

- **These GE field trials have no credible benefits and should not be approved.**
- **The GE plants could never be used without contaminating GE-free production.**
- **Better Scientific information would be gained from contained experiments and research into long-term sustainability.**
- **Most New Zealanders and overseas markets have rejected GE foods**
- **Even trace-levels of contamination are a risk to farmers and the Economy.**

GE-Free Food: Preserving the Preferred Option

1) New Zealanders have made it clear they want to protect availability of clean-green , safe, GE-free, natural, and organic produce in this country.

The Royal Commission on Genetic Modification found that it was in the National interest to preserve options. This **includes** people being able to buy GE-free products, and farmers being able to grow GE-free products.

Products like GE Bt Brassicas being trialed cannot deliver the benefits claimed because they would cause widespread contamination of conventional crops. This is unacceptable and unethical as the contamination would terminate the New Zealand Public's preference to preserve the option to grow and buy GE-free food.

2) A survey of public opinion in 2005 shows 65% of New Zealanders believe GE produce does NOT fit with New Zealand's image for producing clean and healthy food.

Only 9% of New Zealanders agree that "Producing GE products fits with NZ's clean green image", whereas 66% of people disagree. "In all three time snapshots (2001, 2003, 2005) the vast majority of respondents did not agree that producing GE food fits with either NZ's clean green image or the image of marketing health food" (Small, B 2005)

There is evidence that commercial interests and academic researchers are willing to use deception as a tool to 'encourage' acceptance of GE food. Some studies (Knight, J. "Trust and Country Image" 2003), show that people's behaviour can be influenced by the language used in questioning and by a false product-proposition, in ways that lead to behaviour that contradict people's intentions. For example, potentially-leading questioning in academic research includes offering hypothetical "GE Milk with superior health benefits" to gauge appeal without also providing sufficient information on the known risks of gene-manipulated food to the environment, animal or human health to allow informed decision-making by consumers.

(Ref: Small, Bruce: "Genetic Engineering: New Zealand Public Attitudes 2001, 2003, 2005"; Proceedings of the Talking Biotechnology – Reflecting on Science in Society Conference, 2005, Wellington NZ. Published on CDRom).

3) Even if people see a role for GE in agriculture in New Zealand this does not mean they accept contamination of GE in conventional food.

Regulatory Authorities like ERMA cannot justify allowing contamination and removal of choice as a basis for decision-making.

4) Rural New Zealand supports GM-free production

Rural News, October 26, 2005 (New Zealand)

The most recent poll, conducted for the Sustainability Council, on public attitudes to GMOs shows rural and urban dwellers equally support the concept that New Zealand should remain a GM Free food producer. The overall result was that 74.5% of New Zealanders would support the nation's food production remaining GM Free. Rural responses showed fractionally higher support at 75.5% while urban respondents were marginally lower at 74.1%. These August figures compare with 70.1% support when the same question was put two years ago.

The August DigiPoll survey also reported that 79% New Zealanders would support the current policy of zero tolerance to GM contamination of seed imports. It further found 77% support for zero tolerance to GM contamination of crops in the field, once informed that this too is the current policy. Rural and urban support was again quite close - within

2% of the overall result.

Full item: <http://www.GEinfo.org.nz/112005/01.html>

Web Link: <http://www.ruralnews.co.nz/article.asp?channelid=141&articleid=10001>

5) New Zealand supermarket are keen to be GE-Free

Royal Society News, November 6, 2003 (New Zealand)

A week after the moratorium on the commercial release of genetically engineered (GE) organisms was lifted, New Zealand's heavy-hitter supermarket chains are falling over themselves to claim the most anti-GE stance. Yesterday Foodstuffs - the power behind New World, Pak 'N Save, Four Square and Write Price supermarkets - announced it was "going GM free". However, Progressive Enterprises - which owns Foodtown, Woolworths, Countdown and Price Chopper, and the franchise for FreshChoice and SuperValue - today set out to "remind" customers of its long-time GE-free stance on its own brands. "Quite frankly we are well ahead of the game on this score," [said] managing director Ted van Arkel. "It's good for consumers to see other supermarkets following suit."

Full item: <http://www.GEinfo.org.nz/112003/03.html>

Web Link: http://www.non-gm-farmers.com/news_details.asp?ID=829

6) New Zealand Study shows economic problem of GM

NZoom, September 7, 2003 (New Zealand)

A new study from Lincoln University shows that release of GM crops will have no financial benefit for producers. Professor Caroline Saunders from [the] agribusiness and economics research unit says GM food releases have not benefited producers anywhere in the world, and economic modelling shows the situation for New Zealand is no different. Saunders says producers will only benefit from GM crops when consumers demand them, and New Zealand producers do not have anything to gain from growing GM food. Saunders warns that any potential for increased productivity from GM crops would not lead to higher producer returns, saying it is better to have greater demand through shorter supply.

Full item: <http://www.GEinfo.org.nz/092003/09.html>

Web Link: http://oneneews.nzzoom.com/oneneews_detail/0,1227,218948-1-7,00.html

Market Rejection of GE crops Internationally

7) EU consumers: GE food a risk to society

Reuters News 23..6.06

Most Europeans believe that GM foods should not be encouraged and see biotech crops as posing a risk to society, a survey, conducted by a group of academics [for] the European Commission's polling arm Eurobarometer, showed. 25,000 EU citizens polled in nearly all the bloc's 25 countries remained sceptical about biotech used in agriculture.

Average

support among EU citizens for GMO foods ranked at 27 %. The Survey found "Europeans think GM food should not be encouraged, it is widely seen as not being useful, as morally unacceptable and as a risk for society." and that "New regulations on GM crop commercialisation and labelling of GM food appears to have done little to allay the public's anxieties about food biotechnology,"

source: www.GEinfo.org.nz/072006/01.html

8) Aussies still wary of GE food

ABC Science Online, 30.6.06 (Australia)

Australians are becoming more comfortable with new technologies like stem cell research but still have strong reservations about GM foods, a survey, conducted by the Australian Centre for Emerging Technologies and Society, shows. Respondents when asked about GM crops or animals, were decidedly more negative than in 2004. Only 30% said they were comfortable with GM plants for food. The survey also found that just 18% of people were comfortable with genetically modifying animals for food.

Source: www.GEinfo.org.nz/072006/02.html

9) State Government Defends Benefits of GM-free Production

The Mercury, June 29, 2006 (Australia)

Tasmania must maintain its freedom from GM technology or risk valuable agricultural exports, the Primary Industry Minister has told a Budget estimates hearing.

Mr Llewellyn said he could not support coexistence between GM and traditional crops as it had major ramifications for Tasmania. "We are positioning Tasmania as GM-free and we don't want to fall in with those who would target less-than discerning buyers," Mr Llewellyn said this week.

Mr Llewellyn said the managing director of a major Japanese importer of Tasmanian products said if the state moved down the GM line, it would cut its ties with the state.

Full item: <http://www.GEinfo.org.nz/072006/09.html>

10) East Europe's anti-GM food movement is growing

Foodnavigator.com, November 14, 2005 (EU)

Around 76 per cent of Polish consumers said they didn't want to eat any food containing GM ingredients, according to a PBS opinion poll commissioned by Greenpeace. The news follows an earlier study by Russia's largest public opinion research body, VCIOM, that 95 per cent of Russians aware of GM ingredients said they were either opposed to them or seriously concerned by them. The surveys are an important sign that public opinion in Eastern Europe is moving towards the widespread GM scepticism already present in Western Europe.

Full item: <http://www.GEinfo.org.nz/122005/04.html>

11) Two-thirds of Russians unwilling to eat GM

RIA Novosti, May 18, 2005 (Russia)

According to a poll conducted by the All-Russia Public Opinion Research Center, about two-thirds of Russians say they are not ready to eat foodstuffs comprising GM ingredients. Almost half of them (45%) flatly reject GM food, with 23% being unlikely to consume them. Only 3% showed willingness to eat such foods and 4% said they did not care altogether.

Full item: <http://www.GEinfo.org.nz/062005/09.html>

Web Link: <http://en.rian.ru/society/20050518/40375624.html>

12) Asian opposition to biotech product like wheat is steadfast

Reuters, October 9, 2002 (USA)

US Wheat Associates found in its survey of wheat buyers, millers and users that "there is currently an overwhelming rejection" of the biotech "Roundup Ready" wheat plant that Monsanto Co has developed.

Major wheat importing countries like Japan and the European Union have stressed that consumer opposition to genetically modified wheat would override scientific assurances that the biotech grain was safe.

The US Wheat Associates report found that all representatives for Chinese, Korean and Japanese wheat buyers surveyed said they would not buy or use Roundup Ready wheat.

One hundred percent of the Japanese users surveyed indicat[ed] that "regardless of government approval, contracts will stipulate no adventitious presence of GM wheat."

In August, Italy's biggest miller, Grandi Molini Italiani SpA, said it would refuse to import GM wheat or any wheat from countries where GM wheat is grown.

Full item: <http://www.GEinfo.org.nz/092002/05.html>

Web Link:

http://biz.yahoo.com/rc/021009/food_wheat_biotech_1.html

(Not a direct link)

13) Cabinet papers warned Canada off GM crops: Farmers fear long-term threat to food exports

Paul Brown, environment correspondent, The Guardian
Thursday November 13, 2003,

A secret briefing to the Canadian government has warned that the country's massive food exports are at risk from its continued use of GM crops. The paper, which has been obtained under the Access of Information Act, warns the cabinet of the "pressing need to immediately address these concerns".

