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## National News

### **GM Crops: Not a Panacea For World Hunger**

*The GM cohorts argue that in order to meet the demand for food in the developing world, a second green revolution with increased use of GM is needed. On the other side the detractors of the above theme hinted out that there is more than enough food in the world and that the hunger crisis is caused by problems in food distribution and politics.*

**By Dipin Damodharan**

After the Bt brinjal controversy in last February (2010) another line of discussions and debate on Genetically Modified (GM) crops have set off in India. The present debate has started out following a comment made by S R Ramachandran Pillai, Polit Bureau Member, Communist Party of India (Marxist).

Addressing a session on agriculture at the party-sponsored International Congress on Kerala Studies at Trivandrum, Pillai said that it was unscientific to argue that GM crops involved public safety issues.

The comment paved way to another round of serious discussions: Whether India has to espouse GM food crops or to snub it. This article tries to analyze various aspects of controversies regarding GM crops with the support of comments from the experts.

#### **What are GM crops?**

Genetic modification involves the insertion or deletion of genes. Here genes are artificially transferred between organisms that could be conventionally bred by claiming that it would be high yielding ones. The first commercially grown genetically modified whole food crop was a tomato, which was modified to ripen without softening, by Calgene, later a subsidiary of Monsanto in the early 1990s.

Today GM crops are cultivated around 331 million acres in the world. Most of the GM crops are grown in North American countries. Considering the health and environmental problems, certain varieties of GM were banned in some parts of America and countries like France, Venezuela and Hungary.

Since 2002 Bt cotton has been widely cultivating in various parts of India. But the political controversy over GM crops came to the limelight only after Bt brinjal, the first genetically modified food crop in India.

Giving into intense opposition from environmental organizations, activists and the public, Environment Minister Jairam Ramesh, on February 2010, announced the government's decision to put a moratorium on the release of Bt brinjal till such time independent scientific studies establish the safety of the product from long-term view on impact on human health.

#### **Studies and controversies**

The question here is, whether the GM crops can be a panacea for world hunger problems, or even that would be the best way to address the issue. A group of GM followers argue that in order to meet the demand for food in the developing world, a second green revolution with increased use of GM is needed.

On the other side the detractors of the above theme hinted out that there is more than enough food in the world and that the hunger crisis is caused by problems in food distribution and politics.

Dr Yoosaf, Associate Professor, Department of Biotechnology, Calicut University Campus, points out that the cultivation of GM crops eventually lead to the annihilation of original / natural varieties.

Yoosaf, who was also a Research Associate with ICAR (Indian Council for Agricultural Research) mentions the example of Mexico, where natural variety of Maize completely wiped out after the Bt Maize to substantiate his view point.

Mean while Dr S Usha, Director, Thanal, an NGO in Kerala, has stressed the politics behind GM crops. "Actually the GM crops are increasing the agrarian crisis. The statistics of high productivity cannot be true. If so, the suicide of cotton farmers in Vidharba could not happen," she told ViewsJournal.

She also indicates that the only beneficiaries of GM crops are multi national companies like Monsnato, which supplies the GM seeds.

The studies taking place in the world (in India also) are in tune with Dr Usha's argument. In countries like America, there exists a strong point that GM crops actually reduce productivity. US Department of Agriculture even admits that productivity of GM corn and GM soya is less than that of the normal varieties.

Genetic Engineering Approval Committee (GEAC) is the regulatory authority, under the Ministry of Environment and Forest, for approval of GM crops in India. Both the GEAC and ICAR support the commercial cultivation of GM crops without conducting any in-depth scientific studies on the issue.

The Inter-Academy report on GM crops prepared by Indian Academy of Sciences, Indian National Academy of Engineering, Indian National Science Academy, National Academy of Medicinal Sciences and the National Academy of Sciences (submitted in September 2010 to Ministry of Environment and Forests) happened to be a disgrace to Indian science.

It endorses the commercial cultivation of GM crops but their conclusion was based on a previous study conducted by some one.

Through the words from an article by Famous agri policy analyst Devinder Sharma, we can understand the hollowness of that report, "It is no better than the introductory write-ups any graduate student of biotechnology would come out with. In fact, I have a collection of a large number of papers/analysis written by graduate and post-graduate students who seek my comments/views that I would rate much higher than the Inter-Academy report."

