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## A TALE OF TWO PARADIGMS

### The environmental movement's viewpoint

#### KEY THEMES

- Environmentalists' objections.
- Two conflicting agricultural models.
- Social constitution.

**The year 1996 ushered in a battle over the rights and wrongs of genetic modification that has yet to play out.**



#### Sailing into dispute

The year 1996 was a significant one in the history of opposition to genetic modification (GM). It was then that a small fleet of inflatable boats from Greenpeace set out to prevent the first ships carrying Monsanto's GM soybeans from the USA – bound for Europe – from docking in Rotterdam harbour. At the same time, the first banners calling for a halt to GM foods were unfurled at the head offices of major food manufacturers and supermarket chains.

It was as if a starting pistol had been fired. From that point on, many environmental and other non-governmental organisations (NGOs) continued their campaign against Monsanto's soybeans and other GM crops. This had an influence on organic farmers, food producers and retailers, all concerned about possible economic losses ensuing from having GM constituents in their products.

Now, there are signs that the concerns of the food producers are lessening, and that Europe's major consumer organisations have almost given up campaigning against GM. They appear satisfied that EU regulations governing market approval and labelling ensure the safety of GM foods entering European markets.

Many environmentalists, however, remain firm. So what are they really worried about? Why continue to target GM soybeans nearly two decades on?

#### Petition from Toxicsoy.org

In February 2012, a petition signed by 26,000 people from across Europe was sent by the campaign group Toxicsoy.org to major food retailers in the EU, calling for them to turn their back on GM produce. Their argument was that: "Europe imports 34 million tonnes of GM soya every year, mainly to feed factory-farmed animals, [so] this system can never be called responsible and does not deserve a green label."

This is a typical tactic of environmental NGOs: they draw attention to the organisations in the agri-food chain that use GM soybean ingredients and are close to the consumer. They see Monsanto's soybeans as a key component of factory farming that ends in cheap meat products.

They also object more directly to growing GM soybeans. Monsanto's Roundup-Ready soya has been engineered to be resistant to Monsanto's own herbicide Roundup, which is based on glyphosate and which, according to Toxicsoy.org, has had serious health impacts on humans and wildlife. In order to control weeds, the pesticide is repeatedly sprayed by plane over large areas, without affecting the soybean plants but severely damaging, they claim, humans, water sources and other crops.

### **The emperor has no clothes**

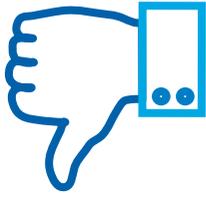
Another attack on Monsanto in particular and genetically modified organisms (GMOs) in general comes from a global coalition of 21 NGOs from North and South America, Europe, Africa and the Asia-Pacific region. They issued a Global Citizens Report with the title *The GMO Emperor Has No Clothes* – a reference to the fable by Hans Christian Andersen in which no one dares tell an authority figure the truth. For the NGOs, the emperor is Monsanto: "Its promises to increase crop yields and feed the hungry have proven to be false; its genetic engineering to control weeds and pests has created superweeds and superpests. Yet the Emperor struts around hoping the illusion will last and the courtiers, not wanting to be seen as stupid, will keep applauding and pretending they see the magnificent robes of the GMO Emperor."

The long report then goes on to examine in detail a series of "false promises":

- *GM crops lower levels of chemical insecticides and pesticides.* The report suggests otherwise: several case studies from the USA, Argentina, Brazil and India are cited which show increases in the use of chemicals and the emergence of herbicide-resistant weeds that demand even more toxic chemicals to control them.
- *Genetically engineered crops can be bred for drought tolerance and other traits conferring resilience to climatic conditions.* When the US Department of Agriculture carried out an environmental risk assessment of Monsanto's drought-tolerant GM maize, it suggested that comparable varieties produced through conventional breeding are readily available. The NGOs contend that the many hundreds of patents taken out on GM are nothing but bio-piracy because traits such as drought tolerance were not invented by genetic engineering: they already exist in nature.
- *GM foods are safe.* The report cites independent studies showing that GM foods can damage health. It also notes that the biotechnology industry has repeatedly attacked scientists carrying out independent research on GMOs and offers evidence that "bad science" has been used to suppress environmental and safety assessments of GM crops.

