

FACT SHEET:

Why GM field trials are risky (and expensive) business

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Greenpeace Australia Pacific Ltd ABN 61 002 643 852

Australia is set to be the first country in the world to commercialise genetically modified (GM) wheat. The Australian Government has approved over 1,300 lines of GM wheat for experiments in open air trials, which are currently taking place in five states and territories across the country.

Past evidence across the globe shows there is a high risk that these experimental GM wheat field trials are highly likely to contaminate conventional wheat varieties and threaten Australia's billion dollar wheat industry.

Contamination of the food supply by experimental GM crops is risky, as most of these GM wheat varieties have not been assessed for food safety.

While wheat is self-pollinating, reducing the risk of gene flow in the field, the risk of contamination due to human error is very high. Sixty per cent of the GM contamination and license breaches in Australia have resulted from human error.¹

Globally, numerous serious incidences of contamination from experimental field trials have cost farmers their export markets, and put human health at risk. For these reasons Greenpeace campaigns to prevent the deliberate release of GM organisms into the environment.

This document highlights some cases of GM contamination so Australia can avoid repeating the same mistakes.

Case Study 1: Field trials of GM Rice LL601 contaminate US rice supplies & exports

What happened?

During 2006 and 2007, traces of three varieties of unapproved GM rice owned by Bayer CropScience were found in US rice exports in over 30 countries worldwide.

What was the economic impact?

The US rice industry collapsed. In July 2011 Bayer eventually agreed to a US \$750 million settlement resolving claims with about 11,000 US farmers for market losses and clean up costs². The total costs to the rice industry are likely to have been over US \$1 billion worldwide.

How did it occur?

Field trials were conducted between the mid-1990s and early-2000s. Bayer halted the trials in 2002 when US rice farmers made clear their customers did not want GM rice. The United States Department of Agriculture (USDA) reported these field trials were the likely sources of the contamination between the GM rice and conventional varieties. However, it was unable to conclude it if was caused by gene flow (cross pollination) or mechanical mixing³. Denying any culpability, Bayer's initial legal response blamed the escape of its gene-altered variety of long-grain rice, LL601, on "unavoidable circumstances which could not have been prevented by anyone"; due to "an act of God"; and on farmers' "own negligence, carelessness, and/or comparative fault."⁴

More information

'Bayer CropScience contaminates our rice' Greenpeace International
08/10/07 www.greenpeace.org/raw/content/international/press/reports/bayer-cropsciencecontaminates.pdf 'Rice industry in crisis'

Greenpeace International 06/02/07

www.greenpeace.org/raw/content/international/press/reports/rice-industry-in-crisis.pdf

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Case study 2: GM linseed contaminated Canadian linseed export market

What happened?

In 2009, unauthorised GM linseed (also known as 'flax') produced by a public research institution was discovered in food in several EU countries having been imported from Canada. The initial discovery of unauthorised GM linseed was in Germany. Since that first discovery GM linseed continues to be discovered in Europe and is thought to have been imported to over 30 countries around the world⁵.

What was the economic impact?

Canada lost exports to its main European market⁶ worth hundreds of millions of dollars and non-GM linseed farmers have faced huge costs and market losses. The exact source of the contamination hasn't been determined⁷.

How did it occur?

In the late 1980s a public research institution, the Crop Development Centre in Saskatoon, Saskatchewan, developed a GM linseed variety FP967 that was later named 'Triffid' by its developers. It was authorised for commercial use in both Canada and the United States in the late 1990's. However, concerns about the European export market meant Triffid was never sold for commercial production. It was de-registered by 2001 and it was believed that all known stocks had been identified and destroyed⁸.

Case study 3: Papaya seeds from GM field trial illegally distributed

What happened?

During 2004, the Thai Government found that papaya samples from 85 farms were genetically modified. The contamination continued into 2006 and it is likely that the GM contamination reached the food chain.

What was the economic impact?

Exports of papaya to Europe have been hit because of fears that contamination could have spread. The Thai Government said it was taking action to destroy the contaminated trees.

How did it occur?

GM papaya is not grown commercially in Thailand, so it was clear that the contamination originated from the government station experimentally breeding GM papaya trees. Following investigations, Thailand's Human Rights Commission conducted tests which showed that one third of papaya orchards tested in the eastern province of Rayong and the northeastern provinces of Mahasarakham, Chaiyaphum and Kalasin, had GM-contaminated papaya seeds in July 2005. The owners said that a research station gave them the seeds⁹.

Case study 4: Biotech seed producer used unapproved GM maize for breeding

What happened?

In 2005, the European Commission announced that illegal *Bt10* GM maize produced by GM seed company Syngenta had entered the European food chain. The GM maize *Bt10* contains a marker gene that codes for the widely used antibiotic, ampicillin, which the *Bt11* did not¹⁰. According to the international Codex Alimentarius Guideline for Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants: "Antibiotic resistance genes used in food production that encode resistance to clinically used antibiotics should not be present in foods" because it increases the risk of antibiotic resistance in the population.

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What was the economic impact?

The European Commission blocked US grain import unless they could be guaranteed free of *Bt10*¹¹. The US Department of Agriculture fined Syngenta \$375,000¹². There are no figures for the wider costs.

How did it occur?

The contamination arose because Syngenta's quality control procedures did not differentiate between *Bt10* and its sister commercial line, *Bt11*. As a result, the experimental and substantially different *Bt10* line was mistakenly used in breeding. The error was detected four years later when one of the seed companies developing *Bt11* varieties adopted more sophisticated analytical techniques.

