

## Genetically-modified crops

The RSPB maintains an open mind on the likely environmental impacts of genetically modified (GM) crops, but believes that firm [scientific facts](#) [[LINK to Farm scale evaluations page](#)] are needed before farmers should be allowed to grow the crops on a commercial basis. It also believes that the regulations need to be improved so that all GM crops are tested for their wider environmental and wildlife impacts before they are approved for release.

It is possible that certain GM crops could produce environmental benefits (however we have yet to see any evidence that such crops are being developed) or that they may have no environmental impact at all. The RSPB has [concerns](#) [[LINK to RSPB concerns about GM Crops](#)] about the types of GM crops that are currently being developed

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## The RSPB's concerns about GM Crops

The RSPB are particularly concerned that the introduction of GM crops could exacerbate the [serious declines](#) [[LINK to countryside bird declines](#)] in farmland wildlife and have a major impact on biodiversity. This is because the use of GM crops could radically change agricultural practice, and in the past the use of pesticides and the use of new types of crops have led to damaging impacts on wildlife.

At this early stage of their development in the UK it is difficult to be sure what the full environmental impact of GM crops on biodiversity might be. The RSPB's current concerns encompass several issues:

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### Possible effects arising from the management of a GM crop:

- increases in the harmful impacts of herbicides, insecticides and other pesticides e.g. [herbicide tolerant crops](#);
- changes to seasonal cropping patterns;
- changes to the range of geographical locations, altitudes and soil types within which the production of certain crops is economically viable;

### Possible effects arising from the actual crop itself:

- GM crops might become agricultural weeds themselves and may invade wildlife habitats;
- [gene transfer](#) might take place between GM crops and related native species leading to the native species becoming a 'pest' with harmful effects on wildlife.

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## The farm-scale evaluations

Following concern about the possible environmental impacts of GM crops, the UK Government has developed a series of farm-scale evaluations to examine the effects of [herbicide tolerant](#) varieties of sugar beet, fodder beet, maize and spring and winter oilseed rape on biodiversity and the wider environment. The trials are looking at these herbicide tolerant crops because they are closest to the market place of any GM crops in terms of development.

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The trials will cost £3.3m and start in 2000, finishing in 2002. The results will be available in late 2002 or early 2003. In each year there will be about 20 or so fields (or part-fields) planted with each of the crops. Each of these will be compared with a control field (or part field) in which a non-GM variety of the same crop will be grown. Sampling design and protocols were tested on trial plots during 1999.

The research is being undertaken on behalf of the Department for Environment, Food and Rural Affairs (DEFRA) and Scottish Executive Environment and Rural Affairs Department (SEERAD) by a consortium led by Centre for Ecology and Hydrology (CEH), including Scottish Crop Research Institute (SCRI) and Institute of Arable Crop Research (IACR). The Supply Chain Initiative on Modified Agricultural Crops (SCIMAC), the trade body representing all the major biotechnology companies, is charged with finding farms on which to hold the trials.

A Scientific Steering Committee has been set up to oversee the trials. Because of the RSPB's concerns about GM crops and our expertise in farmland bird ecology, it was asked to sit on this committee. Scientists from the Game Conservancy Trust and English Nature

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#### Organisations involved

[DEFRA](#)  
[SEERAD](#)  
[CEH](#)  
[SCRI](#)  
[IACR](#)  
[SCIMAC](#)  
[Game Conservancy Trust](#)  
[English Nature](#)

are also included.

The evaluations are examining whether the planting and management of these crops is more damaging to wildlife than conventional crops and their management. The research is mostly looking at effects on wild plants and invertebrates in the fields, both before and after the crops have been grown in the rotation.

## The RSPB and the farm-scale evaluations

In principle the RSPB supports the farm-scale evaluations:

- to assess the environmental impacts of GM [herbicide tolerant crops](#);
- to form the decision on whether or not to ban the use of GM herbicide tolerant crops.

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The RSPB believes that those GM crops shown to be worse than their non-GM equivalents should be banned. It believes that scientifically rigorous trials are the only reliable and responsible means of finding answers to the legitimate concerns surrounding GM technology. The UK Government believes that the evidence the trials provide is the only legal means of banning GM herbicide tolerant crops.

While the RSPB supports the farm-scale evaluations in principle, its future support is not unconditional and it will work to ensure that the trials are carried out with full scientific rigour. The RSPB's position on the Scientific Steering Committee overseeing the trials will allow it to influence the debate for the good.

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## The RSPB and criticism about the trials

Criticisms have been raised about the scientific rigour of the trials. The most frequently cited criticisms are:

### ***There is no baseline data on the trial sites.***

The RSPB view is that it is not necessary to collect baseline information because the GM field will be compared with a conventionally cropped 'control' area. This is standard scientific protocol and, provided the sample of fields is sufficiently large and the experimental and control plots are allocated at random, will demonstrate any impacts of the GM crop and its management on wildlife if they exist.

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### ***The trials do not last long enough to pick up long-term effects, for example changes to crop rotations or the long-term effects on seedbanks.***

This is a valid criticism and the RSPB's view is that post-release monitoring of such effects should be implemented by the UK Government and that provision should be made in the regulations for immediate termination of commercial consent if such effects are shown to exist.

### ***The trials started before the Scientific Steering Committee first met***

This is not the case. GM crops had been sown, but the trials had not started, before the first meeting of the Steering Committee. The relatively few test fields planted in spring and autumn 1999 (some of which have been destroyed by activists) will inform the design of the study but are not part

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of the trials themselves. Information from these fields will not be included in the assessment of the impacts of GM herbicide tolerant crops on wildlife. The trials started in spring 2000 and the steering committee are overseeing their design.

