number of farms currently producing the crop in conventional form):			
Number of holdings in N. Ireland growing conventional crops of ⁴⁷ :		5%	10%	25%	50%
Oilseed rape:	18	1	2	5	9
Forage Maize:	253	13	25	63	127
Sugar beet ⁴⁸ :	0	0	0	0	0
Potatoes:	916	46	92	229	458

4.2 Analysis of Costs and Benefits

4.2.1 The potential costs and benefits of a coexistence regime are by their nature difficult to quantify and will be dependent on the particular characteristics of each individual GM crop. As a contribution to the Government-sponsored GM Dialogue the Prime Minister's Strategy Unit (SU) produced a report in 2003 analysing the impact of the possible cultivation of GM crops in the UK. This reflected input from a wide range of experts and stakeholders. The SU study identified that there are limitations and uncertainties in the available evidence on the costs and benefits of GM crops. The report concluded that:

- although there is a large body of international research on the commercial growing of GM crops, some of this is subject to contradictory interpretations, and its applicability to the UK needs to be treated with caution. It also covers a relatively short time period.
- there is very little research on the economic and environmental impacts of conventional and organic farming⁴⁹. This makes it

⁴⁶ This assumes that for the foreseeable future it would be GM crops that constitute a new production type that is introduced into an area alongside existing non-GM production. If the stage is reached that GM crops predominate in an area it will beg a question about the balance of coexistence responsibilities between GM and non-GM farmers – see the wording of the Commission guidelines at paragraph 42. Defra proposes to keep this under review in the light of developments in GM uptake.

⁴⁷ From Department of Agriculture and Rural Development.

⁴⁸ Sugar Beet is not currently grown in NI. However the RIA produced by Defra includes sugar Beet as one of those crops that could perhaps cause cross contamination if grown.

⁴⁹ As the Strategy Unit study was nearing completion Defra published a major review of the comparative environmental impact of organic farming, *An Assessment of the Environmental Impacts of Organic Farming*, Shepherd et al, May 2003. Other Defra and EU-funded studies have also explored

hard to establish an analytical baseline against which the economic and environmental impacts of GM crops may be assessed.

- there are also significant uncertainties inherent in looking forward over the 10-15 year time horizon considered in the study. For instance, the UK and international policy environment, public attitudes, and the state of science may well change over this time period.

4.2.2 The SU study therefore did not attempt to quantify costs and benefits but made an overall qualitative assessment based on an analysis of various possible scenarios. Further details are available at www.number-10.gov.uk/su/gm/index.htm

4.3 Costs to Business

4.3.1 The main cost to business will obviously fall on those who decide to grow GM crops. This cost will largely be the cost of complying with the new regulations, and will broadly be the same under options B and C. As indicated earlier in the RIA, there are currently no such crops grown in NI and the future level of take up is uncertain. The type of costs which will arise for businesses include:

4.3.2 **Notification costs** – that is, the cost associated with one farmer having to inform one or other neighbours that they intend to grow GM crops. The need to do so will depend on the distance between the intended location for the GM crop and the neighbouring farmland. Thus, farmers sowing GM crop may be able to overcome the need for any further action through discussions with neighbouring farmers. In any case, the cost associated with notification is likely to be minimal. It is estimated that the average cost of notification per farmer would be £12 per hour⁵⁰. This cost will be the same under both options. Where notification is required, it is envisaged that the neighbouring farmers will exchange a pro-forma setting out cropping intentions (so the GM farmer's neighbour has to indicate whether he plans to grow a non-GM crop whose value might be compromised by GM cross-pollination, and, if so, its intended position). They could do this via correspondence or a face-to-face meeting. It is estimated that completion of the pro-forma may take about 30 minutes of each farmers time (the GM farmer and his neighbour). Based on an average value of a farmer's time of £12 per hour, the following table gives a range of possible aggregate costs depending on the number of farmers involved:

this area. Defra believes there is ample evidence of the environmental benefits of organic farming, although in this context the point is that the data is largely qualitative in nature, reflecting the methodological difficulty of producing a firm quantitative analysis of the comparative effect of different farming systems.

⁵⁰ Rate advised by the Office of National Statistics for cost of time spent by agricultural/horticultural manager completing a survey form

Cost of time spent on notification pro-forma per farmer (average)	Aggregate cost if number of farmers affected is:			
	50	100	500	1000
£6	£300	£600	£3000	£6000

4.3.3 **Separation Distances** – under the regulations, farmers sowing GM crop will have to ensure that there is an adequate separation distance between that crop and any neighbouring non-GM crop. The final cost of having to comply with this aspect of the regulation is difficult to estimate and there are a wide range of factors to bear in mind. A separation distance is only required in the case of oilseed rape and maize, where there is the potential for cross pollination. The level of production of oilseed rape is very low in Northern Ireland, although over the past number of years there has been a steady increase in the area of forage maize grown in Northern Ireland.

