

Impact of Growing GM Crops on Biodiversity

Crops modified to tolerate pests or herbicides could potentially influence biodiversity

A crop plant modified to be toxic to insect pests could have a *direct* harmful effect on non-target insects if they eat the plant. It could also have an *indirect* effect by reducing the insects that are a food source for other wildlife, such as farmland birds.

GM crops that are tolerant to herbicides could also lead to a reduction in weed populations that act as refuges for beneficial insects, and/or those that are eaten by birds.

Repeated use of the same insecticide on pest-tolerant GM crops could also cause insects that become resistant to the chemical. This could affect the populations of pest insects and lead to an imbalance in their predator / prey relationships.

What is the evidence that this is likely to happen?

Several preliminary laboratory based studies suggest an adverse impact on biodiversity. Monarch butterfly larvae fed only on leaves covered in pollen from *Bt* corn grew more slowly and suffered higher death rates. Similar results were reported for pink bollworm fed on cotton producing the *Bt* toxin. Aphids fed on GM potatoes producing a different toxin were also reported to have a harmful effect on ladybirds feeding on the aphids.

The results of many of these experiments have been questioned by international scientists and UK Government advisors

Further experiments on Monarch butterflies to test the likely levels of exposure of the larvae to the toxin strongly suggest that *Bt* maize has a “negligible” impact on biodiversity in the field. Many feeding studies have also been widely criticised for lack of scientific rigour and use of appropriate controls. The UK Government, however, requires people wishing to release GM crops in trials to give more prominence to risk assessments of the effect on GM pollen on non-target organisms.

Any impact of GM crops would operate against a biodiversity landscape already affected by post-War intensive agriculture

In the past 20 years in the UK, over 10 million breeding individuals of 10 species of farmland birds have disappeared from the countryside. Experimental changes in farming practices to encourage wildlife have shown a positive impact on bird populations.

Changes in crop husbandry could be incorporated into adoption of GM crops to encourage biodiversity

Understanding the ecology of the area is crucial to ensuring this can happen. Recent research suggests changes in timing of herbicide applications to GM sugar beet can encourage weed plants without compromising crop yield.

It is a big challenge to design meaningful experiments to measure an impact biodiversity in the field

Laboratory studies to test this often indicate a “worst case scenario” or “snap-shot” of the situation. To test effects over time and on a suitable scale, field tests have to be carried out.

The UK has been monitoring the impact of GM herbicide-tolerant sugar beet, fodder beet, maize and oil seed rape in Farm Scale Evaluations for the last 4 years. The numbers of several indicator species (such as earthworms, snails, slugs, ground beetles, bees and butterflies) have been measured throughout the trials. The results of these trials are due in Summer 2003.