



Monthly Bulletin
on Genetic Engineering
September 2008

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Contents

GE India

1. GMOs are Time Bombs, Warns Bhargava
2. Bt Cotton Affects Soil Nutrient Availability
3. GM food on the menu? :The murky GMO scene in India
4. Bhargava Critiques NBRA Bill
5. GEAC miffed with Bhargava!

GE Globally

6. Food Companies Pledge Not to Use Clones
7. Top RP restaurants join 'I love my rice GMO-free' campaign
8. "On principle, we should back prince":
Scottish Environmental Minister, Michel Russell,
supports Prince Charles's comments on the GM foods

GE and Legal Domain

9. BILL TO PROTECT FARMERS AGAINST MONSANTO LAWSUITS

GE & Health

10. NEW THREAT FROM GM CROPS

Research & Publications

11. New Research Rocks Agbiotech

GE INDIA

1. GMOs ARE TIME BOMBS, WARNS BHARGAVA

<http://infochangeindia.org/200807077208/Agriculture/Features/Genetically-modified-crops-The-risk-factor.html>

Leading scientist Dr P M Bhargava warns that India may be flooded with genetically modified foods with unknown health risks unless the government takes urgent action. Widely regarded as the architect of modern biology and biotechnology in India, Dr. bhargava has won several awards including the Padma Bhushan.

In this interview, leading scientist Dr P M Bhargava, who first coined the term 'genetic engineering' in a syndicated article in 1973, warns against genetically modified (GM) foods being pushed into the Indian market without appropriate safety assessment to ensure that they do not increase health risks.

Thirty-two genetically engineered crops are presently being researched across 111 government and 50 private institutes, and already 14 have entered the trial stage. Dr Bhargava says we may be flooded with GM foods with unknown health risks unless the government ensures otherwise.

Q: You have consistently warned about scientific norms being flouted in order to push GM foods into the market.

A very dangerous precedent has been set in the country whereby GM foods like Doritos corn chips are being sold off the shelf against the law, and Bt cotton is being cultivated without a comprehensive risk assessment having been conducted on its effects — for example on the soil and the surrounding fauna. The most disturbing aspect of this trend is that the tests being done on toxicity are being conducted by the applicant company itself or on samples supplied by it. Will any applicant for permission to release a genetically modified organism (GMO) say its GMO is not safe? Monsanto is the world's largest seed supplier, and has a vested interest.

Q: Why is this being done?

For profit and, I dare say, nothing else. Western multinational companies (MNCs) want to make as much money as they can by exploiting people's ignorance. The fact of the matter is that we do not need Bt cotton or GM food. Globally, no major advantage is being conferred by these foods and the damage and harm they may cause

has still to be properly assessed. In the US, GM food does not require to be labelled, so it is being mixed with other foods. One of the reasons for the rising health bill in the US could well be GM foods.

Q: So MNCs are continuing with their monopolistic hegemony by selling GM seeds in third world countries?

Yes. A good part of the first world, including almost all the European countries, has imposed a ban on them. Switzerland, to cite an example, has put a moratorium on release of GMOs till 2012. Most countries across the world have banned GMOs.

The problem is that no one knows what effect these foods will have on us. In animals, we have a good idea about their possible ill-effects. In science, we collect evidence on the basis of which we make predictions. All our predictions so far are not in favour of GM foods unless they are tested extensively and exhaustively, which they are not today. Experts are crying themselves hoarse; it is for the Indian government to listen.

If all our politicians and scientists were committed to their country, not a single GM product would have been permitted in India as of today.

Q: What harm would occur if Bt crops are grown in India?

The government and scientific bodies have ignored several reports on the failure of Bt cotton in terms of yield, and how it has adversely impacted lakhs of farmers, for example in Vidarbha, who are now shifting from cotton to soyabean.

Bt cotton seeds were supposed to increase yields. This has happened in some cases, but not in many others where yields have decreased and the cost of production has gone up. The Bt seeds are also more expensive than normal seeds. The cost of Bt seed started with Rs 1,650 (per standard packet) as opposed to the cost of normal seed which is Rs 450.

The government needs to pay much more attention to the death of over 1,000 cattle that foraged on remnants of Bt cotton plants in some

districts of Andhra Pradesh over the last few years.

Monsanto-Mahyco's new studies have highlighted a gene flow of up to 15-20 metres (that is, the Bt gene can affect non-Bt plants that are 10-20 metres away) in the case of Bt brinjal, and 10 metres for Bt cotton. For the majority of India's farmers, with holdings of less than two hectares of land, a 10-metre gene flow would render a third of their holdings unviable. That is a huge loss.