There is an obvious opportunity cost associated with this separation distance for the GM farmer. That is, it will mean that land is not being used which could otherwise have been farmed in a productive manner. However, this cost can be minimized. For instance, the separation distance is only required if the neighbouring farmer intends to grow a non-GM crop of the same species in adjacent fields at the same time. Thus, the GM farmer may be able to avoid this cost either within their own farm planning processes or through agreement with neighbouring farms.

In Northern Ireland there is an issue of cross border contamination to consider. It is quite possible that farms in close proximity to the border of Northern Ireland and the Republic of Ireland may encounter cross country contamination. In his respect there is the potential for some more significant issues to arise should this situation occur. In order to address this issue, the Department and DARD have been in discussion with the ROI on the harmonization (where possible) of coexistence measures and in particular where farm boundaries do not coincide with national borders. Discussions are ongoing with the relevant parties in this regard.

Cross-pollination can be influenced by the physical barriers between fields. If there is a particularly high hedge or dense stand of trees between two crops this may lessen cross-pollination, compared to a situation where there is just a low hedge. As individual circumstances can vary greatly, it is not possible to advise on how a particular physical barrier will influence the level of cross-pollination. Recommended crop separation distances assume the presence of field boundaries that do not have any specific effect on the degree of cross-pollination.

4.3.4 **Border or barrier rows** – as an alternative to crop separation, farmers sowing GM crops may be able to apply a row or strip of non-GM plants

of the same species. The cost of this and the potential mitigation measures are likely to be similar to those under the separation distance measure. Although, there is little practical experience or research in the use of barrier strips. Thus, the optimum depth of barrier rows is not fully understood.

4.3.5 **Machinery cleaning costs** - there is a possibility that GM crop may be passed from one farm to another through the use of shared machinery. This could arise in particular with combine harvesters used on oilseed rape crops, although even this would not be expected to result in a significant GM transfer. It is not standard practice to clean combine harvesters between operations on separate farms. However, farmers could minimise the scope for unwanted GM transfer by making sure that those parts of a combine that are readily accessible are cleaned reasonably-free of any lodged seed. The GM farmer will therefore be expected to take the lead in ensuring that the combine is cleaned before it goes to a non-GM farm. This may, though, form part of normal good farming practices and therefore may not result in any additional costs for farms.

4.3.6 **GM volunteer costs** - If GM oilseed rape is grown it will drop seed at harvest that could result in GM rape plants appearing for a number of years amongst the subsequent crops in that field. If a subsequent crop is non-GM rape any GM volunteers will mix and cross-pollinate with it, transferring a GM presence. GM volunteers may also cross-pollinate non-GM crops grown in the vicinity. Beet crops can have volunteers (weed beet) but maize will not because spilt maize seed does not remain viable over winter in UK soils. Volunteers can therefore be viewed as weeds in the crop field and something that conventional farmers normally control by applying a suitable herbicide. The frequency and persistence of volunteers can also be influenced by the cropping interval between crops of the same species. While it is not possible to guarantee the complete elimination of volunteers, if they are minimised in line with good practice they will not be a significant source of potential GM transfer between farms.

4.4 **Costs to Government**

4.4.1 Under option C, which involves introducing statutory coexistence regulations, there will be costs to the Department associated with their introduction, relating to regulation, administration and enforcement. Such costs will vary according to the uptake of GM crops, and it is difficult to estimate what those costs will be.

4.5 **Costs to Consumers**

4.5.1 There is a potential cost to consumers as a result of the introduction of these regulations in that businesses facing higher costs may be able to pass these costs on to consumers. The nature of the agricultural

industry and the products under examination are such that it may be difficult for businesses facing higher costs to achieve this. That is, the products would tend to be relatively inexpensive, with a wide range of suppliers both locally and internationally.

4.6 Benefits

4.6.1 There is little difference between Options B and C as regards their potential benefits, although a legislative approach may secure greater public confidence. Both may help to deliver advantages in the areas detailed below.

Economic

4.6.2 If it is assumed that non-GM crops will command a price premium⁵¹, then the introduction of an effective regime of farm-level coexistence measures will benefit such farmers who might otherwise have suffered an economic loss because their crops have a GM presence above 0.9%.

4.6.3 Farmers will not grow GM crops unless there is a market for GM products and the crops give them an economic benefit of some sort. This could be a reduced production cost and/or premium price⁵². A coexistence regime will help to facilitate the introduction of GM crops. If, over the longer term, farmers can produce crops more cheaply this will help to keep food prices down. Although the effect may be marginal, it could mean an indirect benefit to consumers and the wider economy given the potential impact of food price on inflation.

In the absence of effective coexistence measures it is likely that there would need to be widespread routine testing for GM presence in crop material expected to be sold as non-GM. This might be a significant expense overall, given that the only reliable method currently available for quantified GM tests (PCR) costs about £200 per sample. Testing costs would be expected to fall to the non-GM supply chain and be apportioned through the normal operation of the market. They might therefore fall on non-GM farmers, processors, manufacturers, retailers or consumers. A reliable coexistence regime should obviate the need for extensive GM testing.

