Bayer CropScience contaminates our rice

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For more information contact: jeremy.tager@int.greenpeace.org

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by Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands
Tel: +31 20 7182000
Fax: +31 20 5148151

greenpeace.org

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The following is a summary of events surrounding one of the worst cases of genetic engineering contamination of food in history and one of the most damaging events in the history of the US rice industry.

The devastation has been caused by the multinational company Bayer CropScience - which maintains that the contamination wasn't their fault - it was an 'act of God'.

A Contamination Nightmare

On August 18, 2006 the US Department of Agriculture (USDA) announced that genetic engineering contamination had been detected in US rice supplies. The USDA predictably declared that the quantities were small and there were no health risks associated with the rice. (1) They made these claims with no supporting data.

From that low-key announcement, the US rice industry found that Bayer CropScience, the giant pharmaceutical and chemical company, had devastated US rice farmers and global markets of the US rice industry. As events unfolded it became apparent that Bayer had managed to contaminate not only at least 30 per cent of US rice supplies but the seed sources, upon which farmers depended and they had done so not just once but three times - with three different genetically engineered (GE) varieties.

Two of the varieties were unapproved for use anywhere in the world (LL601, LL604), although the USDA quickly gave post-contamination approval to one of those varieties - LL601. (2) One variety (LL62) was approved in the US and in Canada for import - but otherwise has no approval in any other country for consumption or cultivation. (3)

Globally, the impacts have been devastating. The 25 member state EU imposed strict testing and certification requirements and traders and retailers of rice shut down the US trade, stopping shipments, removing rice from shelves, cancelling orders and sourcing their rice from other countries such as Thailand, Vietnam and even Uruguay. (4)

Japan and Korea imposed equally strict testing requirements, followed some months later by the Philippines when Greenpeace revealed contamination there. Russia and Bulgaria imposed bans on US rice and Mexico, Iraq and Canada imposed test and certification requirements on imports. The United Arab Emirates required a GE free guarantee. (5)

As of July 2007, Greenpeace has identified 30 countries where contamination of rice supplies with Bayer's unapproved GE varieties has been confirmed:

Austria, Belgium, Canada, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Ghana, Greece, Guatemala, Hungary, Ireland, Italy, Kuwait, Luxemburg, Mexico, Netherlands, Nicaragua, Norway, Philippines, Poland, Sierra Leone, Slovenia, Sweden, Switzerland, United Arab Emirates, UK, USA.

Additional contamination may have been found but not all countries report their testing results and many countries did not test either for political reasons or because they do not import US rice.

Market response was even stronger. The EU market virtually shut down any imports of US rice. All other major rice exporting countries reported major increases in sales. As a result Thailand and Vietnam announced an agreement to remain GE free in order to take advantage of market opportunities created by the US rice contamination. India announced that all Basmati rice growing areas would remain GE free. Uruguay announced that it would remain GE free for at least the next 18 months in order to take advantage of the market opportunities that had been created for GE free rice.

In early 2007, the USDA announced that contamination had also been found in one of the most popular long grain rice seeds - Clearfield 131 - and they were banning its use. (6)

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US Export markets impacted by GE contamination

(the number preceding the country denotes 2006 ranking as an importer of US rice)

1 Mexico - GE free certification required

2 Japan - testing required (0.01%)

3 Iraq - testing required (1% level)

4 Haiti - trade undisturbed

5 Canada - testing required (0.5%)

6 EU - trade in long grain stopped. Testing and certification required

7 Saudi Arabia - trade continues but labeling requirement (1%) may be invoked

8 Nicaragua - trade continues

9 Cuba - trade disrupted, status uncertain

10 Honduras - trade continues

12 South Korea - testing required, tender complications

16 Philippines - testing requirement, trade stopped

18 Taiwan - testing required

Share of global exports affected: 63 per cent

Source: In re Genetically Modified Rice Litigation, Master Consolidated Class Action Complaint, United States District Court, Eastern District of Missouri, Eastern Division, case 4:06 MD 1186 CDP, May 17, 2007

