Farmer spraying Bt crops with chemical pesticides, Andhra Pradesh, India.

food sovereignty

who benefits from gm crops?

an industry built on myths

february 2011 | issue 121

40 years
Friends of the Earth International

who benefits from gm crops?

an industry built on myths

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friends of the earth international is an international federation of diverse grassroots-based environmental organizations with over 2 million members and supporters around the world. We challenge the current model of economic and corporate globalization, and promote solutions that will help to create environmentally sustainable and socially just societies.

our vision is of a peaceful and sustainable world based on societies living in harmony with nature. We envision a society of interdependent people living in dignity, wholeness and fulfilment in which equity and human and peoples' rights are realized.

This will be a society built upon peoples' sovereignty and participation. It will be founded on social, economic, gender and environmental justice and free from all forms of domination and exploitation, such as neoliberalism, corporate globalization, neo-colonialism and militarism.

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(Please contact the FoEI Secretariat or check www.foei.org for FoE groups' contact info)

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food sovereignty

Friends of the Earth International adheres to the definition of food sovereignty (established by the Nyeleni Forum on Food Sovereignty in 2007) as the right of all peoples to healthy and culturally appropriate food produced through ecologically sound and sustainable methods, and their right to define their own food and agriculture systems.

Food sovereignty puts those who produce, distribute and consume food at the heart of food systems and policies, rather than the demands of markets and corporations. It defends the interests and inclusion of the next generation. It offers an alternative to the current trade and food regime, and directions for food, farming, pastoral and fisheries systems determined by local producers. Food sovereignty prioritises local and national economies and markets and empowers peasant and small-scale sustainable farmer-driven agriculture, artisanal fishing, pastoralist-led grazing, and food production, distribution and consumption based on environmental, social and economic sustainability.

Harvesting organic rice.

executive summary

This report analyses major new developments regarding genetically modified organisms (GMOs) in various regions around the world, including new evidence and testimony from Friends of the Earth International's member groups. In this 2011 edition, we focus particularly on pesticide use, increasing public and legal opposition to GMOs, and the biotech industry's move into breeding and attempting to release genetically modified animals.

The biotech industry and its sponsors generate considerable hyperbole about the benefits that GMOs provide to farmers, consumers and the environment. Every year the International Service for the Acquisition of Agri-Biotech Applications (ISAAA) issues an annual report on genetically modified (GM) crops, but these tend to be based on creative accounting and baseless plaudits.

ISAAA states that it is a not-for-profit, international organisation that shares the benefits of crop biotechnology with various stakeholders including, in particular, poor farmers. Yet ISAAA is partly funded by biotech corporations such as Monsanto and Bayer Crop Science, as well as pro-GM US government bodies, and its data is characterised by exaggerated and unsubstantiated claims about the successes of GM crops. It ignores increasing evidence showing that GM crops do not generate higher yields or help to solve hunger but are actually increasing pesticide use, contaminating seeds and food, and destroying poor famers' livelihoods because of high costs and monopolies.

public opposition

In Europe, public opposition to GMOs is rising and the area of agricultural land dedicated to GM crops is declining. 61% of EU citizens are opposed to GMOs. The area planted with GM crops declined by 23% between 2008 and 2010. GM crop bans on Monsanto's MON 810 maize are now in place in France, Germany, Austria, Greece, Hungary and Luxemburg,[1] and there is a *de facto* ban on all GM crops in Bulgaria. The European Commission's 2010 approval of a new GM potato, Amflora, resulted in bans on the potato in Austria, Luxembourg and Hungary.

Opposition is also building in the US, the largest grower of GM crops. Two recent legal rulings have forbidden the planting of GM alfalfa, and ordered the destruction of GM sugar beet seedlings. Furthermore, Bayer, which is responsible for contaminating rice crops and causing major harm to non-GM rice farmers in 2006, is now losing court cases and being forced to pay compensation.

In India, this rejectionist trend is also evident, and is clearly illustrated by the moratorium imposed on the commercial release of Bt brinjal, in place since February 2010. GM rice trials are also being opposed by peasant farmers, who have torn up field trials in protest against the move to commercialise this vital food crop.

In July 2010, in response to civil society organisations who had highlighted the lack of impact assessments, the Federal Court of Paraná, in Brazil, suspended the commercial release of Bayer's GM maize, Liberty Link, thereby preventing cultivation of this GM maize variety across Brazil.

Farmers and local communities have also expressed strong opposition to GM crops in various regions of Uruguay, including the Department of Montevideo, which has enacted a precautionary measure on GM crops. Furthermore, in the province of Santa Fe, Argentina, local residents who have been adversely affected by the aerial spraying of glyphosate (Roundup) over GM soy crops, won a lawsuit banning the use of Roundup and other agrochemicals near homes.

Brinjal diversity.

Carrying petitions against Bt Brinjal.

executive summary

continued

gm patrons

The biotech sector is marred by public discontent and fails to deliver on its promises of new traits of nutrient-enhanced and climate-resilient crops to address the twin challenges of malnutrition and climate change. Who, then, is backing this ineffective and dangerous technology?

The US government, in close collaboration with Monsanto, is a key proponent. Its forceful promotion of GMOs was recently exposed by Wikileaks. Spain, as the only significant grower of GM crops in Europe, has struck an alliance with the US, with a view to persuading other EU Member States to adopt GMOs and repeal current bans. The US has threatened retaliatory measures against France who, along with other European countries, has been listening to its citizens' concerns about GMOs.

The US, in collaboration with the World Food Program and corporations such as Monsanto, has also provided food aid to Guatemala that was found to contain unauthorised GMOs, a threat to people's food sovereignty. Latin American Southern Cone governments are also allowing local agribusiness elites and Northern biotech corporations to gain further control over food and agriculture in those countries, with devastating social and environmental consequences, particularly from high levels of herbicide use.

In Africa, the Bill & Melinda Gates Foundation is funding the Alliance for a Green Revolution (AGRA), providing large amounts of funding for agriculture projects in Africa. It has also acquired shares in Monsanto, which is aggressively trying to capture the seed market in Africa with corporate-owned seeds and pesticides. Scientists, farmers and civil society organisations in Nigeria are resisting an unpopular draft Parliamentary Bill, which would help secure an important market in Africa for GM crops. Even before proper consultations have taken place, GM nutritionally enhanced cassava is undergoing trials, without taking into account the decade of controversy that has surrounded nutritionally enhanced GM 'golden' rice.

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Haitian protests against Monsanto and GMOs.

pesticides

One of the myths about GM crops is that insect resistant and herbicide tolerant crops reduce pesticide use. In fact, evidence from the US shows a dramatic rise in pesticide usage, driven particularly by the use of Monsanto's glyphosate-based herbicide, Roundup, on GM herbicide tolerant crops.

Despite this, farmers and communities across the US are suffering the impacts of 'superweeds' that have developed tolerance to herbicides that are supposed to kill weeds without damaging the crop. In response, corporations have developed yet more GM crops, which can resist other toxic pesticides, which were set to be phased out in the US, such as 2,4-D. These crops are currently awaiting approval.

Recent research also links glyphosate herbicides to miscarriages, cancer, and damage to DNA and reproductive organs. This reinforces local community testimonies from Argentina about the harmful effects of herbicides and agrochemicals on their health and environment.

gm animals

In the US, a crucial decision is currently under consideration to approve genetically modified (GM) Atlantic salmon as food, which would make it the first ever GM animal approved for human consumption. This fast-growing transgenic fish – with genes taken from two different fish species – could threaten wild salmon stocks, imperil biodiversity, and adversely affect fishing community livelihoods and consumer health.

Applications for the commercialisation of genetically engineered pigs for human consumption are also pending in Canada and the US. Their DNA has had genes inserted from mice and *E.coli* bacteria to reduce the level of phosphorous in their manure. Also awaiting approval are genetically modified *Aedes aegypti* mosquitoes in Malaysia, which raises another array of safety, legal and ethical concerns.

In this report you can also read about how farmers, NGOs, local communities and consumers in West Africa, Uruguay, Brazil, Argentina, India, Malaysia, Australia, the US and across Europe are opposing GMOs through legal actions including bans and moratoria, petitions, lobbying, and direct action against field trials.

footnote

1 All of these countries have banned Monsanto's GM maize MON 810.

one genetically modified crops – an industry built on myths

genetically modified crops – an industry built on myths

The biotechnology industry secures funding from a vast array of public and private sources promising to combat hunger, poverty, malnutrition and now even climate change. Yet large-scale cultivation of GM crops is still limited to six countries, with the vast majority of these crops grown for fibre, industrial agrofuels and animal feed, not feeding people.