Q: Why are so many institutes being allowed to conduct field trials?

The supervisory agencies have turned a blind eye to what is going on. In West Bengal, trials of Bt okra, which started in mid-August 2007, were done on the basis of approval by the panchayat. My question here is: what knowledge do panchayats have about genetically modified organisms and GM foods, especially since they are susceptible to all kinds of pressures? The State Biotechnology Coordination Committee and the District Level Committee have not approved these trials. West Bengal's agriculture university monitoring the trials has also given a damning report about the trials.

I have also highlighted before various government agencies the fact that several of the tests that are claimed to have been conducted may never have been done. This is because Monsanto-Mahyco itself is conducting the tests for its own products that it wants approved. The result may have been very different if an independent professional organisation had conducted the tests – for example, the toxicity tests.

Take, for example, the study on the heat stability of the highly toxic protein in Bt brinjal which is genetically engineered to contain this insecticidal protein to help the brinjal plant escape attack by certain pests. The conclusion of this study is supposed to be that while uncooked Bt brinjal scores positive for the Bt protein, cooked Bt brinjal scores negative. This statement has no meaning as no values are given and no indication is given of the sensitivity of the method used. Thus, if the sensitivity was low, then it is possible that, on cooking, as much as say 25% of the active protein may have been left, which could be toxic.

Many tests on GM foods and crops in our country today are taking place in non-accredited

laboratories that may not have the proven expertise and facilities in the area to test these food and other GM items.

Q: You have expressed other reservations too about these tests.

Yes, to recap some of the issues, the West has done a lot of studies on gene flow. On May 16, 2008, a 147-nation conference in Bonn concluded that GMOs were responsible for damage to other plants. Understandably, the US was not a party to this conclusion.

The recent IAASTD (International Assessment of Agricultural Science and Technology for Development) report makes the point that GM foods are not the solution to the looming agricultural crisis. A review of this report in the journal *Science* emphasises that a redirection of science and technology is needed to move away from processes that have profited primarily large-scale enterprises, to processes that address the most basic needs of the world's 900 million small farmers. This was partly a reference to GM crops.

Reported cases of Bt allergy in north India have not been investigated. We have also not investigated in sufficient detail the impact of GM crops on soil ecology.

There have been recent studies that show that dietary DNA can find its way into blood. This opens up the possibility that GMO DNA could change the characteristics of cells of the body. Such a transformation could have a major deleterious effect on the host. A recent UN study also states, and I am quoting, that "India faces a high safety risk because safety norms on genetically modified crops are not being enforced".

Q: There seems to be quite a lot of evidence against GM foods.

I would say that as of today we do not have reasonably conclusive evidence that GM foods are safe. We should therefore exercise the precautionary principle and ban their use unless incontrovertible evidence regarding their long-term safety is obtained, which would take 10 to 25 years. It is a pity that alternatives to GM crops such as integrated pest management and the use of bio-pesticides, which are cheaper and better, and organic agriculture, are being ignored by our government in spite of the enormous evidence in their favour. Two other examples of Bt technology which has proved harmful to insects and animals may be highlighted. Transgenic

Research magazine (December 2007, Vol 76, p 795 onwards) reports that Bt Cry 3A protein has a deleterious effect on beneficial, non-target beetles. An example of a dramatic metabolic change following genetic engineering would be the recently reported incidence of extraneous melanoma (a cancer) in genetically modified animals (Pigment Cell Research, December 2007, Vol 20(6), p 485 onwards).

I have suggested that the Genetic Engineering Approval Committee (GEAC) should seriously consider calling a meeting to objectively review all our experiences with Bt cotton and information that has been obtained over the years on GM crops, including Bt cotton. This review should involve technical members of the GEAC and RCGM (Review Committee on Genetic Manipulation), a small number of carefully selected experts whose knowledge and objectivity have never been in doubt and who have no vested interests, a small number of reliable and responsible NGOs, and a few representatives from industry. It is to the credit of GEAC that it has agreed to organise such a meeting.

Why has government not taken note of all that I have said above? The answer probably lies in the fact that (a) our country appears nearly at the bottom in the list of corrupt countries, and (b) Remember that Monsanto produced Agent Orange in the US-Vietnam war (which the US lost) to defoliate thousand of square kilometres of Vietnam which I myself saw in 1982 in Vietnam. The combination of (a) and (b) above could be very profitable for people in the government and Monsanto, but a disaster for the billion people of India, 78% of whom live on less than Rs 20 per day and are virtually voiceless. Who cares about them? I do, but does that matter? So some NGOs and concerned individuals have rightly taken the matter to court. I hope the courts will follow a more balanced approach than our government has. Genetic engineering is a marvelous technology. Let us not use it to make biological time-bombs.

