

LIBERTY LINK RICE: THE SCANDAL THAT WOKE UP THE WORLD

An announcement in August 2006 by the US Agriculture Secretary, Mike Johanns, sparked off the biggest GMO scandal in recent times—Bayer CropScience had informed the Department of Agriculture (USDA) that conventional long-grain rice meant for export had been contaminated by its discontinued experimental genetically engineered (GE) Liberty Link Rice strain, LLRICE601. They could, however, offer no explanation as to how this had happened.

Bayer's GE Rice Contamination

LLRICE601 is genetically engineered to be tolerant to the herbicide, glufosinate-ammonium, so that the rice crop will survive the spraying of this weedkiller while surrounding plants will die (See box: "What is glufosinate-ammonium?"). Glufosinate-ammonium has been found to have acute and long-term toxic effects on humans and adverse environmental effects. Chronic health impacts include neurological and reproductive damage. There is the possibility of crop harvested containing traces of this neurotoxin, which has been observed to cause defects in unborn mammals.¹

Bayer field-tested LLRICE601 in open fields in Louisiana and Arkansas, USA, between 1999 and 2001, but stopped this in 2001 for unspecified reasons. However, due to the USDA Animal and Plant Health Inspection Service's (APHIS) weak regulatory system, contamination of non-GE rice fields went undetected until January 2006 when independent testing by one of Riceland Foods' export customers detected it. However, it was only several months later on 31 July 2006 that Bayer informed the USDA of the contamination which in turn took another three long weeks to make the public announcement.

Except for claims by Bayer itself, there has been no independent verification that LLRICE601 and rice contaminated by it is safe for consumption. The USDA and FDA declared the rice safe based on Bayer's assurances, despite the lack of safety testing.²

While the US government tried to downplay the contamination incident, independent testing by Riceland Foods revealed that the contamination of conventional rice crops had spread throughout the southern rice-growing states of Arkansas, Missouri, Mississippi, Louisiana and Texas.³ In addition to contamination of rice for consumption, the planting stock of several popular non-GE long-grain rice varieties – Cheniere and Clearfield 131 – were also found to be contaminated with LLRICE601 and LLRICE604, confirming the risk of contamination by other LL varieties.⁴

Meanwhile, reports of contamination of rice supplies by LLRICE601 in several countries in Europe and other parts of the world began flooding in, revealing the risk of months of exposure to innocent consumers. Prices of US rice tumbled as Japan and South Korea quickly halted imports of long-grain rice from the US.

Bayer adopted an irresponsible attitude to the contamination, refusing to provide reference materials or genetic characterizations for LLRICE601 such that nobody knew what to look for or how to test for them. Instead it filed a petition to deregulate LLRICE601 (APHIS had earlier deregulated (i.e., approved) two similar LL rice lines, LLRICE62 and LLRICE06, in 1999). The Center for Food Safety (CFS) responded by filing a legal petition with the USDA to prevent such approval from being granted, and to rescind the approval of LLRICE62 and LLRICE06.⁵ The CFS advanced, with supporting evidence, a list of reasons to regulate LLRICE. These included the certainty that LLRICE would: 1) Hybridize with weedy red rice, making this serious weed still harder for farmers to control; 2) Promote greater use of the toxic herbicide glufosinate; 3) Foster the evolution of resistant weeds through overuse of glufosinate; and 4) Cause further economic losses to rice farmers through more contamination of commercial rice. The stranglehold agribusiness

corporations have over the USDA was proven when instead of exercising caution, the USDA approved the deregulation in just a matter of a few months in November 2006 based solely on Bayer's report that there were no health or safety concerns.

By November 2007, LL-contaminated rice and rice products had been found in 32 countries: 23 European countries, Ghana, Guatemala, Kuwait, Mexico, Nicaragua, the Philippines, Sierra Leone, the United Arab Emirates and even China.⁶

WHAT IS GLUFOSINATE-AMMONIUM?