No new beneficial traits of GM crops have been successfully commercialised by the biotech industry despite persistent assurances about the development of drought resistance[2] and nitrogen fixation, through to the availability of enhanced nutrients and a reduced need for fertiliser.[3] Most 'new' GM crops turn out to be existing herbicide tolerant and insect resistant gene traits stacked in a single modified crop.

In fact insect resistance and herbicide tolerance are the only two traits that have been developed and cultivated on a large scale, purportedly to reduce pesticide usage. According to ISAAA, 99% of commercially grown GM crops are still herbicide tolerant or insect resistant.[4] In the EU, 43 out of 49 applications for GM cultivation are for herbicide tolerant or insect resistant varieties.[5] 15 out of 23 pending applications in the US are also for herbicide tolerance or insect resistance.[6]

creative accounting

ISAAA annual reports tend to be over-reliant on industry data, contain inaccurate statistics, and have few or unclear sources. They also cite their own chair, Clive James.[7] ISAAA inflates its figures through double and triple accounting, by using its concept of 'virtual hectares', which involves multiplying the actual surface area with the number of GM traits in crops. In this way a field of one hectare in size, growing a GM crop that is tolerant to two herbicides and has an insect resistant gene, counts as three hectares.[8]

few crops in few countries

GM crop cultivation is confined to just a few countries around the world. 95% of GM crops are cultivated in the US, Brazil, Argentina, India, Canada and China. The other 19 countries (out of a total of 25) that the ISAAA reports on collectively grew a mere seven million hectares.[9] Almost 60% of all GM crop field trials worldwide are carried out in the US.[10]

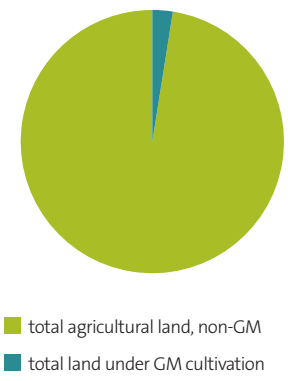
According to ISAAA's annual report 2009, GM crops occupy 134 million hectares.[11] This is out of a total area of global agricultural land of over 4.9 billion hectares,[12] meaning that the combined area of all GM crops in 2009 covered just 2.7% of all agricultural land. Over 97% of global farmland remains GM-free.

Despite public and private investment for over three decades, GM crops have also failed to address global food security concerns,[13] or to consistently raise yields.[14]

Just four crops - soya, maize, oilseed rape and cotton - dominate almost all the production on land under GM cultivation. Staple food crops such as wheat, rice, cassava, barley, oats, sorghum and millet are GM-free as far as commercial production is concerned. The cultivation of GM potatoes for industrial use in Europe is marred by controversy.

Despite PR by biotech companies and pro-GM research institutes, acceptance of GM crops is in fact declining, even in the countries that have historically cultivated the largest areas of GM crops. In the US, a hugely pro-GM country, GM alfalfa has been banned from commercial cultivation[15] and sugar beet seedlings were ordered to be uprooted due to inadequate environmental impact assessments,[16] and in India, Bt brinjal - its first GM food crop - remains banned.[17] In Brazil the commercial release of Bayer's GM maize has been stopped.[18] In Europe concern about GM food is on the increase, while the area under GM cultivation continues to fall.[19]

FIGURE 1 **GM CROPS AS A PROPORTION OF GLOBAL AGRICULTURAL LAND**



one genetically modified crops – an industry built on myths

continued

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Bt cotton, India.

In its 2009 report, ISAAA states that 14 million small and large farmers, 90% of whom are described as resource-poor, benefit from biotech crops.[20] These unsubstantiated claims ignore widespread resistance to GMOs including by farmer mass movements such as La Via Campesina, which has a global membership of 200 million.[21]

footnotes

2 Instead conventional breeding has resulted in a maize variety with higher yields in water-limited environments. Reuters, (2010) *DuPont says new corn seed yields better in droughts*, http://www.reuters.com/article/idUSTRE7043JK20110105

3 Friends of the Earth International (2010), *Who Benefits from GM crops: The Great Climate Change Swindle*, http://www.foei.org/en/resources/publications/pdfs/2010/who-benefits-from-gm-crops-2010
A FAO report in 2005 also explains why genetic modification for nitrogen fixation is so difficult: "Nitrogen-fixation has long been a desired yet elusive 'green' biotechnology. However, the objective of improving-plant- Rhizobium symbiosis or other associations is not easy to achieve due to the complexities of the relationships, the multiplicity of factors involved, the specificity of the interaction between the two organisms, the influence of the environment on the system of expression and the possible competition between beneficial and other soil microflora." (FAO, 2005) FAO (2005). *Status of Research and Application of Crop Biotechnologies in Developing Countries. Preliminary Assessment*. FAO Rome ftp://ftp.fao.org/docrep/fao/008/y5800e/y5800e00.pdf

4 James, Clive, ISAAA briefs 41 *Global status of Commercialized biotech/GM Crops: 2009*, table 43, http://www.isaaa.org/purchasepublications/itemdescription.asp?ItemType=BRIEFS&Control=IB041-2009

5 GMO Compass Database (2010). http://www.gmo-compass.org/eng/gmo/db/

6 USDA, *Petitions for Nonregulated Status Granted or Pending by APHISas of December 28, 2010* http://www.aphis.usda.gov/biotechnology/not_reg.html

7 For instance, the online PowerPoint presentation of the 2008 Global Status Report simply cites the source as "Clive James 2008" (Clive James is the Chair of ISAAA). For more information on ISAAA's creative use of GM data, see http://www.foei.org/en/resources/publications/pdfs/2010/who-benefits-from-gm-crops-2010

8 ISAAA Executive Summary - Brief 41 2009, Executive Summary, http://www.isaaa.org/resources/publications/briefs/41/executivesummary/default.asp

9 ISAAA Executive Summary - Brief 41 2009, Executive Summary, http://www.isaaa.org/resources/publications/briefs/41/executivesummary/default.asp

10 Stein, A, Emilio Rodríguez-Cerezo, E. (2009), *What can data on GMO field release applications in the USA tell us about the commercialisation of new GM crops?* ftp://ftp.jrc.es/pub/EURdoc/JRC52545.pdf

11 ISAAA Executive Summary - Brief 41 2009, Executive Summary, http://www.isaaa.org/resources/publications/briefs/41/executivesummary/default.asp

12 FAO (2009), *FAO Statistical Yearbook 2009*, FAO Rome http://www.fao.org/economic/ess/publications-studies/statistical-yearbook/fao-statistical-yearbook-2009/a-resources/en/

13 Dunwell J. M. and Ford C.S. (2005). *Technologies for Biological Containment of GM and non-GM crops. Defra Contract CPEC 47*, http://www.gmo-safety.eu/pdf/biosafenet/Defra_2005.pdf

14 Gurian-Sherman, Doug (2009). *Failure to Yield: Evaluating the Performance of Genetically Engineered Crops*. Union of Concerned Scientists, http://www.ucsusa.org/food_and_agriculture/science_and_impacts/science/failure-to-yield.html

15 Supreme Court of the United States (2010), Monsanto co. *et al.* v. Geerston Seed Famers *et al.*, 21 June 2010 http://www.supremecourt.gov/opinions/09pdf/09-475.pdf

16 Centre for Food Safety, *Orders Regarding the Remedies on Plaintiffs' Motion for Preliminary Injunction*, Centre for Food Safety *et al* v. Vilsack, 29 October 2010 Centre for Food Safety *et al* v. Vilsack, 30 November 2010. http://www.centerforfoodsafety.org/wp-content/uploads/2010/11/SBII-ORDER-granting-preliminary-inj.pdf

17 Ministry of Environment and Forests, Government of India, *Decision of Commercialisation of Bt-Brinjal*, 9 February 2010 http://moef.nic.in/downloads/public-information/minister_REPORT.pdf

18 Press release by AS-PTA, *Brazilian court suspends release of Bayer's GM maize*, 28 July 2010 http://www.cbgnetwork.org/3483.html

19 EFSA (2010), *Special Barometer 354, Food-Related Risks Report*, November, 2010 http://www.efsa.europa.eu/en/factsheet/docs/reporten.pdf

20 ISAAA (2009b). ISAAA Brief 41-2009: *Global Status of Commercialized Biotech/GM Crops: 2009*, http://www.isaaa.org/resources/publications/briefs/41/executivesummary/default.asp

21 La Via Campesina is the world's largest peasant movement and has a global membership of around 200 million farmers worldwide. www.viacampesina.org

two gm crops in europe

gm crops in europe

The area dedicated to GM crop cultivation in Europe, which is limited to MON 810 maize and the 'Amflora' potato, has fallen steeply over the last two years. At the same time popular opposition to GMOs in the EU has increased to 61%.[22] These concerns over GM contamination are warranted, and new cases of GM potato contamination have also led to bans:[23] the 2010 approval of a new GM potato by the European Commission has resulted in bans on the potato in Austria, Luxembourg and Hungary.

