SAGE

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South Against Genetic Engineering

Children harmed by GM pharma rice trial

Two small children developed allergies after treatment with a transgenic serum. Fabrizio and Jordano are part of a group of 140 children who received a rehydration serum that contained human and plant genes. Their mothers are requesting that the Ministry of Health monitor the status of their sons.

The day that Diana Canessa Garay believed that she would lose her only baby, a friendly hand appeared in the halls of Children's Hospital. The hand belonged to a nurse who was saying that she had a remedy for eight-month old baby Fabrizio's acute diarrhea.

For the desperate 24-year-old mother, it was enough to hear that the "rice serum" would stop the diarrhea for her to authorize use of the treatment. They did not explain to her that the rehydration salt was of transgenic origin and that its sale was prohibited because it was still in the experimental phase.

Because the only thing that mattered was the immediate recuperation of her baby, Diana Canessa signed a document on February 15, 2005. "They only wanted to experiment with my little baby, they tricked me," she lamented now that her son suffers the first side effects of the treatment.

There can be many side effects in the long run. Children who have consumed this serum may suffer from diseases such as alzheimer's since the altered protein in the serum may cause an amyloid substance to be deposited in neurons, altering their function.

It may also cause pulmonary fibrosis since the elasticity of the altered protein may change and affect the elasticity of the lung.

Children are exposed to many degenerative diseases to say nothing of allergies.

For full report visit: gmwatch.org

Govt sets up committee on GM food

Even as controversy rages over pesticides in soft drinks, a new committee will look into what some consider another health hazard - genetically modified food.

The labelling of GM foods has been set up by the Health Ministry and the Parliament has just passed a new law, which will set up one single authority to replace the existing arrangement where a number of ministries validate GM technology.

But politics once again has taken the centrestage, pushing the serious issue to the backseat.

Health hazard?

Are soft drinks really safe? Or could they damage your health?

The same question is being asked about genetically modified or GM food like soyabean oil.

Last year, India imported 20 lakh tonnes from the USA, Argentina and Brazil. These are countries where genetically modified food is not banned and labelling is not compulsory.

The government has now set up a committee to ensure all GM food is labelled and consumers know exactly what they are eating or drinking. But members say labelling is not enough.

"This is a very tricky area where we do not even have the wherewithal to test how it impacts human health," said Bejon Mishra, Member, GM Food Labelling Committee.

The government has also proposed an integrated food and standards authority - a one-stop shop to clear GM food and technology, part of the 2005 Food Bill just passed by Parliament.

Turf war

This is being currently done by the Genetic Engineering Approval Committee of the Environment Ministry and has sparked off a turf war.

The Health Ministry, presently regulating the import of GM food, is unwilling to give up control. It has been backed by parliamentary committees as well as the Agriculture Ministry.

The matter has now gone to the Prime Minister's office, which wants the body to be autonomous. However, the Food Processing Ministry is unwilling to give up its claims.

"I think we have a claim over this. The commission should be under our jurisdiction," said Subodh Kant Sahay, MoS, Food Processing.

The impact of Bt cotton on the financial health of the farmers has been documented.

But what Bt brinjal and Bt potato will mean to human health has not been documented and to add to it, unseemly bickering between ministries over the issue conveys a degree of unseriousness over an issue of utmost public importance.

Source: http://www.agbios.com/news.php

South African local watchdog expresses concern over GMO bill

Local biological resources watchdog, Biowatch South Africa, has expressed its concern over Parliament's Select Committee on Land and Environmental Affairs having passed the Genetically Modified Organisms (GMO) bill, as its key concerns had not been addressed, Biowatch said on Tuesday.

However, the bill was passed on Tuesday, despite the Select Committee not having addressed the key concerns that it said it would before passing the bill, the Biowatch statement said.

Department of Agriculture deputy director-general Shadrak Moephuli assured the Committee that most of its concerns would be addressed in regulations to the bill, but gave no indication of when these would be published for comment, or what the process would be for finalising them.

The concerns that the committee raised included that the bill did not oblige the regulator to take public objections and input into account when it considered permit applications for GM crops.

It also failed to adequately specify who would be liable, should damage arise from GM crop use.