Such fears contrast with the government's repeated endorsement of GM crops and technology as a great opportunity for Canada. The paper, which was drafted by a senior civil servant, says that "producers are becoming worried about losing markets and losing

choice over what they produce", while consumers are becoming more worried that they cannot distinguish between GM and non-GM products.

"These concerns could precipitate a loss of confidence in the integrity of the Canadian food system, which could be very disruptive to the domestic system as well as Canada's ability to export to demanding markets."

.....The Canadian Wheat Board has just surveyed its overseas customers in Europe, Japan and the US, with 82% saying that they would not take GM wheat. The export market for milling wheat into bread is worth £2bn a year to Canada.

The paper says that large Canadian producers in other fields have already taken defensive action. Flax producers, for instance, will not produce a GM version, while the largest potato processor, McCains, has declared it will not purchase GM potatoes. Jim Robbins, a farmer and business consultant for the Canadian National Farmers Union said that large exports of oilseed rape had been lost to Europe as it was impossible to separate GM and conventional crops. In Canada, they had all been mixed together. **Cross contamination, it said, was now "irreversible"**. Canadian farmers feared the same would happen with wheat, prompting a loss of exports and a crash in prices.

Source: <http://www.guardian.co.uk/gmdebate/Story/0,2763,1083640,00.html#article>

14) Meacher admits GM crops threaten organics

The Guardian, May 20, 2003 (UK)

Contamination from GM crops threatens the drive to increase organic food production, Michael Meacher, the environment minister, conceded yesterday. "The coexistence of organic and GM crops is a very real problem," he said. "Whatever decisions the government comes to about the commercial growing of GM crops in Britain, it has to be compatible with allowing the growth of organics." About 30% of the organic produce consumed in Britain is grown here. The government wants to increase this to 70% by 2010. All super markets in Britain had a no-GM policy. Though consumers might be opposed to GM crops, he added, it was impossible under EU rules for Britain to stop them being grown commercially, unless it found health or environmental evidence they were harmful. Ethical or moral reasons did not count.

Full item: <http://www.GEinfo.org.nz/052003/05.html>

Web Link: <http://politics.guardian.co.uk/green/story/0,9061,959641,00.html>

15) Organic farms have been contaminated already in the US

ENS, May 15, 2003 (USA)

Certified organic farmers have reported the first direct financial and operational impacts associated with the threat of contamination by genetically modified organisms (GMOs) in

a nationwide survey conducted by the Organic Farming Research Foundation (OFRF). One-third of the respondents rated the risk of exposure and contamination of their organic farm products by GMOs as high or very high. Said OFRF executive director Bob Scowcroft, "These new survey results based on the 2001 crop year document that significant impacts have begun to occur within a very short time frame. If this trend continues, what we're seeing now will prove to be just the tip of the iceberg." OFRF president Ron Rosmann, a diversified organic farmer from Iowa said, "This new data supports OFRF's call for a moratorium on GMO release until there is a solid regulatory framework that prevents genetic pollution and assigns liability for the damages imposed by contamination." The survey found that 8% of respondents indicated that their organic farm operation has borne some direct costs or damages related to the presence of GMOs. 17 percent have had GMO testing conducted on some portion of their organic farm seed, inputs or farm products. Of those, 11% said they received positive test results for contamination. Web Link: <http://ens-news.com/ens/may2003/2003-05-15-09.asp#anchor1>

16) Monsanto admits crops may contain genetically-modified canola seed

Wall Street Journal, April 15, 2002 (USA)

Monsanto Co. believes that some of its canola seed might contain genetically modified material that isn't federally approved. Angling to avoid a massive recall of food products, the company is asking regulators to forgive any presence of it.

The situation is potentially a big headache for the US food industry, because canola oil is a basic ingredient in hundreds of products. In conceding that for three years US farmers have been planting canola seed that may contain certain genetic material that was never meant to leave the laboratory, Monsanto has become the latest example of the biotechnology industry failing to control plants whose genes it has altered.

Last year, the GT200 version showed up in Canadian canola seed, forcing Monsanto to recall hundreds of tons of it.

Although Monsanto had sought and received Canadian approval for GT200, the recall was necessary because Canada exports huge amounts of canola to Japan, which hadn't approved GT200. Monsanto says it never sold the GT200 version commercially in Canada and isn't sure why it wound up in canola seed there.

Full item: <http://www.GEinfo.org.nz/052002/09.html>

Web Link: <http://www.connectotel.com/gmfood/ws150402.txt>

(Not a direct link)

17) Sixth Contaminated Bt10 shipment found; Syngenta to pay

Bridges Trade BioRes, Vol. 5 No. 14, July 22, 2005 (Japan)

On 13 July the Japanese government found a sixth import shipment of US grain feed that was contaminated with unapproved GM corn strain Bt-10. Japan has a zero-tolerance policy for unapproved GM imports and any shipments found with Bt-10 must either be destroyed or shipped back to the US.

Japan has been testing imports of US grain feed since 23 May as a result of the discovery in March that US exports of approved GM corn strain Bt-11, created by biotech company Syngenta, had been unintentionally contaminated by the company's unapproved Bt-10.

The same day, Syngenta agreed to pay additional costs incurred by US grain exporters and Japanese importers to test cargoes for Bt-10.

Full item: <http://www.GEinfo.org.nz/082005/03.html>

Web Link: <http://www.ictsd.org/biores/05-07-22/story3.htm>

18) Contamination by Modified Canola Worries Oz Farmers

Daily Telegraph April 10, 2003 (Australia)

Almost three quarters of Victoria's farmers dispute a finding by the nation's gene technology watchdog that genetically modified canola does not pose a threat or environmental risk.

A survey, commissioned by ICM Agribusiness in consultation with the Network of Concerned Farmers, found 70 per cent were worried, with fears including GM canola's possible contamination of traditional crops. The poll found 71 per cent had concerns about the commercial release of GM canola, 67 per cent were worried about their ability to market the grain, while 80 per cent said they had fears about GM and non-GM canola co-existing.

Full item: <http://www.GEinfo.org.nz/042003/07.html>

Web Link: http://www.dailytelegraph.news.com.au/common/story_page/0,5936,6260267%25E704,00.html

19) Farmers face extra costs to stay GM-free

@agriculture Online, May 17, 2002 (Online)

Organic and conventional farmers will face extra costs keeping their produce "GM-free" once genetically modified crops become more common in Europe, the European Commission said on Friday. A draft of the report by the EU's Joint Research Centre estimated that costs for rapeseed farmers could increase by between 10 and 41 percent.

Full item: <http://www.GEinfo.org.nz/052002/08.html>

Web Link: http://www.agriculture.com/worldwide/IDS/2002-05-17T144104Z_01_L1779050_RTRIDST_0_FOOD-EU-GENES.html

20) GM crops will destroy farms UK Commission Warns

Western Morning News, April 22, 2003 (UK)

The Government has come under fire from campaigners after a scientific commission revealed that cultivating genetically modified crops could devastate organic farming.

In the light of new documents prepared by the Agriculture, Environment and Biotechnology Commission, more than 4,000 organic farmers nationwide could see their livelihoods endangered if their crops are contaminated by GM plants. The independent commission suggests that the spread of pollen from genetically modified crops means that certified produce would be forever tainted. "The effects of pollution are visible only after many years. That's the case of the North American countries which have switched to GM and can no longer go back to organic." A spokesman said: "The AEBC is an independent body which analyses all data received on GM. It has been established to assess both the benefits and risks of the biotechnology." (Distributed by Financial Times Information Limited)

Web Link: http://hoovnews.hoovers.com/fp.asp?layout=displaynews&doc_id=NR20030422670.4_340a0021516204c6

21) GM corn has contaminated native plants in Mexico

Scientific American, November 29, 2001 (USA)

Scientists have found evidence that genes from GM plants can spread far and wide to native ones. According to a report published in the journal Nature, wild corn from the remote mountains of Oaxaca, Mexico contains transgenic DNA. This, the researchers note, bolsters concerns that such unintentional contamination can threaten the genetic diversity of natural crops.

Full item: <http://www.GEinfo.org.nz/052002/11.html>

Web Link: <http://www.sciam.com/article.cfm?articleID=000E3961-1D8A-1C68-B882809EC588ED9F&pageNumber=1&catID=1>

Insect Resistance Will Develop

It is known that insects can rapidly develop resistance to single Cry genes in Bt plants.

'Stacking' multiple-Cry genes in Bt crops can only be a short-term defence to slow resistance, before any benefit is lost.

22) It is widely considered to be only a matter of time before resistance occurs in Bt-plants

Already some 17 insect species have become resistant to Bt in the laboratory, and one insect species shows widespread resistance in the field. (Glare & O'Callaghan 2000 cited in Tuelon and Losey 2002), (Andow 2002)

One suggestion made by scientists and supported by the applicants is to develop Bt plants with multiple 'Cry' protein toxin genes as a way to slow the resistance.

This theory may warrant laboratory study but does not legitimate open field tests.

There is already evidence that resistance will still inevitably emerge, and bring to an end any short-term benefits of 'gene stacking' Bt toxins in GE plants.

Research (Tabashnik et al 1997) indicates just a single gene in Diamondback moths - one of the pest insect targeted in the field trials, confers multiple resistance to four different versions of Bt toxins.