According to reports, 6.5 billion people are living on earth and we produce food for 11.5 billion people. Thus it is evident that the problem is not with the production but with the distribution of food crops.

Then we have to think one thing: what is the relevance of this genetically modified highly unsafe food crops?

<http://www.viewsjournal.com/coverstory/49-gm-crops-not-a-panacea-for-world-hunger.aspx>

## **Jairam must take a call on Bt brinjal**

**New Delhi January 20, 2011**

While announcing the moratorium on bt brinjal a year ago environment minister Jairam Ramesh had said it would remain in force till independent scientific studies establish safety of its long-term use on human health and environment.

No new studies have been initiated till now. But independent analysis of data submitted by Mahyco to the regulator has raised new questions. First it was Dr David Andow of University of Minnesota who had pointed holes in environment risk assessment data submitted by Mahyco. Now Dr Lou Gallagher has done the same with toxicity issues. She has pointed out that the toxicity data is full of holes, inconsistencies and conclusions that do not match raw data.

Sets of ten male and female rats were fed with powder of Bt brinjal mixed with vegetable oil for 90 days (they could not have been fed baigan bharta!). This study, according to evaluation of raw data by Gallagher, revealed signs of inflammation, allergy, tissue injury, liver damage, reproductive toxicity and chronic infection and even blood cancer.

Neurological functions, behavioral effects, reproductive performance and biological resilience were not even tested. Yet Mahyco concluded that Bt brinjal produced no toxicity and was safe for human consumption. In contrast, six science academies have cleared Bt brinjal for human consumption - like an ostrich - even in their revised report released recently. Now Jairam has to make a choice - between two independent reports and one white washed version of plagiarised report of Indian academies. Don't think it is going to be tough for him.

This also exposes how our regulators work. Many years ago a medical expert familiar with drug approval procedures narrated to me how easy it was to get new drugs approved in India.

Companies are supposed to conduct animal studies and human clinical trials which generates huge amounts of data, based on which the drug controller takes a decision. But

many times, the expert said, companies submit old dossiers with just a few new pages on the top because they know that nobody had time or expertise in the government to review raw data.

Now it seems the same practice is being followed for approval of genetically modified (GM) food crops. The biotechnology regulator accepted company data without a rigorous peer review and gave its go ahead. Everyone else - including six hallowed science academies - accepted this as Gospel truth. It is a pity that no Indian scientist cared to examine raw data - available on the website of environment ministry - before issuing 'safety certificates' to Bt brinjal. This amounts to scientific treachery of the highest order. One wonders how can scientists - who swear by truth and experimental evidence - can be so blind to stark reality. Meanwhile, have a suggestion for disposal of Bt brinjal seed stocks - feed them to rats and surely rats would die given the sickness they developed on a miniscule dose. At least this way, Bt brinjal will help in pest control.

<http://indiatoday.intoday.in/site/Story/127101/C O L U M N S / Jairam+must+take+a+call+on+Bt+brinjal.html>

### Strong pitch for GM crops

CHENNAI: Advocates of genetically modified (GM) crops, both in the private sector and the government research establishments, got an opportunity to press their case for lifting the moratorium on Bt brinjal and hailing GM crops as the sole hope for India, with the 98th Indian Science Congress here offering them a platform to air their views.

Apart from a special lecture session by Shanthu Shanthanam, executive director of ABLEAG, New Delhi, which saw five speakers, most of them from the private sector, saying that India's food security would be under serious threat without biotechnology, a plenary session echoed similar sentiments on Friday, the last day of the event.

At the plenary on 'Agriculture, Biotechnology and Food and Nutrition Security', Soumya Swaminathan, coordinator, WHO, Geneva, who spoke on the prevalence of undernutrition

and how it caused more diseases in the country, suggested biotechnology as a solution.

Director of National Institute for Nutrition, Hyderabad, B Sesikaran, claimed that most of the biotech products were not developed by the private sector and listed a few government institutes that have undertaken research in that field. However, he did not make it clear if those researches had the backing of any corporate house.

V Prakash, director of Central Food Technological Research Institute, talking about food production, acknowledged the treasure trove of ethnic, traditional and tribal knowledge in India and said that science can coexist with them.