Glufosinate-ammonium is a broad-spectrum herbicide, in use in relatively small quantities since the 1980s. Its use is being increased by the recent development of a more than 100 varieties of transgenic plants, genetically modified to be tolerant of it. It carries unacceptable risks to humans, especially the neurological development of the foetus, to agricultural biodiversity, and to the environment. Formulations are more toxic to humans and the aquatic environment than the active ingredient alone, but there is very little information publicly available on the inert, or adjuvant, ingredients in the formulated products.

- **Common trade names:** *Basta, Liberty*
- **Other trade names :** *Aeh, Buster, Challenge, Conquest, Dash, Derringer, Finale, Harvest, HOE 00661, HOE 039866, Ignite, Rely, Remove, Tepat*
- **Major producers :** *Bayer CropScience (Germany), Zhejiang Yongnong Chem. Ind. Co., LTD (China)*

Acute toxicity

- *the effects are firstly gastrointestinal (nausea, vomiting, abdominal pain, diarrhea etc.) followed by the onset of neurological symptoms (convulsions and coma), then respiratory failure; death results from circulatory failure. No antidote.*

Long-term toxicity

- *chronic effects are primarily neurological and reproductive because glufosinate-ammonium is structurally similar to a neurotransmitter, glutamate, and interferes with its proper functioning.*
- *serious effects on early embryonic development, including damage to the brain and neural tube.*
- *causes the loss of many foetuses and damage to those actually born, including cleft lips.*
- *transgenerational effects on brain function are reported.*

Environmental effects

- *is moderately persistent in some soils, and has the potential to leach to groundwater, especially in sandy soils.*
- *has insecticidal properties which is highly toxic to beneficial organisms (spiders, predatory mites, butterflies etc.).*
- *is toxic to a number of soil micro-organisms, and may increase susceptibility to plant diseases, with consequent increased use of and dependence on pesticides.*
- *long-term use is likely to give rise to herbicide-resistant weeds. Glufosinate tolerance transgenes have already escaped from genetically modified plants and been found in weedy relatives in Japan and the UK.*
- *there are indications of synergistic interactions with other herbicides, such as with metolachlor to cause damage to testes, and with metsulfuron-methyl to increase phytotoxicity.*

Source: Extracted from "Glufosinate-ammonium Monograph", prepared by Dr. Meriel Watts, 2007. PAN AP.

Collusion and Cover Up Across Borders

The scandal and cover up continued across US borders and beyond the Atlantic. The Canadian Food Inspection Agency (CFIA) and Health Canada followed the unscientific lead of USDA and Bayer, stating that untested LLRICE601 was unlikely to pose safety problems.⁷

Meanwhile, the European Union (EU), a major market for US rice, only took steps to impose compulsory testing of imports for the GE rice⁸, but it failed to carry out any independent assessment of the contamination problem or impose penalties against Bayer.⁹ Environmental and food safety groups slammed the EU for its minimal response to a serious contamination problem. Although the European Commission reported that contaminated rice had been found in 33 out of 162 samples from imported rice consignments by the European Federation of Rice Millers¹⁰, more extensive testing (on rice and rice-based products) were carried out by concerned social and environmental groups and retailers themselves.

It was these groups that forced national regulators in Europe to conduct more rigorous testing of samples and impose mandatory withdrawals of contaminated rice and rice-products from the shelves. For example, in spite of the finding by Friends of the Earth (FOE) that rice from Morrisons' supermarket chain (Britain's fourth largest) was contaminated by LLRICE601, the FSA only ordered stores to remove rice known to contain GE strains from their shelves after the FOE mounted a legal challenge against it.¹¹

In Germany, Aldi Nord, a major supermarket only removed stocks of a brand of rice that Greenpeace tests revealed to be contaminated by LLRICE601.¹² In Switzerland, retailers Migros and Coop suspended sales of and sealed their storage silos containing long-grain rice from the US after tests confirmed traces of the banned rice in their stock.¹³