2. Bt Cotton Affects Soil Nutrient Availability

A study at the Indian Agricultural Research Institute (IARI), New Delhi suggests that transgenic Bt cotton may constrain the availability of nitrogen, but enhance phosphorus-availability in some soil types in India. The commercialized Bt and non-Bt cotton cultivars

MRC-6301Bt and MRC-6301 developed by Mahyco Research were used in the study by B. Sarkar and other researchers at the IARI.

The group determined that root biomass was not significantly different between the Bt and non-Bt cultivars during their growth. Root volume was also determined to be similar between cultivars at 60 days after sowing, but become significantly different after 60 and 90 days. The group hypothesize that the higher nutrient depletion is a consequence of an increased root volume of Bt-cotton which subsequently affected the chemical composition of root or microbial properties in the rhizosphere. They recommend further studies to investigate enzyme activities and the availability of nitrogen and phosphorus in Indian soils under Bt cotton.

The full paper is available to subscribers of the J. Agronomy & Crop Science at <http://dx.doi.org/10.1111/j.1439-037X.2008.00312.x>

3. GM food on the menu? :The murky GMO scene in India

<http://india.merineews.com/catFull.jsp?articleID=139624>

The chances of genetically-modified food, finding a place on your dining table are not remote. As consumers, we have a right to ensure that the food we eat and serve our family lovingly is not 'frankenfood'.

IF YOU thought that the chances of genetically-modified food finding a place on your dining table are remote, chew this. GM rice trials have been approved in 10 out of India's 25 states. The GM crops under field trials in India are: Brinjal, cabbage, cauliflower, chickpea, cotton, groundnut, maize, mustard, okra, pigeon pea, potato, rice, sorghum and tomato (source- Press Information Bureau, July 26, 2007). **London Institute of Science in Society chief biologist, Dr Mae-Wan HE says that the technology is uncontrollable and unreliable, and typically ends up damaging and scrambling the host genome, with entirely unpredictable consequences that might unleash a deadly 'andromeda strain'.**

Multinational seed companies have promoted GM seeds as a key technology for feeding growing populations. But GM seeds do not solve the world's hunger problem; these merely destroy soil and the biodiversity.

Fewer than half a dozen giant multinational companies control the world market in GM seeds—Monsanto, Cargill and DuPont of the America and Syngenta of Switzerland.

Readers, wouldn't you be concerned if the food you so lovingly serve your family is just 'frankenfood'? As consumers, we have a right to know what we eat, and to eat what we know, or believe, is right.

4. Bhargava Critiques NBRA Bill

<http://www.thehindu.com/2008/08/27/stories/2008082755611100.htm>

The proposed bill to create such an authority is entirely industry-centric.

The proposal to create a National Biotechnology Regulatory Authority (NBRA), for which a draft bill is now in circulation, is being moved in an unprofessional manner by the Government of India.

The bill is driven by the Department of Biotechnology. The DBT ought to know that biotechnology covers some 30 areas, of which many need to be regulated. These areas include stem cells, nanobiotechnology, biological warfare, vaccines, bioinformatics, organ transplantation, new drug delivery systems, new materials such as spider silk and bacterial ropes, plant-based traditional drug formulations, and assisted reproductive technologies. But the proposed bill is confined to Genetically Manipulated Organisms (GMOs) and their products. Should it not, therefore, have been called a National GMO Regulatory Authority instead of an NBRA? Biotechnology cannot be equated with genetic engineering. If the DBT really thinks so, it ought to change its own name to "Department of Genetic Engineering."

The bill has a range of other problems as well.

The objective of any proposed bill should be to fill a defined void. There is already a regulatory procedure in place for GMOs and their products, involving the Review Committee on Genetic Manipulation (RCGM) of the DBT and the Genetic Engineering Approval Committee (GEAC) of the Ministry of Environment and Forests. Therefore, it should first be determined if anything is wrong with the present system. Then an attempt should be made to correct the existing system. Only if this is not possible should a new bill be considered. The authorities concerned should state what part of the existing procedures is

undesirable and how the proposed bill will correct it. For example, the present system does not prescribe any penalty for contamination of a non-GMO farm by GMOs in an adjoining farm. The proposed bill is silent on such problems.