Currently, the bill made any person who conducted an activity with a GM crop liable, which meant that farmers who used the seed could be held liable, instead of the multinational seed companies that produced the GM seed, and own the patents to them.

In addition, the bill did not adequately specify how costs for the harmful impacts of GM crops would be recovered, particularly if their impacts only became apparent some years later.

Finally, the bill failed to adequately deal with cross-pollination from GM crops, and the resultant contamination of non-GM crops.

Source: checkbiotech.org

Chile to host first biosafety course

The first academically accredited postgraduate biosafety course in the world is set to start at the University of Concepción (UDEC) in Chile this month.

The International Diploma of Biosafety, a 12-month distance-learning course run by the Biosafety International Network and Advisory Service (BINAS) and the United Nations Industrial Development Organisation (UNIDO), is designed to give key professionals the skills to deal with complex issues surrounding the assessment and management of biological risks.

The course has been piloted at UDEC for the past two years.

Roger Hull, who studied plant viruses at the John Innes Centre before retiring in 1997 and being awarded an Emeritus fellowship, said: "This course is really important because it trains professionals in all aspects of biosafety and enables them to implement the biosafety regulatory structures in an informed manner.

"The programme lasts a full year so covers a more comprehensive range of subjects than previous training courses that only last one or two weeks. The combination of distance-learning and on-campus training sessions allows trainees to study flexibly whilst working full-time."

Source: www. agbios.com

No need for launching GM seeds in India'

Lucknow -- EVEN as the Union government is looking at introducing genetically modified (GM) seeds in the country, they are totally ignoring the problems of the farmers. It launched BT Cotton in Vidharbha leading to suicides by farmers as they could not pay back the loans they had taken to buy hybrid seeds. There is actually no need for launching Genetically modified seeds in India. This was stated by Dr Suman Sahai, eminent scientist and director of Gene Campaign, which has been opposing the introduction of genetically modified food in the country. She was speaking at the Public debate on Genetically modified foods, organised by Centre for Contemporary Studies and Research (CCSR) and Gene Campaign in the state capital on Wednesday.

Speaking about the problems with GM seeds like BT Cotton and now, the forthcoming BT brinjal, Dr Sahai said that these technologies will not only harm the farmers, but also the consumers in a big way. "We have seen the BT Cotton seeds failing in Vidharbha. Tons of cotton is lying waste in Vidharbha, as the government is importing cotton from China. If you are asking the farmers to use BT seeds, then one should also give them a market," said Dr Sahai.

Talking about introducing hybrid GM seeds, Dr Sahai said that it should be noted that India is the only country where GM seeds are being used as hybrid. "In countries like Australia, China and Spain, they are being used as two-brid variants. Indian government is the only one which is introducing a hybrid variety," said Dr Sahai adding that after a certain time, hybrid varieties are less effective and its the farmers who have to bear the loss.

The other speakers of the debate included eminent botanist Dr Vivek Prasad. Speaking on the issue of genetically modified seeds, he said that technology is never bad for development of human beings. Instead, it should be seen that how the technology is being used and the GM technology is certainly not right in Indian context.

Dr Sunilam, MLA and founder of the Kisan Sangharsh Samiti at Madhya Pradesh, said that scientists should try to develop farmer friendly technologies.

He said that although they have kept themselves aloof from social issues, yet scientists should try to think in a more humane manner when it comes to agriculture. The director of the CCSR Utkarsh Sinha said that the participants from three states of Madhya Pradesh, Uttar Pradesh and Delhi have finally decided to launch a large scale campaign against GM seeds in the country.

Source: http://www.agbios.com/news.php

Why spare hidden villain pesticide?

Ashok B Sharma

The recent findings of high limits of pesticide residues in beverages like Pepsi and Coca Cola has initiated a debate in the country.

Kerala chief minister VS Achuthanandan went to the extent of banning the sale and production of the beverages in the state. Karnataka, Gujarat, Madhya Pradesh, Rajasthan and Punjab imposed bans on sales of these two beverages in educational institutions, hospitals and state government offices.

Ban on these two beverages, however, is not a solution to the problem. The issue is of the presence of hazardous pesticides. The Centre for Science and Environment, which conducted the study, found a cocktail of 3-5 different pesticides in 57 samples of 11 soft drink brands from 25 different manufacturing plants of Coca-Cola and PepsiCo spread over 12 states. In all the samples, pesticides limits were 24 times higher than the permissible norms formulated by the Bureau of Indian Standards.