Meanwhile, the European Food Safety Authority (EFSA), though taking a more cautious stand while admitting to insufficient data to provide a full risk assessment on the rice, nevertheless declared that consumption of the long-grain rice containing trace levels of LLRICE601 was not likely to pose an imminent safety concern to humans and animals.¹⁴ The GM Free Cymru group revealed that EFSA's assurance was based only upon highly selective data provided to it by Bayer, which had blanked out 30 pages of its dossier containing crucial data on the molecular characterization and other crucial characteristics of the LLRICE601.¹⁵ To compound the deceit, the EFSA claim of "not harmful if consumed in small quantities" was based on two worthless "scientific" assessments, one of which was based on the same blanked-out Bayer report and the other being an "informal assessment" without any scientific research done.¹⁶

The whole scandal has revealed blatant cover-ups, the pro-industry stance of most regulatory bodies, and their failure to discharge their duty to protect public health and safety. In particular, the reputations and credibility of the FDA, the USDA Animal and Plant Health Inspection Service (APHIS), Britain's Food Standards Agency (FSA) and the European Food Safety Authority (EFSA) were seriously called into question. The agricultural biotechnology industry too came under fire for risking the biological safety of global food supplies in its pursuit of profit. On the upside, however, the scandal highlighted the important role social and environmental groups play as watchdogs in ensuring consumer health and safety by forcing regulatory bodies do what they are tasked to do, uncovering and publishing irregularities and cover-ups as well creating public awareness on the dangers of GE/GE-contaminated food.

No Protection from the Dangers of GE Crops

GE technologies carry with them serious risks. Trials with rats and mice on GE potato have shown results such as abnormal organ development and potentially precancerous cell growth in the digestive tract while rats fed with GE tomato demonstrated bleeding in the gut.¹⁷ Meanwhile, there have been reports of cows becoming sick and dying after eating GE corn.¹⁸ Reports on tests with GE soya are equally disturbing: liver cell problems in mice¹⁹; significant differences in enzyme levels in the kidneys, hearts and livers of rabbits²⁰; and higher mortality rate of rat offspring.²¹ In humans, soya allergies in the UK jumped from 10% to 15% of a sample group soon after GE soya was introduced in the country, and a GE food supplement was linked to the death of some 100 people and illness in 5,000 – 10,000.²² Cotton workers handling GE cotton in India have also reported allergic reactions to handling it.²³

Contamination of local rice plants by GE rice is irreversible and remains a constant threat as it is impossible to identify which plants are contaminated from a visual examination. Thus it is difficult to eliminate all contaminated plants and as long as they remain, they may contaminate other plants. In addition, LLRICE varieties may increase the weediness of red rice and lead to herbicide resistance in other weeds. These are all serious threats to local biodiversity and the stability of the ecosystem.

In today's globalised economy, the ease, speed and spread of contamination and the serious negative economic consequences as shown by the LLRICE601 fiasco should send out clear warning signals to governments to adopt the precautionary principle when thinking of testing and growing GE crops, especially if they do not possess the required biosafety protocols and enforcement structures to safeguard against contaminating non-GE crops of the same variety. For instance, the USDA's regulatory system is so weak that it does not even require companies to provide site location information on GE crops or conduct testing of neighbouring fields to look for contamination during field trials. Said Center for Food Safety science policy analyst, Bill Freese: "There is all this stuff in writing to give you a sense of security but when you look at what they're actually doing, it's nothing."²⁴

At the time of the contamination, the US was the only country that had approved the commercial growing of GE rice. India is contemplating approving the experimental growing of GE rice, but Indian rice farmers are dead set against this, with farmers in Haryana and Tamil Nadu destroying the field trial plots of GE rice set up by the Maharashtra Hybrid Seeds Company on behalf of Monsanto.²⁵ However, China approved GE rice and corn for commercial production at the end of 2009.