Farmers in Arkansas did not have enough rice seed to sow in their fields. Many were forced to destroy crops already sown. Others chose to plant corn or soy. BASF, the company that produces Clearfield suffered up to 9 million dollars in losses. (7)

The rice contamination scandals of 2006 and 2007 are likely to be the most damaging event in the history of the US rice industry - and may well continue for years. The US rice industry, it should be noted, is an unwilling victim in the contamination. While they may have failed to protect their industry from Bayer's field trials, they have consistently refused to support commercialisation of GE rice because of consistent market opposition. Bayer's contamination of US rice supplies directly undermines the caution of the US rice industry. (7)

In early 2007 over 200 individual lawsuits against Bayer were consolidated into a single class action lawsuit representing thousands of US rice farmers. (8)

Key dates in the LL rice scandals

Bayer is a multinational company with a primary focus on pharmaceuticals, but which has become increasingly involved in GE crops. This 2006 contamination scandal follows the Starlink scandal in 2001 in which a GE maize, deemed unfit for human consumption was found in maize products. Starlink was produced by Aventis, now a Bayer company.(9) These are likely to be the two most expensive contamination events in the history of the GE industry.

1998-2001 - Aventis field trials of LL601 are conducted in the United States including sites at Louisiana State University.(10)

2002 - Bayer buys Aventis and discontinues field trials. Field trials of other GE rice varieties continue worldwide. Plans for commercialization of LL601 apparently abandoned.

2005 - USDA criticised heavily by its Inspector General for poor oversight of field trials of GE crops.

2006 January - Riceland, the largest US producer and exporter of rice, tests rice intended for export. Presence of GE LL601 is revealed. Further testing conducted and confirmed in Arkansas, Missouri, Louisiana and Texas.

2006 May - Bayer claims it was first made aware of the contamination. No explanation for Riceland's delay in notifying Bayer.

2006 June - LL62 approved for use as food and feed in Canada.

2006 July - Bayer notifies the USDA of contamination and requests deregulation of the strain. No explanation for the delay in notifying the USDA.

2006 August - The USDA publicly releases the contamination information. No explanation for delay in notifying rice importing countries and traders. Sharp trading decline in US rice market.

2006 August - EU issues Emergency Declaration (2006/578/EC) in order to prevent ongoing contamination of EU rice supplies. Japan suspends imports of long grain US rice. South Korea demands that its importers be guaranteed there is no GE content in US rice shipments. Other countries follow suit.

2006 August - Bayer CropScience applies to Philippine Government for approval of LL62 rice for food and feed use.

2006 September - Japan widens testing of US rice to look for GE contamination in short- and medium-grain rice.

2006 September - Two multi-million dollar class action lawsuits filed by farmers and rice traders against Bayer. (11)

2006 October - France detects LL62 in long grain rice. LL62, approved in the US but not in the EU, represents an entirely new contamination problem. Testing in the US indicates that the problem is widespread in US rice supplies.

2006 November - USDA approves LL601 for consumption, despite 15,000 objections and the European Food Safety Authority finding that there was insufficient data to make a finding of safety. No penalties or prosecutions of Bayer to date.

2007 March - USDA announces contamination in Clearfield rice seed (CL131) and its use is banned.

The scandal is made all the more disturbing because the cause and source of the contamination is still not known. None of the GE varieties has ever been grown commercially and most of the field trials of the various 'Liberty Link' varieties ended over five years ago. (12) How did field trials of GE rice that finished over five years ago contaminate almost 30 per cent of US rice supplies?

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The situation now

Despite their clear inability to control contamination, it now appears that Bayer is growing one of their authorised varieties of GE rice in Arkansas although there is no commercial market for it - and obviously high levels of risk. (13) Bayer continues to use the contamination to seek commercial approval for one of its LL rice varieties - LL62 - in a number of countries.