(see Tabashnik, B.E., Y.B. Liu, N. Finson, L. Masson, and D.G. Heckel; "One Gene in Diamondback Moth Confers Resistance to Four *Bacillus thuringiensis* Toxins." Proceedings of the National Academy of Sciences 94 (1997) 1640-1644)

See also www.hortnet.co.nz/publications/nzpps/journal/55/nzpp55_396.pdf
Dave Tuelon and John Losey (2002)

Issues relating to the practical use of transgenic crops for insect pest management. NZ Plant Protection 55:396-404

23) Use of 'Refuges' can only delay resistance but won't stop spread of GE contamination

The claimed potential benefits of the trial are therefore impractical and cannot be seriously considered by ERMA as credible support for the application.

Use of refuges and high-dose Bt plants proposed in the field trial may limit the speed of resistance but cannot prevent contamination of other crops, making the approach impractical as it unacceptably compromises standards of agricultural production necessary to protect the national interest.

"Determination of the size of refuges is a compromise between practical and commercial considerations which favour smaller refuges and scientific theory which favours larger refuges.(n Gould 2000, Shelton et al. 2000) The size of refuges is further complicated by some farmers failing to plant them at all (Anon.2001b)." (Tuelon and Losey 2002, p398)

The suggestion made on Radio NZ by Dr Mary Christy that these Bt brassicas will benefit home gardeners also contradicts the stated need for regulation of such crops if commercialized (see application
Which would also be impractical for home gardeners.

24) Refuge-Management of BT crops cannot be adequately delivered in reality.

USDA survey shows some 20% of farmers of Bt corn were failing to adhere to the EPA's refuge requirements aimed at slowing resistance.

Source: Associated press, 10 Sept 03 <http://www.GEinfo.org.nz/092003/08.html>
USDA National Agricultural Statistics Service: <http://www.usda.gov/nass>
<http://www.tallahassee.com/mld/tallahassee/news/politics/6739974.htm>

25) Scientist Warn that "50% refuge" needed for [new] Bt corn *Nature Biotechnology vol. 21 no. 5, May 2003 (USA)*

A new transgenic corn hits US fields for this year's growing season. The Environmental Protection Agency (EPA), which approved the corn in February, finds itself at odds with its own scientific advisory panel over how to manage pest resistance to the crop. The unheeded scientific advice, and other decision-making glitches, left critics wondering whether EPA regulation is firmly grounded on the best scientific advice. "The EPA is calling for science-based regulation, but here that does not appear to be the case," says Scientific Advisory Panel (SAP) member David Andow, a corn entomologist at the University of Minnesota. Panel members convened by the EPA were mystified and frustrated when the agency bypassed some of their major recommendations. Other technical experts say they were asked to give their opinion on the corn, then blacklisted from the advisory panel later. The major disagreement, however, is the size of the

transgenic crop 'refuge'. The SAP majority recommended a 50% refuge be planted, [ie] the same amount of nontransgenic corn must be planted beside or within transgenic crops. The EPA required a 20% refuge in the 3-year registration, the size Monsanto and another group of experts recommended.

Full item: <http://www.GEinfo.org.nz/052003/12.html>

Web Link: <http://www.nature.com/nbt/>

Contamination Is Inevitable if BT crops Used in Future

26) Brassicas are particularly prolific in spreading their genetic material.

(see Wrightsons submission to MAF on protocol for seed testing. "Brassica Cross pollination", Dr Stewart Gowers, Forage Brassica breeder, Crop and Food Research.)

27) It is unethical for ERMA to allow trials of GE Bt crops based on the assumption that if successfully developed, the GE contamination that is inevitable will be forced on the public and farmers.

The Bt Crops to be trialled will inevitably contaminate other brassicas if released. This will close off "options" for GE-free production which the Royal Commission on Genetic Modification said should be preserved.

This inevitable contamination would deny the right to choose GE-free produce for consumers and farmers.

Contamination problems overseas have shown segregation systems have failed and that unexpected gene-flow as well as major human error may be occurring and needs urgent investigation.

Major Contamination incidents to date include: spread of GE maize into natural crops in Mexico, contamination of conventional canola (a brassica) in Canada and Australia, contamination of US exports of Long grain rice by an experimental GE rice that was terminated five years before, contamination of human food by the Starlink corn variant approved only for animals because of its potential to cause allergies in people.

28) Scientists have identified contamination risks in GM oil seed rape

The Guardian, October 14, 2003 (UK)

Government scientists have discovered that genetically modified oil seed rape cannot be contained by separating it from fields of conventional crops, after bees carried the pollen up to 16 miles (26km) away. A second piece of research has shown that once GM oil seed rape has been grown in a field, it would be 16 years before a conventional crop could be grown in the same field without fear of contamination of more than 0.9%, the threshold for claiming that the crop was GM free. The amount of gene flow rapidly declines over tens of metres and long distance transfer is "rare". Transfer from one field to the next is around 0.1%, one in 1,000. Long distance transfer was blamed on bees carrying the pollen back to the hive and swapping it with other pollen - fertilising plants thought to be miles out of reach. The scientists concluded: "Complete (100%) purity cannot be maintained by geographical separation." The second study involved the cross-pollination of rape with other wild relatives and spilt seed regrowing in fields the next year. Only rigorous spraying with weedkiller every year for five years would reduce them to less than the 0.9% contamination level for the new crops to be classed as non-GM. If the field was not sprayed, the model predicted that the presence of the original variety in subsequent crops would not fall below 1% for 16 years.

Full item: <http://www.GEinfo.org.nz/102003/09.html>

Web Link: <http://politics.guardian.co.uk/green/story/0,9061,1062559,00.html>

29) Tests for contamination found traces of GM crops in the US wheat supply

Reuters, May 30, 2003 (USA)

Tests have revealed that traces of genetically modified grains are repeatedly creeping into US wheat supplies. Biotech soybeans and corn, the two most widely grown genetically modified crops in the world, are the common culprits. Traces of the GM crops have been found not only in unmilled wheat but also in flour and other foods, sources said. "We've already got GM contamination in wheat in small levels from non-GM sources," said one US milling source. "If we can't keep the corn and soybeans out of the wheat, how are we going to keep the GM wheat out of the wheat?"

Full item: <http://www.GEinfo.org.nz/072003/08.html>

Web Link: <http://www.planetark.com/dailynewsstory.cfm/newsid/21017/story.htm>

30) GM Contamination Occurring in Australia

AAP NewsWire, Australia 26.10.05

The state government is concerned up to 150,000 hectares of the state's canola crop could be affected by the latest GE contamination of West Australian crops. WA Agriculture Minister Kim Chance said "It is either a malicious act, or unbelievable sloppy practice, but either way we will be investigating".

31) Canola GM contamination traced to late 1990s trial ABC, 2.11.05

www.abc.net.au/news/items/200511/1496141.htm?tasmania

Tasmania's head of biosecurity is welcoming an inquiry, to determine exactly how GM canola contamination occurred. Contracted by the Victorian Govt to grow a variety of canola in 1999, recent tests show that while the seeds were apparently GM-free, return shipments were contaminated.

32) GM can 'Ruins fields for 15 years'

The Independent, 9.10.05 (UK)

GM crops contaminate the countryside for up to 15 years after harvest[ing], new government research shows.

The study, published by the Royal Society, examined 5 sites across England and Scotland where GM oilseed rape has been cultivated, and found significant amounts of GM plants growing even after the sites had been returned to ordinary crops. The researchers found one plant per sq. m., 15 years after a single GM crop, enough to break the EC limit on GM contamination.

33) Probe into sales of unapproved GM corn

Nature, March 22, 2005 (USA)

Syngenta revealed th[at] a strain of GM corn that does not have regulatory approval has been distributed by accident over the past four years. Although believed to be safe, the fact that it was sold for years by accident raises serious questions about how carefully biotechnology firms are controlling their activities, critics say. Syngenta has approval to sell a variety of the transgenic crop called Bt11. But between 2001 and 2004, [it] inadvertently produced and distributed several hundred tonnes of Bt10 corn - a different modification that has not been approved.

Full item: <http://www.GEinfo.org.nz/042005/01.html>

Web Link: <http://www.nature.com/news/2005/050321/full/nature03570.html>

34) Big insurer refuses GE farm cover

New Zealand Herald, September 27, 2003 (New Zealand)

New Zealand's second-biggest insurer, Vero, will not cover farmers for liability against damage or injury from the use of genetic modification technology. "We perceive that the use of genetic modification technology in farming will present liability risks that we do not wish to insure," the memo said. Green Party co-leader Jeanette Fitzsimons warns that other insurance companies are likely to follow suit and says the decision reveals "just how big a risk insurers believe the GE industry to be. The combined result of the liability regime and the lack of insurance is that the full risk for any GE organism that goes wrong will be borne by the victim." Environment Minister Marian Hobbs, Federated Farmers and the Insurance Council agreed that other companies would follow the lead

set by Vero, formerly Royal & SunAlliance, in refusing cover. But they played down the significance, saying it had been predicted and simply reflected the newness of the technology.

Full item: <http://www.GEinfo.org.nz/092003/02.html>
<http://www.nzherald.co.nz/storydisplay.cfm?storyID=3525771&thesection=news&thesubsection=general>

Learning the Lessons from Overseas Problems with Bt crops

35) Toxic GE Crops have sometimes allowed insects to thrive

15.7.06

www.scoop.co.nz/stories/SC0607/S00025.htm

Genetically modified crops highly toxic to humans but insects seem to thrive on them. Two research teams in England and Venezuela have discovered something alarming about the new GM crops filled with insecticide. The insects not only eat them, they seem to thrive on them.