The norms were formulated, but implementation needs to be done. Even implementation of the norms will not address the real issue. The soft drinks majors say that the problem is due to the presence of pesticide residues in water and sugar used as raw materials for the product. The government too agrees to this view. In a way the buck has been passed on to the pesticide industry.

The pesticide industry has already forewarned that the crop loss in the current kharif season could amount to Rs 55,000 crore if adequate doses of pesticides are not applied in time. Apex industry body Agrochemical Promotion Group (APG) has estimated that the annual crop loss due to incidence of pests in both kharif and rabi is about Rs 90,000 crore. APG said the collosal crop loss is due to low application of pesticides. Only one-fourth of the total 180 million hectare cropped area are treated with crop protection chemicals. APG chairman S Kumaraswamy said this year the industry is prepared to sell about Rs 3,100 crore worth of technical grade pesticides in the current summer season.

The biotech industry, with their Bt cotton, claimed there would be a reduced application of pesticides due to increased area coverage under GM cotton. Usually, cotton consumes the maximum amount of chemical pesticides.

Unlike at the global situation, where pesticide majors are the producers of transgenic seeds, the situation is different in India. Many domestic pesticide companies are yet to venture into biotech business. Hence there are claims and counter claims about reduction or increase in pesticide use.

A recent study titled 'Tarnishing Silver Bullets' by the Cornell University, US, has exploded the myth that Bt cotton leads to a drastic reduction in pesticide use. The study says, "We saw that the total pesticide expenditure for Bt cotton farmers in China is nearly equal to that of their conventional counterparts, about $101/hectare. Bt farmers in 2004, on the average, have to spray pesticides 18.22 times, which are more than 3 times higher compared with 6 times pesticide spray in 1999."

The study further says, "They (Bt farmers) spend 40% more on pesticides designed to kill an emerging secondary pest. The extra expenditure needed to control secondary pests nearly offsets the savings on primary pesticides frequently cited in the current literature." Such reports of increased pesticide use are also noted in different case studies on Bt cotton cultivation in India.

Thus the current situation has led to trading of charges, claims and counter claims between the three sectors of the industry - soft drinks, pesticides and biotech. But this sort of passing on the buck would not solve the problem.

The government, too, is playing safe in the situation by attempting to please all the three sectors of the industry. It is promoting integrated pests management (IPM) as a way out. But IPM has a component for use of chemical pesticides. Why can't government promote the concept of non-pesticide management (NPM) developed by the former director of Central Tobacco Research Institute? This concept, which is almost organic farming, has worked well with cotton cultivation in Andhra Pradesh and the state government is planning to promote this concept through its Indira Kranti Pratham scheme.

http://www.financialexpress.com/fe_full_story.php?content_id=137213

HEALTH EFFECTS OF GM FOOD – WHAT ARE THE ISSUES?

The following is the introduction of a power point presentation made by ARPAD PUSZTAI and his wife SUSAN BARDOCZ at a Bio safety-training course held between 31st July to 11th August 2006 in Norway, organized by GENOK.

GENETICALLY MODIFIED ORGANISMS (GMOS)

•A new technology, with a difference
–electricity, even nuclear power can be turned off
•GM is self-replicating, cannot be turned off and no method is known to make the gene disappear

ACCORDING TO THE BIOTECHNOLOGY INDUSTRY

•There is no "credible" evidence that GM crops damage the environment
•There is no evidence either that GM food can harm human/animal health
•Therefore they are as safe as their "substantially equivalent conventional counterparts" and need no testing

ARE THESE VIEWS BACKED UP BY PEER-REVIEWED PUBLICATIONS IN SCIENCE JOURNALS?

•A review concluded that the most pertinent questions on environmental safety of GM crops are just beginning to be studied (Wolfanberger & Phifer, Science, 2000; and ESA Report, Snow et al, 2005)
•A review (Domingo, Science, 2000) found only eight peer-reviewed papers published on health aspects of GM food; this increased to a dozen by 2003 (Pusztai et al, 2003) and to 20 by 2005 (Pusztai and Bardocz, 2005)
•Royal Society Canada report stated that regulation based on "substantial equivalence" is flawed exposing Canadians to health risks of toxic and allergic reactions

IS IT ACCEPTED THAT GM CROPS SAFE AND NO TESTING IS NEEDED?

