10 reasons why GM won't feed the world

Mark Anslow
The Ecologist
March 1, 2008

Genetic modification can't deliver a safe, secure future food supply. Here's why...

1. Failure to deliver

Despite the hype, genetic modification consistently fails to live up to industry claims. Only two GM traits have ever made it to market: herbicide resistance and BT toxin expression (see below). Other promises of genetic modification have failed to materialise. The much vaunted GM 'golden rice' – hailed as a cure to vitamin A deficiency – has never made it out of the laboratory, partly because in order to meet recommended levels of vitamin A intake, consumers would need to eat 12 bowls of the rice every day.1 In 2004, the Kenyan government admitted that Monsanto's GM sweet potatoes were no more resistant to feathery mottle virus than ordinary strains, and in fact produced lower yields.2 And in January 2008, news that scientists had modified a carrot to cure osteoporosis by providing calcium had to be weighed against the fact that you would need to eat 1.6 kilograms of these vegetables each day to meet your recommended calcium intake.3

2. Costing the Earth

GM crops are costing farmers and governments more money than they are making. In 2003, a report by the Soil Association estimated the cost to the US economy of GM crops at around $12 billion (£6 billion) since 1999, on account of inflated farm subsidies, loss of export orders and various seed recalls.4 A study in Iowa found that GM soyabeans required all the same costs as conventional farming but, because they produced lower yields (see below), the farmers ended up making no profit at all.5 In India, an independent study found that BT cotton crops were costing farmers 10 per cent more than non-BT variants and bringing in 40 per cent lower profits.6 Between 2001 and 2005, more than 32,000 Indian farmers committed suicide, most as a result of mounting debts caused by inadequate crops.7

3. Contamination and gene escape

No matter how hard you try, you can never be sure that what you are eating is GM-free. In a recent article, the New Scientist admitted that contamination and cross-fertilisation between GM and non-GM crops 'has happened on many occasions already'.8 In late 2007, US company Scotts Miracle-Gro was fined $500,000 by the US Department of Agriculture when genetic material from a new golf-course grass Scotts had been testing was found in native grasses as far as 13 miles away from the test sites, apparently released when freshly cut grass was caught and blown by the wind.9 In 2006, an analysis of 40 Spanish conventional and organic farms found that eight were contaminated with GM corn varieties, including one farmer whose crop contained 12.6 per cent GM plants.

4. Reliance on pesticides

Far from reducing dependency on pesticides and fertilisers, GM crops frequently increase farmers' reliance on these products. Herbicide-resistant crops can be sprayed indiscriminately with weedkillers such as Monsanto's 'Roundup' because they are engineered to withstand the effect of the chemical. This means that significantly higher levels of herbicide are found in the final food product, however, and often a second herbicide is used in the late stages of the crop to promote 'dessication' or drying, meaning these crops receive a double dose of harmful chemicals.10 BT maize, engineered to produce an insecticidal toxin, has never eliminated the use of pesticides,11 and because the BT gene cannot be 'switched off' the crops continue to produce the toxin right up until harvest, reaching the consumer at its highest possible concentrations.12

5. 'Frankenfoods'

Despite the best efforts of the biotech industry, consumers remain staunchly opposed to GM food. In 2007, the vast majority of 11,700 responses to the Government's consultation on whether contamination of organic food with traces of GM crops should be allowed were strongly negative. The Government's own 'GM Nation' debate in 2003 discovered that half of its participants 'never want to see GM crops grown in the United

Kingdom under any circumstances', and 96 per cent thought that society knew too little about the health impacts of genetic modification. In India, farmers' experience of BT cotton has been so disastrous that the Maharashtra government now advises that farmers grow soybeans instead. And in Australia, over 250 food companies lodged appeals with the state governments of New South Wales and Victoria over the lifting of bans against growing GM canola crops.13

6. Breeding resistance

Nature is smart, and there are already reports of species resistant to GM crops emerging. This is seen in the emergence of new 'superweeds' on farms in North America – plants that have evolved the ability to withstand the industry's chemicals. A report by then UK conservation body English Nature (now Natural England), in 2002, revealed that oilseed rape plants that had developed resistance to three or more herbicides were 'not uncommon' in Canada.14 The superweeds had been created through random crosses between neighbouring GM crops. In order to tackle these superweeds, Canadian farmers were forced to resort to even stronger, more toxic herbicides.15 Similarly, pests (notably the diamondback moth) have been quick to develop resistance to BT toxin, and in 2007 swarms of mealy bugs began attacking supposedly pest-resistant Indian cotton.

