



Green biotechnology - *a help to the environment*

Genetically enhanced crops are one tool that could contribute to a more harmonious balance between food production and our surrounding environment.

The current generation of genetically modified (GM) crops – herbicide tolerant, disease and insect resistant – can lead to greater farmland biodiversity, reduced need for spraying, improved soil quality and reduced pressure on fragile wildlife habitats, while maintaining or even increasing overall yields and product quality. The indirect effects are also important: significant savings in diesel fuel and reduced carbon dioxide emissions, making a valuable contribution to Europe's action on climate change. Future generations of biotechnology derived crops aim to provide a wider range of benefits, including the supply of an increased number of renewable raw materials for the food, manufacturing and pharmaceutical industries.

Impact of farming on the environment

All farming, whether intensive or extensive, industrialised or organic, has an effect on the environment in which it is practiced. As our ancestors cleared the woodlands and drained wetlands to

provide fields and meadows for growing crops and grazing livestock, so they changed the natural habitat. As a consequence the numbers of individual wildlife species decreased or increased in the newly formed "agricultural" countryside. For instance, naturalists have been observing the numbers of different bird species in the UK over the past two centuries, and some have thrived and increased in numbers in the "modern" agricultural environment of the time, whilst others have declined. Some birds species have dramatically decl-

ined in numbers in the past 25 years, some to the point of concern, but even so, during this same period other species have become more common.

In the last fifty years, the emphasis in many European countries on efficient food production and intensification of agriculture, has given us low-cost, high-quality food, but is considered in some cases to have put pressure on some farmland wildlife species. Now, however, environmental considerations are beginning to receive a higher priority. Biotechnology derived crops have an important role to play in establishing a better balance between farming and the environment.

Environmental benefits of current GM crops

Herbicide tolerant crops – maize, oilseed rape and sugar beet – can give the farmer much more flexibility in controlling weeds. For example, sugar beet grown conventionally needs to be kept free from weeds from the very earliest stages, whether by spraying or ploughing, if the crop is to thrive. Genetically modified (GM) varieties allow the farmer to control the weeds much later. Leaving the weeds in the field for a longer period provides food for insects (and, in turn, birds) before the weeds are sprayed, and later leaves behind a mulch of dead weeds which is also a good habitat for insects. After harvest in the autumn,



Plant biotechnology is a tool

- to reduce soil erosion
- to reduce spraying, making pesticide use more efficient in agriculture
- to use less fossil fuel

new winter crops can be planted directly, with no need to disturb the soil structure by ploughing. This no-till system also maintains greater soil biodiversity and reduces fuel use. The broad-spectrum herbicides used affect only green plants and are safe for people and wildlife.

Another example is insect resistant GM maize, already being grown commercially on a limited area in Spain. The crop is protected from losses of up to 15% caused by corn boring insects¹. There is no need to control this pest by spraying, and so no effect on beneficial "non-target" insect species. In addition, improving yields in this way means there is no need to increase the area of land under cultivation to increase production.

It has been estimated that if half the maize, oilseed rape, sugar beet and cotton grown in Europe used these current GM traits, over 7 million fewer hectares of land would need to be sprayed. This reduced spraying would save over 20 million litres of diesel fuel and reduce carbon dioxide emissions by 73,000 tonnes each year². Such benefits are already accruing in other countries such as the USA³.

The future of GM crops in sustainable European farming systems

Sustainable farming has to balance food production, farm income and environmental impact. Current GM crops could play a big part in achieving this balance, and future developments may be even more important. Fungal and viral diseases can lead to major yield losses of some crops: resistant strains which do not need spray treatment and give consistent yields are being developed using biotechnology.

Genetic modification could also provide big benefits by delivering new or improved renewable raw materials. For example, trees could be grown with lower levels of lignin, which means that paper-making would need less chemical treatment and would produce less toxic waste.



The European Association for Bioindustries

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EuropaBio calls on European legislators to:

- Support workable legislation that enables farmers and society to receive the environmental benefits of biotechnology derived crops today and in the future.
- Recognise biotechnology as an essential tool in the development of environmentally-friendly, sustainable European agriculture.

Don't let Europeans lose these benefits

The proposed revisions to EU legislation on GM crops are in danger of preventing Europeans from taking advantage of these environmental benefits. Proposals such as reducing the allowable level of adventitious presence to 0.5% put unrealistic restrictions on our own farmers using GM crops. While other countries – now including Romania, Bulgaria, Australia, India and China as well as the USA, Canada and Argentina – receive increasing environmental and economic benefits, EU farmers and citizens outside of Spain may not. Future generations of Europeans may suffer because of our inaction today.

¹ The farm level impact of using Bt maize in Spain, Graham Brookes (September 2002)

² Environmental benefits of genetically modified crops: Global and European perspectives on their ability to reduce pesticide use, published in the Journal of Animal and Feed Sciences (2002) Volume 11, pp. 1-18. Dr R. H. Phipps, Department of Agriculture, University of Reading.

³ Plant Biotechnology: Current and Potential Impact For Improving Pest Management In U.S. Agriculture: An Analysis of 40 Case Studies by the National Centre for Food and Agriculture Policy (NCFAP) Leonard P. Gianessi, Cressida S. Silvers, Sujatha Sankula and Janet E. Carpenter June 2002.

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the European Association for
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