•British Medical Association: Any conclusion upon the safety of introducing GM material into the UK is premature as there is insufficient evidence to decide whether it is safe or not
•A majority of British consumers thinks that GM foods are unsafe and don't want to buy them. Thus, UK supermarkets phased them out
•European consumers demand labelling of GM and transparent and independent safety testing

PRESENT STATE OF GM FOOD SCIENCE

•Many opinions but few data!
•Only one human clinical trial and few animal studies have been published to date
•The industry's and regulators' preferred "safety assessment" is based on the poorly defined and not legally binding concept of "substantial equivalence"

HOW CAN A PLANT BE NOVEL AND 'THE SAME'?

•The basis of substantial equivalence:
•A plant should be novel to be patented (have the new gene)
•The GM plant is practically the same as the non-GM; therefore need not be safety tested

SUBSTANTIAL EQUIVALENCE

•Similarity in composition is no guarantee that GM- is as safe as conventional food
•A BSE-cow is substantially equivalent to a healthy cow
•It is a qualitative, non-scientific term; must be used only as a starting point in risk assessment
•It must be established by animal testing that GM food has no harmful, toxic/antinutritive or allergenic effects

SAFETY ISSUES IN GM SCIENCE (NOT DEALT WITH)

•Methods of plant genetic transformation, role of transgenes, promoters, terminators, selection markers and other construct DNAs, vectors
•Establishment of the genomic stability of the GM plant over several generations
•Indirect effects on plant metabolism resulting from insertion-site and genome-wide mutations; profiling techniques to detect unexpected changes in the composition of proteins, DNA/RNAs and small metabolites
•Ames test to detect mutagens

TRANSGENE INSERTION (NOT DEALT WITH!)

•Sequencing the transegene and flanking regions and comparing with that of parental DNA after extensive backcrossing of GM plant
•Identifying and discarding GM plants with altered DNA sequences, superfluous DNA insertions, deletions or rearrangements
•Identifying insertion sites that lead to aberrant transcripts and/or alter the regulation of neighbouring genes; these plants should also be discarded

SAFETY ISSUES ADDRESSED IN THIS TALK

•Selection of "safe" transgene based on short-, long-term and multigenerational animal testing of the gene product before GM transformation
•Biological testing of parts of the construct: promoter, terminator, selection markers, reporters, vectors
•Exploring direct/indirect effects of GM DNA and proteins on ingestion of GM crops/foods; identifying changes in function, gut-reactivity, immune-, hormonal and metabolic effects

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Article

LENS ON BT COTTON

Bt: Flaky results, pre-determined consensus

Keya Acharya

Can transgenic cotton ever be a livelihood security measure for the majority of India's smallholder farmers? Keya Acharya is circumspect. She says that the Bt cotton story in India is one of confusion. Bt appears more to favour 'rich' farmers, who have access to water, better resources, and alternative support.

The phrase itself is tiring out with wear, but Bt cotton continues to jostle for public debate along with its increasing acreage on Indian fields. In 2005, 3.1 million 450-gm packets of Bt seeds were sold in India, accounting for approximately 1.26 million hectares, or 14 per cent of India's total 9 million hectares of cotton cultivation. This year that figure is estimated to increase to 81,00,000 acres, or approximately 3.28 million hectares, according to the central government.

But its increase countrywide has not yet ensured the national, whopping success, both economic and yield-wise, that the GM crop industry has claimed. Instead, what has emerged are 'yo-yo-ing' reports of success and failures, compounded by a harshly-divided 'pro' and 'anti-Bt' stance in India and elsewhere, that has contributed to confusion.

Downs and ups

During 2000-05, there were numerous reports of cotton-crop failures and farmer-suicides in Andhra Pradesh, Maharashtra and Tamilnadu. Running alongside these, were reports of cotton-crop success and increased revenue in some areas of Maharashtra and Gujarat, according to an AC Nielsen survey in 2003-04.