⁵¹ according to Kennedy, S. (see ref. 9), the price premium on a range of organic products in NI was between 55% and 200%.

⁵² The Strategy Unit study noted that from the available evidence there is uncertainty about the extent to which UK farmers might achieve cost savings or yield increases with the current generation of GM herbicide-tolerant crops. It indicated that more significant benefits might accrue from different types of GM crop that are under development, such as varieties which are disease resistant. Again, however, the study stressed that it is not possible to draw firm conclusions about the precise extent of these potential future benefits.

Environmental

4.6.4 GM crops will not be approved for commercial release unless they are at least as environmentally sustainable as the conventional crops whose use they replace. It is possible that they will offer comparative environmental benefits, for example - through reduced use of pesticides or herbicides, although this will depend on the specific nature of the crop in question. Nonetheless, it should be recognised that the use of GM crops, as facilitated by a coexistence regime, may contribute to the objective of sustainable food and farming.

Improved Consumer Choice

4.6.5 One of the principle benefits of a coexistence regime is to provide a choice for farmers and consumers. By its nature, this benefit is difficult to quantify since it requires an estimate of consumer willingness to pay for benefits which are not themselves easily quantifiable. Consumers would value highly their ability to choose between GM and non-GM products. An effective coexistence regime which ensures that consumer choice can be delivered may ease some of the tension around the use of GM crops.

4.7 Distributional Impact

4.7.1 Having identified the various costs and benefits associated with the introduction of the new regulations, it is important to examine how these costs and benefits are distributed. That is, the RIA will need to consider what the impact of these costs and benefits could be on the various groups in society. Again, regardless of what the preferred option will be, the distributional impact of costs will be the same under each option.

4.7.2 It is apparent that the costs identified will fall mainly on those farmers who intend to use GM crops. Many of these costs can be avoided through good practice, voluntary agreements and proper planning. The scale of any impact will depend on the take up rate of GM crops by the agricultural industry. It is therefore difficult to estimate what the effect of regulations on income distribution would be. However, the following factors are worth bearing in mind:

- the use of GM crops, as highlighted earlier, is most likely to occur at least initially in only a few crop species – oilseed rape, forage maize, sugar beet and potatoes. As indicated earlier, the level of farming in these areas is quite low. The vast majority of farming is either 'Dairy' or 'Cattle and Sheep'. Only around 1.14%⁵³ of all farms in Northern Ireland can be described as General Cropping. Thus, if current trends continue, the possible scale of impact across NI is likely to be low;

⁵³ DARD: Statistical Review of Northern Ireland Agriculture (2004)

- average incomes in General Cropping type farms do tend to be lower than for other farm types (see table below):

Indices of average cash income in real terms by farm type, 1999/2000 to 2004/05 £000's

Business type	1999/2000	2000/01	2001/02	2002/03	2003/04	2004/05
Cereals	70	56	52	20	72	51
General cropping	10	24	10	16	27	19
Pigs and poultry	11	5	8	24	34	41
Cattle and Sheep (LFA)	48	54	65	58	60	70
Cattle and Sheep (lowland)	20	34	10	33	37	53
Mixed	75	103	94	97	97	109

- the number of farms in the General Cropping category which are located in Less Favoured Areas (LFA's) is, however, generally lower (see table below)

Business type	%age LFA
Cereals	22
General cropping	32
Pigs and poultry	61
Cattle and Sheep	59
Mixed	39
Others	52

4.7.3 A number of groups are likely to see benefits flowing from the regulations. Both GM and conventional farmers will benefit from increased public confidence over the control of GM crops, and this should result in increased trade for both sets of producers.

4.7.4 The increased choice of product will, of course, benefit consumers. In the longer term, if GM crops do increase in popularity, consumers may also benefit from reduced prices if producers are able to pass cost savings onto consumers. Statistics show that those on lower incomes spend a relatively higher proportion of their incomes on food and drink and so would benefit most from a reduction in food prices as well as an increase in choice (see table below⁵⁴)

<i>Income group</i>	Percentage of expenditure on food and non – alcoholic drinks
Lowest 10%	15%
Second decile group	16%
Third decile group	15%
Fourth decile group	12%
Fifth decile group	12%
Sixth decile group	11%

4.7.5 In summary, therefore, the scale of any distributional impact is likely to be low. In terms of the costs, the majority of the compliance costs will fall on GM crop farmers. Evidence on the socio-economic status of this sector of the industry is mixed. In addition, the majority of farmers in Northern Ireland tend to be either dairy or cattle and sheep. The main indirect cost could, though, fall on organic farmers, should public expectations about this produce be high, particularly if the debate over threshold levels is not resolved. In terms of the benefits of the regulations, consumers will accrue many of these through increased choice and the possibility of reduced prices.