However, the strongest pitch for biotech came at the 'special lecture' session where the panelists went to the extent of saying that if modern methods were not adopted India would face a food crisis. One of them said that in crop production, India was lagging in all crops except cotton. The production of cotton shot up only because of the introduction of Bt cotton, she claimed.

Stressing the need for lifting the moratorium on Bt brinjal, they said genetic modification was an ancient practice in the country. Transgenic crop is just a modern version of it as it involves genesplicing technology. Biotechnology alone can improve breeding and the quality of seeds, they claimed.

The elevator pitch: biotechnology can provide the nation more food, better quality food, safe food, healthy food and designer food. <http://expressbuzz.com/cities/chennai/strong-pitch-for-gm-crops/237822.html>

## Global

### US Approves Genetically Modified Alfalfa

[The New York Times](#) , Friday, 28 Jan 2011 | 10:36 AM ET

By: Andrew Pollack

Agriculture Secretary Tom Vilsack announced on Thursday that he would authorize the unrestricted commercial cultivation of genetically modified alfalfa, setting aside a

controversial compromise that had generated stiff opposition. In making the decision, Mr. Vilsack pulled back from a novel proposal that would have restricted the growing of genetically engineered alfalfa to protect organic farmers from so-called biotech contamination. That proposal drew criticism at a recent Congressional hearing and in public forums where Mr. Vilsack outlined the option.

Mr. Vilsack said Thursday that his department would take other measures, like conducting research and promoting dialogue, to make sure that pure, nonengineered alfalfa seed would remain available.

“We want to expand and preserve choice for farmers,” he told reporters. “We think the decision reached today is a reflection of our commitment to choice and trust.”

Mr. Vilsack in recent months has been calling for coexistence among growers of genetically engineered crops, organic farmers and nonorganic farmers growing crops that have not been genetically altered.

Organic farmers can lose sales if genetic engineering is detected in their crops, which occurs through cross-pollination from a nearby field or through intermingling of seeds. And exports of nonorganic but nonengineered crops to certain countries can be jeopardized if genetically engineered material is detected in significant amounts.

The genetically modified crop — developed by **Monsanto** and Forage Genetics, an alfalfa seed company that is owned by the Land O'Lakes farming and dairy cooperative — contains a gene that makes the plant resistant to the herbicide Roundup. That allows farmers to spray the chemical to kill weeds without hurting the crop.

Alfalfa is grown mostly to make hay fed to dairy cows and horses. More than 20 million acres are grown in the United States; it is the nation's fourth-largest crop by acreage, behind corn, soybeans and wheat, with a value of about \$8 billion. About 1 percent of alfalfa is organic.

In deciding whether to approve the genetically engineered alfalfa, the Agriculture Department was considering restricting areas where the

crop could be planted. That, Mr. Vilsack argued, would help prevent litigation, like the lawsuits that have already delayed the approval of genetically altered alfalfa and sugar beets.

“The rapid adoption of G.E. crops has clashed with the rapid expansion of demand for organic and other non-G.E. products,” Mr. Vilsack wrote [in a letter](#) issued by his department in December. “This clash led to litigation and uncertainty. Such litigation will potentially lead to the courts' deciding who gets to farm their way and who will be prevented from doing so.”

But the proposal ran into considerable opposition in Congress and from some farm groups and biotechnology companies.

They argued that since the department's environmental impact statement had concluded that growing the alfalfa would be safe, the government was obligated to allow it to be grown without restrictions.

Introducing restrictions based on economic consequences of pollen drift “politicizes the regulatory process and goes beyond your statutory authority,” Representative Frank D. Lucas, Republican of Oklahoma, who is the new chairman of the House Agriculture Committee, wrote to Mr. Vilsack on Jan. 19, before holding a hearing on the proposals the next day. [The letter was](#) also written by Republican Senators Saxby Chambliss of Georgia and Pat Roberts of Kansas. At the news conference on Thursday, Mr. Vilsack at one point said that the department did have the authority to restrict planting. But at another point, he said of the decision to allow unrestricted planting: “We are working within the statutory and regulatory system we have available to us.” Organic farmers and food companies said they were not pleased with the decision on Thursday. “It was disappointing, but as you know, there is a tremendous amount of pressure here,” said George Siemon, chief executive of Organic Valley, the nation's largest organic dairy cooperative. He said federal oversight was needed to keep organic crops free of genetically engineered material. Critics of planting restrictions said they were concerned that the approach used in alfalfa would eventually be extended to other crops, causing restrictions on the growing of corn,

soybeans and cotton, the vast majority of which are already genetically engineered."It's like a Pandora's box," said Keith Menchey, manager of science and environmental issues for the National Cotton Council of America.