In addition to the United States, Bayer is at work attempting to commercialize GE rice in the following countries. This list is based on publicly available materials and may not be comprehensive. Greenpeace International is not aware that any of the applications, authorisations or approvals discussed below are for LL601 or LL604 two of the unauthorised varieties that are part of the current global contamination.

Countries in which Bayer Cropscience has applied for authorisation for cultivation or food/feed consumption. All approvals are for LL62 unless otherwise noted.

1) Australia - food and feed. Applied 2006

2) Brazil - cultivation, food and feed, seed import, additional field trials. Applied 2006

3) Canada - approval granted for food and feed 2006

4) European Union (25 states) - food and feed. Applied 2004

5) New Zealand - food and feed. Applied 2006

6) Philippines - food and feed. Applied 2006

7) South Africa - food and feed. Applied 2006

8) United States - approvals granted for cultivation, food and feed. Approvals - LL601, 62, 06 (2006, 2002)

It appears clear that regulators won't hold Bayer accountable for keeping track of their genes, by requiring stringent measures to prevent contamination. Canadian authorities gave import and food approval to LL62 in June 2006. Mexico, the world's largest importer of US rice, gave a post-contamination approval for LL62 this past March. With these approvals, regulatory bodies have not imposed any extra conditions on Bayer to protect non-GE rice from contamination.

An application for cultivation is still pending in Brazil and applications for food approval are pending in a number of countries, including the EU, South Africa, Australia, New Zealand and the Philippines. The European Food Standards Agency, Food Standards Australia New Zealand and the Philippine Bureau of Plant Industry have never rejected any GE application. South Africa rejected its first early in 2007 when it rejected an industrial biofuel maize for food approval. (14)

Even in Europe where response to the rice contamination was rapid and public outrage high, the European Commission has taken no measures against Bayer for the contamination. Despite the damage to the rice industry, the contamination of public food supplies and the costs to the taxpayer, no government anywhere has investigated or imposed any penalties against Bayer CropScience.

LL601 and other Bayer GE rice varieties

Bayer's LL rice varieties have been engineered to resist glufosinate-ammonium herbicide (marketed by Bayer as 'Liberty Link' or 'Basta'). There are four known varieties of LL Rice, all of which are engineered to be resistant to Bayer's 'Liberty Link' glufosinate herbicide. Three of those are currently authorised for cultivation in the United States (LL62, LL06, LL601). Those varieties are not approved for cultivation in any other country. There have been field trials of LL rice varieties in Arkansas, Missouri, Florida, California, Texas, Puerto Rico and Mississippi.

The LL601 GE rice was developed by Aventis and field tested in the US between 1998 and 2001. The company decided not to commercialise the variety shortly after the field trials, and Bayer did not seek commercial approval after its purchase of Aventis. Bayer has revealed less information about LL604. The reasons for abandoning LL601 and LL604 are not known, nor is it yet known how Bayer's GE rice contaminated rice supplies 5 five years after all trials had ceased.

Should consumers be worried about eating LL rice?

The basis of Bayer's application for US approval was that one of the unauthorized lines, LL601, is similar to the two lines of GE glufosinate-resistant varieties of rice that are already authorised in the US, namely LL62 and LL06. However, this is not so. There are fundamental differences in the production of LL601 that would warrant a full safety assessment, distinct from the other lines. In fact, the only similarities between the GE rice events LL62, LL06 and LL601 are that all three were produced by Bayer (15) and that all three GE rice events are resistant to the herbicide glufosinate (Liberty) produced by Bayer.

For the event LL601 a different rice-variety was transformed with different gene constructs using a completely different method of genetic engineering. Importantly, LL601 was produced using Agrobacterium tumefaciens, whereas LL62 and LL06 are produced by the gene gun method (or direct gene transfer). LL601 contains a different terminator (“stop” code) than LL62 and LL06. Hence, with regard to many fundamental characteristics, LL601 is not similar at all to LL62 or LL06.