5. Small Firms Impact Test

5.1 The RIA process also requires special attention to be given to the impact of regulatory proposals on small businesses (those with an annual turnover of less than £10m and fewer than 10 employees). Most farms fall into this category, including those which are likely to

⁵⁴ National Statistics: 2003-04 UK Expenditure and Food Survey (2004)

grow GM crops and therefore could be affected by coexistence requirements. EPD is consulting on the possible arrangements to ensure they adequately reflect the likely impact on farmers. The written consultation may generate further comment on the practicality and cost of coexistence measures and the RIA will be developed further in the light of this.

6. COMPETITION ASSESSMENT

6.1 Introduction

- 6.1.1 A competition assessment must be carried out in an RIA, except where the proposal only affects the public services. The aim of this assessment is to ensure that the normal workings of the markets involved will not be adversely impacted by the introduction of the regulations.
- 6.1.2 The competition assessment has two stages. Stage 1 is to carry out a competition filter test in order to determine what the likely effects on competition are. This test takes the form of a series of yes or no answers to a number of set questions.
- 6.1.3 If the result of the competition filter test is that competition will not be seriously affected, then a simple competition assessment can be carried out. However, if the competition filter signals a likely risk of a competitive impact through a high number of yes answers, a detailed assessment should then be undertaken.

6.2 Competition filter test

6.2.1 The results of the test are shown in the table below:

Competition filter test questions

Question	Answer Yes/No
Q1: In the market(s) affected by the new regulation, does any firm have more than 10% market share?	No
Q2: In the market(s) affected by the new regulation, does any firm have more than 20% market share?	No
Q3: In the market(s) affected by the new regulation, do the largest three firms together have at least 50% market share?	No
Q4: Would the costs of the regulation affect some firms substantially more than others?	No
Q5: Is the regulation likely to affect the market structure, changing the number or size of firms?	No
Q6: Would the regulation lead to higher set-up costs for new or potential firms that existing firms do not have to meet?	No
Q7: Would the regulation lead to higher ongoing costs for new or potential firms that existing firms do not have to meet?	No
Q8: Is the sector characterised by rapid technological change?	No
Q9: Would the regulation restrict the ability of firms to choose the price, quality, range or location of their products?	No

6.3 Simple Competition Assessment

6.3.1 The filter test above suggests that a simple competition assessment is adequate for this RIA. This assessment takes the form of the following:

- identification of the affected market(s) ;
- a summary of the characteristics of each market; and
- a discussion of the anticipated positive and negative effects on competition for each policy option with an explanation of the reasoning behind the answers to the nine questions.

6.3.2 The main market affected will be the agricultural industry. As noted earlier, given the range of products which are likely to use GM crops, it is the General Cropping sector which will be most affected. The following provides some information on the general characteristics of this sector of the industry:

There were just 314 recorded farms in this sector in Northern Ireland in 2004⁵⁵, although this number has been falling (there were 372 in 1999). The spread of these farms in terms of business size is

⁵⁵ DARD Statistical Review of Northern Ireland Agriculture (2004)

highlighted in the table below, showing that the majority (77%) are either small or very small.

Business size	Very small	Small	Medium	Large
Number of farms	183	59	34	38

The market for the produce of this sector appears to be a competitive one, judging by the price paid for output, although prices have not fallen in the same way that they have for other agricultural commodities.

The table below shows the index of producer prices for potatoes in Northern Ireland:

Year	1999	2000	2001	2002	2003	2004
Price index	173	100	136	136	141	145

(2000 = 100)

6.3.3 Having examined the characteristics of the main markets affected, the next stage in the simple competition assessment is to consider the potential positive and negative impacts. This is done through providing a rationale for the answers which were given in the competition filter test:

- Questions 1, 2 and 3: the market
 - The market is typified by a large number of small firms. This is likely to restrict the ability of suppliers to increase prices. In fact, the regulations should allow GM farmers to operate more effectively, leading to potential cost savings for them in their productive processes. In addition, local companies will be competing with firms from abroad, including non-EU firms in some cases.
- Question 4: substantially different effect on firms
 - There is no evidence to suggest that the cost of regulations will effect some firms more substantially than others.
- Question 5: changes to market structure
 - There is no evidence to suggest that the regulations will force any firms to leave the market or will affect the market structure in any way.
- Questions 6 and 7: penalising new firms

- The regulations will apply to existing firms as well as new entrants.
- Question 8: technological change
- The new regulations are unlikely to have a negative impact on the degree of innovation in the markets affected. In general, the markets for these goods are not characterised by rapid technological change.
- Question 9: restrictions on firms
- The new regulations are unlikely to have a significant impact.