A Bitter Harvest

The discovery of LL-tainted rice triggered the largest financial and marketing disaster in US rice history. As a result of the contamination, major customers Japan and Korea immediately suspended the import of long-grained rice from the US along with many other countries. Ebro Puleva, a Spanish food group and the largest rice processing company in the world controlling 30% of the EU's rice market, stopped imports of US rice into the EU in August 2006.²⁶

Within four days of the 2006 announcement, a decline in rice futures had cost U.S. growers about \$150 million, according to a farmers' complaint in a federal court in St. Louis.²⁷ News of the contamination caused futures prices to fall approximately 14 percent, and American rice exports also fell, the growers said.²⁸

In 2007, Greenpeace estimated the economic cost of the contamination to the rice industry to be as much as USD 1.2 billion, including losses of up to USD 253 million from food-product recalls in Europe, US export losses of USD 254 million in the 2006/07 crop year, and future export losses of USD 445 million.²⁹ In its court case against Bayer in February 2011, Riceland claimed the negligence of Bayer in the handling of LLRICE601 cost it USD 379,930,000 in projected future losses and losses since 2006.³⁰

The application to commence class action lawsuits against Bayer by the thousands of US farmers whose livelihoods had been severely affected was rejected by the courts thus forcing each farmer to file individual suits giving rise to thousands of cases and making it difficult and costly for individual farmers to maintain their suits.³¹ It has also put a heavy toll on court services and public funds.

As of October 2008, 1,200 suits had been filed against Bayer by American farmers for damages caused by temporary bans on long-grain rice varieties from the US, export restrictions, a plunge in prices and loss of markets that followed the discovery of the contamination, damage to property and equipment and other costs.³² Arkansas farmers who filed suits claimed that they were unable to find enough unaffected seed and were unable to plant rice on all their available land.³³ They said that the rice that was planted was less profitable because of reduced yields and added expense in controlling weeds.³⁴ European businesses handling the contaminated rice also sued for losses.

Some US farmers who have persevered have won their cases.^{35,36} Bayer admitted that contamination took place but refuses to admit negligence and therefore liability in relation to the contamination and the losses suffered by the farmers. Bayer went so far as to cite an “Act of God” and blame farmers themselves to cover up for its own negligence.³⁷

Fortunately, US rice farmers have received at least partial compensation for their losses. According to news reports collected by CFS, Bayer paid out nearly \$200 million to farmers and rice companies in court decisions and out-of-court settlements through October 2010. Failing to win even a single court battle, Bayer was forced to capitulate. In a settlement announced on 1 July, 2011, Bayer agreed to pay out USD 750 million to about 11,000 farmers who had suffered losses from the LLRICE contamination debacle.³⁸

This ‘catastrophe’ for US rice farmers is only one instance of major economic damage being inflicted by the GE industry. Thanks to GE, American farmers have already suffered the loss of their corn export market to the EU, worth hundreds of millions of dollars annually. US soybean exports to the EU, formerly America’s most lucrative overseas market, have fallen substantially, while soybean meal exports to the EU have “dropped to almost economically insignificant levels”.³⁹

LLRICE601 contaminated local rice varieties and rice products and as a result, exposed thousands of unsuspecting consumers in 32 countries to potential adverse health impacts, hurt the livelihoods of rice farmers and traders, resulted in environmental harm to local rice biodiversity, and cost countries a lot of money and time in handling and containing the contamination at the national level.

Perhaps the title of a news report by the Associated Press news agency sums up the US rice growers’ feelings best: “Biotech instills fear and loathing in California rice belt”.⁴⁰ The false promise that the GE industry held out to secure the world’s food supply has turned out to be a bitter harvest indeed.

Adapted and updated in July 2011. The original article was a PAN AP Rice Grains booklet “Liberty Link Rice: A True Story of Science Fiction” written by Rash Behari Bhattacharjee, 2007. Our sincere thanks to the Center for Food Safety, USA, for its valued review and input.

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