Scientists at Imperial College in London and the Universidad Simon Rodrigues in Caracas found that the insects that the chemical additive was supposed to kill were not only feeding on the poison, but the stuff seems to help them thrive.

36) Monsanto admits "numerous problems" with transgenic pest control New Scientist August 17, 2002 Vol. 175; Pg. 22

Monsanto's patents admit transgenic pest control (as in Bt corn and Bt cotton) "may not be desirable in the long term" because it produces resistant strains and "numerous problems remain...under actual field conditions".

37) Farmers protest over BT seeds' poor yield

Hindu Business Line, October 18, 2004 (India)

Contending that GM BT cotton seeds supplied by multinational companies had failed to give the promised yield, the All India Kisan Sabha announced a State-wide agitation to press for adequate compensation from the companies.

AIKS National Vice-President Mr K Nageswara Rao lamented that farmers raised the GM cotton in one lakh acres expecting a yield of 20 to 25 quintals per acre as claimed by the MNCs. But they were able to get only about five quintals per acre as against the normal

yield of five to 10 quintals.

Full item: <http://www.GEinfo.org.nz/112004/11.html>

38) 'GM plants no panacea' by Barry Fox

Opponents of GM technology will surely pounce on new patents from the US agrichemicals company Monsanto which admits that genetically engineering plants to resist pests is not a panacea. Novartis has already had doubts (New Scientist, 18 December 1999, p 5) and now Monsanto's patents (W0 02/28184/5) admit even more frankly that transgenic pest control "may not be desirable in the long term" because it produces resistant strains and "numerous problems remain...under actual field conditions". So they're going for a belt-and-braces approach. Monsanto will now bioengineer maize to release endotoxins, but also treat the maize seed with the pesticides clothianidin and thiamethoxam. This, says Monsanto, has a synergistic effect with the endotoxin, giving increased resistance to corn rootworm. (Source: <http://www.ngin.org.uk> Date: 19 August 2002)

39) Insects Develop Resistance to Engineered Crops, say Cornell Research

Newswise, June 21, 2005 (USA)

Newswise - Genetically modified crops containing two insecticidal proteins in a single plant efficiently kill insects. But when crops engineered with just one of those toxins grow nearby, insects may more rapidly develop resistance to all the insect-killing plants, report Cornell University researchers.

Cornell University researchers found that after 26 generations of the insect living in the greenhouse with single-gene and dual-gene plants housed together, all the plants were eventually damaged by the insects, because over time, greater numbers of insects developed resistance to the plants' toxins. However, in the same two-year time frame, all or almost all of the insects died when exposed to pyramided plants alone.

"It's easier for an insect to develop resistance to a single toxin," said Shelton. "If an insect gets a jump on one toxin, then it becomes more rapidly resistant to that same toxin in a dual-gene plant. And when one line of defense starts to fail, it puts more pressure on the second toxin in a pyramided plant to control the insect," Shelton added.

Full item: <http://www.GEinfo.org.nz/072005/08.html>

Web Link: <http://www.soyatech.com/bluebook/news/viewarticle.ldml?a=20050621-6>

Though this finding is argued to support dual-genes plants, it also indicated lack of prior research by the applicants on existing problems and does not justify open-field trials instead of contained research

40) Bt Crops can Drive Development of Secondary Pests

Transgenic cotton drives insect boom- secondary pests could undermine initial benefits of Bt cotton, by Helen Pearson

Source: News@Nature.com Published online 25 July 2006 , doi: 10.1038/news060724-5

Making cotton resistant to bollworm can leave it open to other insect attacks.

After 7 years of planting cotton genetically engineered to kill bollworms, other insects have boomed so much on Chinese farms that their owners are losing money.

The new finding, from a study of nearly 500 cotton farmers, is likely to be controversial because it suggests that the genetically modified (GM) Bt cotton, named for the *Bacillus thuringiensis* bacterial gene it contains, doesn't live up to the agricultural success story suggested by some earlier studies....The new study conducted 7 years after the cotton's introduction , paints a gloomier picture of the crop's economic impact....

The researchers found that populations of other cotton pests, particularly ones called mirids, have blossomed. These were once killed by the same broad-spectrum pesticides used to control the bollworm. Now, farmers are spending almost as much on pesticides to control these secondary pests as those farmers growing regular cotton. "

41) Bollworm eats into Bt cotton prompting use of more toxic sprays

The Hitavada, October 10, 2002 (India)

American bollworms have eaten more than 80% of the yield on a three acre farm, sown with Bt cotton seed. When the [Genetic Engineering Approval Committee] GEAC cleared Bt cotton seed early this year, it was called the ultimate answer to American bollworms, considered the biggest enemy of cotton crop in India.

But at the Anandwan farm, the dreaded bollworm has emerged triumphant, deracinating what was projected to be its nemesis. Ironically, just beside the ruined Bt cotton crop stands a successful crop of Nanded 44 cotton, a domestically developed breed of cotton. This is no ordinary farm. It belongs to Anandwan College of Agriculture. The person crying foul is none other than the Dean of the College Dr. M Y Palarpawar. In September, the college staff had to clear the farm of 10,000 bolls left completely parched by the worms.

"The scale of attack forced us to spray insecticides. When Bt seed was introduced, its advocates said it would render pesticides obsolete," Dr Palarpawar said. "Farmers went for Bt as they were unable to bear the cost of insecticides. What's the point in purchasing expensive Bt seed and also using equally expensive insecticides?" he asked.

Full item: <http://www.GEinfo.org.nz/092002/07.html>

Web Link:

http://www.agbioindia.org/archive_m.asp?id=106&mo=10

(Not a direct link)

42) GM cotton fails to improve biodiversity

Scientific American, May 2, 2006 (USA)

"One thing I was a bit surprised to find is that if you control some pests with [transgenic] cotton, others become more of a problem."

A study of randomly chosen cotton fields reveals that although GM cotton did reduce pesticide use, it did not reduce use of herbicides nor did it improve biodiversity when compared to unmodified strains.

Ecologist Yves Carriere of the University of Arizona and his colleagues randomly selected 81 cotton fields - split between unmodified and transgenic cotton breeds. The scientists gathered data on pesticide use, herbicide use and all the ants and beetles they could find in pitfall traps placed in the fields.

The data confirmed that farmers applied pesticides less often to transgenic fields - and used more precisely targeted chemicals when they did. But use of such targeted pesticides on modified cotton did rise in the fields selected during the second year of the study, perhaps due to the need to control pests unaffected by the engineered toxin, the authors speculate. And herbicide use remained the same no matter whether the cotton in question was unmodified, toxin-producing, or toxin-producing and herbicide resistant. Nor did genetic modification seem to have an effect on ant and beetle biodiversity; no matter which type of cotton was grown, ant populations declined and beetles boomed in farmed fields compared to adjacent unfarmed fields, according to the paper in Proceedings of the National Academies of Science.

"You cannot simply assume that you will get across-the-board benefits," Carriere notes.

"One thing I was a bit surprised to find is that if you control some pests with [transgenic] cotton, others become more of a problem."

Full item: <http://www.GEinfo.org.nz/082006/01.html>

43) Scientists: Bt cotton drives insect boom

IndiaNews, July 27, 2006 (India/China)

Bt cotton, said to provide extra security against bollworms, has actually led to a larger menace from other insects on Chinese farms, according to a study that advises farmers in India to guard against GM seeds.

The results of the study were presented at the American Agricultural Economics Association annual meeting, reports the science journal Nature. The study covered nearly 500 cotton farmers who planted Bt cottonseeds seven years ago.

Per Pinstrup-Andersen and his colleagues at Cornell University in Ithaca, New York, worked with Chinese agricultural researchers to interview cotton farmers about their finances and insecticide use in 2004.

'The researchers found that populations of other cotton pests, particularly ones called mirids, have blossomed. These were once killed by the same broad-spectrum pesticides used to control the bollworm. 'Now farmers are spending almost as much on pesticides to control these secondary pests as those farmers growing regular cotton,' the report said. 'The study raises fears that explosions of secondary pests will also gradually erode the benefits of Bt cotton in other countries where it has been adopted, such as India and South Africa,' said the report. China was the second country after the US to adopt Bt cotton in 1997.

After two to three years of use, studies had shown a dramatic rise in yield and 70 percent reduction in the use of insecticides. The current picture, however, is dismal. The researchers found the Bt cotton farmers have a net average income that is eight percent

lower than farmers growing conventional cotton.

Full item: <http://www.GEinfo.org.nz/082006/02.html>

44) Bt cotton benefits short-lived: study

Financial Express , February 10, 2004 (India)

There is some bad news for Indian farmers who have started growing a type of genetically modified cotton containing the bacillus thuringiensis (Bt) gene. The Bt gene produces a toxin called "cry1ac" that kills bollworms. A study released by entomologists K Chandrasekar and G T Gujar at Indian Agricultural Research Institute in New Delhi has cast doubts on the long-term benefits of Bt cotton. It found that the protection afforded by Bt gene is at best for six years - the bollworm develops "31-fold resistance to the toxin "cry1ac" within six generations." This means that cotton farmers may have to go back to spraying pesticides after six seasons unless scientists come out with Bt cotton hybrids that produce a high dose of the cry1ac toxin. The scientists say their findings "mandate the necessity of Bt resistance management." Development of resistance to Bt cotton is not unknown. In China the expected life of Bt cotton was found to be 7 to 10 years in areas under Bt cotton exceeding 70 per cent.