However, whilst these are the only two GM crops permitted for cultivation in Europe, a number of GMOs are approved for feed and food imports. The feed industry is currently exerting pressure on the EU to repeal its zero tolerance regulation of non-approved GM feed and food. Furthermore, the European Food Safety Authority (EFSA), which assesses the risks associated with GMOs with respect to food and feed safety, has had its close relationship with biotech corporations exposed.[24]

2.1 gm cultivation declining in europe

As the biotech industry continues to be hit by legal proceedings, scandals and public concern over the safety of GM crops, their cultivation continues to fall in the European Union. Between 2008 and 2010, the total area under GM crops has declined by 23% (see Table 1). In Romania, the area under cultivation declined by 87%, in Slovakia by 55% and in Czech Republic by 42% (see Table 1).

Over 80% of the total area of land dedicated to growing GM crops in Europe is in Spain, which cultivates Monsanto's GM maize MON 810. Even within this exceptionally GM-receptive European country, official data shows there was a 15% drop over two years, with 11% of that drop taking place between 2009 and 2010 (see Table 1).

In Spain, GM crops have contaminated conventional and organic maize, and the human food chain, which has in turn had negative economic impacts and resulted in some of the largest ever demonstrations against GM crops in Europe.[25] Yet new evidence shows the Spanish Government collaborating with the US to push for greater acceptance of GM crops in Europe.[26]

TABLE 1 **GMO CULTIVATION IN EUROPEAN COUNTRIES IN 2008-10**

COUNTRY	2008 (ha)	2009 (ha)	2010 (ha)	CHANGE OVER TWO YEARS
Spain[a]	79,269	76,057	67,726	-15%
Portugal[b]	4,856	5,202	4,869	0.3%
Romania[c]	6,130	3,244	823	-87%
Germany[d]	3,173	30	28	-99%
Czech Republic[e]	8,380	6,480	4,830	-42%
Slovakia[f]	1,931	875	875	-55%
Poland[g]	3,000	3,000	3,000	-0%
Sweden[h]	0	0	103	100%
Total	**106,739**	**94,888**	**82,254**	**-23%**

Sources:

a: Official government figures 2010
www.mapa.es/agricultura/pags/semillas/estadisticas/serie_maizgm98_06.pdf

b: Official government figures 2010
http://www.dgadr.pt

c: INFO MG 2010
http://www.infomg.ro/web/en/GMOs_in_Romania

d: Official government figures 2010
http://apps2.bvl.bund.de/stareg_web/bundeslandStatistic.do?page=/bundeslandStatistic.do&language=de&year=2010
No maize MON 810 cultivation since Germany's national ban in April 2009, now only GM Amflora potato crops.

e: Press Release from the Czech Ministry of Agriculture, 25 November 2010.
http://eagri.cz/public/web/mze/zemedelstvi/gmo-geneticky-modifikovane-organismy/geneticky-modifikovane-plodiny-jsou.html
In 2010 MON 810 Bt corn was grown on 4,680 ha and Amflora potatoes on 150 ha (it is the only country in the EU that grows both). It acknowledges the fact that there has been a decrease in acreage of Bt corn since 2009 due the fact that it is difficult to market it.

f: Data from 2009 as no new data is available for 2010, personal correspondence with Daniel Lesinsky, CEPTA, Centre for Sustainable Alternatives. Data used is from www.polnoinfo.sk

g: This assumes no change throughout 2010. There are no official government figures in Poland. According to an article in daily Rzeczpospolita (20 January 2010) quoting the estimates of the Polish Association of Maize Producers (Polski Zwiazek Producentow Kukurydzy) in 2009, the total acreage of MON 810 was 3000 ha.
http://www.rp.pl/artykul/422200.html

h: Official government figures, 2010
http://www.jordbruksverket.se/amnesomraden/odling/genteknikgmo/kommersiellanvandning/kommersiellodlingochhandel/kommersiellodlingiar.4.7e1323431288aff333480001901.html

two gm crops in europe

continued

2.2 public opposition increasing

The decline in area under GM crops is a result of years of public opposition, which is increasingly being backed up by independent scientific opinion.[27] Governments have heeded widespread health and environmental concerns by banning GM crops. Six countries across Europe have now banned the main EU-authorised commercial crop, Monsanto's GM maize MON 810. France, Germany, Austria, Greece, Hungary and Luxemburg have all put in place bans on GM maize MON 810, based on health and environmental concerns. In February 2010, Bulgaria also initiated a total ban on GMOs.[28]

The tide of public rejection of GMOs is sweeping across Europe, with 169 regions, 123 sub-regional provinces and departments, and 4,713 local governments officially declaring themselves GMO-free zones.[29]

The latest Eurobarometer, published by the European Commission in October 2010, showed that 61% of EU citizens are opposed to GMOs, an increase over the previous year.[30] In December 2010, a petition with signatures from over one million EU citizens was delivered to the European Commission, calling for a GMO moratorium and the creation of an independent, scientific and ethical body to test and regulate GM crops.[31] This appeal followed the requirements of a new legal process, the European Citizens' Initiative,[32] and is a landmark event.

2.3 patent decision

Along with the national bans, another recent successful development for consumers and farmers is the European Patent Office's (EPO) decision that essential biological methods of breeding plants and animals cannot be considered a technical process to be covered by patents.[33] Patents on plants and animals block innovative breeding and weaken the independence of farmers and consumers, whilst allowing multinationals to take control over global food production.

This 70-page decision was reached after arguments were considered from both patent owners and their opponents, concerning attempts to patent the biological processes of tomato and broccoli plants. This decision delivers a major blow to the biotech corporations, who have been using broad legal definitions of patents to gain control over farming and the food chain. Nevertheless conventionally bred plants and animals can still be patented in Europe, since the EPO decision only excludes processes for breeding; it does not concern itself with patents on plants and animals more generally. Still, this is a success for the international coalition against patents on seeds, which is supported globally by over 300 NGOs and farmers' organisations.[34]

Pigs feeding on animal feed that contains GM soya beans.

Feed for dairy cattle.

2.4 gm potato contamination scandals

Europe is the only region in the world that allows the commercial cultivation of GM potatoes. In March 2010, the new European Health Commissioner John Dalli authorised BASF´s GM 'Amflora' potato, for the production of industrial starch and as animal feed.

In addition to that, Amflora is allowed to contaminate food up to a threshold of 0.9% – even without being approved for human consumption. This is unprecedented and a concession to biotech company BASF (since it protects BASF against product recalls and liability). So far the contamination threshold of 0.9% has only been applied to GMOs authorised for human consumption (and only if the contamination is accidental and technically unavoidable). According to BASF´s own admission, it would not be possible to prevent Amflora entering the human food chain.[35] Since the authorisation, its cultivation has been characterised by contamination scandals, public opposition and judicial proceedings initiated by five European governments.

In 2010, Amflora was grown only in Sweden (103 hectares), Germany (15 hectares) and the Czech Republic (150 hectares).[36] In Sweden and Germany, Amflora was grown to gain propagation material for the next cultivation season; in the Czech Republic, it was grown for industrial use. Even in the year following approval for commercial cultivation, the GM potato sparked a scandal in Sweden, when an illegal variety of potato 'Amadea', also created by BASF, was found in a field of Amflora potatoes. BASF claimed this mistake was because of Amadea and Amflora potatoes being in close proximity in their facilities. This resulted in 16 of the total 103 hectares of Amflora potatoes being destroyed.[37]

The Amflora[38] potato has been banned by Austria, Luxembourg and Hungary because of the presence of an antibiotic resistance marker (ARM) gene. There are concerns that this gene could transfer horizontally into pathogenic bacteria, which would worsen the problem of antibiotic resistance in veterinary and human medicine.

The governments of France, Poland, Luxembourg and Austria have also supported Hungary's legal complaint against the approval of this potato, submitted to the European Court of Justice.[39] Under EU law plants with antibiotic-resistant genes are supposed to be phased out because they jeopardise human health.[40]

In July 2010, the legal case against GMOs was strengthened further when the French High Council of Biotechnologies also called into question the legality of the commercial authorisation of the GM potato.[41]

2.5 eu animal feed imports

While GM MON 810 maize and the Amflora potato are the only GM crops authorised for cultivation in the EU, there are around 40 GMOs approved for feed and food imports.[42] Imports of GM animal feed into Europe are the main method of entry for GMOs into Europe.