Moreover, according to the European Food Safety Authority, the dossier submitted by Bayer does not contain enough information for any regulatory authority to begin to assess this GE rice.

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In Europe, GE crops are first reviewed for safety by a scientific body, the European Food Safety Authority (EFSA). EFSA has been strongly criticized for being pro-GE, for relying on company-produced data and always giving a positive opinion of GE crops regardless of the data. However, for the first time, EFSA have admitted uncertainties with the food safety of the GE rice LL601. Their conclusions are important as EFSA would have access to the confidential business information included in the application papers - information that the general public and non-governmental organisations cannot access. EFSA states (16) that:

> *"Although extensive data have been presented regarding the molecular characterisation of the intended insert, no full molecular characterization was presented and only limited summary data have been provided regarding the compositional analysis of the rice and agronomic and nutritional equivalence to conventional rice. It is therefore not possible to conclude on the safety of LLRICE601 itself, in accordance with the EFSA guidance for risk assessment."*

The EFSA further identifies the following specific concerns:

- that there is a lack of analysis on a second copy of the CaMV 35S promoter, which has been inserted at a separate location to the herbicide tolerance gene and its promoter and termination regions.
- that Bayer have not provided the raw data with which to assess the morphology, agronomic performance and compositional analysis of LLRICE601.

Currently there is inadequate testing into the safety of consuming GE LL rice.

Contamination threats

Rice is not only the world's most important staple food, it is produced and consumed around the globe. There are millions of people involved in the production, harvest, transport, storage, processing and sale of rice, from small subsistence farmers to major companies with global reach.

The contamination of the US rice supply with Bayer's LL rice varieties has demonstrated clearly the inability of the global rice trade to control contamination. These global contamination events resulted from field trials alone. Contamination of world rice supplies, should commercial scale production of GE rice occur, is virtually inevitable - with probable serious consequences for producers and consumers alike.

In addition to the potential human health risks from consuming GE foods, there are risks to the environment, to the diversity of rice varieties, to markets and farmers who rely on the reputation rice has of being healthy and clean. (17)

In late 2005 the Inspector General of the USDA blasted the Department of Agriculture for its failure to adequately regulate, monitor or control field trials of GE crops. Those criticisms were later supported by Federal Court decisions in Hawaii in August 2006 (18) and San Francisco in March 2007. (19)

The response of the United States and Bayer to the contamination of US rice stocks is of significant concern. Last year, the United States failed to notify export and trading partners of the contamination of maize with an unauthorized GE construct (Bt10) for over four months. (20) When the contamination was announced, the US government insisted that the amounts of Bt 10 were minor and there were no health concerns. They failed to take any steps to protect their own consumers or those of countries receiving maize.

The current contamination follows the same pattern. It was almost eight months between the first discovery of liberty contamination of rice in January 2006 and the public announcement by the USDA in August 2006.

The uncontrolled cultivation of GE rice will expose countries, particularly centres of diversity and countries with little regulatory or technical capacity, to unwanted and uncontrolled contamination. If GE rice is commercially grown in the US, it is probable that wide-scale contamination of all US rice will occur. The importance of protecting centres of diversity and treating them as precious world resources cannot be overstated. For example, rice resistant to two of Asia's four main rice diseases originated from a single sample of rice that came from central India. (21) These diversity storehouses are critical to the utility and success of sophisticated - and acceptable - biotechnology techniques, such as marker assisted selection, which rapidly identifies beneficial traits that can be used in conventional breeding.

Bayer's history of contamination with GE extends beyond rice. In 2005, for instance, a GE canola (rapeseed) produced but never commercialized by Bayer contaminated as much as 325,000 ha of conventional canola in Australia. (22)

Bayer CropScience

Bayer is a German-based transnational corporation with 350 companies on five continents. It is best known worldwide for its aspirin. The cornerstones to the company are in Europe, North America and the Far East with a growing presence in China. Bayer focuses on the creation of healthcare, material science and crop science products.