***Genes from the trial crops will escape into other crops and related plants***

This is a real danger. Gene escape into wild plants or neighbouring crops is inevitable if GM crops are grown on a large scale. The RSPB insisted that gene flow should be investigated as a part of the trials. The UK Government have now commissioned research into gene flow from the trials.

**The SCIMAC crop management guidelines (which are being used as a guide for growing the trial crops) are not legally enforceable**

The RSPB believes that the SCIMAC guidelines will not limit the impact of GM crops on the environment. The guidelines should be considerably strengthened and made legally binding before any crops are allowed to be grown commercially in the UK.

***Impacts on earthworms are not being studied in the trials***

The RSPB agrees with the position of the Scientific Steering Committee (SSC) that studies of the impacts on earthworms are not a priority because it is best to study species which are likely to be sensitive to the GM/non-GM comparison - to try and find a real effect. Earthworm numbers are greatly affected by tillage so the SSC felt that this would overwhelm any effect from the comparison. Other soil organisms (collembola) are being studied as part of the trials as there is existing evidence to suggest that these might

be influenced by GM herbicide tolerant  
cropping.

## Gene transfer

The transfer of genes from GM crops into non-GM crops, or from GM crops into related wild plants, has caused a great deal of concern. If GM crops are grown in an open environment it is highly likely that gene transfer will occur if wild relatives or related crops are present.

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The most important question to address is, does it matter? The RSPB's view is that the transfer of genes is undesirable but in the event it is only likely to have negative environmental impacts in certain situations.

In the case of [herbicide tolerant crops](#), if a gene escaped into a wild plant there would be no competitive advantage for the plant in a situation where herbicides are not used. This means that the gene is unlikely to spread any further, indeed the presence of the new gene may actually weaken the ability of the crop to survive due to energy usage.

In the case of [insect resistant](#) genes, in wild situations this could convey a competitive advantage to the plant, making it able to out-compete other plants without the gene, therefore allowing the genes to spread to the wider population. The impact of the gene itself could also damage native insect populations which could have impacts on species such as birds higher up the food web.

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## Herbicide tolerant crops

Herbicide tolerant crops are the first GM crops to be developed for use by farmers in the UK. There are herbicide tolerant varieties of oilseed rape, sugar and fodder beet, and maize. These crops are already grown in some countries in Europe and widely in United states, Canada and China.

Herbicide tolerant (HT) crops are made resistant to 'broad spectrum'; weed killers. These are designed to kill a wide range of plants which means that the farmer, instead of having to apply lots of different chemicals to kill the weeds in the crop, can just apply one. In terms of wider environmental impact the reduction in the number of chemicals applied to crops could be seen as a benefit to the environment. Evidence is not clear as to whether the overall amount of weed killers applied will be reduced.

From the point of view of wildlife these aspects are less important than the actual impact of the weed killers. Weeds are an important part of the food web in crops. Birds eat both their seeds and the insects associated with weeds. As the point of herbicide tolerant crops is to improve weed control in crops, it could be deduced that these crops by their very nature might have a negative impact on wildlife.

It is already known that the effects of herbicides (and insecticides) on the food web are having a disastrous effects on our wildlife. The RSPB is concerned that herbicide tolerant crops may increase this impact. The UK Government's Farm-scale evaluations are designed to look at these possible impacts of herbicide tolerant crops.

There are also some concerns about the possible impacts of gene transfer from herbicide tolerant crops.

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## Insect resistant crops

Much has been talked about the development of insect resistant crops, however these crops are some way off commercial use in the UK. However, they are grown in some parts of Europe and widely in the United States and Canada. There are insect resistant varieties of oilseed rape, maize and cotton.

Insect resistant crops are genetically modified so that they produce their own chemical insecticide. This insecticide is then passed into the insect pest when it feeds on the crop. There are some crops that occur in the wild that have developed such insect resistance through the natural evolution.

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The application of insecticides to crops is already known to be extremely damaging to the environment, wildlife and in some cases to human health. The use of insect resistant crops may well reduce the need to apply insecticides.

However, research has shown that some insect resistant crops affect insects that are not pests - for example insects that feed on the crop pest which has ingested the insecticide. This could lead to damage to the food chain for birds.

If gene transfer from insect resistant crops to related wild plants were to occur this could have serious implications for the environment. Insect resistant genes could give wild plants a competitive advantage over other plants and upset the balance of ecosystems. Much more research is required to assess these impacts before any consideration is given to wider scale planting of these crops.

### Changes to cropping patterns

Crops that have been modified to resist certain pests (weeds, insects or diseases), or pesticides, may remove the need for crop rotations. Crop rotations are

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traditionally used to reduce the impacts of pests and increase soil fertility. Rotations are also important for wildlife in that they provide a variety of crops within a small geographic area, in which a variety of weeds and insects will exist, consequently providing food for a wider variety of birds and mammals.

**Changes to the range of geographical locations, altitudes, soil types etc. within which the production of certain crops is economically viable**

Modifying a crop to enable it to be grown under new environmental conditions may lead to major impacts on non-farmed habitats. Large areas of the UK, which are currently of low agricultural but high nature conservation value, could be opened up to different types of economically viable land-use. For example the addition of frost tolerance to certain crops could allow them to be grown in the uplands, replacing existing grazing systems.