Currently, animal products from animals fed on GM crops do not have to be labelled, although due to consumer demand some European dairy and meat companies and retailers have started voluntarily labelling their products as GM-free, in the UK, Austria, Germany, and France.[43] In fact non-GM soya cultivation in Brazil could also increase in response to European consumers' rejection of GMOs.[44]

pressure to drop the eu´s zero tolerance policy for non-approved gm feed and food

Alarmingly, both the GM industry and the animal feed industry are pushing for the acceptance of thresholds in the EU, in relation to GMOs that have not been approved, and are currently treated as illegal. This attempt to repeal the EU's 'zero tolerance policy' with respect to unauthorised GMOs started in 2007, after soy shipments from the US were discovered to contain non-approved GM maize.[45]

Claims that this policy is causing a crisis by disrupting trade in animal feeds when contamination is discovered are not evidence based. In June 2007, the European Commission's DG Agriculture predicted a dramatic decline in pork and poultry meat production within the EU because soya would not be available to EU farmers, or only at exorbitant prices.[46] But 2009 and 2010 turned out to be record-breaking years, with the highest ever number of pigs and poultry sold on the market. [47]

The number of contamination incidents and the amount of contaminated animal feed has been so low that it cannot be argued that the EU zero tolerance policy has caused any kind of animal feed crisis. Of all soy imports used as animal feed (for livestock and pets) a maximum of 0.2% contained EU non-approved GMOs, and these shipments were from the US.[48] According to the EU's Rapid Alert System on Food and Feed (RASFF) data, the two other main producers of GM soy – Brazil and Argentina – have not caused a single contamination case.[49]

In reality the feed crisis is due to a global rise in commodity prices including soy, and the only sustainable long-term solution would be for Europe to free itself from dependency on imported soya.[50]

two gm crops in europe

continued

2.6 european food safety authority's revolving doors

The European Food Safety Authority (EFSA) GMO Panel is responsible for the risk assessment of GMOs, but close associations between some of its members and the biotech industry are undermining its credibility.

In November 2009, former head of EFSA's GMO Panel, Suzy Renckens, became Head of Biotech Regulatory Affairs for Europe, Africa and Middle East (EAME) at Syngenta after leaving EFSA. Renckens was previously responsible for GMO regulation, but now lobbies for Syngenta to influence EU decision-making on GMOs. This stark example of conflict of interest has never been investigated and casts doubts over the independence of EFSA.[51] Unfortunately, this is not a unique case.

Harry Kuiper, a leading scientist who has chaired the EFSA GMO panel since 2003, worked for a Task Force established by the International Life Sciences Institute (ILSI) before joining EFSA. ILSI is a strongly pro-biotech lobby group funded by food and chemical companies.[52] A Monsanto member of staff heads this Task Force and all other members are representatives from large biotech corporations such as Monsanto, Dow and Syngenta.[53]

In October 2010, Diana Banati, the chair of EFSA's management board, resigned from the European board of directors at ILSI after complaints of conflicts of interest from politicians and NGOs.[54]

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three gm crops in latin america

gm crops in latin america

southern cone (argentina, uruguay and brazil)

In the Southern Cone of South America GM technology has been forced through, primarily due to the power of agribusiness, in one of the largest agricultural reserves in the world. GM crops and their accompanying pesticides are an integral part of an unsustainable agribusiness model that is increasing corporate control over the food chain, from seeds to supermarkets. These developments are triggering conflicts and public opposition throughout the region.

3.1 new approvals

In 2010, the National Technical Biosafety Commission of Brazil (CTNBio) approved the commercial release of eight new transgenic 'events' or 'traits' in Brazil, one in cotton, three in soy, and four in maize, all with herbicide tolerant and insect resistant traits, or stacked with both.[55] This Commission has granted the largest amount of commercial authorisations in the region, 27 GM events in total.

CTNBio is a technical commission within the Brazilian Ministry of Science and Technology, and is comprised of experts in a range of fields related to GMOs. It is the only technical commission in the Southern Cone region with the authority to make decisions regarding the release of GM crops. It adopts decisions through a simple majority. This allows the views of the representatives of the Science and Technology Ministry to be prioritised over the opinions of other ministries, such as those dealing with environment, health, and agrarian development, and those of civil society representatives.[56]

In Argentina, three new GM maize events were authorised for commercial release in 2010. Other GMOs, which were not authorised for commercialisation within the country, were still authorised for the production of GM seeds for export.[57]

In Uruguay, no new commercial events were permitted but testing has been authorised for the inclusion of four new maize and two new soy events in the National Crop Assessment (which is a pre-requisite for the commercial release of events). The National Biosafety Cabinet also authorised the production of soy seeds containing three new events for export. As in Argentina, these have not so far been authorised for commercial use.[58]

3.2 area planted with gm crops

The area planted with soy in 2010/11 in these three countries is expected to be similar to that during 2009/10. In 2009/10, 23.5 million hectares of soy were planted in Brazil,[59] out of which 70%, or 16.5 million hectares, was under cultivation with GM soy.[60] In Argentina, 18.3 million hectares of soy were planted,[61] almost all with GM seeds. In Uruguay, soy covered 860,000 hectares, almost all of which was GM.

In 2009/10, there were 13 million hectares planted with maize in Brazil, out of which four million were GM crops, according to Brazil's Council for Biotechnology Information (CIB).[62] In Argentina, out of the 3.7 million hectares planted with maize, 2.7 million were planted with GM maize, according to pro-biotech organisation, ArgenBio.[63] In Uruguay, around 90,000 hectares were planted during this period, and 80% (approximately 70,000 hectares) were GM.[64]

In terms of cotton, 134,000 hectares of GM cotton were planted in Brazil, out of a total area of 835,000 hectares;[65] and 456,000 hectares of GM cotton were planted in Argentina, out of a total area of 490,000 hectares.[66]

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Soy beans, Rio Grande do Sul, Brazil.

three gm crops in latin america

continued

3.3 adoption or imposition of technology?

Mato Grosso state is the largest soy producer in Brazil. A study conducted by the state agency CONAB (the National Supply Company) in the Sorriso municipality, showed that in 2010/11, the cost of growing GM soy is turning out to be higher than that of conventional soy.[67]

In November 2010, in Mato Grosso, Brazil, the state agricultural research company Embrapa, together with the Association of Mato Grosso Soy Producers (Aprosoja) and the Brazilian Association of non-GM grain producers (Abrange), launched the Free Soy Program (Programa Soja Livre) to increase the distribution of conventional seeds and eventually reduce the cultivation of GM soy. This will ensure availability: in past years, the use of non-GM soy seeds had dwindled (going from 58% in 2008/09 to 40% in 2010/11) due to a lack of supply, as national seed-producing companies were absorbed by Monsanto and other GM seed corporations.[68]

In Uruguay, almost all maize seeds are imported. According to the National Institute of Seeds, in 2009 90% of these were GM.[69] If we take into account that the provisions in force in Uruguay require that at least 10% of the area of a field be planted with non-GM maize, one can infer that non-GM seeds are being imported merely to comply with this provision. As a result, farmers are unable to secure access to conventional seeds in the domestic market.[70]

3.4 threats posed by glyphosate

Criticism of biotechnology is unwelcome. On 7 August 2010, for example, Dr. Andres Carrasco's open lecture to the La Leonesa community, in the Chaco Province in Northern Argentina was violently interrupted. A group of municipal officers and rice workers in favour of pesticide sprayings, led by the mayor, José Carbajal, threatened and beat up part of the delegation that had joined the speaker. Local police and military officers had to intervene.[71]

This stems from Carrasco's research into GM technologies. In April 2009, Carrasco, a professor and researcher at the Buenos Aires University, became internationally renowned when he publicised research exposing the fact that glyphosate, the main element of Monsanto's Roundup herbicide, is linked to the malformation of amphibian embryos and could have severe negative impacts on human health.[72]

Glyphosate has been qualified as innocuous by agribusiness researchers and managers. However, in August 2010, the studies conducted by Carrasco and his team were published in the scientific journal Chemical Research in Toxicology,[73] triggering a debate on this widely used herbicide's impact on health and ecosystems. Dr Carrasco has been subjected to a campaign to discredit him.[74]

3.5 research and testimony condemn monsanto's glyphosate

In September 2010, Professor Carrasco and other international scientists published further research – based on studies from across the Americas – that links glyphosate to premature births, miscarriages, cancer, and damage to DNA and reproductive organs.[75]

These research findings support widespread anecdotal evidence and the testimony of local people who have suffered negative impacts associated with the spraying of glyphosate (Roundup) over Monsanto's GM Roundup Ready (RR) soy in Argentina.[76] One interviewee, Viviana Peralta from Santa Fe, Argentina, had to rush her new-born baby daughter, Ailen, to hospital after she turned blue when Roundup and other agrochemicals were sprayed on GM soy near their home. Peralta and other residents then filed and won a lawsuit against the soy producers, banning the spraying of Roundup and other agrochemicals near houses in Santa Fe.[77]

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Soya field with Roundup transorb label, a herbicide produced by the US company Monsanto, Rio Grande do Sul, Brazil.