**Opponents of genetically modified crops claim they do not reduce pesticide use, that patents taken out on some crops are effectively bio-piracy, and that the resulting foods can damage human health.**





**Environmentalists argue that efforts to promote bioscience in the media and political arenas have failed to win public support.**

- *GM, conventional and organic crops can co-exist peacefully.* According to many NGOs, this is another falsehood promoted by the biotechnology industry. The report argues that cross-pollination is unavoidable and cites several cases of GM plants contaminating fields.

### **Importance of patents**

The Global Citizens Report argues that the patenting of GM seeds lies at the heart of the agri-industry's interest in GMOs. The GM firms have, by lobbying governments, buying up seed companies and withdrawing conventional seeds from the market, marketed their crops to 15 million farmers. Patents, mergers and licensing agreements give them monopolies on seeds such that nearly half of all sales worldwide are controlled by just three multinational companies: Monsanto, Dupont and Syngenta.

The NGOs argue that the world is losing, along with biodiversity, its seed and food freedom, along with food democracy and food sovereignty. This takes the debate into different territory. The NGOs are assessing the offerings of biotechnology not just from a health or environmental perspective. They are also judging them from a socio-economic standpoint.

### **The Golden Triangle**

Environmentalists see themselves in combat with what has been called a Golden Triangle of interlocking players: government, industry and science. These three factions in many European and other countries around the world express frustration at NGO campaigns that accuse them of irresponsible behaviour, especially in light of the need to confront global challenges such as hunger and climate change.

To counter these accusations, the Golden Triangle has, alongside its expenditure, public and private, on developing GM and other genomics-based plant breeding tools, spent large sums of money on social science research, consumer surveys and public communication.

The environmentalists, meanwhile, argue that after 15 years of efforts to promote the new technologies in the media and political arenas, the Golden Triangle has failed to win the public debate.

### **A tale of two paradigms**

If one looks more closely at this clash between opposing parties, what emerges is a battle between two agricultural philosophies.

## Feeding 9 billion

The NGOs criticise genetic engineering and the agro-industrial system that supports it on the grounds that they promote what is known as the Life Sciences paradigm – the dominant model of the past 20 years or so. This promises to make agriculture more sustainable through greater efficiencies – by engineering genetically precise changes to plants to protect them from external threats and increase their productivity. Under this paradigm, the research and development agenda favours new knowledge that can be kept in private, commercial hands.

The NGO philosophy is shaped by the very different Agro-Ecology paradigm. This promises to maintain eco-efficiency by keeping growing cycles as short and as closed as possible in order to use biologically diverse resources more effectively, as is the case for example with organic farming.

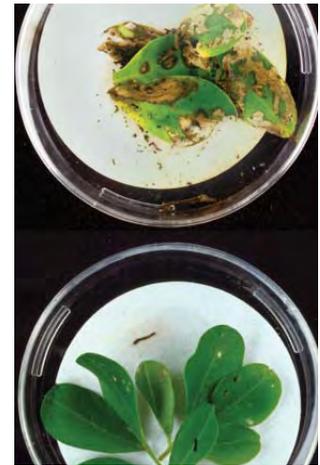
According to the Agro-Ecology model, sustainability problems stem from the fact that farmers' knowledge of natural resources and how to use them has been displaced by laboratory knowledge and the demands of distant commodity chains. State-run research has tended to shut out agro-ecology. The incremental improvements made locally by farmers have generally been undervalued by officialdom; the state has valued instead laboratory-based biotechnology research.

Thus, the Golden Triangle has shifted state research agendas towards specialist laboratory-based knowledge. The environmentalists argue that this has largely dismantled disinterested science and training for the public good, along with extension services designed to take research and new knowledge on agricultural practices out to the farmer. In their place are public-private partnerships based on the belief that scientific research can best drive successful innovation if it is aimed at market opportunities.

There is no doubt that the Life Sciences paradigm has been dominating its Agro-Ecology opposition. Is there any sign of this changing?