Full item: <http://www.GEinfo.org.nz/052004/02.html>

Web Link: http://www.financialexpress.com/fe_full_story.php?content_id=52355

45) Bt cotton ineffective against bollworm: research

ASHOK B SHARMA

FRONT PAGE - Financial Express, August 01, 2005

Recent research findings on Bt cotton have placed the country's regulatory authority, Genetic Engineering Approval Committee (GEAC) in the dock. Based on a series of experiments, a team of scientists from Nagpur-based Central Institute of Cotton Research (CICR), have proved that the Bt cotton becomes ineffective in its resistance to bollworm after 110 days.

GEAC is slated to meet on August 10 and take up the matter. The civil society organisations, who have claimed that Bt cotton has failed to produce the desired results, are now up in arms demanding a review of the decision.

Bollworms cause extensive damage to the cotton crop. With a view to make the cotton plant resistant to bollworms, transgenic technology was applied by inserting the gene from a soil bacteria, Bacillus thuringiensis (Bt). This inserted gene allows the plant to produce Cry1Ab protein which is toxic to bollworms.

However, a team of scientists from CICR, led by Keshav R Kranthi, have recently found that the resistant power in cotton plant remains only for 110 days, after which the crop can be exposed to bollworm attacks. The Cry1A level declines as the plant grows and is found to drop below its "lethal level" of 1.9 mg within 110 days after sowing.

"In our next meeting, we may discuss the findings of the paper published in Current Science," said a senior GEAC member. The study further said that toxin expression were lowest in the ovary of flowers and rinds of green bolls which are the most favoured sites of bollworm attack.

The study was published in the July 25 edition of Current Science. Current Science also published in May 25, 2003, a similar study conducted by a team of scientists in the University of Agricultural Sciences, Dharwad.

"The decline in resistant power means that the farmer has to apply more chemical pesticides to save his crop. Already, the cost of Bt cotton seeds are high and added to this, he incurs additional costs on pesticides. Eventually, he lands up in heavy debts," a researcher said.

"Those farmers, who hope that Bt cotton can be a miracle and, therefore, do not apply heavy doses of chemical pesticides, are at a loss," said the director of Secunderabad-based Centre for Sustainable Agriculture (CSA), DrGV Ramanjaneyulu. "The very fact that scientists do not have control over toxin expression in plants shows that transgenic technology is imprecise and unpredictable," he said.

He said that CSA conducted studies on each of the three years of commercial cultivation of Bt cotton in India. All the results proved that Bt cotton growers incurred losses. In contrast, the farmers growing non-Bt cotton, following the procedures of organic farming and applying bio-pesticides, reaped good profits, he said.

In the past three years of commercial cultivation of Bt cotton, several other NGOs like Gene Campaign, Research Foundation for Science, Technology and Ecology, and Deccan Development Society, conducted studies and came out with similar results. These NGOs and farmers' organisations like Bharat Krishak Samaj had cautioned GEAC to withdraw approval to Bt cotton.

However, GEAC, this year, approved 13 new varieties of Bt cotton for different regions of the country. At the same time, it banned cultivation of Mech-12 Bt in the entire south Indian region and Mech-162 Bt and Mech-184 Bt in Andhra Pradesh on receiving adverse reports from the concerned state government.

Source: http://www.financialexpress.com/fe_full_story.php?content_id=97943

Alternative Research Offers the Community Significant Benefits over this Research

46) There is an 'opportunity-cost for the Bt crop research which has no commercial output: efforts can be better invested elsewhere.

Alternative research could deliver marketable products as well as scientific benefits that significantly exceed the approaches being developed by the applicants.

These may include, but are not limited to redirecting the investment from the proposed trial to IPM (Integrated Pest Management) and Organic production systems.

Such approaches already offer solutions to the problems of chemical applications the applicants claim as the benefit of their research.

Organic farmers do not use organophosphates, carbamate and other insecticides or synthetic pyrethroids in New Zealand. Existing Integrated Pest Management (IPM)

methods have led to a 50-65% reduction in total insecticide application to brassicas in New Zealand (Teulon and Losey, 2002).

New Zealand has a strong history of successfully implementing IPM programmes with non-GE crops that which do not contaminate conventional food with GE constructs as BT brassica crops will do.

47) There are clearly alternatives to many biotechnology products : Union of Concerned Scientists

Source:

http://www.ucsusa.org/food_and_environment/genetic_engineering/alternatives-to-genetic-engineering.html

When the goals include reducing dependence on pesticides and herbicides, there are clearly alternatives to many biotechnology products. Many of these alternatives are not other products, but instead the systems and methods of sustainable agriculture. Conversion from industrial agriculture to sustainable systems that depend less on chemicals would eliminate the need for many of the currently projected products of biotechnology. Agricultural biotechnology, as it is currently developing, is not particularly fruitful in the quest for a sustainable agriculture. Sustainable agriculture solves problems by understanding and adjusting the elements of the system to achieve its goals rather than by developing new products that must be purchased. Agricultural biotechnology, by contrast, is basically an input industry, developing products, often expensive products, priced to cover the costs of research and development. In sustainable agriculture, new products are less important than new knowledge and new ways of manipulating agricultural ecosystems.

48) The theoretical concern about resistance developing has been repeatedly demonstrated in conventional medicine

Source: Weaver S, Morris.M, "Risks Associated with Genetic Modification: An Annotated Bibliography of Peer Reviewed Natural Science Publications

"Evolutionary ecologists would predict that a substance designed to kill insects would at the same time act as a selection pressure for resistance to the same substance. This theoretical concern has been repeatedly demonstrated in conventional medicine with the evolution of resistance to antibiotics in human medicine and in the evolution of resistance to chemical pesticides in agriculture....Insecticide resistance has environmental and human health consequences. Bt protein is used in organic agriculture as a non-toxic means of insect pest control. If pests become resistant to Bt protein then more toxic sprays may be substituted. This could increase occupational exposure to insecticides and would produce increased adverse effects in soil and water through run-off." (pg 4, 90-103)

Experiments with Bt Broccoli have been undertaken overseas but these* and other peer-reviewed studies (listed in Weaver, Morris 2005) are not cited by the applicants.

*Cao.J, J.D.Tang, N.Strizhov, A.M Shelton and E.D.Earle, " Transgenic Broccoli with high levels of Bacillus thuringiensis Cry1C Protein Control Diamondback Moth Larvae Resistant to Cry1A or Cry1C," Molecular Breeding 5 (1999) 131-141

Gould.F, " Sustainability of Transgenic Insecticide Cultivars: Integrating pest genetics and ecology," Annual Review of Entomology 43 (1998) 701-726

Tabashnik B.E, Y.B Liu, n. Finson, I. Massson, and DG Heckel, "One Gene in Diamondback Moth Confers Resistance to Four Bacillus thuringiensis Toxins", Proceedings of the National Academy of Sciences 94 (1997), 1640-1644

Significant Differences between Bt Plants and other Bt bio-pesticides Must Not be Ignored

49) Bt plants produce much more toxin and for longer periods than other applications so their impacts cannot be expected to be the same.

There are also significant differences in risk associated with the nature of the recombined genetic elements and molecular changes occurring in transgenic plants.

"The transgenic Bt genes have been substantially modified. They are truncated and engineered to produce 100 times higher expression in plants (Hilder and Boulter 1999; Andow 2002). Significantly, many Bt genes in transgenic crops are modified so that they are toxic without need for proteolytic activation in the insect gut, (Groot & Dicke 2001). The ubiquitous and continuous availability of these highly expressed toxins in Bt-plants has important implications for their use in the field, (and) necessitates new risk management techniques to take these differences into account(Jepson et al 1994). (Quoted from Teulon and Losey, 2002)

50) There is evidence that Bt plants can present new risks to natural predators and beneficial insects like bees, but the data is limited.

The absence of data "may be partly due to the inability of current risk assessment procedures to adequately address the complexity of ecosystems. (Obrycki et al. 2001; Hilbeck 2002)" (Teulon and Losey 2002, page 398)

51) It is wrong for the applicant to claim "Therefore Bt crops are not adding anything new to the already existing flow of cry genes among soil micro-organisms" (page 27)

Though the applicant states research associated with the trial will test for Horizontal Gene transfer this research is suitable for fully contained studies, not open field trials.

The applicant is also wrong to ignore concerns about HGT of antibiotic resistant marker genes (NPTII resistant to kanamycin) in people or animals consuming the Bt crops. At the same time they dismiss concerns about HGT in soil, stating "the NPTII gene DNA will not alter or disturb a soil ecosystem".

Regulation of GE Crops Overseas is Unreliable for Scientific Risk Management

Independent scientist and a growing body of evidence shows that Regulatory approval of existing GE crops produced overseas has been seriously flawed. ERMA cannot consider past " case by case" approvals of genetically engineered Bt crops for consumption in New Zealand / Australia or overseas as proof of safety or legitimate data for risk management purposes.

A two year safety audit by the United States Office of the Inspector General found that " Current (USDA) regulations, policies and procedures do not go far enough to ensure the safe introduction of agricultural biotechnology".

52) Report blasts oversight of test fields

December 30, 2005 • ID: des2005123011458778

By PHILIP BRASHER Washington, D.C. - The U.S. Department of Agriculture has failed to properly oversee field trials of genetically engineered crops, including plants designed to produce chemicals for medical and industrial uses, investigators say. A report released Thursday by the USDA's inspector general said the department "lacks basic information".