The bill is supposedly up for public debate. While the DBT organised meetings at several places to discuss the bill, participation was by invitation, and the invitees were selected "carefully." At one of the meetings held in Hyderabad, this writer, who had a role in the setting up the DBT, as also the Centre for Cellular and Molecular Biology in Hyderabad, which was the first laboratory in the country to do any serious work in genetic engineering, was not invited. I had to invite myself to the meeting on learning about it. (I was the first chairman of the National Committee on Genetic Engineering and Molecular Biology set up by the Science and Engineering Research Council of the Department of Science and Technology, and had the privilege of coining the term "genetic engineering" and using it in a syndicated article in 1973.)

At a meeting in Bangalore held a day earlier, on June 11, 2008, no State government official was present. Farmers are the largest stakeholders in the business of GMOs, yet their representation at the meetings appeared to be minimal and unrepresentative.

The meeting was organised by the Biotechnology Consortium of India that is committed to the maximum possible deregulation of GMOs. As someone suggested, the name of the authority that the bill proposes to set up should have been "National Biotechnology Deregulatory Authority."

The proposed bill has little substantive content, and no rules and regulations have been circulated or debated. Whatever little substance it has, is entirely industry-centric and not people or farmer-centric.

Top-heavy authority

The proposed authority is top-heavy. It would make the processing of an application far more cumbersome than it is today. It has been said that the proposed authority will be autonomous but the bill does not say how that autonomy would be exercised. If it is going to be similar to the Atomic Energy Regulatory Board which operates under the Department of Atomic Energy, we can forget any autonomy.

It says "international standards" would be observed in regard to GMOs. The question is:

are there any international standards? Will they follow Switzerland which has put a moratorium on GMOs till 2012, or the European Union, which requires labelling of GM food, or the U.S. which, for all practical purposes, has no regulation of GMOs?

There are many organisational flaws in the bill. For example, the laboratory that is to carry out appropriate tests such as for toxicity and allergenicity will be a part of the proposed authority, whereas it should be independent of it to be able to function objectively. There is hardly any attention paid to detail. For example, in Section 2 K, the term 'modern biotechnology' excludes in vitro fertilization but not intracytoplasmic sperm injection.

The bill proposes to dispense with existing laws relating to environmental safety, including the Food Safety Act, but without defining how it will take over their functions and discharge them in a better way. Also, it does not provide for any interface with the public.

(Dr. P.M. Bhargava is a member of the National Security Advisory Board of the Government of India.)

5. GEAC miffed with Bhargava!

http://timesofindia.indiatimes.com/India/6_months_on_GM_crops_panel_wants_expert_off_board/articleshow/3423882.cms

NEW DELHI: The marriage forced by the Supreme Court to introduce "transparency" took exactly six months to break down as the regulator for genetically modified organisms has come out with its intention to seek a divorce from independent expert P M Bhargava.

In its last monthly meeting held on August 13, the genetic engineering approval committee (GEAC) decided to "seek modification" of the February 13 SC order which had asked the 30-member regulatory body, which is part of the environment ministry, to invite Bhargava to participate in its deliberations. It is trying to get Bhargava off its back although SC said that the whole purpose of his induction was to take on board the concern of the petitioner, Aruna Rodrigues, that "the constitution of GEAC is not proper as it lacks independent experts, thereby leading to lack of transparency" in determining the bio-safety aspects of the GM crops that have already been cleared or are undergoing field trials.

The presence of Bhargava, founder director of the prestigious Centre for Cellular and Molecular Biology, in GEAC's meetings did serve the intended purpose of uncovering bio-safety compromises in the clearance already given to the commercial cultivation of Bt cotton and the proposal of making brinjal the first GM food crop in India.

GEAC, which is headed by additional secretary in environment ministry B S Parsheera, is miffed with Bhargava's attempts to reform the system. Bhargava was earlier in the news for his outspokenness as a member of the Knowledge Commission set up by Prime Minister Manmohan Singh. According to the minutes of its meeting, GEAC made a series of allegations against Bhargava, a Padma Bhushan awardee:

- It held him responsible for "the malicious and distorted views on the regulatory process being reported in the newspapers periodically."
- His personal views, which were "without any scientific basis", were being used by NGOs to file PILs.
- His attempts to rake up public sentiments are "totally unprofessional and unethical".
- Bhargava committed a "breach of trust" by going to the media although he was not GEAC's spokesperson.
- Apart from advocating a moratorium on GMOs, Bhargava has "never provided any constructive inputs for streamlining the regulatory mechanism."