Critics also said that restricting the growing of alfalfa would undermine Washington's efforts to persuade other countries to accept genetically modified crops. The Agriculture Department first approved the commercial planting of the genetically engineered alfalfa in 2005. But some environmental groups and alfalfa seed producers sued. In 2007, a federal judge rescinded the approval, saying the department had not adequately assessed the environmental impacts of the biotech crop, including the possible effect on organic and conventional farmers. The judge ordered the department to do a full environmental impact statement and banned further planting of the engineered seeds. The Supreme Court in 2010 overturned the ban on planting, but did not reinstate the approval of the crop, so no new seeds could be planted.

The final environmental impact statement, 2,300 pages long, was released last month. It said that the department would decide between two options: allowing unrestricted commercial growing or partly restricted growing. The partial restriction would have prohibited growing the biotech alfalfa on about 20 percent of current alfalfa acreage nationwide, and about 50 percent in Western states, where most alfalfa seed is produced, according to Forage Genetics. Andrew Kimbrell, executive director of the Center for Food Safety, the advocacy group that organized the lawsuit against the Agriculture Department, said his group would soon ask the judge in the case to rule that the environmental impact statement was still inadequate. "It's clear that Vilsack caved to pressure from the biotech industry and Monsanto," he said. "We'll be back in court seeking to vacate this approval, as we have done in the past."

*This story originally appeared in the The New York Times*

<http://www.cnbc.com/id/41311850>

### **GM crops breed economic dependence, new form of slavery, says cardinal**

By Carol Glatz  
[Catholic News Service](#)

VATICAN CITY (CNS) — If farmers in Africa had greater access to fertile, arable land safe from armed conflict and pollutants, they would not need genetically modified crops to produce food, said the head of the Pontifical Council for Justice and Peace.

Making growers reliant on proprietary, genetically modified seeds smacks of "the usual game of economic dependence," which in turn, "stands out like a new form of slavery," said Cardinal Peter Turkson.

The Ghanaian cardinal's comments came in an interview with the Vatican newspaper *L'Osservatore Romano* Jan. 5.

It is "a scandal" that nearly 1 billion people suffer from hunger, Cardinal Turkson said, especially since there is more than enough food to feed the whole world.

Crops and livestock are destroyed because of strict trade restraints or in order to keep food prices high and, in wealthier countries, edible food "is thrown in the garbage," he said.

"All it would take is a little bit more solidarity and much less egoism" and there would be enough food to nourish even twice the current world population, he said.

The cardinal said high-tech agricultural practices and techniques are all but useless in areas of conflict and areas that are ravaged by the exploitation of natural resources.

"In searching for and extracting petroleum, gold or precious minerals present under African soil, multinationals cause enormous damage: they excavate large pits and irreparably devastate fields and forests," he said. Whether such areas would ever be arable again is uncertain "even if one relied on genetically engineered plants."

Cardinal Turkson said some multinational companies are actively engaged in trying to

persuade bishops in Africa to support greater use of genetically modified organisms.

"I think that the real issue is not being for or against GMO," he said.

There would be no need for such crops if African growers had access to fertile land that was "not destroyed, devastated or poisoned by the stockpiling of toxic waste" and if growers were able to benefit from the fruits of their labors by being allowed to set aside enough seeds for planting the next year and not be forced to continually buy genetically modified seeds from abroad, he said.

"Why force an African farmer to buy seeds produced in other lands and by other means? I'm beginning to wonder if behind this there isn't the usual game of maintaining economic dependence at all costs," he said.

Cardinal Turkson said he is not opposed to scientific and technological progress, but it's important to evaluate whether there is a real need for genetically modified crops.

He said people should "honestly ask themselves whether it's more about business trying to make somebody rich," which was "a reasonable suspicion" given the many examples of similar exploitation in Ghana.

The extensive interview with Cardinal Turkson also touched upon the justice and peace council's task of promoting Pope Benedict XVI's encyclical "Caritas in Veritate" ("Charity in Truth"), the 2009 encyclical that addressed social justice issues.