The AC Nielsen study however, which claimed a premium for bollgard cotton in the market, attracted round criticism from NGOs and 'anti GM' activists for having being conducted cursorily. Its credibility also became suspect due to its commissioning by seed corporate Monsanto-Mahyco Biotech Ltd (MMB).

There have other criticisms as well. Earlier, in 2003, a CICR-Nagpur (Central Institute of Cotton Research) study of the then eight commercial Bt cotton hybrids grown in India found that the expression of the Cry1Ac gene inserted to be a repellent to Indian cotton's biggest threat, the bollworm pest, was far below levels needed to actually repel the bollworm, resulting in continuing bollworm attacks. The study also revealed that incorporation of the Cry1Ac gene into local hybrids was far less effective than incorporation into original varieties being used in Australia, US and elsewhere. MMB has since gone into production of a second patented Cry2Ab gene called Bollgard-II which expects to be more effective in targeting both bollworm and sucking aphids.

Amongst reports of success, a 2002-2003 Maharashta survey by Bennet, Ismael et al in *AgBioForum*, had reviewed two crop seasons from Khandesh, Marathwada and Vidarbha, this last district also the scene of rampant cotton distress. The researchers reported in *The Hindu* that "since its commercial release in 2002, Bt cotton has had a significant positive impact on yields and on the economic performance of cotton growers in Maharashtra."

Even here, the study did agree that reduced pesticide costs were neutralised by high seed costs and that overall costs for Bt farmers were higher. But the researchers concluded that the real benefit of growing Bt cotton was in higher output. "When costs are taken into account (gross margin = revenue - variable costs), the result is a much higher gross margin for Bt growers compared to growers of non-Bt varieties. It is worth noting that the average gross margin gap between Bt adopters and non-adopters was larger in 2003 (74%) than in 2002 (49%)", the study said.

Nevertheless, Bt cotton crop failures were reported in 2004 and 2005, most notably from Andhra Pradesh and Maharastra, where thousands of farmers reported crop losses, driving large numbers of them to suicide. The local government in AP's Warangal district demanded compensation from Monsanto Biotech Ltd., for farmers who lost their crop. The Genetic Engineering Approval Committee of the central government (GEAC) then banned the use of MMB's MECH-184, MECH 162 and MECH 12 in AP in 2005.

While most recognize of the price-savings of using lower pesticides, with applications reducing from six rounds per crop to fewer than four rounds of sprays, the high cost of seed, according to agriculture specialist Devinder Sharma, outweighs the savings from reduced pesticide sprays. In 2006, in the fields in Karnataka, farmers however, said they still made an overall saving from reduced pesticide spraying-rounds.

Seed costs went up in 2004-05 to Rs.1800 per 450 gm packet with the AP government challenging the company under the Monopolies and Restrictive Trade Practices Commission for hugely overcharging farmers for its seed. The AP government appealed for prices to be fixed at Rs.750 per packet, making it comparable to rates internationally. The Central government has backed the State's appeal and ordered the company to charge

Rs.750 per packet. But conversations with cotton farmers in Karnataka in June 2006 reveal that the seed continues to be sold at Rs.1250-1400 per 450 gm packet.

Seed costs apart, central to the issue of crop behaviour, higher yields and yet less revenue, is the variety of Bt cottonseed that has been used by farmers till 2005. MMB's short-stapled MECH 162, MECH 184 in Karnataka had given average results in irrigated areas, with a very poor rate of success in non-irrigated areas in AP, giving small farmers in AP, as well as in Maharashtra, no buffer at the failure.

In Karnataka, farmers reported middling yields and lesser revenue earnings from Bt than from non-Bt varieties till 2004. In 2005, the State has shown good yields in both traditional and non-traditional cotton-growing belts but has earned lesser revenue from Bt than non-Bt varieties like DCH-32 and DHH-11.

This was in spite of reduced use of pesticides in Bt fields and happened more due to demand of the long-stapled varieties existing within non-Bt varieties. But in 2005, at least one Bt long-stapled variety, MECH 6918 was introduced which has reported good results in Karnataka, making the economics of long-stapled Bt comparable to long-stapled non-Bt.

It is the economics of short-stapled varieties like MECH 162 and similar others that have been criticised by academics, NGOs and agricultural consultants like Sharma. In 2003 - 04, an FAO report from Karnataka showed that nearly 45% of all Bt-growing farmers had bought the seeds at an expensive Rs.1600 for a 450 gm packet on the expectation of high yields promised by seed agents and were then disappointed at the low market price.