In an equally hard-hitting written response, Bhargava threatened to file a case of defamation against GEAC for "casting personal aspersions" without addressing any of "the purely scientific and professional views" expressed by him at its meetings. "May I, in all humility, remind you that I am not a member of GEAC. I am an invitee to GEAC, not because GEAC chose to do so, but only because of a Supreme Court's decision," Bhargava added, by way of explanation for not submitting to what he called a "dictatorial set up."

Refuting the allegation that he had only offered criticism, Bhargava said GEAC's own minutes would bear out his "many inputs" and that he had in addition submitted a comprehensive list of the risks of GMOs with suggestions of how they could be assessed "in an objective and transparent way."

GE Globally

6. Food Companies Pledge Not to Use Clones

http://online.wsj.com/article/SB122049659020697987.html?mod=googlenews_wsj

Twenty food companies have told a consumer group that they won't use milk or meat from cloned livestock.

The companies, including Smithfield Foods Inc. and Kraft Foods Inc., were responding to a survey conducted by the Center for Food Safety, a consumer group that opposes animal cloning.

Polls have shown most consumers are uncomfortable with the idea of eating products from cloned livestock, whether for health, ethical or environmental reasons. At the same time, products from the offspring of cloned animals are trickling into the food supply. Currently, the best way for consumers to avoid such foods is to eat organic food.

Basil Maglaris, a spokesman for Kraft, the U.S.'s largest food company by revenue and a major cheese producer, said the company has told suppliers it will accept only ingredients from conventional animals. "The surveys we've seen indicate that consumers aren't receptive to ingredients from cloned animals," he said. The pledge now only applies to cloned animals; the company says it will continue to monitor consumer acceptance of products from clones' offspring.

Other companies, including Wal-Mart Stores Inc. and Tyson Foods Inc., have also banned the use of cloned animals in food products. Many haven't made a similar pledge to avoid using food from the conventionally bred offspring of clones, however, partly because no one is tracking the offspring.

A few have made such a pledge. The center said eight companies it surveyed said they wouldn't knowingly use food from the offspring of clones.

These include Seattle-area organic retail cooperative PCC Natural Markets and Unilever's Vermont-based ice-cream maker Ben & Jerry's, which is pushing the government to create a national registry for clones and their offspring.

Andy Barker, social-mission coordinator at Ben & Jerry's, said the company isn't planning to advertise its clone-free status on its ice-cream cartons. It uses groups like the Center for Food Safety to publicize its status.

The International Dairy Foods Association, a trade group for dairy suppliers and manufacturers, said it isn't ready to embrace products made from cloned animals or their offspring. "Our concern is what impact it would have on the market," said spokeswoman Peggy Armstrong. "We don't want to see people not buy milk."

After the Food and Drug Administration ruled in January that products from cloned cattle, swine, goats and their offspring "are as safe to eat as the food we eat every day," U.S. regulators quietly withdrew their request for the food industry to voluntarily refrain from selling milk and meat from offspring of clones. A similar request for products made from the cloned animals themselves remains in place.

Clones — at about \$20,000 a copy — are too expensive to be slaughtered for food themselves, but some ranchers said they have sold clones' offspring for food.

The Center for Food Safety began surveying the industry after the FDA denied its petition in January asking for mandatory labeling of clones and their offspring, as well as the regulation of animal cloning as a "new animal drug," which would require pre-market approval for safety before cloning can be used on animals. The FDA said the requests didn't meet the requirements for such actions.

The FDA “has denied the desire and will of the consumers and just about all food processors,” said Joseph Mendelson, the center’s legal director.

Write to Jane Zhang at Jane.Zhang@wsj.com and Julie Jargon at julie.jargon@wsj.com

7. Top RP restaurants join ‘I love my rice GMO-free’ campaign

<http://www.abs-cbnnews.com/storypage.aspx?StoryId=129712>

Some of the top restaurants in the Phillipines have decided to “go green”, and they’ve started by promising that the rice they serve will always be natural and free of GMOs (genetically-modified organisms).

The Bistro Group of Companies, in partnership with Greenpeace, launched the “GMO-free rice restaurants” campaign at Fish and Co. restaurant in Shangri-la Ortigas.

The project aims to get restaurants to serve only GMO-free rice. It is part of the “I love my rice GMO-free” campaign of Greenpeace, which calls for keeping the Phillipines’ rice supply free of genetic contamination. “It is our responsibility to make sure that we serve only naturally grown and safe rice,” said Lisa Ronquillo, Bistro Group Marketing Director.