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Production of soy bean flour, Brazil

3.6 actions to oppose the advance of gmos

In July 2010, the Federal Court of Paraná, Brazil accepted a request from a coalition of NGOs[78] and suspended the commercial release of Bayer's GM maize, Liberty Link, due to the lack of both a plan to monitor the impacts of such a release (as demanded by Brazilian law) and impact assessments on potential negative effects on eco-systems. This ruling makes it illegal for Bayer to commercialise this maize anywhere in Brazil.

Since 2007, civil society organisations have been denouncing CTNBio for blocking access to the processes of authorisation, in violation of the right to information. This ruling vindicates the charge that CTNBio has acted inappropriately when authorising GM crops.[79]

3.7 community resistance to gmos in uruguay

In response to the Uruguayan government's inaction with respect to managing the risks associated with GM crops, local community based organisations have begun to take initiatives to address these risks in areas where GM crops are being grown. In Cuchilla de Rocha, in the province of Canelones, for example, a movement of producers and local people has evolved to counter the advance of large-scale soy crop farming in a region of family-based producers. They succeeded in their efforts to persuade the mayor to create a Special Commission to study the use of rural lands in Canelones. In August 2010, this Commission recommended the implementation of precautionary measures for a period of eight months and bans on GM crops in their locality. In response to this recommendation, a series of organizations representing the interests of agribusiness expressed their opposition. The Commission's recommendations have yet to be met.[80]

Community-led initiatives against GMOs are also having a major impact elsewhere in Uruguay. In 2009, the people and producers from the area of Arroyo Carrasco, who opposed the growing of GM crops, took action, resulting in a precautionary measure being enacted by a district court that established a ban on GM crops in the department of Montevideo.[81] In September 2010, following civic opposition to the advance of soy, the Atlantida municipality issued a statement rejecting GM crops and calling for departmental legislation to ban GM crops in Canelones.

guatemala: the risks of gmos in food aid

Guatemala lies at the heart of a region that has traditionally cultivated maize, but is currently in the grip of a food security crisis as it struggles to address changes in the global market and climate change-related events.[82]

According to the Guatemalan Human Rights Office (PDH), the Ministry of Agriculture, Livestock and Food has not enough grain reserves on stock to help the vulnerable population who lost their crops in 2010.[83]

As in previous years, the Guatemalan government, through various institutions, will administer funds and donations to solve the food problems that many families throughout the country are facing. One of the measures taken to address the lack of staple grains is the delivery of food aid, including grains and flours produced with soy and maize.

However, as long ago as 2005, several organisations from the Central American Alliance in Defence of Biodiversity, of which Friends of the Earth Guatemala / CEIBA is a member, warned about the presence of GMOs in food aid coming from the US and the UN's World Food Program (WFP). That same year, in samples tested from the flours distributed by the WFP, varieties of GM maize GA21 (Syngenta),[84] NK603 (Monsanto's Roundup Ready), Herculex (Du Pont's Bt variety), Bt11 (Syngenta), and Roundup Ready GM soy were all found.[85] The presence of Starlink maize (Aventis) in grains distributed by the WFP was also confirmed. In the US, Starlink was approved for animal use only, due to its potential to provoke allergic reactions.

This event opened the door for a debate on the safety of food aid, and the danger that GM maize seeds, such as Starlink, could end up being grown in peasant farmers' fields because of a lack of native seeds. This would also put local varieties at risk due to the potential transfer of genes from GM plants.[86]

Even though the US Embassy questioned the results of the testing and the WFP ignored them at the time, social pressure to keep GMOs out of food aid led to a drastic reduction of GM contents in donated flour and grain. In 2009, the REDSAG (Food Sovereignty Network from Guatemala) and FoE Guatemala / CEIBA, tested new samples of food aid flour, and Monsanto's Roundup Ready maize NK603 was found, but no contamination was found in the actual maize grain tested.[87]

3.8 feed the future

Seed companies like Monsanto are also showing considerable interest in food security programs in countries such as Guatemala, Honduras, Nicaragua, and Haiti. This is demonstrated by their involvement in such programs including Feed the Future, the US government's global hunger and food security initiative.[88] By the end of 2010, the US was expected to give resources to at least 15 potential countries for initiatives in countries that "plan to produce more food, build strong markets and encourage private sector investment", and to ensure that these investments are in line with private sector investment in, for example, grain storage and market information systems.[89]

While USAID states that the program goes beyond food aid, the extent to which companies like Monsanto are interested in participating in it is worrying, especially given their proposed donation of a GM white maize variety resistant to drought that Monsanto claims will help combat hunger.[90]

three gm crops in latin america

continued

3.9 food sovereignty

In countries such as Guatemala,[91] where policies to protect biodiversity and community rights to access food are extremely weak, governments tend to support the introduction of GMOs for the production of food. But programs such as Feed the Future, or food aid donated without concern for GM contamination, represent an enormous risk to people's food sovereignty, as the incoming seeds may contaminate local seed varieties peasants have preserved for many generations.

It is important to bear in mind that when a country faces problems with malnutrition and receives food aid that is contaminated with GMOs, it means that there is also another country or region suffering problems generated by the large-scale cultivation of GM crops. Their production contributes to a reduction in the size of the rural workforce, increases in the quantities of pesticides applied, and the concentration of agricultural land in the hands of a small group of industrial farmers, with direct benefits for the agro-biotech industry.[92] Problems also include land grabbing, the disappearance of peasant farming, and preferential treatment for larger corporations, which can include subsidies, and better access to seeds and raw materials. Given the need to grow food for all, food production should be in the hands of local producers.

In the case of Mesoamerica, the introduction of GM seeds and crops is also of great importance since many crops such as maize, cotton, tomato and cucurbitaceae are originally from this region, meaning that the very source of such crops could be affected, with severe negative impacts on people's food sovereignty.[93]

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The US, which produces 64% of GM crops globally,[94] is facing unprecedented legal opposition to them, with recent rulings that demand that GM sugar beet seedlings are destroyed and Roundup Ready Alfalfa is banned. In addition to promoting GMOs domestically, the US government also tries to put pressure on the EU to accept GMOs, including through the threat of retaliatory measures, a trend that has been exposed by Wikileaks.

The biotech industry is also moving beyond GM crops, aiming to release fast-growing GM salmon, and commercialise GM pigs that excrete less phosphorous. These would pose risks for human health and the environment in the US and Canada.

4.1 gm foray into animal kingdom: salmon at stake

In August 2010, the United States Food and Drug Administration (FDA) announced that it is considering the approval of a genetically modified (GM) salmon, which would make it the first GM animal in the world to be approved for human consumption.

The corporation, AquaBounty Technologies, has engineered AquAdvantage fish to grow nearly twice as fast as wild salmon, using genetic material from Chinook salmon, Ocean pout, and Atlantic salmon to create it.

Approval of GM salmon could have serious biodiversity implications, adverse socio-economic impacts on fishing communities and health risks for consumers in the US and around the world. Research shows that gene spread could lead to the collapse of the entire species.[95] Wild Atlantic salmon is already listed as an endangered species,[96] partly due to genetic and fitness disabilities caused by inbreeding with escaped farmed salmon. Farmed salmon frequently escape into the wild from cages that are damaged due to weather conditions, predators, or wear and tear.[97]

GM farmed fish would be highly susceptible to diseases and parasites compared to wild fish which could in turn have a negative impact on human health if consumed. There are potential health impacts from the physical properties of GM fish which suffer from jaw erosion, tissue inflammation, high levels of hormones and low levels of healthy fatty acids.[98] Civil society organisations and consumers are demanding that the FDA conduct a thorough environmental impact assessment before approval.[99]

A recent research poll commissioned by Food and Water Watch found that 91% of Americans believe that the FDA should not allow genetically modified fish and meat into the marketplace.[100]

4.2 enviropig - gm pork on the plate?