The cardinal said there has been a "satisfactory" amount of attention paid to the document by bishops, professors and scholars, but that the council had to address a number of problems that have arisen in the United States concerning the meaning of some of the terms in the encyclical.

For example, he said the term "social," as in social development or social responsibility, is meant to convey the sense of the common good, not a political ideology associated with socialism.

Also the term "gift" reflects the Christian sense of self-giving, while stateside it was thought to refer to a kind of welfare, he said.

"This made us understand how important it is to put the pope's texts out in such a way that it's possible for them to be understood by everyone, even regular people," he said.

Even though the cardinal was a member of the Pontifical Council for Justice and Peace for many years, he said when the pope named him in October 2009 to head the council, he wanted a more complete understanding of what the pope had in mind for the church's endeavors in the field of justice and peace.

The cardinal asked for a private papal audience and was granted "a long encounter during which I learned what was the path to take" in the new job.

The pope said that in the field of justice and peace, "it is necessary to teach people to distinguish between pastoral and political" work, the cardinal said.

"We are pastors, and we don't do politics," he said.

The church's pastoral work involves offering a stance and judgment on diverse social issues, not getting involved in the political realm, he said.

<http://www.catholicnews.com/data/stories/cns/1100033.htm>

## **GE and Food**

### **Victory for Independent Science**

*World-famous independent scientist researching the risks of GMOs wins libel case against biotech association fronting a concerted campaign to discredit and victimise him* [Dr. Mae-Wan Ho](#)

Gilles-Eric Seralini, professor of molecular biology at the University of Caen in France, and president of the scientific council for independent research on genetic engineering (CRIIGEN), is a leading researcher into the risks of GMOs. Not surprisingly, he and his team became the target a concerted campaign of vilification, which included Monsanto, EFSA (European Food Safety Authority) and scientific societies representing biotechnology in France: the French Association of Plant Biotechnology

and the French High Counsel on Biotechnology (see [1] [Defend Gilles-Eric Seralini and Transparency in GMO Risk Assessment! SiS 46](#)).

This attach was triggered by the team's recent thorough re-analysis of data submitted by Monsanto to obtain commercial approval in Europe for three GM maize lines, MON 863, MON 810, NK603, on which EFSA had given a favourable opinion. In a published paper, the team concluded that the data "highlight signs of hepatorenal toxicity, possibly due to the new pesticides specific to each GM corn. In addition, unintended direct or indirect metabolic consequences of the genetic modification cannot be excluded."

Séralini and his colleagues received massive support from scientists and civil society. But Séralini decided to sue for libel; he believed the researchers Claude Allegre, Axel Kahn, and Marc Fellous were behind the defamation and intimidation campaign in France and that is why he pursued Fellous, who chairs the French Association of Plant Biotechnologies (AFBV), in the courts. Séralini argued that the campaign had damaged his reputation, reducing his opportunities for work and his chances of getting funding for his research [2].

On Tuesday 18 January 2011, the court of Paris concluded the lawsuit and decided in Séralini's favour, much to everyone's surprise [3].

During the trial, it transpired that Fellous, who presented himself as a 'neutral' scientist without personal interests, and accused those who criticise GMOs as 'ideological' and 'militant', actually owns patents through a company based in Israel. This company sells patents to corporations such as Aventis. Séralini's lawyer showed that various other AFBV members also have links with agribusiness companies, and so their scientific impartiality and integrity came under intense scrutiny.

The judge sentenced the AFBV to a fine on probation of 1 000, 1 for compensation (as requested by the plaintiff) and 4 000 in court fees.

Corinne Lepage, president of CRIIGEN, was delighted by the victory, as she stressed that she was not optimistic when leaving the first court session that had been held on 23 November 2010. "One cannot any longer say

whatever one wants about whistleblower," she said. "It is the first time that a whistleblower is not on the defensive but on the offensive."

Commenting on the court victory, Pete Riley of UK's GM Freeze said: "We warmly welcome this judgement and are delighted for Professor Séralini. Let's hope that we now see an end to the type of smear campaign we saw in this case and others over the last decade or so. Freedom of independent scientists to challenge the finding of scientific findings funded by an industry trying to sell seeds or chemicals is a vital element. The history of technological disaster tells us that industry and regulators are the last people to recognise and admit there is a problem. We fully support Séralini's right to pursue his research on GM crops and wish him more power."