8. “On principle, we should back prince”: Scottish Environmental Minister, Michel Russell, supports Prince Charles’s comments on the GM foods

[http://www.sundayherald.com/oped/opinion/displayvar2432193.0.on principle we should back prince.php](http://www.sundayherald.com/oped/opinion/displayvar2432193.0.on+principle+we+should+back+prince.php)

IN RECENT weeks, the Prince of Wales has reignited the GM debate. Some people, such as UK environment minister Phil Woolas, were quick to criticise, but many others have indicated agreement. The Scottish government also supports his argument. GM is not the panacea its advocates claim it is, and the dangers of GM crop cultivation continue to outweigh the advantages.

The criticism from Woolas was particularly strange. We are both environment ministers and should approach such matters with the precautionary principle firmly in mind. The principle that “if an action or policy might cause severe or irreversible harm to the public or to the environment, in the absence of a scientific consensus that harm would not ensue, the burden of proof falls on those who would advocate taking the action.”

This makes sense. That is why it is enshrined in European law and is commanding global respect. Indeed, the Indian Supreme Court is considering a petition which would ban GM experimental crop cultivation. **It is merely common sense to be careful; once the GM genie is out of the bottle it would be impossible to get it back in.**

But for Scotland there is a second principle - one that I call the preventative principle. Scotland is lucky - we enjoy a clean, pure and sustainable natural environment. This not only attracts many tourists, but also underpins our ability to sell our whisky, beef, lamb, salmon and so many natural products. It makes no sense to play fast and loose with such an asset. Fortunately most people in Scotland agree, as every poll on the issue has shown.

But, contrary to the pro-GM spin, we are not alone - not even in these islands. The government of Northern Ireland agrees, as do many others across Europe. They share our concerns and, like us, are prepared to stand up and be counted. Earlier this year I discussed the issue with European environment commissioner, Stavros Dimas, who has urged sensible caution on the issue.

There is no evidence GM will feed the world. Conventional plant breeding techniques - at which Scots scientists excel - have a far better track record in improving yield and protection from disease. Scotland does not need GM crops, Scotland does not want GM crops and Scotland should not have GM crops. Scottish agriculture and exporters are better off without them. And so is the environment right across our planet.

GE and Legal Domain

9. BILL TO PROTECT FARMERS AGAINST MONSANTO LAWSUITS

http://www.organicconsumers.org/articles/article_14436.cfm

August 31 2008 - A landmark piece of legislation protecting California's farmers from crippling lawsuits was passed through both legislative houses this week in an end-of-session flurry. The Senate voted 23 - 14 to support it, and the Assembly was unanimous in their support. The bill, AB 541 (Huffman, D-Marín/Sonoma), is now headed to the Governor's desk for his signature. Sponsored by diverse organizations, some of whom are traditionally opposed on farm issues, AB 541 is the first bill passed by the California legislature that brings much-needed regulation to genetically engineered (GE) crops. "I am very pleased that my office, working with the stakeholders on both sides of this historically

divisive issue, was able to find common ground and pass California's first legislation on genetic engineered crops," stated Assembly member Huffman. "While there is still work to be done on other aspects of genetic engineering, AB 541 is an important step in establishing basic protections for California's farmers."

AB 541 enacts protections against lawsuits brought against California farmers who have not been able to prevent the inevitable - the drift of GE pollen or seed onto their land and the subsequent contamination of their non-GE crops. Currently, farmers with crops that become contaminated by patented seeds or pollen have been the target of harassing lawsuits brought by biotech patent holders, particularly Monsanto. The bill also establishes a mandatory crop sampling protocol to prevent biotech companies that are investigating alleged violations from sampling crops without the explicit permission of farmers.

GE & Health

10. NEW THREAT FROM GM CROPS

<http://www.naturalnews.com/024154.html>

A new generation of genetically modified (GM) crops, engineered to produce pharmaceutical or industrial products and ingredients, poses an even more serious threat to health and the environment than older GM crops, the Union of Concerned Scientists has warned.

Presenting at the conference of the American Association for the Advancement of Science in Boston, the group warned that the primary risk comes from the possibility of genetic contamination, in which the modified genes from a GM plant spread via normal cross-pollination to the same or closely related species of domestic or wild plants. This would lead to pharmaceutical and industrial chemicals potentially entering the food supply of humans and wildlife.

Most commercial genetic engineering to date has focused on making food crops more resistant to herbicides or pests. Even this degree of

modification has raised concerns about cross-pollination and contamination of non-modified varieties, and the health impacts this could have on humans and wildlife.

