

Blurring the lines between fact and fiction

Introduction

In April 2008, Greenpeace circulated four “Fact sheets on Genetically Modified Organisms”. Many claims made in these fact sheets are one-sided, misleading or incorrect claiming that the European Commission and the European Food Safety Authority (EFSA) are violating their obligations.

Greenpeace is ideologically opposed to biotechnology in agriculture consequently, Greenpeace claims about GMOs must always be checked, because the information it provides is frequently inaccurate.

No flaws in the authorisation process, just lack of implementation

Authorisation process

Greenpeace makes three claims about the GMO authorisation process: 1) scientific opinions are provided only by the European Food Safety Authority (EFSA), 2) the EU approval process “contravenes EU legal requirements for a broad consideration of a GM product’s risks and impacts”, and 3) no consideration is given to societal or economic arguments.

The reality:

All three Greenpeace claims are factually incorrect:

- 1) The process by which GMOs are approved considers, allows and encourages input from many different stakeholders, including EFSA, Member State governmental and non-governmental scientific bodies, Ministers, the Commission and others. Greenpeace says that EFSA makes “decisions” on GM approvals. This is incorrect - EFSA issues scientific “opinions” upon which the Commission and Member States decide. Greenpeace attacks EFSA and the scientific process because it doesn’t like the outcome of the reviews – positive safety and environmental assessments for GM products.
- 2) The entire risk assessment and management process is about assessing “risks and impacts”. To suggest that the EU is not doing this is bizarrely inaccurate and misleading.
- 3) Societal or economic arguments are considered by national governments when they vote on GM approvals. EFSA’s role as risk assessor is to weigh the scientific elements, not the political elements, and then to provide a scientific opinion.

The Council

Greenpeace says that the Council has “...consistently questioned the safety and usefulness of the GM products submitted for authorisation and has voted against the Commission’s positive proposals.”

The reality:

This is not true. There is no record of the Council having questioned the safety or usefulness of a GM product. The Council has never “voted against” a GM product - there has never been a qualified majority against a GM product. In the latest votes on approval dossiers, a majority of countries, representing more Council votes, is voting in favour rather than against approvals. An analysis of voting behaviour shows that this trend is increasing – more countries are voting in favour than against approvals.

European Food Safety Authority

Greenpeace claims that EFSA “violated obligations” and that it has “failed to identify and evaluate cumulative long-term effects of GMOs”.

The reality:

EFSA’s GM product safety assessment is one of the most rigorous in the world. GM foods now approved are at least as safe to consume as their conventional counterparts. Consumers can be confident that foods produced using biotechnology meet the most stringent food safety standards.

Before GM food enters the market, it is exhaustively tested by experts in nutrition, toxicology, allergenicity and the environment.

The consideration of potential long-term effects on humans/ animals consuming GM food/feed and on the environment is a key element in the GMO risk assessment.

The environmental risk assessment is based on field trials from multiple growth seasons and geographical locations. Uncertainty analysis is also an inherent part of EFSA’s risk assessment. Scientific uncertainty can have many causes and it is not realistic to expect that it can be fully eliminated. However, even when the degree of uncertainty in the risk assessment is negligible, unanticipated long-term effects on human health and the environment remain an important component of the general post-marketing surveillance.

The correct facts and figures about GMOs

Fact and figures about GMOs

In the section “Facts and figures about genetically modified organisms”, Greenpeace lists only some information about GM crops.

The reality:

Important facts about GMOs are omitted. Namely:

- 1) Farmers are adopting GM crops faster than any other agricultural technology ever introduced. That means double digit annual growth, with predictions that this growth will accelerate.
- 2) In 2007, 12 million farmers in 23 countries grew 114 million hectares of GM crops.
- 3) There is rapid growth in both the number of, and benefits from, GM crops. Around the world, hundreds of GM crops are approved, awaiting approval or in the final stage of development.

Incorrect data

Greenpeace claims that: 1) GM maize represents less than half of all maize grown in the US, and 2) organic farmland represents “4% of EU agricultural land”.

The reality:

The first statement is incorrect, the second is misleading.

- 1) 77%, not “half” of US maize was GM in 2007 (source ISAAA).
- 2) Regarding organic farmland, Greenpeace uses the figure of 4% to compare it to the acreage under GM cultivation. The 4% figure is not the right comparative figure, because it includes millions of hectares of grazing land. IFOAM, the global organic association says about 1.4% of EU land is organic.

Resistance management

Greenpeace claims that pests develop resistance in the medium and longer term.