Bayer AG, the main Bayer corporate name, is now a management holding company with several subsidiaries. Bayer AG is a massive German-based chemicals and pharmaceuticals manufacturer, and it is a key player in the development, commercialisation and sale of GE crops. (23)

The Bayer subsidiary dealing with crops is Bayer CropScience AG. The company's Crop Protection unit makes fungicides, herbicides and insecticides. Bayer CropScience also has two other divisions, Environmental Science and BioScience, which focus on non-crop chemicals (such as consumer lawn care products) and genetically modified seeds, respectively.

Rice facts

- At least 114 countries grow rice, but Asian farmers produce 90 per cent of the total global supply.
- There are over 100,000 varieties of rice that have been developed by farmers over thousands of years containing an extraordinary diversity of traits and qualities.
- Rice is eaten by nearly half the world's population. It is the staple food for the largest number of people on Earth. Among low- and middle-income countries, rice is by far the most important crop worldwide.
- Rice is a main ingredient in many different kinds of food, e.g. rice noodles, rice snacks, baby foods, rice milk and breakfast cereals to name but a few.
- Consumption of rice ranges from an average of 10kg per person per year in the west to approximately as high as 200kg per person a year in parts of Asia.
- Currently, no genetically engineered rice is grown commercially anywhere in the world.

Securing a Healthy Industry - Conclusion and Demands

This briefing has documented the introduction of unapproved GE rice varieties into the global food chain and the resulting havoc, with US rice growers experiencing the brunt of negative financial impact. A summary of these events allows us to conclude that as long as new GE field trials are approved, the global rice industry faces enormous risks. In this risk climate the industry faces increased testing and administrative costs, the ongoing prospect of new contaminations being detected and repeated economic losses.

In light of this evidence, Greenpeace urges:

- An immediate ban of GE rice field trials as containment cannot be guaranteed;
- Accountability from GE corporations engaged in GE field trials, including legal and financial liability;
- Bayer CropScience be investigated by governments of countries where LL contamination has been found and penalties imposed on behalf of farmers, traders, retailers, processors and exporters;
- That Bayer withdraw all applications for approvals of LL rice and surrender all existing approvals;
- Governments of rice-producing countries to follow the lead of the rice industry in places such as Thailand and Vietnam and prohibit the growth and production of GE rice crops.

It is clear that the financial risks to business, farmers, traders, millers and processors are very real. While litigation may allow farmers and others in the industry to recover partial damages, it will not allow recovery for lost markets, brand damage or a reduction in the amount of rice eaten by wary consumers. The troubles of the rice industry are not over. Field trials of GE rice cannot be confined and can no longer be seen as safe undertakings. Banning open field trials is the only way to ensure that contamination of food from GE trials will not occur.

Greenpeace is campaigning for a global agricultural system based on biodiversity and sustainability, that protects the world's forests and other natural ecosystems, reduces greenhouse gas emissions, encourages soil and water health, uses less fertilisers and pesticides, protects biodiversity with no genetic engineering releases and provides fair trade and food security for all.

End Notes

1) U.S. Food and Drug Administration's Statement on Report of Bioengineered Rice in the Food Supply CFSAN/Office of Food Additive Safety, August 2006 http://www.cfsan.fda.gov/%7Elrd/biorice.html

2) Petition for non-regulated status granted by USDA/APHIS; http://www.aphis.usda.gov/brs/not_reg.html (3) Canadian Food Inspection Agency, Decision Document DD2006-58

Determination of the Safety of Bayer CropScience's Glufosinate Ammonium Tolerant Rice (Oryza sativa) Event LLrice62

4) EU Emergency Declaration, 2006/578/ED, see e.g., Biggest rice exporters say no to GE as new US contamination found in the Philippines, 28 November 2006,

http://www.portofentry.com/site/root/resources/industry_news/4332.html.