According to plant geneticist Paul Gepts of the University of California-Davis, it is essentially impossible to keep modified genes from spreading.

"Gene flow is really a regular occurrence among plants," Gepts said. "So if you put a gene out there, it's going to escape. It's going to go to other varieties of the same crop or to its wild relatives. It's clear that zero contamination is impossible at present."

In fact, a number of cases of contamination of non-GM crops with modified genes have been well-documented, leading in many cases to major economic losses as crops intended for food involuntarily found themselves in the same category as crops not approved for human consumption. And while no cases of human health problems from this contamination have ever been proven, the risk is expected to increase

as large-scale cultivation of second-generation GM crops begins.

Largely a U.S. phenomenon, wide-scale planting of GM crops has mostly been rejected in Europe. Ironically, however, studies show that the European public feels less strongly negative about crops engineered for medical benefits - the very plants that are most dangerous.

"With the products we are talking about, there's the potential for [consequences] to be much more serious than what we have seen so far," said Robert Wisner of Iowa State University.

So-called "pharma" crops, or crops modified to produce pharmaceutical chemicals and ingredients, are becoming an increasingly popular area of research, and the biotechnology industry has been promoting their supposed benefits over conventional drug production methods. According to advocates of the technology, drug-producing plants could be grown cheaply in poorer countries, and edible drugs would eliminate the expensive need for refrigeration and a supply of sterile needles.

The U.S. Department of Agriculture has already allowed outdoor test trials of these crops in 35 states. This means that genetic contamination may already have occurred, and would certainly worsen if large-scale commercial farming begins.

Among the chemicals produced by pharma crops are disease treatments, anticoagulants, artificial blood, hormones, enzymes and antibodies intended to target tooth decay or cancer. Another popular area of research is "edible vaccines," or plants engineered to deliver a vaccine when eaten.

A related area of research is into plants that produce industrial or research chemicals, such as substances used to manufacture plastics, detergents, paper and personal care products. Other chemicals engineered into plants include laboratory diagnostic chemicals and enzymes used in biofuel manufacture.

The Union of Concerned scientists has warned that many of the chemicals produced in these plants are toxic or otherwise bioactive.

"What would be the impact societally, economically, if for example, cornflakes were contaminated by some sort of drug or chemical?" asked Karen Perry Stillerman, senior food and environment program analyst with the Union of

Concerned Scientists. "I think it's really hard to say, because there is a variety of different drugs and chemicals that might be manufactured in plants this way. **Our perception is that some of them might be toxic, but all of them would certainly cause tremendous economic upheaval.**"

It is for this reason that both the Grocery Manufacturers Association and the Food Products Association have expressed concerns about the possibility of pharma and industrial genetic contamination of the food supply.

The USDA is currently revising its GM crop guidelines, with new rules expected by the end of the year. In response to this ongoing process, the Union of Concerned Scientists has urged the USDA to ban all outdoor cultivation of GM pharma and industrial crops, if the species modified is also one used for food production.

This ban would not go as far as the measures some people say are needed. According to Gepts, outdoor cultivation poses the greatest contamination risk, because pollen and seeds can be carried to other locations by wind, birds and other animals, and even from falling on farm machinery. He says that growing crops in greenhouses or underground, or using non-food crops such as tobacco, would eliminate much of this contamination.

It would still be possible, however, for pollen or seeds to be carried out of a greenhouse on someone's clothing. And the Union of Concerned Scientists acknowledges that while cultivating non-food pharma crops outdoors would reduce the risk of food contamination, it might still place wildlife at risk.

"If these crops are grown out of doors, grazing wildlife, pollinators, herbivorous insects, and soil microbes will be exposed to pharma/industrial compounds that may have adverse effects," the organization writes on its Web site. "The crops could also outcross with wild and weedy relatives, perpetuating the pharma/industrial transgenes in nearby ecosystems."

www.NaturalNews.com/terms.shtml

"The greatest threat of childhood diseases lies in the dangerous and ineffectual efforts made to prevent them through mass immunization.....There is no convincing scientific evidence that mass inoculations can be credited with eliminating any childhood disease."—Dr Robert Mendelsohn, M.D.

READ THE NUMBERS ON YOUR FRUITS

by Dr. Leo Rebello

The information given below should come handy to those who buy their fruits in the Malls. As stores management will not tell you if the fruits they are selling is GM fruit or not. Here is how you find out yourself, as per the Buyer Beware principle.