(source: DesMoinsRegister.com accessed 11 November 2006)

53) USDA "highjacked" by corporate interests

Associated Press, July 23, 2004 (USA)

The US Department of Agriculture has shifted from being a people's agency to an agency for corporate agriculture, a new report by a coalition of agriculture leaders charges.

The report, titled, "USDA Inc.: How Agribusiness has hijacked regulatory policy at the US Department of Agriculture," was commissioned by the Agribusiness Accountability Initiative, a network of family farm and public interest groups.

The report calls the USDA "one of the strongest proponents" of GM foods, even though many farmers have been vehement in their opposition. The report charges that the USDA support can be directly attributed to top-ranking USDA officials having ties to biotechnology companies.

"These industry-linked appointees have helped to implement policies that undermine the regulatory mission of USDA in favor of the bottom-line interests of a few economically powerful companies," the report states.

Full item: <http://www.GEinfo.org.nz/092004/08.html>

Web Link: <http://www.aberdeennews.com/mld/aberdeennews/news/9227760.htm>

54) The US FDA declared GE food are 'substantially equivalent' to conventional food. It ignored the warnings of its own scientist

The FDA put in place food rules that assume unforeseen effects will occur and, therefore no safety testing is required, for genetically engineered foods. This premise has been proven wrong. (source: Physicians and Scientist for Responsible Genetics: Submission to Councils, April 2006)

55) Experts Warn GE Foods Previously Approved Must be Tested Using New Techniques

In 2006 agricultural economist Dr Charles Benbrook – a former advisor to the Carter, Reagan and Clinton administrations- warned of serious concerns over safety in respect of genetically engineered foods. He says these crops should be retested using Australian food safety technology developed by the Australian National University.

(Source: Canberra News Bureau, Rural Press Agricultural Publishing: " GM crops: US expert wants crops e-tested with latest technology," by Michael Thomson, 30 November 2005)

The tests were used to identify problems with a decade-long project by CSIRO to develop genetically modified peas with built-in pest-resistance. The tests showed the GM pea caused allergic lung damage in mice and the was project abandoned.

(source 21.11.05 NewScientist.com)

56) FDA policies for GM foods show major flaws

Washington Post, January 7, 2003 (USA)

The Center for Science in the Public Interest, a Washington group known for a moderate stance on the use of genetic engineering to alter food plants, contends that the Food

and Drug Administration, the primary federal agency responsible for food safety, missed "obvious errors" in reviewing some gene-altered crops. "Had FDA conducted thorough reviews, the errors would have been easily detected," the[y] said.

The group said the FDA's procedures are so full of holes that continued safety cannot be ensured as companies press to bring many more GE plants to market.

"The companies don't provide enough data to prove these foods are safe," said Gregory A. Jaffe, director of biotechnology issues at the center. "And FDA's review process doesn't give you a lot of comfort that they've looked at it closely and challenged the companies."

Some gene-altered food plants fall under regulations requiring mandatory approval from the Environmental Protection Agency before going to market. But others fall solely under the FDA's food-safety jurisdiction, and that agency has adopted only voluntary procedures for companies to follow.

In many instances the FDA requested information on the nutritional composition of a plant that industry failed to provide.

Full item: <http://www.GEinfo.org.nz/012003/01.html>

Web Link: <http://www.washingtonpost.com/wp-dyn/articles/A19370-2003Jan6.html>

57) There is a Lack of research into GM health effects

Medical News Today, June 24, 2004 (Online)

A study by scientists in Norway and Denmark shows a serious lack of published research into the health effects of GMOs. The study, published in the journal Nutrition and Health says that there have only been ten published studies of the health effects of GM food or feed. Over half were undertaken fully or partially in collaboration with companies, and these found no negative effects on body organs. The other studies were independent and looked more closely at the effects on the gut lining. Several of these found potentially negative changes which have not been explained. The biotechnology companies often refer to some 100 animal feeding studies as proof of safety. [But] these were designed to test the commercial value of the animal feed, not safety. Many of these studies were duplicates and not all were published.

Full item: <http://www.GEinfo.org.nz/072004/02.html>

Web Link: <http://www.medicalnewstoday.com/medical/news.php?newsid=9876>

58) Official Watchdogs fails on GM food: Minister

West Australian, April 10, 2006 (Australia)

Agriculture Minister Kim Chance [is] claiming the national food safety watchdog (Food Standards Australia New Zealand), does not adequately assess health impacts of GM crops. "[It] is not rigorous. They review information sent to them by GM companies, the review is fairly superficial and they don't look at the raw data," Mr Chance said.

Mr Chance opened fire in defence of the Governments move to fund one of only a few trials to be held worldwide into the effect of feeding animals GM crops. The plan attracted criticism from pro-GM scientists and FSANZ because the work will be conducted by a research group which is openly opposed to GM products.

The trial, due to start mid-year, will see laboratory rats or mice fed GM and non-GM crops over a six month period. Their blood and organs will then be analysed to see if there is any significant difference between those fed different crops.

Full item: <http://www.GEinfo.org.nz/052006/02.html>

Web Link: http://www.non-gm-farmers.com/news_details.asp?ID=2711

59) EC approved GM crops despite scientific fears

The Daily Telegraph, April 18, 2006 (EU)

The European Commission approved a range of GM foods and crops despite having serious doubts over their health and environmental impacts, according to green charities. Greenpeace and Friends of the Earth said the documents revealed scientific arguments put forward behind closed doors in the EC's recent GM trade dispute.

In the documents, the Commission argues that there were "large areas of uncertainty about the health risks posed by GM produce," and that "some issues have not yet been studied at all." The papers also say "there simply is no way of ascertaining whether the introduction of GM products has had any other effect on human health," and "no unique, absolute, scientific cut off threshold available to decide whether a GM product is safe or not." The documents [also] suggested there were huge disagreements between the Commission and the European Food Safety Authority, the agency that is responsible for GM risk assessments.

Full item: <http://www.GEinfo.org.nz/052006/03.html>

Web Link: <http://www.telegraph.co.uk/news/main.jhtml?xml=/news/2006/04/18/ugm.xml&sSheet=/portal/2006/04/18/ixportaltop.html>

60) Safety checks on GMOs flawed: EU enviro chief

Reuters, April 5, 2006 (EU)

EU Environment Commissioner Stavros Dimas attacked the EU's top food safety agency on Wednesday for flawed risk assessments of GM crops and foods, saying it relied too much on data given by the biotech industry. In a strong hint he was unwilling to process new requests for approval of GMOs for growing until their long-term impact was known, [He] also warned against using such data as a sole information source.

"There are questions like whether scientific opinions rendered by EFSA have relied exclusively on information provided by companies that look at short-term effects," he said. "EFSA cannot give sound scientific opinion on long-term effects of GMOs. There are also questions on whether GMO companies are providing the right information to the Commission."

Full item: <http://www.GEinfo.org.nz/052006/05.html>.

Web Link: <http://www.planetark.com/dailynewsstory.cfm/newsid/35913/story.htm>

61) EU has been found guilty of withholding GM food data

Dow Jones News Service, July 19, 2006 (EU)

The European Commission has been found guilty of withholding information on GM food. The Ombudsman charged the commission with "maladministration" after it refused to disclose documents to environmental pressure group Friends of the Earth. The documents revealed scientific concerns about the long-term health safety of genetically-modified foods.

Full item: <http://www.GEinfo.org.nz/082006/08.html>

A lawsuit filed [by] the Center for Food Safety seeks to force the US government to conduct mandatory reviews of GE foods and require labeling of such foods once approved.

The suit against the Food and Drug Administration comes after years of lobbying by environmental and consumer groups for more stringent regulation and labeling of biotech crops.

The US requires no independent testing of these crops or the food products they are used in, does not mandate what data companies must submit for review, and does not require that foods that contain biotech crops be labeled, CFS said.

Last year scientists found that bean genes engineered into pea plants created a potentially dangerous allergen. CFS said the tests that exposed that potential hazard have not been conducted on any of the GM foods currently marketed in the US.

Full item: <http://www.GEinfo.org.nz/072006/08.html>

62) Pew Report highlights questions over biotech regulation

Pesticide & Toxic Chemical News, April 5, 2004 (USA)

The Pew Initiative on Food and Biotechnology released a lengthy report on the US review process for future biotech food products. Th[e ensuing] debate cuts across the usual industry versus consumer lines, with some regulators and industry officials privately conceding that the current system is - if not broken - at least in need of preventive maintenance. The existing regulatory framework was assembled during the Reagan administrations from a patchwork of existing laws and regulations and given to USDA, FDA and EPA to administer in a coordinated fashion. The report acknowledges that current ag biotech products have been widely adopted without evidence of food safety or environmental problems. However, it said "the potential complexity of future products may challenge the ability of the existing Coordinated Framework for Regulation of Biotechnology to continue to protect public health and the environment and maintain public trust."

Full item: <http://www.GEinfo.org.nz/052004/08.html>

Web Link: <http://news.bbc.co.uk/1/hi/sci/tech/3584763.stm>

Risks to Human Health

63) There are serious concerns about the hazards of Antibiotic Resistance

Genes in GE Foods

"The spread of antibiotic resistance is the main threat from gene transfer from GM crops," said Joe Cummins, Ph.D., professor emeritus of genetics at the University of Western Ontario, Canada. "I have found that the antibiotics used in GM crops are used in surgery and to treat a number of diseases."