7. Creating problems for solutions

Many of the so-called 'problems' for which the biotechnology industry develops 'solutions' seem to be notions of PR rather than science. Herbicide-resistance was sold under the claim that because crops could be doused in chemicals, there would be much less need to weed mechanically or plough the soil, keeping more carbon and nitrates under the surface. But a new long-term study by the US Agricultural Research Service has shown that organic farming, even with ploughing, stores more carbon than the GM crops save.16 BT cotton was claimed to increase resistance to pests, but farmers in East Africa discovered that by planting a local weed amid their corn crop, they could lure pests to lay their eggs on the weed and not the crop.17

8. Health risks

The results of tests on animals exposed to GM crops give serious cause for concern over their safety. In 1998, Scottish scientists found damage to every single internal organ in rats fed blightresistant GM potatoes. In a 2006 experiment, female rats fed on herbicide-resistant soybeans gave birth to severely stunted pups, of which half died within three weeks. The survivors were sterile. In the same year, Indian news agencies reported that thousands of sheep allowed to graze on BT cotton crop residues had died suddenly. Further cases of livestock deaths followed in 2007. There have also been reports of allergy-like symptoms among Indian labourers in BT cotton fields. In 2002, the only trial ever to involve human beings appeared to show that altered genetic material from GM soybeans not only survives in the human gut, but may even pass its genetic material to bacteria within the digestive system.18

9. Left hungry

GM crops have always come with promises of increased yields for farmers, but this has rarely been the case. A three-year study of 87 villages in India found that non-BT cotton consistently produced 30 per cent higher yields than the (more expensive) GM alternative.19 It is now widely accepted that GM soybeans produce consistently lower yields than conventional varieties. In 1992, Monsanto's own trials showed that the company's Roundup Ready soybeans yield 11.5 per cent less on harvest. Later Monsanto studies went on to reveal that some trials of GM canola crops in Australia actually produced yields 16 per cent below the non-GM national average.20

10. Wedded to fertilisers and fossil fuels

No genetically modified crop has yet eliminated the need for chemical fertilisers in order to achieve expected yields. Although the industry has made much of the possibility of splicing nitrogen-fixing genes into commercial food crops in order to boost yields, there has so far been little success. This means that GM crops are just as dependent on fossil fuels to make fertilisers as conventional agriculture. In addition to this, GM traits are often specifically designed to fit with large-scale industrial agriculture. Herbicide resistance is of no real benefit unless your farm is too vast to weed mechanically, and it presumes that the farmers already farm in a way that involves the chemical spraying of their crops. Similarly, BT toxin expression is designed to

counteract the problem of pest control in vast monocultures, which encourage infestations. In a world that will soon have to change its view of farming – facing as it does the twin challenges of climate change and peak oil – GM crops will soon come to look like a relic of bygone practices.

Mark Anslow is the Ecologist's senior reporter

References

1 http://www.gmwatch.org/archive2.asp?arcid=8521

2 http://www.greens.org/s-r/35/35-03.html

3 Telegraph, 14th January 2008, http://tinyurl.com/38e2rp

4 Soil Association, 2007, http://tinyurl.com/33bfuh

5 http://ianrnews.unl.edu/static/0005161.shtml

6 http://www.i-sis.org.uk/IBTCF.php

7 Indian Muslims, 20th November 2007, http://tinyurl.com/2u7wy7

8 New Scientist, 'Genes for Greens', 5th January 2007, Issue 2637, Vol 197

9 http://gmfoodwatch.tribe.net/thread/a1b77b8b-15f5-4f1d-86df-2bbca5aaec70

10 http://www.prospect-magazine.co.uk/article_details.php?id=9927

11 http://www.btinternet.com/~nlpWESSEX/Documents/usdagmeconomics.htm

12 http://www.prospect-magazine.co.uk/article_details.php?id=9927

13 http://www.indybay.org/newsitems/2007/11/27/18463803.php

14 http://www.english-nature.org.uk/pubs/publication/PDF/enrr443.pdf

15 Innovations Report, 20th June 2005, http://tinyurl.com/3axmln

16 http://www.gmwatch.org/archive2.asp?arcid=8658

17 http://www.i-sis.org.uk/GMcropsfailed.php

18 All references from 'GM Food Nightmare Unfolding in the Regulatory Sham', Mae-Wan Ho, Joe Cummins, Peter Saunders, ISIS report.

19 http://www.i-sis.org.uk/IBTCF.php

20 http://www.gmwatch.org/archive2.asp?arcid=8558

Source: http://www.theecologist.org/archive_detail.asp?content_id=1185