1. If you come across an apple in the store that is labelled 4922, it's a conventional apple grown with herbicides and harmful fertilizers.
2. If it has a sticker 99222, it's organic and safe to eat.
3. If it says 89222, then run. It has been genetically modified. Remember these critical numbers and know how to avoid purchasing inorganic and GMO fruits.

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Research & Publications

11. New Research Rocks Agbiotech

Suman Sahai provides horrifying information that challenges the very base on which Genetic Engineering industry is banking, in a very simple and understandable way.

<http://www.genecampaign.org/genenews/genes-archives=July-August107/editorial-vol-2-n-4=id-July-august7.htm>

A paper published in June 2007 by a consortium of scientists from 80 research organisations has provided evidence that genes do not necessarily behave in a linear fashion with information flowing one way, from DNA to RNA to protein, as was thought till now. This central dogma that has been the bedrock of genetics and the foundation on which the genetic engineering industry is based, has been challenged by a growing collection of data but scientists have been reluctant to revise the scientific principles established by the Watson-Crick discovery of the structure of DNA and the subsequent understanding of gene function.

Now, unequivocal evidence comes from research organised by the US National Human Genome Research Institute, which has found that the human genome is not really a clear and organised set of genes but rather a tangle of overlapping, interacting genetic material that functions as a complex network, with highly nuanced gene regulation. Almost none of these

mechanisms are understood. Not being able to predict how genes will behave strikes at the very basis of using genetic engineering as a tool to create new products. The biotechnology industry is built on the linear model of the “one gene, one protein” principle, postulated by scientists who created recombinant DNA in the 1970s. Earlier, it was thought that genes had clearly defined functions, therefore a gene from any organism could fit neatly and predictably into any other organism, however unrelated, and carry on its prescribed business. In this way, the Bt gene that produces a toxin in a soil bacterium is presumed to perform exactly the same function when inserted into cotton, or rice plants.

The new research shows that this assumption cannot be upheld. The use of genetic engineering to create new products rests on the presumption that there is a universal, genetic code that sets the rules for creating proteins from DNA and that the rules are virtually identical across all organisms. Even before this research on the human genome, the theory of a uniform system for making new proteins was challenged by a number of scientific discoveries like the presence of large amounts of ‘junk DNA’ in all organisms and the fact that the highly complex human organism was found to have just 30,000 genes, a fairly small number considering the myriad functions a human being performs.

The new research casts the spotlight on the role of 'junk DNA', the large amounts of DNA detected during genome sequencing for which no clear functions can be ascribed. It is now accepted that the so-called "junk" DNA has a key regulatory role and it is of critical importance in regulating gene expression in organisms, a process about which there is as yet little understanding.

Apart from the new evidence and the presence of junk DNA, there are other findings that challenge the one gene-one protein foundation of agricultural biotechnology. One of these is the discovery that DNA is not the sole hereditary material and not the only means of transmitting information for new protein synthesis.

Understanding of the Mad Cow Disease and its link with the human Jakob-Creutzfeldt disease shows that both diseases can be passed from generation to generation not via genes, but via a protein molecule called a 'prion'. Pioneering work done in the US by Stanley Prusiner, Susan Lindquist and Eric Kandel indicates that prions mediate a form of protein-based information flow, which seems to be important in a variety of biological processes. To all this, if we add what is being discovered about the other ways in which RNA acts and the process of RNA interference, the reliability of genetic engineering becomes questionable. RNA's normal role is to

carry a message from the DNA to the cytoplasm where it provides the direction for making proteins. Now it appears that ordinary RNA can enter a cell, seek out a gene's protein making template and then destroy it. This process is called RNA interference.

A complex, interactive network of genetic material incorporating so-called 'junk DNA', prions as units of heredity and the phenomenon of RNA interference, invalidates the premise on which agricultural (and other) biotechnology has been founded. Evidence that gene expression is complex and non-linear begins to explain why so many things go wrong during the process of genetic engineering and why predicting its outcome remains a gamble. This opens up the question about the extent to which genetic engineering can be considered accurate and predictable as a 'manufacturing process'.

What else is transmitted along with genes and how do these factors determine the outcome? How do genes actually function in the new environment and can one ever hope to control the complex regulatory mechanisms that come into play once a gene, or many genes, are engineered into another background?

This monthly bulletin is brought out by South Against Genetic Engineering (SAGE), a coalition of civil society activists, farmers, scientists, academicians, and consumer groups of four Southern States of India, viz., Andhra Pradesh, Karnataka, Tamil Nadu and Maharashtra. SAGE has been waging a concerted battle against genetic engineering through a series of activities that involve public protests, media actions, seminars, consultations and publication of a series of educational materials.