Researchers at the University of Guelph, Ontario, Canada – with support from private investor Ontario Pork, the Government of Ontario and the Government of Canada – have developed an 'enviropig'[101] that is genetically engineered to contain less phosphorous in its faeces.[102] These GM Yorkshire pigs apparently digest plant phosphorus more efficiently than conventional pigs, which results in phosphorous-depleted manure that causes less pollution to water and aquatic life. This was achieved by inserting genes from mice and *E.coli* bacteria into the pigs' DNA.[103]

In 2007, its creators submitted the 'enviropig' to the US Food and Drug Administration (FDA) for regulatory approval for human food consumption, and subsequent commercialisation in the United States. Likewise, in 2009, a submission for commercialisation was made to the Canadian Regulatory Agencies.[104] Neither of these regulators has approved it so far. Worryingly, there are no regulations for GM animals in Canada and the processes for application and evaluation are kept secret. Apparently, licenses have also been sought in China.[105]

The main argument for such a GM pig is to protect water resources. Run-off from pig manure that contaminates water is an expensive problem faced by large-scale, industrial hog producers. These 'enviropigs', if approved, would allow the few giant hog production corporations that run factory farms to continue to raise large numbers of pigs, fed on grain, in small confined areas.

Friends of the Earth action agains GM salmon in front of the White House, USA

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continued

Smaller-scale hog producers, many of whom have already been forced out of business because of unfair competition from the large hog producers, have not experienced this problem as they keep small numbers of animals over wider geographical areas.[106] Indeed, the levels of phosphorus produced from smaller-scale pig farming are essential for soil fertility and plant nutrients.

4.3 promoting pesticides for profits

Research from the US provides evidence to expose the falsehood that GM crops reduce pesticide usage and bring benefits to farmers. During the first 13 years of cultivation of GM crops, there has been an increase of 173 million kg (383 million pounds) of pesticides applied in the US.[107]

Increased herbicide use is also evident from the 46% increase in the sales of Monsanto's glyphosate-based herbicide Roundup in 2007 and 2008; Roundup is marketed to be used along with its Roundup Ready (RR) crops.[108] Herbicide sprays are the norm with GM crops and over 90% of GM soy crops in the US are herbicide tolerant.[109]

Farmers across the US are reeling under the impact of the 'superweeds' epidemic, which has been caused by the continual use of glyphosate in tandem with glyphosate-tolerant crops, which has caused the weeds to develop resistance to the herbicide. A weed science expert, who addressed the US House Oversight Committee in July 2010, has asserted that superweeds infest over 4.5 million hectares – a fivefold increase in three years.[110] Congressional oversight hearings on the growth of superweeds provide damning testimony from farmers and scientific experts on the adverse affects of GM technology.[111] Farmers are being locked into a vicious circle of dependency on pesticides that can cause birth and reproductive defects, water and soil contamination.[112]

TABLE 2 **PENDING APPLICATIONS FOR HERBICIDE-RESISTANT CROPS IN THE US, DECEMBER 2010**

FIRM	CROP	PHENOTYPE	COMMENTS BY CENTER FOR FOOD SAFETY
Monsanto	Soybean MON-877Ø8-9	Dual herbicide resistant	Dicamba is volatile and drifts to damage neighbouring fields. Moderately persistent, genotoxic, disrupts an enzyme essential for neurological function, and is associated with increased risk of non-Hodgkin's lymphoma (an immune system cancer) and colon cancer.
Dow	Soybean DAS-68416-4	Triple herbicide resistant	Tolerates 3 classes of herbicides including 2,4-D. 2,4-D was part of the dioxin-laced, Vietnam War defoliant Agent Orange. Strongly linked to increased incidence of non-Hodgkin's lymphoma.
Bayer	Soybean FG72	Double herbicide resistant	Bayer, like Stine Seed and DuPont (see below) have developed their own glyphosate-resistant crops, a development that will hasten the already rapid emergence of glyphosate-resistant weeds.
Dow	Corn DAS-40278-9	Double herbicide resistant	Tolerates 2,4-D, which was part of the dioxin-laced, Vietnam War defoliant Agent Orange. Strongly linked to increased incidence of cancer.
Stine Seed	Corn HCEM485	Glyphosate resistant	As Monsanto's competitors introduce glyphosate-resistant crops such as this, there will be fewer conventional, non-glyphosate-resistant options.
BASF	Soybean BPS-CV127-9	Imidazolinone resistant	Imidazolinones are a class of ALS inhibitor herbicides linked to increased incidence of bladder cancers. More species of weed have developed resistance to ALS inhibitors than to any other family of herbicides.
Bayer	Cotton T304-40XGHB119	Glufosinate resistant; insect resistant	As with other herbicide-resistant crop offerings, the likely result is weed populations resistant to multiple herbicides.
Monsanto	Sugar beet	Glyphosate resistant	A federal district court reversed USDA's original approval of Roundup Ready sugar beets as illegal because USDA failed to conduct a meaningful environmental review.
Monsanto & Forage Genetics	Alfalfa J101, J163	Glyphosate resistant	In 2006, a federal district court reversed USDA's original approval of Roundup Ready alfalfa; it is once again being considered for deregulation after a court-ordered, but deeply flawed, Environmental Impact Statement
Monsanto & Scotts	Creeping bentgrass ASR368	Glyphosate resistant	In 2006, a federal district court ruled that USDA's failure to assess field trials of glyphosate-resistant creeping bent grass for environmental impacts violated federal law. Research by EPA has shown pollen and seeds can travel for miles.

Source: *http://www.aphis.usda.gov/biotechnology/not_reg.html provided by Center for Food Safety.*

As a result even newer GM crops are set to be approved, that resist other dangerous herbicides that cause cancer and other serious illnesses and were set to be phased out.[113] Dow's Soybean (DAS-68416-4) contains genes tolerant for 2,4-D, part of Agent Orange, which was used as a defoliant in the Vietnam War and is strongly linked to increased incidence of non-Hodgkin's lymphoma.[114]

4.4 wikileaks exposes us government arm-twisting on gmos

Although only a fraction of the 250,000 plus US embassy cables that Wikileaks holds has so far been released, evidence is already emerging about the US Government striking alliances with or aggressively applying pressure to countries it wants to adopt GMO technologies, to promote the expansion of the technology and the spread of GM products around the world.

us backing isolated spain

In April 2009, Spanish Secretary of State and Deputy Minister Josep Puxeu contacted the US *Charg d'Affaires* to express his concern about the fact that Spain is under increasing pressure to ban MON 810 cultivation in the wake of the German ban on GM maize, and about an EU vote urging the maintenance of existing bans in Austria and Hungary. Due to fears of Spain's increasing isolation over its pro-GM policies, the US was urged to step up pressure on Brussels, in collaboration with Spain, to keep agricultural biotechnology an option for EU Member States.

In May 2009, during a meeting with the Monsanto's Director for Biotechnology in Spain and Portugal, Spanish embassy officials were told that: "Spain is increasingly becoming a target of anti-biotechnology forces within Europe and that Spain's cultivation of MON 810 corn was under serious threat" and "If Spain falls, the rest of Europe will follow."[115]

The cable highlights that the bans against Monsanto GM maize in Germany, France, Austria, Hungary, Greece and Luxembourg, despite EU approval of MON 810, are due to anti-biotechnology sentiment in the EU, where there is increasing momentum and strong political support to stop GM cultivation.

Anti-GM decisions in Spanish regions are described as cause for "serious concern". The Canary Islands were declared GM-free in March 2008, the Catalonia Regional Parliament has proposed that it will be GM-free, and strict anti-biotech legislation was passed in the Basque Country in April 2009 which could lead to a future ban.

In a separate cable, Spanish officials responded to US pressure over GMOs being accepted elsewhere in Europe by concluding that: "commodity price hikes might spur greater liberalization to biotech imports."[116]

us anger at french and eu intransigence towards transgenics

A recently released cable, sent from the US embassy in December 2007, outlined concerns over GMOs: "Europe is moving backwards not forwards on this issue with France playing a leading role, along with Austria, Italy and even the Commission." The US response is to propose "retaliation" in collaboration with "the pro-biotech side in France." France is seen as a key player in "renewed European consideration of the acceptance of agricultural biotechnology."