5) see In re Genetically Modified Rice Litigation, case 4:06-md-01811-CDP, United States District Court Eastern District of Missouri, Eastern Division, p. 25

6) http://www.aphis.usda.gov/newsroom/content/2007/03/CL131update3-9-07.shtml 9 March 2007 Brownfield, March 6 2007 http://www.brownfieldnetwork.com/gestalt/go.cfm?objectid=29619657-B177-208E-4FA289D3C916F9BB

7) see In re Genetically Modified Rice Litigation, case 4:06-md-01811-CDP, United States District Court Eastern District of Missouri, Eastern Division; see also Attack of the Mutant Rice, originally published in Fortune, July 9, 2007, p 74,

http://lists.eco-farm.org/pipermail/ge_news/2007-August/000002.html.

8) Arkansas Democrat-Gazette. Saturday, August 18, 2007 http://www.nwanews.com/adg/Business/198876/

9) 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

10) http://www.isb.vt.edu/CFDOCS/fieldtests1.cfm or http://www.aphis.usda.gov/brs/ph_permits.html

11) see, eg., http://findarticles.com/p/articles/mi_qn4181/is_20060920/ai_n16736530

12) see In re Genetically Modified Rice Litigation, part C; see also www.aphis.usda.gov/brs/ph/permits_html

13) 'Bayer testing 2nd modified rice in state', http://www2.arkansasonline.com/news/2007/jun/19/bayer-testing-2nd-modified-rice-state-20070619/, June 2007.

14) Biotech Update: South Africa Rejects, EU Accepts, New GMOS; Greenpeace Study Finds Evidence of GM Toxicity, 26 March 2006; see http://www.ictsd.org/biores/07-03-30/story2.htm

15) "AgrEvo, whose parent company Hoechst AG merged with Rhone-Poulenc to form Aventis in 1999. Aventis was acquired by Bayer in 2002, USDA/APHIS draft EA 06-234-01P, page 16

16) Statement of the Scientific Panel on Genetically Modified Organisms in response to the request of the European Commission on inadvertent presence of genetically modified rice LLRICE601 adopted on 14 September 2006. http://www.efsa.europa.eu/en/science/gmo/statements0/efsa_statement_gmo_LLRICE601.html.

17) Greenpeace International. 26th November 2006. Health risks: Bayer's Genetically Engineered Liberty Link (LL) RICE 601. http://www.greenpeace.org/raw/content/international/press/reports/health-risks-bayer-s-genetica.pdf Greenpeace International. Future of Rice report. 16th November 2006. http://www.greenpeace.org/raw/content/international/press/reports/future-of-rice.pdf Scientist statement: health concerns posed by Bt genetically engineered rice from China. September 2006 http://www.greenpeace.org/raw/content/international/press/reports/scientists-say.pdf

18) Federal judge: Officials cut corners with biotech crop permits, Associated Press, August 15 2006. http://www.freenewmexican.com/news/47911.html

19) Geertson Seed Farms v Mike Johanns, Secretary United States Department of Agriculture. Case no. 3:06-cv-101075-CRB, February 2006, District Court for the Northern District of California

20) see, e.g., GMOs : Commission requests information from Syngenta to confirm reliability of detection method for Bt10 maize, European Commission Media Release. April 4, 2006.

http://europa.eu.int/rapid/pressReleasesAction.do?reference=MEX/06/0404&format=HTML&aged=0&language=EN&guiLanguage=en

21) World Resources Institute: http://www.wri.org/wri/biodiv/agrigege.html

22) see GM Contamination Register, http://www.gmcontaminationregister.org/index.php?content=re_detail&gw_id=92&reg=0&inc=0&con=0&cof=0&year=0&handle2_page=

23) see, e.g., http://archive.corporatewatch.org/genetics/commercialisation/bayer.htm

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Greenpeace International
Ottho Heldringstraat 5
1066 AZ Amsterdam
The Netherlands
Tel: +31 20 7182000
Fax: +31 20 5148151

greenpeace.org