Dr Brian John of GM-Free Cymru said: "This is a very gratifying outcome to a case which would never have been necessary had the GM industry followed long-standing traditions of respect for fellow scientists and honest debates with academics whose views, and research findings, do not coincide with theirs. For years now, the industry and its apologists have indulged in the vilification and intimidation of those who have the temerity to question the safety of GM products... Some quite senior academics working for the GM industry have behaved more like thugs than scientists. Their philosophy has always been to "shoot the messenger." Their list of victims is a long one: Arpad Pusztai, Ignacio Chapela and David Quist, Irina Ermakova, Judy Carman, Manuela Malatesta, Andres Carrasco, and many others.

"We congratulate Prof. Séralini for having the courage to stand his ground and fight back. Let's hope his success will make GM multinationals and the regulators give independent scientists the respect that they deserve."

More importantly, our regulators should take heed of Séralini's findings and those of other independent scientists around the world in their persistent efforts to foist GMOs on the people.

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3. "Independent GM researcher wins court victory for defamation", GM Free Cymru, Press Notice, 19 January 2011, via GM Watch [www.gmwatch.org](http://www.gmwatch.org)

### **Bt brinjal can damage liver, hit immunity: Study**

India Today

New Delhi January 17, 2011

<http://indiatoday.intoday.in/site/Story/126821/India/bt-brinjal-can-damage-liver-&-hit-immunity-of-a-human-being.html>

The consumption of genetically modified brinjal can make you sick. If eaten regularly, it can adversely hit the immune response of the body, cause liver damage and lead to reproductive disorders.

This has emerged from toxicity studies done by Mahyco in rats fed on Bt brinjal for up to 90 days, but the company either suppressed these facts or misrepresented them while submitting data to the regulator - the Genetic Engineering Approval Committee (GEAC).

Based on this data, the GEAC approved the commercial release of Bt brinjal, but the approval was subsequently put on hold by environment minister Jairam Ramesh in February 2010. The moratorium remains in force till now. An analysis of raw research data done by an independent expert has revealed that major health problems arising in test animals were ignored and standard research protocols set by the department of biotechnology (DBT) were not followed.

Similarly, there is no clarity on the concentration of toxic protein in dried brinjal powder fed to rats.

"Release of Bt brinjal for human consumption cannot be recommended given the current evidence of toxicity to rats in just 90 days," the report concluded.

Veggie's toxic effects

- White blood cell counts lower by 9 to 12 per cent compared to those on normal diet, indicating lower immunological function

- Levels of aspartate aminotransferase (AST) 54 to 60 per cent higher than the controls, indicating damage to the liver or heart

- Elevated bilirubin and lower plasma acetylcholinesterase - evidence of liver damage

- Ovary weight was 50 per cent less compared to the controls.

<http://www.gmwatch.org/latest-listing/1-news-items>

## **GE and Agriculture**

### **Mexico said no to "Monsanto" for an expansion of its pilot project in the planting of genetically modified corn**

**Friday, January 28, 2011**

The Mexican authorities rejected a request from Monsanto Co. nursery consortium to expand its pilot project in the planting of genetically modified Corn in northern Mexico, because more information and tests are needed to be done, Said Wednesday the head of the regulator in that sector.

Mexico is the birthplace of corn. Scientists and activists fear that genetically modified species may contaminate or displace native varieties Whose genetic content could be valuable in the future for the production of hybrids.

The head of the Interministerial Commission on Biosafety of Genetically Modified Organisms (Cibiogem), Reynaldo Alvarez Morales, said the companies will have to plan at least one agricultural cycle in small areas of about one hectare (two acres) to examine the possibility of further "pilot" with plots of 50 hectares (124 acres).

If no hazards found at the experimental level, the next step might be some commercial plantings supervised but much more restricted.

“It is impossible, to assess a crop with a single experimental planting,”He said, indicating that annual variations in temperature, humidity and wind can affect the results. “

The experimental plots in northern states of Sinaloa are usually planted at a mile (500 yards) of any planting potentially at risk. Those areas are tested for possible effects on native corn.

Monsanto did not immediately respond to requests for comment on the government’s decision, which was taken three weeks ago.  
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**This monthly bulletin is brought out by Southern Action on 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 Orissa. 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.**