Case study 5: Prodigene pharmaceutical maize contaminated follow on crop

What happened?

In the US in 2002, seeds from a GM maize pharma crop containing a pig vaccine grew independently among normal soybean crops¹³. US authorities said the corn did not reach food crops or animal feed.

What was the economic impact?

Prodigene, the company responsible, was fined \$3 million for tainting half a million bushels of soya bean with a trial vaccine used to prevent stomach upsets in piglets. Prodigene agreed to pay a fine of \$250,000 and to repay the government for the cost of incinerating the soya bean that had been contaminated with genetically altered corn¹⁴. The episode has drawn attention to the dangers of GM pharm crops¹⁵.

How did it occur?

Seeds from the GM maize crop sprouted voluntarily in the following season.

Case study 6: Experimental GM rice sold illegally in China

What happened?

In 2005 Greenpeace discovered that GM rice seeds had been illegally sold in Hubei. In 2006, GM rice event *Bt63* was found in baby food sold in Beijing, Guangzhou and Hong Kong. In late 2006, GM rice *Bt63* was found to be contaminating exports in Austria, France, UK and Germany. In 2007 it was again found in EU imports to Cyprus, Germany, Greece, Italy and Sweden¹⁶.

What was the impact?

The European Commission adopted emergency measures (commencing on 15 August 2008) to require compulsory certification for the imports of Chinese rice products that could contain the unauthorised GMO *Bt63*¹⁷. The Chinese Government took several measures to try to stop the contamination¹⁸, which included punishing seed companies, confiscating GM seed, destroying GM rice grown in the field and tightening control over the food chain.

How did it occur?

The source of the contamination appears to have been the result of illegal planting of GM seeds. Seed companies in China found to have sold GM rice hybrid seed to farmers operated directly under the university developing GM rice. It has been reported that the key scientist sat on the board of one GM seed company.

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Case study 7: StarLink maize intended for animal feed found in human food

What happened?

In 2000 in the US, a GM maize event produced by Aventis (now Bayer), known as StarLink, was discovered in taco shells sold for human consumption when it was only approved for use as animal feed¹⁹. StarLink maize is genetically modified to contain a gene coding for an insecticidal *Bt* toxin known as Cry9C. The Cry9C protein is not readily digestible in simulated gastric conditions and has been shown to be stable at 90°C – characteristics shared by many allergens. For this reason it was only approved for use as animal feed in the US. It was not approved at all anywhere outside of the US²⁰.

What was the economic impact?

Aventis was forced to remove StarLink from sale. The US Department of Agriculture issued a formal recall order for all 350,000 acres of StarLink corn planted across the US in 2000. Exports to Japan²¹ and Korea were contaminated. Costs are estimated to have been around \$1 billion US²².

How did it occur?

Many farmers reportedly did not know that StarLink had to be kept separate²³. Aventis was legally responsible to take steps (such as labelling seed bags and having signed contracts with farmers) to insure that farmers knew the restrictions, but evidence including seed bags and documents show that Aventis failed to abide by its license.

Further examples of GM contamination and links at: <http://gmcontaminationregister.org>

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Notes

1. Based on data compiled by Greenpeace, from the reports of the OGTR. These reports are found here: <http://ogtr.gov.au/internet/ogtr/publishing.nsf/Content/reports-1>
2. <http://www.bloomberg.com/news/2011-07-01/bayer-to-pay-750-million-to-end-lawsuits-overgenetically-modified-rice.html>
3. <http://www.aphis.usda.gov/newsroom/content/2007/10/content/printable/RiceReport10-2007.pdf> http://www.aphis.usda.gov/biotechnology/compliance_history.shtml – say the same as above.
4. <http://www.washingtonpost.com/wp-dyn/content/article/2006/11/21/AR2006112101265.html>
5. <http://www.grain.org/article/entries/4080-contaminatedcanadian-flax-barred-from-europe>
6. <http://www.agcanada.com/Article.aspx?ID=21873>
7. <http://www.cbc.ca/news/canada/manitoba/story/2010/01/20/mb-flaxtriffid-manitoba.html>
8. http://www.gmcontaminationregister.org/index.php?content=nw_detail1
9. <http://www.forbes.com/feeds/afx/2005/09/06/afx2206796.html>
10. <http://www.nature.com/nature/journal/v434/n7035/full/434807a.html>
11. <http://news.bbc.co.uk/2/hi/business/4450735.stm>
12. <http://www.saveourseeds.org/en/library/maize-bt10.html>
13. <http://www.aphis.usda.gov/lpa/news/2002/11/prodigene.html>
14. http://www.guardian.co.uk/environment/2002/dec/24/food_research
15. <http://www.nature.com/nbt/journal/v21/n1/full/nbt0103-3b.html>
16. http://ec.europa.eu/food/food/rapidalert/reports/week39-2006_en.pdf
17. <http://www.food.gov.uk/news/newsarchive/2008/apr/bt643>
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20. http://www.aaaa.com.au/pdf/IssuePaper7_StarLink.pdf
21. http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=163633
22. "Starlink™: Fallout From A Shooting Biotech Star." Stephen Moose, Assistant Professor, Department of Crop Sciences, University of Illinois - Urbana Champagne <http://agronomyday.cropsci.uiuc.edu/2001/tours/StarLink/index.html>
- 23 http://www.organicconsumers.org/ge/ge_corn_starlink.cfm