The reality:

This is incorrect. After more than 10 years of cultivation of insect-resistant Bt crops worldwide, researchers have hardly found any signs of pest resistance in the field. For example, populations of the European corn borer have been carefully monitored in Bt maize fields, with no detectable change in susceptibility¹. To decrease the chance of the development of resistance and to ensure the sustainable use of Bt technology, farmers use a buffer zone or a structured

refuge of non-Bt crops that is planted in close proximity to the Bt crops. In this way, Bt is a useful tool which is part of a broader strategy of integrated pest management. A key target of this strategy is to prevent resistance of the target pest(s).

GM traits

Greenpeace says that there no commercially available GM plants that increase yield, enhance nutritional qualities, can resist drought or are salt tolerant.

The reality:

Despite globally organized opposition and regulatory obstacles, innovations in agbiotech are spreading worldwide at an unprecedented pace. The precision, flexibility and speed of genetic engineering in comparison with alternatives is vital in meeting the twin global challenges of climate change and ensuring the sustainability of agriculture². The first generation of GM plants with enhanced nutritional qualities is already commercially grown, such as maize with improved feed quality (higher amino acid content) or soybean and rapeseed oil with an altered composition and improved oil content. In recent years, scientific progress has been made in elucidating the genetic mechanisms underlying yield, drought and salt tolerance, but considerable challenges remain. One of the challenges is the increasing difficulty to obtain approvals to carry out field trials to test these newly developed varieties, and strikingly, to protect these trials from destruction by activists.

Lower yields

Greenpeace claims GM insect-resistant maize produces lower yields compared to conventional non-GM maize

The reality:

This Greenpeace claim is not true. Bt crops, like other pest-control technologies, produce variable yield gains, depending mainly on local pest pressure and damage. A recent overview study on the impact of nine years of commercial cultivation of Bt maize in Europe showed that there have been important yield and net economic benefits at the farm level³. In all European countries growing Bt maize, yield gains were reported, ranging from 5-15% up to 25% in heavily infested regions.

This confirms the results of the long-term field experiments with Bt maize by the European project ECOGEN, where GM maize was found to produce a higher grain yield and grain size and allowed a significant reduction in pesticide use⁴.

A recent survey among Spanish farmers also showed that farmers adopting Bt maize experienced higher average yields than conventional maize growers⁵. For example, significant yield gains were reported in the province of Zaragoza, with a yield increase of 1.11 kg/ha or 11.8%, leading, together with reduced pesticide costs, to an increased farmer income of up to € 120 per ha.

Pesticide use

Greenpeace claims GM crops do not reduce the use of chemical pesticides.

The reality:

This claim is not true. Biotech varieties have dramatically reduced farmers' reliance on plant protection products. This was one of the conclusions of a recent large project which made an inventory of altered agrochemical use per hectare of transgenic crops compared with conventional

crops by collecting data from public sources, including scientific literature and reports published by dedicated institutions⁶. Several large studies in the US reported lower herbicide use⁷⁻⁸ (up to 25-33%⁹) in herbicide-resistant crops (canola, cotton, maize, soybean) compared to conventional counterparts.

Also for insect-resistant Bt crops, many scientific studies continuously indicate a decrease in insecticide sprays. One of the best examples is Bt cotton: a nationwide survey carried out in India in 2003 indicated that the farmers were able to obtain on average a reduction in chemical sprays by 60%, and a yield increase by about 29% due to effective control of bollworms, as compared to non-Bt cotton. For France, it was estimated that the 22,000 ha of Bt maize cultivated in 2007 allowed for saving up to 8 800 litres of insecticide sprays¹⁰. In Spain, farmers growing Bt maize applied almost three times less agrochemical treatments/year compared to conventional maize farmers⁵.

Environmental and other benefits

Toxicity

Greenpeace claims that insect resistant crops are toxic to 'non-target' organisms, such as butterflies. Insect resistant crops are toxic to other, beneficial insects.

The reality:

Many studies have confirmed that Bt action is more specific than conventional pesticides. In fact, Bt has been used in organic farming as an alternative to conventional insecticides for almost 60 years. It is regarded as highly selective and environmentally friendly¹¹.

Two recent meta-analysis studies in the renowned scientific magazines *Science* and *Nature Genetics* looked at the effects of Bt. They concluded that:

- Non-target organisms are generally more abundant in Bt maize fields than in non-transgenic fields managed with insecticides¹².
- Bt crops grown today are more specific and have fewer side effects on non-target organisms than most insecticides currently used. Bt technology can contribute to natural enemy conservation and can be a useful tool in integrated pest management systems¹¹.

The articles Greenpeace is referring to, claiming toxic effects of Bt plants on non-target organisms, such as the monarch butterfly and the green lacewing, have been strongly rebutted in numerous follow-up studies¹³. Also the claim that Bt might be toxic to certain water insects was proven to be unfounded¹⁴. No adverse effects on non-target organisms resulting from direct toxicity of Bt-crops have so far been observed in the field. Experimental field studies have only revealed minor transient or inconsistent effects of Bt crops when compared to a non-Bt control¹³.