Cummins, who reviews research published by biotech companies, has many reservations about the safety of genetically modified crops. "Their practice of science is a peculiar one," he said. The large biotechnology companies can present research to the USDA and most of it is accepted in the United States and "rubber stamped" in Canada. He paused and said, "They say they feel in their guts the science is safe." He laughed and added, "What they feel in their guts is big bucks." (Source: <http://www.organicconsumers.org/ge/genemarker.cfm>)

64) Prof. Joe Cummins has exposed the regulatory sham involved in GM crops containing biopesticides

ISIS Press Release 01/12/03

"In spite of the clear differences between the genes and the insecticide toxin proteins produced in bacteria and those produced in transgenic plants the US and Canadian regulators have agreed with the corporations manufacturing the GM crops that the products are substantially equivalent. So long as the final toxins are similar the bacterial toxins can be used as surrogates for the crop toxin in safety testing. The regulators made little or no effort to directly test the validity of their presumptions. They are placing the burden of proof that the toxins in the GM crops are unsafe for mammals and the environment on the shoulders of the public, not the corporations who profit from the GM crops. In the final analysis, the regulators are providing essential public relations benefits for the corporations but not adequately protecting the public. And so long as GM crops are not labeled in the market, the errors of the regulators will go undetected" (Source: www.i-sis.org.uk)

65) The British Medical Association called for further studies on GM foods *British Medical Journal, 2004;328:602, March 13, 2004 (UK)*

A BMA report calls for more long term research into the potential of GM food to cause allergies, although it acknowledges that preliminary, short term studies of GM foods have not shown any health risks. It says that more research is also needed on the

impact of GM foods in vulnerable groups, such as babies, elderly people, and people with chronic diseases, and that the health effects generally of GM foods should be closely monitored. Dr Vivienne Nathanson, BMA Head of Science said "The current absence of any evidence suggesting GM foods pose a threat to human health should not lead to complacency. Public health surveillance should be so complete that we can be certain that adverse effects from any dietary change would be recognised. We also need a commitment to research in key areas to minimise the potential risks to human health and the environment posed by genetically modified food."

Full item: <http://www.GEinfo.org.nz/042004/05.html>

Web Link: <http://bmj.bmjournals.com/cgi/content/full/328/7440/602-a>

66) The use of the Cauliflower Mosaic Virus (CaMV) promoter sequence demands research prior to field testing

The 35S CaMV promoter has been shown to potentially activate genes in mammalian species, and may even be a cancer risk

" The (Genetic Engineering) tool includes a "promoter," virtually always a gene from the Cauliflower Mosaic Virus, to allow the new genes to work within the host organism. Organisms normally repress, or "silence" new genes: The presence of the Cauliflower Mosaic Virus makes this defense less effective. Geneticist Cummins said he fears this promoter gene could recombine with other genes (bacteria and dormant viruses) to create new pathogens that could be harmful or lethal to plants, animals or people." (Source: <http://www.organicconsumers.org/ge/genemarker.cfm>)

67) The 35S CaMV plant virus promoter is active in human enterocyte-like cells

European Food Research and Technology, October 20, 2005 (Online)

The 35S cauliflower mosaic virus (CaMV) promoter is commonly used to drive transgene expression in the GE crop plants that have been commercialized so far. Whether, and how far, the 35S promoter might be active in mammalian cells has been scientifically unsettled and controversial.

We have investigated the promoter capacity of 35S in human enterocyte-like cells. It was demonstrated that the 35S CaMV promoter was able to drive the expression of both reporter genes to significant levels, although the protein expression levels might seem modest compared to those obtained with the strong promoters derived from human cytomegalovirus (hCMV) and simian virus 40 (SV40).

Some of the identified motifs indicate that transcriptional activation by the 35S CaMV promoter may be stronger in other human and animal cell types than in those investigated.

Research News: <http://www.GEinfo.org.nz/122005/07.html>

Web Link: [http://www.springerlink.com/\(qizf2h55r4bpyd3pzmznyfkip\)/app/home/contribution.asp?referrer=parent&backto=searcharticles/results,9,560;](http://www.springerlink.com/(qizf2h55r4bpyd3pzmznyfkip)/app/home/contribution.asp?referrer=parent&backto=searcharticles/results,9,560;)

68) Significant negative health effects have been linked to Bt crops and must be investigated prior to further trials.

These impacts include:

Dozens falling ill in Mindanao, Philippines www.i-sis.org.uk/MILTBFull.php

In the Nimad region of Madhya Pradesh, India, 23 farm workers fell ill after working with Bt Cotton containing Cry1Ac and Cry 1Ab toxic proteins, prompting an initial study by a 3-person independent team from non-government organizations. Their report states: "All the evidence gathered during the investigation shows Bt has been causing skin, upper respiratory tract, and eye allergy among persons exposed to the cotton". The team found allergy symptoms in people in direct contact with Bt cotton on their hands, feet, face, in their eyes and nose, with some becoming very severely ill.

A recent paper by Dr. Terje Traavik and Dr. Jack Heinemann (http://www.biosafety-info.net/file_dir/719762120455431f1a3942.pdf) takes a critical look at the state of scientific knowledge about the potential human health effects of genetic engineering and genetically engineered organisms. The authors identify some of the putative health hazards related to genetically engineered plants used as food or feed. They also identify numerous areas of omitted research, which need urgent investigation. This includes risks related to rearrangements of transgene inserts, the fate and consequences of DNA persistence and uptake in the mammalian gastro-intestinal tract, alteration in protein contents of GM food, the allergenicity of transgenic products, the implications of post-translational modifications and questions over the 35S CaMV promoter and the use of antibiotic resistance marker genes.

69) Scientists suspect health threat from GM maize

John Vidal, environment editor

Friday February 27, 2004

The Guardian

Scientists investigating a spate of illnesses among people living close to GM maize fields in the Philippines believe that the crop may have triggered fevers, respiratory illnesses and skin reactions.

If preliminary results are confirmed, it would be one of the first recorded cases of serious health problems associated with GM crops, and could damage the reputation of the biotech agriculture industry, which is rapidly expanding in developing countries.

Terje Traavik, scientific director of the Norwegian Institute of Gene Ecology, was asked to investigate. Blood tests showed the villagers had developed antibodies to the maize's inbuilt pesticide.

Professor Traavik, who issued a summary of his results yesterday, said more tests were needed, but felt his preliminary findings were reliable.

His studies suggest that a virus promoter - which is like a motor driving the production of the genetic message - was unexpectedly found intact in human cells.

His team also said it had found that genetically engineered viruses used in the GM

process recombined with natural viruses to create new hybrid viruses with unpredictable characteristics. If confirmed, this could suggest that they could cause new diseases. Prof Traavik said tests so far showed evidence of an immune reaction. He will return to the Philippines this week to continue the research before publishing full results in a peer-reviewed scientific journal.

But he rejected accusations that he was trying to scare people with data not yet reviewed by other scientists. "Publication of results typically requires a waiting period of up to one year or more," he said in Kuala Lumpur.

"With such evidence of possible human health impacts of foods already on the market, we believed that waiting to report our findings through publication would not be in the public's interest."

Monsanto said it was "extremely unlikely" that the limited production of the GM crop in the Philippines would have produced such results.(cont.)

Web Link: <http://www.guardian.co.uk/gmdebate/Story/0,2763,1157222,00.html>

See Also:

RI Vazquez Padron et al (1999) Intragastric and intraperitoneal administration of Cry1Ac protoxin from *Bacillus thuringiensis* induces systemic and mucosal antibody responses in mice. *Life Sciences*, 64, 1897-1912.

Impact of Bt Cotton on Farmers' Health (in Barwani and Dhar District of Madhya Pradesh) Investigation Report, Oct - Dec 2005, www.GMWatch_org.htm

Mortality in Sheep Flocks after grazing on Bt Cotton fields, – Warangal District, Andhra Pradesh, Report of the Preliminary Assessment, April, 2006 www.GMWatch_org.htm

Chowdhury EH, Kuribara H, Hino A, Sultana P, Mikami O, Shimada N, Guruge KS, Saito M, Nakajima Y. Detection of corn intrinsic and recombinant DNA fragments and Cry1Ab protein in the gastrointestinal contents of pigs fed Genetically modified corn Bt11. *J. Animal Science* 2003, 81, 2546-51

Vanessa E. Prescott, Peter M. Campbell, Andrew Moore, Joerg Mattes, Marc E. Rothenberg, Paul S. Foster, T. J. V. Higgins, and Simon P. Hogan* , Transgenic ___Expression of Bean -Amylase Inhibitor in Peas Results in Altered Structure and Immunogenicity, *Journal of Agricultural and Food Chemistry*, 2005, vol 53 (23), p 9023-9030.

70) Antibiotic resistance: GE crops adding to the problem

The use of antibiotic resistant marker genes is a negative risk factor that has prompted the British Medical Association as long ago as 1998 to call for the end of such uses.

In 2000 German scientists discovered that antibiotic resistant markers (ARM) genes from engineered canola were transferring their resistance to the bacteria found in guts of bees that had consumed pollen from plants.

European Union studies revealed ARM genes in GE foods could transfer into bacteria in the human gut as well as soil bacteria.

Source: www.organicconsumers.org/ge/genemarker.cfm

70) Survival of DNA in the human gut Has been proven

Weaver and Morris (Journal of Agricultural Environmental Ethics, 2005, 576) identify :
"the first recorded confirmation in the scientific literature that fragments of the tDNA can be transferred to gut bacteria in the human gut. There is some indication that transgenic DNA is more readily transferred to gut bacteria than non-transgenic DNA from the same plant"

(Netherwood T., S.Martin-Orue, A.G.O'Donnell, S.Gockling, J.Graham,J.c.Mathers and H.J.Gilbert; "Assessing the Survival of Transgenic Plant DNA in the Human Gastro intestinal Tract", Nature Biotechnology 22 (2004), 204-209)

GM genes found in human gut

The Guardian, July 17, 2002 (UK)

Although the genetically modified material in most GM foods poses no health problems, many of the controversial crops have antibiotic-resistant marker genes inserted into them at an early stage in development.