### **A key report: towards a change of direction?**

In 2008, a study commissioned by the UN and World Bank was published through the International Assessment of Agricultural Science and Technology for Development (IAASTD), an intergovernmental body involving more than 400 scientists and 30 governments. The IAASTD findings were that the global agricultural system needed to change radically in order to avoid future environmental and social problems. Although recent advances had increased food production,



Herb Pletcher/USDA ARS/PPD

**Some claim that improvements made by local farmers have generally been undervalued in favour of laboratory-based biotechnology research.**

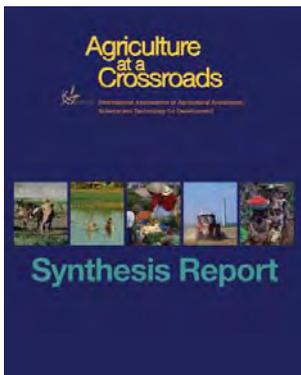
the benefits were spread unevenly around the world, with more than 800 million people still not getting enough food.

For NGOs this publication was a call to arms. Greenpeace, for example, saw its core message as “the urgent need to move away from destructive and chemical-dependent industrial agriculture and to adopt environmental modern farming methods that champion biodiversity and benefit local communities”. At the same time, Greenpeace acknowledged that, although the report was well balanced and scientific, it would take a good deal of work in the coming years to persuade the relevant decision makers of its value.

The prediction was accurate. Although as many as 60 governments signed up to the findings, some major grain producers and heavy users of genetic engineering – Australia, Canada and the USA – rejected the IAASTD report. The biotechnology industry had already pulled out of the consultation process before it was published.

Today, the impact of the report on public and private agricultural research and innovation is still in doubt. Its recommendations do not appear, for example, to have been taken up in the EU's Common Agricultural Policy. The NGOs contend that, given the extensive interests of the Golden Triangle in developed and emerging economies, they are likely to continue to try to shape agricultural research and development (R&D) according to the Life Sciences paradigm – turning farming into a biomass production line for food, feed, fibre and fuel.

**The IAASTD suggested that the global agricultural system needs to change radically to avoid future environmental and social problems.**



### **Suspicious about philanthropy**

Environmentalists also distrust various philanthropic initiatives such as the Alliance for a New Green Revolution in Africa. Operating across Africa, this programme, which is dedicated to establishing food security, has received millions of dollars from donors including the Bill and Melinda Gates Foundation and billionaire investor Warren Buffet. The NGOs claim that this apparent altruism is opening up huge new markets for the agri-industry by persuading farmers to depend on its seeds and chemicals. They contend that this will, in effect, lay the foundations for the large-scale influx of GMOs into Africa, especially since the Gates Foundation has already stated its belief that GMOs will form part of the solution to the continent's hunger problem.

### **The issue of social constitution**

The clash of paradigms, representing the NGOs on one hand and government, science and industry on the other, clearly encapsulates the position of the

environmentalists towards GM and other innovative technologies. But this is not the whole story.

For the NGOs, the real issue at stake is not the rightness or wrongness of the arguments but what they call the social constitution of the new technology. By this they mean that the political and economic interests of those who own and control the technology will largely determine how it is used.

It would, according to Greenpeace, be disastrous for a new technology to be in the hands of those who care little about environmental or human health, or the social consequences of its use. They advocate thorough public scrutiny, as a matter of democratic right, of any new technology before financial or political commitments make it impossible to go into reverse. If public debate and stakeholder scrutiny are to mean anything, it is argued, they should at least ask the following questions concerning social constitution:

- Who is in control?
- Where can I get information that I trust?
- On what terms is the technology being introduced?
- What risks apply, with what certainty, and for whom?
- Where do the benefits fall?
- Do the risks and benefits fall to the same people?
- Who takes responsibility for resulting problems?

Only by addressing such questions about agricultural research and innovation openly, transparently and democratically can the public controversy over GM in both developed and developing countries be resolved. If the Golden Triangle continues to monopolise agricultural research and innovation, the NGOs will continue, through the media, consumer networks, supermarket chains and food manufacturers, to criticise official risk assessments of genetic engineering technologies and to point out the agro-ecological alternatives.



**To overcome antipathy to genetically modified food, scientists, industry and governments must be clear and transparent about:**

- **who is in control;**
- **where to find trustworthy information;**
- **the terms under which the technology is being introduced;**
- **what the risks are and for whom;**
- **who stands to benefit;**
- **who takes responsibility for any emerging problems.**