7. Enforcement, Sanctions and Monitoring

7.0 Enforcement of coexistence measures

- 7.1.1 Under Option B, observance of the coexistence measures in the industry code of practice would be checked via existing inspections carried out for farm assurance scheme purposes. Under Option C, it is proposed that the inspection and enforcement of coexistence regulations would be carried out by DARD. Compliance inspections could possibly be combined with visits for other inspection purposes, so minimising the cost both to the farmer and to DARD.
- 7.1.2 The additional cost of inspections under Option B would be met by GM farmers through an increased fee for assurance scheme membership. Under Option C the cost of inspections would be born by the Government in particular DARD, not by GM farmers. DARD does not have the power to introduce charges for coexistence inspections and this would require primary legislation. In addition, even with primary legislation any charge would have to relate to the costs incurred, which would not include overheads. This may mean that charging is not viable as a charging scheme would be more expensive to administer than the cost of inspections. DARD does not charge for analogous inspections related to the EU rules on the tracing and labelling of GM products.
- 7.13 The cost of each coexistence inspection is expected to be broadly the same under Options B and C. It is estimated that the DARD farm assurance inspector would have to spend about an hour checking that the farmer has observed the specified requirements. It is estimated that the cost for each inspection would be £12 for the GM farmer's time and £70 for the Government in respect of a farm assurance inspector's time. (This would be passed on to the GM farmer). The table overleaf shows a range of possible aggregate costs.

	Aggregate cost of coexistence enforcement checks if number of GM farmers inspected is:			
	50	100	500	1000
Option B				
Cost of GM farmers' time:	£300	£600	£3,000	£6,000
Cost of inspectors' time: (also borne by GM farmers)	£3,500	£7,000	£35,000	£70,000
Total cost to GM farmers:	£3,800	£7,600	£38,000	£76,000
Option C				
Cost to GM farmers:	£300	£600	£3,000	£6,000
Cost to Government (DARD inspectors' time):	£3,500	£7,000	£35,000	£70,000

7.14 Total inspection costs might differ between Options B and C depending on the rate at which checks are undertaken. For Option C (Government regulations), it is envisaged that initially every farm growing GM crops would be inspected annually, but after the initial period, if monitoring shows that the scheme is working well, the percentage of farms being inspected could be reduced and selected on the basis of risk assessment. For CAP scheme purposes it has been normal for the RPA to inspect arable farms at a rate of 5% per annum, and over time Defra would see this as the standard rate for coexistence. For Option B, it is normal for every member of an assurance scheme to be inspected annually, and for all scheme requirements to be checked. Therefore, unless the assurance scheme departs from this convention in relation to coexistence checks, over time the total cost of inspections under Option B would be significantly more than those under Option C (borne by GM farmers).

7.2 Sanctions

7.21 Under Option B, if a farmer breaks an assurance scheme requirement the usual sanction is to lose scheme certification for that aspect of production (so that, in this case, the farmer would not be able to sell his GM crop as an assured product). This is generally seen as a significant penalty because supply contracts are often based on meeting assurance scheme status. Under Option C, coexistence regulations would be made under section 2(2) of the European Communities Act and the statutory offences and penalties would be consistent with the legal maxima available under the Act. It is anticipated that they would be consistent with those applied in the Genetically Modified Organisms (Traceability and Labelling) Regulations (Northern Ireland) 2005.

7.22 As well as the sanctions themselves, legal costs could arise under Option C from the Department taking prosecution action through the courts. It is difficult to predict the potential number of such cases. Costs of prosecution action vary greatly depending on the

circumstances, but a typical cost to the Department of investigating and prosecuting after a one day trial would be around £4,000. This does not include Court administrative costs and defence costs, which are unlikely to be legally aided.

8.0 Monitoring and review

8.1.1 The Department will review the coexistence regime after it has been in operation for a sufficient period to assess its effectiveness. The Department's current thinking is that this might be two or three years after the start of any commercial GM cropping, but the precise timing will depend on the extent to which GM crops are being grown, as it will be necessary to have acquired enough data and experience before a proper assessment can be made.

8.1.2 In relation to Option B (a farm-assurance based scheme), the Department would let a contract to a third party to check the efficiency of the industry scheme. The aim would be to advise whether the voluntary arrangements were effective, whether they should be revised, and generally to provide a basis for considering whether regulations should be introduced. The data would be collected through:

- farm visits to check records and fields to see if the measures were being adhered to;
- taking samples and testing non-GM crops. If the results show excessive GM cross-contamination, finding out the cause i.e. if the scheme is not being adhered to or the scheme itself is not robust. If the fault is with the scheme we will need to identify the weakness, for example - if it is the separation distance;
- gaining information from farm assurance schemes on compliance rates and also ensuring that they are inspecting in line with the agreement (note: this will be in a context where assurance scheme inspections are expected to be carried out by an independent body accredited to standard EN 45011); and
- possibly, undertaking a farmer questionnaire survey, to get general feedback on how they have found the coexistence measures, what has proved straightforward, what might be improved, etc.