France is deemed a lynchpin for changing EU policy on GMOs: "Our contacts have made clear that they will seek to expand French national policy to a EU-wide level and they believe that they are in the vanguard of European public opinion in turning back GMOs."[117]

In a separate cable, such a change of heart is deemed challenging as GMOs are: "a subject of considerable domestic concern in France" and that the intentions of France to implement a moratorium on biotech planting in 2007 "would significantly undermine US agricultural exports to Europe."[118]

us undue influence in africa

A cable from November 2007 also reveals that gathering information on "government acceptance of genetically modified food and propagation of genetically modified crops"[119] is among the top priorities for intelligence officials in Burundi, the Congo, and Rwanda.

4.5 legal rulings on gm alfalfa and sugar beet seed

On 21 June 2010, in the case of Monsanto versus Geerston Farms,[120] the United States Supreme Court ruled in favour of a ban on Roundup Ready alfalfa. This was the first ever case on genetically modified crops brought before the Supreme Court and means that the selling and planting of Roundup Ready Alfalfa (RRA) is illegal in the US.[121]

The Court recognised that the threat of transgenic contamination is harmful to organic and conventional farmers and that any injury would allow them to challenge future biotech crop commercialisations in court.[122]

The legal disputes have been taking place since 2006, when the Center for Food Safety filed a lawsuit against USDA as it planned to commercialise alfalfa seed designed to tolerate Monsanto's herbicide Roundup, despite concerns over environmental, health, cultural, and economic impacts on farmers and consumers. GM alfalfa can spread uncontrollably through the cross-pollination of plants by bees, contaminating non-GM alfalfa fields.[123]

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continued

On 30 November 2010, the District Court for the northern district of California also demanded the first-ever destruction of a GMO crop when hundreds of acres of GM sugar beet seedlings, planted in September 2010, were ordered to be removed.[124] Their planting violated federal law. The District Court ruled that "farmers and consumers would likely suffer harm from cross-contamination" and stated that past contamination incidents were "too numerous" to allow the crop to remain in the ground.[125]

The ruling is in response to a lawsuit filed by Earthjustice and the Center for Food Safety – on behalf of organic growers, consumers and environmental organisations – which demonstrated the likelihood of irreparable harm from GM sugar beet crops. The plaintiffs filed this action against USDA as it issued permits for the planting of GM sugar beets without conducting any environmental review. The plaintiffs argued that other herbicide resistant crops have caused increased levels of toxic chemicals in soil and water.[126] Yet USDA is proposing to commercialise GM sugar beets despite this ruling.[127]

4.6 bayer losing cases over gm rice contamination

2010 was a bad year for the US biotech industry, which was hauled through the US legal system. In October 2010, the German corporation, Bayer, was taken to court by three Texas rice growers and forced to settle over the contamination of their rice crops by Bayer's Liberty Link rice.[128] This was the seventh trial that Bayer has lost in succession, spanning across five US states, and all related to claims concerning contamination leading to export restrictions and economic losses.[129]

In August 2006, the US Department of Agriculture, announced that Bayer's genetically modified seed had been found in commercially grown long-grain rice in Louisiana, Mississippi, Texas, Arkansas and Missouri.[130] Five days later, the European Union banned US imports to its 27 member countries, which was followed by Japan and Russia. This sudden loss of a key export market had devastating socio-economic impacts for US rice farmers whose crops were contaminated.

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five gm crops in africa

gm crops in africa

Africa has seen a major increase in food production in recent decades but 265 million sub-Saharan Africans still go hungry.[131] This food crisis is being used to justify opening up Africa as the new test bed for GMOs: GM technology proponents argue that the technology can combat hunger, poverty and climate change. Yet, many Africans continue to eschew expensive, dangerous GM crop cultivation that can increase indebtedness and does nothing to withstand erratic weather conditions, as Friends of the Earth International has documented.[132]

This reluctance is being met by corporate-backed, pro-GM initiatives promoted by the Gates Foundation and Alliance for a Green Revolution in Africa (AGRA). This poses grave threats to traditional, sustainable farming practices that could feed the continent and significantly reduce levels of poverty.

5.1 gates foundation buys into monsanto

The Bill & Melinda Gates Foundation, founded in 1994, exerts a major influence on global agricultural policy. It manages total grants of US$24 billion, which finance the Foundation's projects.[133] The Gates Foundation claims to promote "new techniques to help farmers in developing countries grow more food and earn more money" whilst openly supporting genetic engineering projects in Africa and other developing countries.[134] Nearly 80% of Gates Foundation funding in Kenya involves biotechnology and there have been over $100 million in grants to organisations connected to Monsanto.[135]

The revolving door between the Foundation and Monsanto was flung wide open when the Foundation bought US$23 million worth of Monsanto shares, in August 2010.[136] Farmers, social movements and civil society organisations reacted with outrage. La Via Campesina,[137] the global peasant movement, has condemned this acquisition of Monsanto shares. Chavannes Jean-Baptiste of the Haitian Peasant Movement of Papaye and Caribbean coordinator of La Via Campesina stated:

"It is really shocking for the peasant organizations and social movements in Haiti to learn about the decision of the Bill & Melinda Gates Foundation to buy Monsanto shares while it is giving money for agricultural projects in Haiti that promote the company's seed and agrochemicals."[138]

5.2 agra's unwelcome green revolution

Along with the Rockefeller Foundation, the Gates Foundation is supporting the implementation of the controversial Alliance for a Green Revolution in Africa (AGRA) to the tune of US$265 million.[139] AGRA consists of a team of scientists, economists and business leaders, including from the biotech industry, and Kofi Annan is the Chair of its Board.

AGRA is prising open the African continent to GM seeds and pesticides sold by corporations such as Monsanto, DuPont and Syngenta. In contrast to the approach by the Gates Foundation and AGRA, a major study by UNCTAD and UNEP that examined organic agricultural practices throughout Africa concluded these could reduce poverty, increase yields and incomes whilst protecting the environment.[140]

African farmers and environmentalists have challenged the Gates Foundation and AGRA's initiatives that disregard the structural causes of hunger and poverty, and instead promote policies that undermine traditional knowledge and farming systems.[141]

West African farmers have clearly rejected such corporate-driven initiatives by demanding "a fundamental re-orientation of public research away from a focus on input-intensive farming and the development of new GM seeds, to instead support agriculture which does not require high chemical inputs, to improve local seeds and landraces, and to regenerate local food systems and markets".[142]

5.3 nigerian government pushing gm

Nigeria, Africa's most populous country with 150 million citizens, is on the biotech industry's radar. For example, the Gates Foundation has granted the Donald Danforth Plant Science Center US$5.4 million to conduct trials for genetically modified banana, rice, sorghum and cassava plants that contain increased amounts of vitamins, minerals and proteins.[143]

Millions of Nigerians depend on cassava as a staple food crop. On behalf of the Danforth Centre and biotech corporations, the Nigerian National Root Crops Research Institute (NRCRI), has been conducting "contained" field trials of genetically modified 'Super Cassava' on a plot on the banks of Qua Iboe River, Abia State.

The Danforth Center claims that the cassava-based diet of over 250 million sub-Saharan Africans does not provide complete nutrition. Their solution is to develop nutritious, higher-yielding cassava with traits to deliver enhanced levels of zinc, iron,

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continued

protein, vitamin A, vitamin E, improved post-harvest durability, and improved resistance against viral diseases.[144] Yet efforts to engineer the cassava to resist cassava leaf mosaic disease have failed. Nigerian Ministry of Agriculture officials have confirmed that there are over 40 conventionally-bred hybrid varieties of cassava that already have the capacity to resist this disease.[145]

5.3 lessons unlearned from gm golden rice

Nutrient-enhanced GM crops were once hailed as a panacea for vitamin A deficiency, when the infamous Golden Rice, which was lauded as being able to save one million children a year, made it to the front page of Time Magazine in 2000.[146]

Yet trials failed to develop high levels of Vitamin A[147] and scientists have expressed major disquiet over potential negative health impacts. In February 2009, a group of international scientists and experts expressed outrage over health threats from GM Golden Rice clinical trials being conducted on adults and children at Tufts University in Massachusetts, as there has never been a regulatory, approval process on its effects anywhere in the world.[148]

Recent analysis highlights that after almost two decades of research and development, GM 'golden' rice has not made any impact on the prevalence of vitamin A deficiency. This has drawn attention and resources, which could otherwise have been targeted at supporting sustainable, agro-ecological farming.[149]

While it is true that diets based only on rice and cassava are not sufficient for nutrition, there are simple solutions to ensure a healthy intake of vitamins and minerals. The World Health Organisation (WHO) recommends tackling Vitamin A deficiency through the promotion of breastfeeding and development of gardening practices.[150] WHO malnutrition expert Francesco Branca suggests that providing supplements, fortifying existing foods with vitamin A, and teaching people to grow carrots or certain leafy vegetables are more promising approaches than relying on the unsubstantiated technology of Golden Rice.[151]

5.4 pro-gm policies

Despite many African countries being unreceptive and sceptical of GM, new pro-GM legislation is being pushed through in Nigeria. In December 2009, public health and environmental concerns were marginalised as a draft Bill was progressing through Parliament to pave the way for the introduction of GMOs. As the Bill was passed the Chairman of the House Committee on Agriculture, Hon. Gbenga Makanjuola, stated that biotechnology was a technology that could not be stopped and must be accepted by Nigerians.[152]

During the discussions on the Bill, while pro-GM commercial farmers, scientists, professors and biotech NGOs from across the nation had ample time to make their points, critical opponents such as Friends of the Earth Nigeria / ERA, consumer groups, women and youth groups and other organisations were either not allowed to voice their concerns or had to rush them in a fraction of the time allocated to the GM proponents.[153] According to provisions of the draft Bill, yet to be passed through the Senate, it appears that GMOs may be approved without taking into account public opinion or opposition.