If genetic material from these marker genes can also find its way into the human stomach, as experiments at Newcastle university suggest is likely, then people's resistance to widely used antibiotics could be compromised.

The research, commissioned by the food standards agency, is the world's first known trial of GM foods on human volunteers.

They found "to their surprise" that "a relatively large proportion of genetically modified DNA survived the passage through the small bowel".

In three of the seven samples they found bacteria had taken up the herbicide-resistant gene from the GM food at a very low level.

Michael Antonio, a senior lecturer in molecular genetics at King's College Medical School, London, last night said that the work was significant. "To my knowledge they have demonstrated clearly that you can get GM plant DNA in the gut bacteria. Everyone used to deny that this was possible."

Full item: <http://www.GEinfo.org.nz/072002/01.html>

Web Link: <http://www.guardian.co.uk/gmdebate/Story/0,2763,756666,00.html>

Negative Impacts on Animal Health

71) Further independent research is required to investigate impacts of Bt crops on animals consuming them.

The GE brassica application makes no mention of pleiotropic effects, that is, unexpected side effects of a genetic change. Saxena and Stotzky (2001) studied Bt corn which had been genetically modified to produce the cry1Ab protein to kill lepidopteran pests. The Bt corn ended up having very much higher levels of lignin, a pleiotropic effect. High levels of lignin are associated with disease resistance to insect and microbial pests, so this looked positive. However animals feeding on grasses or corn with high lignin content utilize the food inefficiently.

When a bean gene (-amylase inhibitor-1) from the common bean (*Phaseolus vulgaris* L. cv. Tendergreen) was inserted into peas (*Pisum sativum* L.), it led to the synthesis of a structurally modified form of this inhibitor. Mice fed with the transgenic peas exhibited an altered immunological response, resulting in inflamed lung tissue (Prescott et al., 2005).

Saxena, D and Stotzky, G. (2001). Bt corn has a higher lignin content than non-Bt corn. *American Journal of Botany* 88:1704-1706.

Prescott, V.E., Campbell, P.M., Moore, A. Mattes, J., Rothenberg, M.E., Foster, P.S. Higgins, T.J.V and Hogan, S.P (2005). Transgenic Expression of Bean-Amylase Inhibitor in Peas Results in Altered Structure and Immunogenicity. *Agric. Food Chem.*: 53 (23), 9023 -9030, 2005.

72) Mass Deaths in Sheep Grazing on Bt Cotton

ISIS Press Release 03/05/06

At least 1 800 sheep were reported dead from severe toxicity after grazing on Bt post-harvest cotton fields in just four villages in Andhra Pradesh India

The symptoms and post-mortem findings strongly suggest they died from severe toxicity. This latest report confirms the findings of an earlier fact-finding investigation, on illnesses in cotton farm workers and handlers caused by Bt cotton in another cotton-growing state, Madhya Pradesh, in India. Similar illnesses and deaths among villagers in the Philippines linked to exposure to Bt maize since 2003. Similar Bt toxins from the soil bacterium *Bacillus thuringiensis* incorporated in GE crops are involved in all cases; but the regulators have done nothing.

73) GM pea causes allergic damage in mice

21.11.05 NewScientist.com

A decade-long project at Australia's national research organisation, CSIRO to develop genetically modified peas with built-in pest-resistance has been abandoned after tests showed they caused allergic lung damage in mice.

When the protein is expressed in the pea, its structure is subtly different to a harmless original protein expressed by a gene extracted from a bean. This may be to blame for the unexpected immune effects seen in mice. The work underlines the need to evaluate new GM crops on a case-by-case basis, said the researcher calling for comprehensive tests to screen GE plants. Each new GM food should be very carefully evaluated for potential health effects. Generally, digested proteins do not create a specific immune system response, but researchers found that mice that ate transgenic pea seed did develop antibodies specific to the protein.

Jeremy Tager, Greenpeace Australia's GE campaigner. "These results indicate the potential for unpredicted and unintended changes in the structure of transferred proteins. And I'm not aware of any country that requires feeding studies as part of its approval process." *Journal of Agricultural and Food Chemistry* (vol 53, p 9023)

74) Detection of GM DNA fragments and Cry1Ab protein in gastrointestinal contents of pigs

Journal of Animal Science 81:2546-2551, 2003

GM corn has been approved as an animal feed in several countries, but information about the fate of GM DNA and protein in vivo is insufficient. GM corn Bt11 is developed by inserting a recombinant DNA sequence encoding insecticidal Cry1Ab protein from *Bacillus thuringiensis* subsp. *kurstaki*. We examined the presence of corn intrinsic and recombinant cry1Ab gene by PCR, and the Cry1Ab protein by immunological tests in the gastrointestinal contents of five genetically modified corn Bt11-fed and five nonGM corn-fed pigs. Fragments of recombinant cry1Ab gene (110 bp and 437 bp) were detected in the gastrointestinal contents of the Bt11-fed pigs but not in the control pigs. These results suggest that ingested corn DNA and Cry1Ab protein were not totally degraded in the gastrointestinal tract, as shown by their presence in a form detectable by PCR or immunological tests.

Full item: <http://www.GEinfo.org.nz/102003/07.html>

Web Link: <http://jas.fass.org/cgi/content/abstract/81/10/2546>

75) EU demands Monsanto's tests on MON863

Agence France-Presse, May 24, 2005 (EU)

Agribusiness giant Monsanto has been asked to provide all its research results into a GM corn that may be a health risk. "Monsanto must immediately transmit to the EU's food

safety authority (EFSA) its entire research into MON 863," said Italy's professor Giorgio Calabrese, an EFSA member.

The company is said to have given only partial results of its tests when first seeking backing for the strain from the EU, [he] said. Guinea pigs fed on the corn developed abnormalities, an internal scientific report at the company found.

Full item: <http://www.GEinfo.org.nz/062005/04.html>

Web Link: <http://www.soyatech.com/bluebook/news/viewarticle.ldml?a=20050524-8>

Impacts on Soil and Other Organisms

76) Persistence of higher-levels of Bt toxins in soil surrounding Bt raises concerns for impacts on other microflora and fauna

Research has shown that the toxin released in root exudates accumulates in soil as it adsorbs and binds rapidly on surface-active particles (e.g. clay and humic substances) and retains insecticidal activity for at least six months (Saxena et al., 2002). (Weaver, Morris 2005)

Further contained research in the laboratory is appropriate but does not require open-field trials of a Bt Brassicas crops that can have no commercial application.

77) "Bt toxin is released in root exudates from 12 transgenic corn hybrids representing three transformation events"

Soil & Biology Biochemistry, January 2, 2002

The anti-lepidopteran toxin (Cry1Ab protein) encoded by truncated genes from *Bacillus thuringiensis* was released in the root exudates from all hybrids of Bt corn studied and which represented three transformation events (Bt11, MON810, and 176).

In vitro and in situ studies indicated that the toxin released in root exudates accumulates in soil, as it adsorbs and binds rapidly on surface-active particles (e.g. clays and humic substances), and retains insecticidal activity for at least 180 d, the longest time studied.

The results indicated that the release of the Cry1Ab protein by roots is a common phenomenon with transgenic Bt corn and is not restricted to only the one Bt corn hybrid (NK4640Bt) and transformation event (Bt11) studied initially.

D. Saxena, S. Flores and G. Stotzky Soil & Biology Biochemistry Vol. 34 pp 133-137

Full item: <http://www.GEinfo.org.nz/042002/06.html>

http://www.checkbiotech.org/root/index.cfm?fuseaction=subtopics&topic_id=6&subtopic_id=26&doc_id=2733&start=1&control=108&page_start=1&page_nr=121&pg=1#

78) Native and other insects, particularly beneficial insects important for pollination and honey producers may be impacted

Flies show pollen power

The Press, October 7, 2005 (New Zealand)

The skills of native flies in pollinating South Island crops may shed more light in evaluating the potential of cross contamination from genetically modified plants. A study by Crop & Food Research is monitoring the behaviour of native flies in arable plants and has found they could be major pollinators.

"If New Zealand was ever to allow commercial transgenic crops we must first examine any possibility of gene flow from these crops to other crops, weeds and native flora," said Crop & Food Research entomologist Dr Brad Howlett.

Little was known about the role of native pollinators in transferring pollen in crops before this study. Until now it was assumed bees do most of the crop pollination and arable farmers have traditionally placed honey bee hives next to crops for this purpose. Native flies have, however, been found in some crops carrying up to 19,000 pollen grains - as many as honey bees. On crops of pak choi, a bionid fly was found in numbers 10 times more than honey bees and carrying the same amount of pollen. The range of pollinators in crops, however, varies widely even on sites that are close together. In Central Otago it was found that two onion fields about 17km apart attracted completely different ranges of insects.

"To evaluate the likelihood of the movement of transgenic genes via pollen from GM plants, we must first understand the mechanisms that cause pollen movement," said Howlett.

Full item: <http://www.GEinfo.org.nz/102005/06.html>

<http://www.stuff.co.nz/stuff/0,2106,3436158a3600,00.html>