Ecosystems

Greenpeace claims that insect resistant crops are a threat to soil ecosystems and that Bt accumulates in the soil.

The reality:

Completely in line with the data assessed by EFSA¹⁵, long-term field experiments with Bt maize convincingly showed that the Bt protein did not accumulate in soil year on year and remained close to the limit of detection⁴. There have never been any reports of soil function problems in countries where Bt crops have been cultivated continuously for several years and the impact of Bt on soil function and soil organisms was assessed to be negligible¹⁵.

Cross-fertilisation

Greenpeace suggests that there have been many cases of GMO cross-fertilising with non-GM plants, and that farmers "are paying for this".

The reality:

Greenpeace paints a deceptive picture. Whilst there may be individual cases of cross-fertilisation, these are the exception to the norm. In Europe, for example, for a decade, Spanish farmers have grown GM maize next to non-GM maize and there have been no co-existence-related problems, despite the absence of formal co-existence measures. Spanish farmers employ practical measures based on extensive cooperation. These include: isolation distance and rows, planting near other crops, different flowering dates, cleaning of equipment, traceability and labeling, testing, etc. The Commission Marjann Fischer Boel said: "The co-existence of different production types is not a new issue in agriculture." Farm Commissioner said: "Co-existence can be achieved by using appropriate measures that are well adapted to the different local conditions in the different regions."

Social and economic benefits of GMOs

Poverty and hunger

Greenpeace claims that “GM crops do not solve hunger or poverty”.

The reality:

In fact, no one is claiming GM crops solve hunger altogether. What is true is that GM crops can, and often do, play a contributing role in increasing yields, both in the developed and developing world. There is now considerable evidence that this technological potential is real for the most precarious agro-ecologies and the poorest rural people^{2,16-21}. There are still over 800 million people who are chronically undernourished, and many others whose diet is poor, and GM crops can play an important role in developing crops that are better resistant to insect pests or hardy conditions, and help increase yield. These sentiments are widely shared:

- “...the current crisis demands an immediate and thorough discussion among the EU institutions and the Member States on the role that modern biotechnology can play in ensuring the continued production of food at reasonable prices”. European Parliament resolution, May 2008.
- “We have to devote the necessary resources to scientific and technological research and development, including biotechnology.” President Thabo Mbeki of South Africa.
- “I think there is little doubt that GM has real potential for increasing food production..”. Sir Beddington, chief scientist of the UK Government.
- “Genetically modified crops, under attack in the West, may provide an answer to cutting malnutrition in poor nations by developing seeds resistant to drought.” UN Human Development Report 2001

Imported food and feed.

Greenpeace says growing or importing GM crops does not reduce food and animal feed prices.

The reality:

Both points are incorrect.

Growing GM crops. GM crops often offer higher yields per hectare. Higher yields mean that more food and feed is produced to meet growing demand. An increase in quantity is one of the contributing factors to ease price pressure.

Importing GM crops. Europe’s livestock is strongly dependent on feed imports. Currently, the EU imports about 75% of its animal feed, mainly soybean and maize. The EU is far behind in the approval of GM crops compared to its main suppliers Brazil, Argentina and the US, which is limiting the types and quantities of feed that can come

into Europe. This, combined with the fact that farmers in these countries are overwhelmingly switching to GM crops because they produce higher yields, means that it is becoming increasingly difficult, and more expensive, to source GM-free from Europe’s major suppliers.

The European farming industry, food industry, European Commission and others have all clearly made these points. “The advantage [of GM crops] may turn out to be one of lower prices and better availability.» said the president of the UK food manufacturer’s lobby, the Food and Drink Federation. The Economist magazine wrote in May 2008: “...the way to feed the world is not to bring more land under cultivation, but to increase yields, science is crucial.”

Who profits?

Greenpeace suggests that biotechnology companies are the main beneficiaries of GM technologies.

The reality:

Contrary to Greenpeace’s opinion, it is mainly the farmer who substantially gains from GM technologies²². In Europe, as in the rest of the world – two thirds of the benefits of growing GM are shared among European farmers and consumers, while one third goes to the developers and seed suppliers. Farmers get a direct profit (12-21% on average) from growing GM crops via higher yields and lower crop protection product use³. There is also an economic advantage for consumers, because of lower prices. On top of that, Bt maize has delivered important improvements in grain quality through significant reductions in the levels of mycotoxins found in the grain²³⁻²⁴.

If farmers did not benefit from the technology, then why has there been double digit increase in biotech crops year on year for the last decade since the technology was introduced? (ISAAA report) Because farmers benefit, and there are markets for their products.

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