Friends of the Earth Nigeria / ERA is currently challenging the National Biotechnology Development Agency (NABDA) of Nigeria for attempting to pass this Bill without greater participation of all stakeholders, including farmers, and is initiating a public debate to consider health and environmental implications.

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six gm in asia (malaysia & india)

gm in asia (malaysia & india)

The biotech industry is causing controversy in India and Malaysia. The launch of GM mosquitoes in Malaysia that is spearheaded by the British company, Oxitec, is fraught with ethical and environmental concerns, and could breach national and international law.

India has been one of the countries celebrated as a success case for GM crops by the biotech industry, due to its cultivation of Bt cotton. Yet pressure from various sectors of society including farmer unions, scientists, consumer groups, civil society organisations and several state governments led to a moratorium on Bt brinjal in India, and now there is strong resistance towards biotech industry plans to grow various food crops commercially, including GM rice.

6.1 bt brinjal battle: moratorium triumph in india

Brinjal (also known as aubergine or eggplant) is the second most consumed vegetable crop in India, providing livelihoods for small-scale farmers, and food and nutrition to impoverished rural and urban communities. Mahyco, a partner company of Monsanto's in India,[154] developed an insect-resistant version, Bt brinjal (the gene having been developed by Monsanto), which was approved by the lead regulatory body on GMOs in India, the Genetic Engineering Approval Committee (GEAC),[155] in October 2009.[156]

On 9 February 2010, after a month-long public consultation with various segments of society including scientists concerned about its impact on human health, the environment, and traditional Indian varieties of brinjal, this approval was overturned by the Minister for Environment and Forests, Jairam Ramesh. An indefinite moratorium was implemented. He said the moratorium will last until such time that independent studies establish the long term safety of Bt brinjal from a human health and environment standpoint, and that the approach is "responsible to science and responsive to society".[157, 158]

Children hugging a brinjal, India.

On the other hand, the industry and many GM scientists are trying very hard to get Bt brinjal released commercially. A report about GMOs commissioned by the Minister from leading science academies in the country recommended the limited release of Bt brinjal.[159] This was reported and lauded by ISAAA.[160] However, it was revealed that almost the entire section on Bt brinjal in the report was copied verbatim from a GM crop promoter's article.[161]

New analysis outlining the risks of Bt brinjal has been submitted to the Supreme Court as part of the on-going public interest litigation on GM crops in India.[162] This scientific study highlights the risks of contamination of native crops and biodiversity, and the risks of potentially increasing the prevalence of pests. Bt brinjal could also have major negative socio-economic impacts on small-scale resource poor brinjal farmers, as they would be forced into unfair competition with large-scale commercial brinjal producers.[163]

While GM-free brinjal production is currently safeguarded, field trials on numerous other food crops continue unabated. In 2010 alone, approvals have been granted for trials on 12 GM food crops (with multiple events under each crop) including staples like rice, maize and sorghum; vegetables like tomato, cauliflower, brinjal and cabbage; fruits such as watermelon and papaya; and sugar cane, mustard and ground nut.[164]

Seed corporations like Monsanto and Bayer are also carrying out field trials on herbicide tolerant cotton and maize, despite the superweed crisis that has unravelled in the USA.[165]

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Action against Bt Brinjal, India.

six gm in asia (malaysia & india)

continued

6.2 farmers destroy dupont gm rice trial crop

India has the world's largest area under rice cultivation and around 4,000 different varieties are grown.[166] On 12 May 2010, the GMO regulatory body, GEAC, granted permission for confined field trials for event selection on transgenic hybrid rice to prepare for commercial hybrid seed production by US chemical corporation, DuPont.[167]

GM rice trials were being carried out by DuPont in Doddaballapur, in Karnataka, in collaboration with the University of Agricultural Science, Bangalore. In November 2010, peasant farmers belonging to Karnataka Rajya Raitha Sangha (KRRS), a leading farmers' organisation and a member of La Via Campesina, took action and destroyed most of the one-acre field trial crop.

The Vice President of KRRS said that the farmers will oppose open air field trials of GM crops as it is a first step to surrendering Indian agriculture to American multinational seed corporations; he added that GM rice is a threat not only to farmers but also to the health and environment of all Indian citizens.[168]

As the Bayer rice contamination case in the US demonstrates (see chapter four), contamination from GM rice trial fields have had major socio-economic, environmental and legal implications that run the risk of being repeated.

6.3 pest resistance in bt cotton

A recent scientific study that was carried out in Karnataka, a major cotton growing state, has established that the bollworm, the major cotton pest in India, is thriving on both the single gene Bt cotton (Cry1Ac) and the double gene Bt cotton (Cry1Ac and Cry2Ab).[169] According to the authors, earlier studies have demonstrated that bollworms feed on Bt cotton, but this is the first time that it has been demonstrated that the bollworms not only survive after feeding on Bt cotton plants, but are able to complete their lifecycle, reproduce and create the next generation of resistant pests.[170]

6.4 gm mosquito experiments in malaysia

Some 6,000 transgenic mosquitoes developed to help fight dengue were released in Malaysia on 21 December 2010.[171] The Malaysian National Biosafety Board (NBB) approved the release of genetically modified *Aedes aegypti* mosquitoes on 5 October 2010. A consultation for this application was carried out in August 2010 over 30 days, which officials claim addressed public disquiet.[172] However, civil society organisations say that the brief consultation process was marked by a lack of transparency, and that safety, ethical and legal concerns have not been dealt with satisfactorily.

The GM technology used for the mosquitoes is owned and patented by Oxitec, an Oxford-based company, which is a spin off from Oxford University.[174] Oxitec has genetically modified these male mosquitoes so that once the males have mated with the wild female population, its progeny die in the larval stage, reducing the dengue carrying *Aedes aegypti* population and thereby the prevalence of this mosquito-borne disease.

This company is facing major financial difficulties[175] but the GM mosquito program, if approved, could involve the repeated release of GM mosquitoes into the environment and provide an on-going revenue stream for the company.

As the Malaysian land mass is not an isolated area and is connected to other countries (and mosquitoes do not recognise national borders), national and international laws could be broken by the import and release of GM mosquitoes, as such a trans-boundary movement of GMOs is governed by the Cartagena Biosafety Protocol.[176]

In laboratory tests it has been revealed that about 3-4% of the offspring from the male GM mosquitoes and wild females survived, despite being programmed to die. This persistence of the transgenes in the environment means that there could be unknown, possibly hazardous consequences. Furthermore, the plan to release GM male mosquitoes, which do not spread disease, is based purely on separating the smaller male mosquitoes from the female larvae, which is open to both human and mechanical error.[177]

Based on current plans, a total of 16-24,000 GM mosquitoes could be released into the Malaysian environment but this figure would rise steeply if the experiments are repeated. Indeed, if GM mosquitoes become part of Malaysia's dengue control programme, it has been suggested that 100 million to a billion GM mosquitoes should be stockpiled for a given project.[178]

Even if this experiment leads to a reduction in *Aedes aegypti* mosquitoes, it is feared that consequently there could be a proliferation of *Aedes albopictus* mosquitoes, which also transmit dengue and chikungunya (another disease similar to dengue).

There are significant ethical concerns about submitting Malaysians and their environment to such a risky experiment. Oxitec was also behind the controversial GM mosquito trials in the Cayman Islands, which took place without public disclosure during 2009 and 2010, leading to UK and European Parliamentary scrutiny.[179]

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