8.1.3 In relation to Option C (a statutory scheme) - In addition to the enforcement inspections by DARD, the Department would commission work to look at both the statutory and non-statutory elements as set out above. With information from this and the inspections, the Department would be able to assess all the coexistence arrangements.

8.1.4 The Department will consult stakeholders as part of the review, and on any specific changes to the coexistence regime that the Government may propose as a result of the review. Depending on the conclusions

from this review, the Department will consider if and when a further review should be undertaken.

A POSSIBLE REDRESS MECHANISM FOR ECONOMIC LOSSES

1. With any pragmatic coexistence regime it cannot be guaranteed that there won't still be instances where a non-GM crop ends up with a GM presence above the 0.9% labelling threshold. There remains the potential, therefore, for non-GM farmers to incur an economic loss if they are forced to sell a crop as GM when it was meant to be sold into a premium non-GM or organic production chain.
2. In its report to Government on coexistence and liability the AEBC recommended that:

“There should be special arrangements for compensation for farmers suffering financial loss as a result of their produce exceeding statutory thresholds through no fault of their own, with a view to an insurance market developing in due course.”⁵⁶
3. Following this, the Government confirmed in its GM policy statement that it would consult stakeholders on options for compensating non-GM farmers, with the proviso that any compensation scheme would have to be funded by the GM sector.

Options

4. There are three main options for dealing with the redress issue:
 - (i) Do nothing: if no specific redress mechanism is provided for a non-GM farmer who wants to recover a financial loss would have to seek redress through the civil courts under the current law. However, it is generally held that this would be an uncertain process, as it not clear how the courts would treat a case under existing law relating to GM cross-contamination.
 - (ii) A voluntary, industry-led scheme: as noted previously in England, SCIMAC is developing plans for a coexistence regime that would include an industry-run redress mechanism. The details of this are still being considered and SCIMAC's general outlook is to avoid an overly prescriptive approach, on the basis that no single mechanism is likely to be the most effective solution in all cases. It must be noted, however, that the possible extension of the SCIMAC scheme to Northern Ireland needs to be explored further. One specific idea is a crop-substitution procedure that mirrors existing supply chain arrangements. This would involve the affected non-GM crop being re-directed to a GM outlet and the non-GM farmer being provided with a crop that meets his original non-GM specification.

⁵⁶ Paragraph 293 of *GM Crops? Coexistence and Liability* (link at footnote 6).

- (iii) A statutory redress mechanism: this would probably require new primary legislation to provide for:
- a requirement to pay redress on the terms specified
 - the establishment of a body to receive and adjudicate on redress claims (with the power to order payment), and an appeal mechanism
 - the costs of the process to be charged to the GM sector

Costs

5. All of the above options give rise to costs. Under (i), the cost of litigation would have to be borne by the non-GM and/or GM farmer involved, and if the court found against the GM farmer he would have to fund the compensation awarded. Under options (ii) and (iii) the GM sector would have to cover the cost of administering the redress mechanism and the cost of the redress itself. The 'GM sector' could mean those farmers growing GM crops, the GM seed companies, or both. Under option (iii) there would be a specific cost to Government in terms of making the required primary and secondary legislation.
6. The amount of redress due in each case would generally be the difference between the value of the affected crop as originally intended (as non-GM or organic) compared to it being sold into a non-premium GM outlet. Whether or not there is a premium for non-GM or organic crops, or the extent of any premium, will depend on the type of GM crop involved and the market forces prevailing at the time. As a rough indication of what might constitute a typical claim for redress, a premium of 5% on the value of a conventional oilseed rape crop of £140/tonne (2004 average) would suggest a figure in the region of £180 (assumes average yield for winter rape of 3.2 tonnes per ha and average field size of 8ha)⁵⁷.
7. The total costs will depend on the number of claims for redress. If the coexistence measures in place are broadly effective, then the instances where a planned non-GM crop has a GM presence above 0.9% should be rare. The likelihood will vary by crop. It should be very remote for beet and potatoes because coexistence management of these crops is relatively easy, whereas it will be more of an issue for maize and oilseed rape. It is difficult to quantify this precisely, but Defra have stated that their general thinking would "put the probability in the realm of, say, one in a hundred cases where compatible GM and non-GM crops of maize or rape are grown in proximity to each other".
8. Claims for redress will only arise if cases of excessive GM presence are identified, raising the question of the likely extent to which non-GM

⁵⁷ Organic premiums would be expected to be higher than those for non-GM conventional, and thus the amount of redress due for an affected organic crop could be higher. However, there is little or no organic oilseed rape produced in the UK so coexistence with GM production should not be a significant issue. As regards maize, this is mostly grown by farmers to feed to their own cattle, in which case there is no coexistence issue in relation to staying within the 0.9% statutory labelling threshold (there is no legislative requirement for products from animals reared on GM feed to carry a GM label).

crops will be tested. Given the current cost of quantified tests for GM presence (c.£200 per sample) and normal crop margins, it would not be cost-effective to undertake widespread testing of non-GM crops to identify potential problem cases at an expected rate of around 1 in a 100. It is part of the logic and benefit of having a reliable coexistence regime that you obviate the possible need for routine GM testing. Decisions on the extent of any testing will be taken by relevant operators in the supply chain, but a Department sponsored coexistence regime will be premised on being robust enough to make specific crop testing necessary⁵⁸.