Farmers in Karnataka in 2006, however, say they still make a savings of Rs.1500 per acre. This, despite irrigation costs for farmers growing only Bt cotton being significantly higher than for farmers using both Bt and non Bt varieties. (See first article in this series: 'Bt cotton farmers are alert this year.')

Behind the downs and ups

The FAO had also shown, as a 'major conclusion' that irrigation for higher productivity seemed to be more important than Bt or non Bt cotton varieties. Under rainfed conditions, Bt cotton showed no advantage at all. The FAO study has asked for a careful consideration of agro-climatic factors before using Bt seeds. "Economic performance of a cotton crop is not only determined by its genetic makeup, but also by the agro-ecological conditions under which it is grown," states the study.

Indeed, in the absence of any further definitive research and debate, Bt cotton's mixed results could well have more to do with the FAO study's concern on agro-climatic variables, than what meets the eye at present.

Some agree. Professor Ronald Herring of Cornell University points to the MECH 184 variety as an example, which wilts if not watered early; a point that not many farmers either knew of or understood until they learnt it the hard way.

"This is why three hundred or so varieties of cotton are planted in India; this number is necessary to adapt to different regions with different agro-ecological conditions," says Herring

If this be true, then India's small-holder farmer (61% of total farmers, at last count by the government) has unfortunately borne the brunt of these poor and inadequate varieties.

Coming back to the present, Bt cotton did well in traditional and now-extended cotton-growing areas in Karnataka in 2005-6, adding even more weight to the need to discuss this unpredictability.

But unpredictability and confusion notwithstanding, the GEAC has approved six new Bt cotton hybrids for commercial cultivation in northern India with more varieties shortly being commissioned.

Whilst new varieties might be what is needed, as per Herring's argument, it is the silence on these poor results by the seed corporates themselves, and the GEAC's lack of acknowledgement of Bt cotton's erratic performance that is disturbing.

The existing varieties that have had such disastrous results in the southern Indian region however are still allowed in Madhya Pradesh, Gujarat and Maharastra till 2007. It remains to be seen whether the varieties are suited to these states' conditions.

The patterns

While there appears to be little that can be categorically stated about Bt cotton's success/failure in India itself, a few aspects stand out.

One, the determined approach to extend and increase Bt cotton shown by Indian government's political and scientific administration along with private scientists is matched by their seemingly equal inability to discuss Bt cotton's mixed results so far. Instead, the authorities appear to be pinning their hopes on transgenic crops with Bt cotton as the flagship and as the only way forward for cotton cultivation.

Two, and in line with this, the Bt seed industry meanwhile has found easy coincidence between their commercial interests and the government's professed national interests. Marketing of Bt cotton seeds has taken on the aggression of a race with reports of unapproved, trial-run seeds being deliberately distributed to spread awareness on them.

Three, as noted earlier, India's small farmers have borne the brunt of the experimentation of Bt cotton, shouldering, in addition, more failures due to spurious seeds, and having less agricultural resources to bolster the crop. The current transgenic seed scene appears more to favour 'rich' farmers, with better resources and more lands for alternative support. The poor farmer will hopefully fare well in a good monsoon year; how he manages in lesser rains is anybody's guess.

Even though good monsoons are good for cotton just as they are for other crops, seed corporates are holding out a banner on food and livelihood security over Bt cotton and other transgenic crops as if they are special. The reality is that three years ago, the government acknowledged falling farm incomes and growing inequities amongst farmers in the *Situation Assessment of Farmers (2003)*. This makes me circumspect about transgenic crops as a livelihood security measure for the majority of India's small-holder farmers.

The only decision by the government that appeared reasonable was in 2003, when the GEAC decided to extend Bt-trial runs for 3 years till March 2006, in the face of protests at poor trials. Also in 2003, the Ministry of Environment and Forests setup a commission to formulate a mechanism for the evaluation, monitoring and control of Bt cotton in India. Despite the situation being ripe for debate, the website of the Ministry of Environment is silent on what the commission has to say.

Source: http://www.indiatogether.org/2006/aug/agr-btnomics.htm