9. The above suggests that the number of claims for redress could be very low indeed. This in turn suggests that:
 - it should not be a significant overall burden on the GM sector to cover the cost of a redress mechanism; and
 - it may be disproportionate to incur significant costs setting up and administering a redress mechanism; in particular, it may be difficult to justify the resources needed to introduce a statutory scheme (option C) relative to a voluntary industry solution (option B). However it is important to realise that the ability of an industry led approach to ensure enforcement of the regulations in Northern Ireland needs further exploration.
10. The redress issue will be covered in more detail in EPD's written consultation paper, with this RIA developed in the light of the position the Department reaches after the consultation process.

⁵⁸ The Department envisages that as part of monitoring the performance of the coexistence regime to ensure its effectiveness, there could be some anonymous testing of non-GM crops growing adjacent to GM crops. This would inform the review and possible development of the measures being applied.

ANNEX C

NIAB RECOMMENDED SEPARATION DISTANCES (in metres; for cross-pollination thresholds from 0.1-0.6%)

	Field depth of 100m		Field depth of 200m		Field depth of 400m		Field depth of 600m	
	Index 1	Index 2	Index 1	Index 2	Index 1	Index 2	Index 1	Index 2
Spring oilseed rape	0.1%	50	39	46	31	38	27	34
	0.2%	41	32	39	24	31	20	27
	0.3%	36	27	35	20	26	16	23
	0.4%	33	25	32	17	24	14	20
	0.5%	30	23	30	15	22	11	18
	0.6%	28	21	28	13	20	10	16
Winter oilseed rape	0.1%	54	44	50	38	44	35	40
	0.2%	43	34	40	28	35	25	30
	0.3%	37	28	35	22	30	20	25
	0.4%	33	25	30	19	26	16	22
	0.5%	30	22	27	16	23	14	19
	0.6%	28	20	25	14	20	11	16
Forage maize	0.1%	86	57	77	41	61	34	53
	0.2%	65	42	62	29	47	21	39
	0.3%	53	34	54	22	38	14	31
	0.4%	45	28	48	17	32	8	25
	0.5%	40	23	43	13	28	4	20
	0.6%	35	20	40	9	24	0	16
Grain maize	0.1%	105	72	93	56	75	48	66
	0.2%	84	55	77	41	60	33	50
	0.3%	72	46	67	34	52	25	42
	0.4%	65	40	61	28	46	20	37
	0.5%	60	36	56	24	41	16	33
	0.6%	55	32	53	20	38	12	30

EQUALITY SCREENING EXERCISE FOR THE PROPOSALS FOR MANAGING THE COEXISTENCE OF GM, CONVENTIONAL AND ORGANIC CROPS

Section 75 of the Northern Ireland Act 1998 requires that public authorities, in carrying out functions relating to Northern Ireland, have due regard to the need to promote equality of opportunity. This is assessed against the nine categories listed in the table below:

Main Groups Relevant to the Section 75 Categories	
Category	Main Groups
Religious belief	Protestants; Catholics; people of non-Christian faiths; people of no religious belief
Political opinion	Unionists generally; Nationalists generally; members/supporters of any political party
Racial Group	White people; Chinese; Irish Travellers; Indians; Pakistanis; Bangladeshis; Black Africans; Black Caribbean people; people with mixed ethnic group
“Men and women generally”	Men (including boys); women (including girls); trans-gendered people
Marital status	Married people; unmarried people; divorced or separated people; widowed people
Age	For most purposes, the main categories are: children under 18, people aged between 18-65, and people over 65. However, the definition of age groups will need to be sensitive to the policy under consideration
“Persons with a disability”	Disability is defined as: A physical or mental impairment, which has a substantial and long- term adverse effect on a person’s ability to carry out normal day-to-day activities as defined in Sections 1 and 2 and Schedules 1 and 2 of the Disability Discrimination Act 1995
“Persons with dependants”	Persons with personal responsibility for the care of a child; persons with personal responsibility

	for the care of a person with an incapacitating disability; persons with personal responsibility for the care of a dependant elderly person
Sexual orientation	Heterosexuals; bi-sexuals; gays; lesbians

In addition, without prejudice to these obligations, public authorities are also required to have regard to the desirability of promoting good relations between persons of different religious belief, political opinion or racial group.

Background

The coexistence of GM and non-GM crops allows farmers to make a practical choice between growing conventional, organic and GM crops (those GM crops approved under Directive 2001/18/EC) while at the same time achieving the lowest practical level of adventitious admixture and complying with the legal obligations for labelling. Non-GM crops with adventitious presence of GM content above the maximum tolerance thresholds set out in the Community legislation must be labelled as containing GMOs. Admixture in excess of the tolerance threshold may have market implications and hence, financial consequences for growers. Coexistence is therefore concerned with the:

- crop management measures to minimise admixture of GM and non-GM crops and the cost of such measures;
- economic impact associated with the admixture of GM and non-GM crops; and
- liability implications where there is an economic loss or where damage occurs following admixture.

Under European Union (EU) legislation, a GM crop can only be approved for commercial use if a specific risk assessment confirms that it is safe for human health and the environment. No commercial GM cultivation is expected in Northern Ireland for several years, but if authorised GM crops are grown here, in due course, this may result in non-GM crops having a small GM presence (for example - through cross-pollination or the dispersal of GM seed). To facilitate choice between conventional, organic and GM crops, coexistence measures will be needed to minimise unwanted mixing of GM and non-GM material. From a regulatory standpoint, the key benchmark for distinguishing GM and non-GM produce is the 0.9% threshold for adventitious GM presence adopted by the EU (products with a presence above this level must be labelled and sold as GM).

The European Commission favoured an approach that would require each Member State to develop and implement its own coexistence arrangements. The Commission's Recommendation 2003/556/EC provides a list of general principals to assist Member States in establishing best practices for coexistence.

The Department is seeking comments on a proposed coexistence regime for Northern Ireland that would aim to minimise any unwanted GM presence in non-GM crops so that it is below 0.9%.

The main aims of the proposals are to implement best practice to ensure the coexistence of GM and non-GM crops in Northern Ireland.

2. The screening appraisal is summarised in the following table.

Question	Is there any evidence of higher or lower participation or uptake by different groups?
Answer	No
Question	Is there any evidence that different groups have different needs, experiences, issues and priorities in relation to the particular policy?
Answer	No
Question	Is there any opportunity to better promote equality of opportunity or better community relations by altering the policy or working with others in Government or the community at large?
Answer	No
Question	Have consultations with relevant groups, organisations or individuals indicated that particular policies create problems that are specific to them?
Answer	No

Impact Assessment Decision

Full impact assessment procedure is confined to those policies considered likely to have significant implications for equality of opportunity and community relations.

Taking account of the Screen Analysis this proposal does not need to be submitted to a full equality impact assessment as it is considered that there will be not be significant implications for equality of opportunity or community relations as a result of the introduction of these regulations.

Annex E

RURAL PROOFING OF THE CONSULTATION PACKAGE ON THE PROPOSALS FOR MANAGING THE COEXISTENCE OF GM, CONVENTIONAL AND ORGANIC CROPS

Rural Proofing is a process to ensure that all relevant Government policies are examined carefully and objectively to determine whether or not they have a different impact in rural areas from that elsewhere, because of the particular characteristics of rural areas. Where necessary the process should also examine what policy adjustments might be made to reflect rural needs and in particular to ensure that, as far as possible, public services are accessible on a fair basis to the rural community.

The screening appraisal is summarised in the following table.

1.	Will the policy affect the availability of public and private services?	No
2.	Is the policy to be delivered through existing service outlets, such as schools, banks and GP surgeries?	No
3.	Will the cost of delivery be higher in rural areas where clients are more widely dispersed or economies of scale are harder to achieve?	No
4.	Will the policy affect travel needs or the ease and cost of travel?	No
5.	Does the policy rely on communicating information to clients?	No
6.	Is the policy to be delivered by the private sector or through a public-private partnership?	No
7.	Does the policy rely on infrastructure (e.g. broadband ICT, main roads, utilities) for delivery?	No
8.	Will the policy impact on rural businesses, including the self-employed?	No
9.	Will the policy have a particular impact on land-based industries and, therefore, on rural economies and environments?	No
10.	Will the policy affect those on low wages or in part-time or seasonal employment?	No
11.	Is the policy to be targeted at the disadvantaged?	No
12.	Will the policy rely on local institutions for delivery?	No
13.	Does the policy depend on new buildings or development sites?	No
14.	Is the policy likely to impact on the quality and character of the natural and built rural landscape?	No
15.	Will the policy impact on people wishing to reach and use the countryside as a place for recreation and enjoyment?	No

The Department has considered this policy in relation to the rural community and has found no potential differential impacts.

HUMAN RIGHTS ISSUES

The Human Rights Act 1998 implements the European Convention on Human Rights. The 1998 Act makes it unlawful for any public authority to act in a way that is incompatible with these rights. Since the implementation of the Human Rights Act 1998, all legislation must be checked to ensure compliance with the European Convention rights

We believe that the proposals contained in the coexistence consultation document do not breach any of the provisions of the Convention rights.

The Human Rights Commission will receive copies of the consultation document as part of this consultation. We will take into account any comments that the Commission might have.