Bt Brinjal- The truth behind it.

GREENPEACE

ग्रीनपीस

Greenpeace believes that GMOs should not be released into the environment as there is no adequate scientific understanding of their impact on the environment and human health.

We campaign for creating a paradigm shift in agricultural production - to transform how politicians, industry, media and the public see agriculture and to replace the industrial agriculture of corporate control, monoculture, genetically engineered crops, and synthetic agrochemical inputs with sustainable farming that has low external inputs, enhances agro-diversity, protects bio-diversity and helps meet local food and employment needs.

Published by:
Greenpeace India Society
60 Wellington Street, Richmond Town
Bengaluru 560025, India

Contact:
jaikrishna.ranganathan@greenpeace.org

Design and layout:
Lighthouse Creative Services Pvt. Ltd.

Bt Brinjal - why should we be worried?

Brinjal also called as the king of vegetable is the third largest cultivated vegetable after potato and tomato in our country. It is cultivated in approximately 5.5 lakh hectares and is an indispensable part of the common man's food across India. **Our Brinjal is under the threat of getting genetically modified forever. Bt Brinjal, if approved, would also be the first Genetically Modified (GM) food crop to be released in India.**

GM crops are plants in which a gene from an unrelated organism is artificially introduced through Genetic Engineering (GE). It is an imprecise technology, which leads to irreversible changes in the plant. Genetically Modified Organisms (GMOs), be it a plant, micro organism or animal cannot be traced or recalled once released into the environment. It is this irreversibility and uncontrollability added to the potential threat to human health and that of the environment that makes it a potent subject of global debate.

The other contention is with respect to the fact that GM crops are patented products. This leads to a few multinational seed corporations controlling agriculture and eventually food production.

WHO IS MODIFYING OUR BRINJAL AND WHY?

Bt Brinjal has been produced by inserting a toxin gene, Cry 1 Ac, from a soil bacterium called *Bacillus thuringenesis* [Bt] into brinjal plant using the technique of genetic engineering. Bt Brinjal has been developed by Maharashtra Hybrid Seed Company Ltd [Mahyco], the largest private seed company in India. Mahyco claims that by inserting the modified version of the bacterial toxin gene Cry 1 Ac into the Brinjal plant the cells in the plant would start producing the toxin and thereby kill the major insect pest in Brinjal, the Fruit and Shoot Borer [FSB].

Mahyco has further leased out this technology with specific conditions to two Indian agricultural universities, University of Agriculture (Dharwad) and Tamil Nadu Agriculture University [TNAU] (Coimbatore) under the US AID programme, Agri-biotechnology Support Programme II [ABSP II].

WHY SHOULD WE BE WORRIED?

Bt Brinjal, like the other few GM crops that have been released elsewhere in the world, fails to answer many a questions related to its impact on our health, environment, culture, and socio-economic set up.

a. Long-term health impacts not assessed:

There are no assessments yet to gauge the long term impact of consuming Bt Brinjal. The Genetic Engineering Approval Committee (GEAC), the apex regulatory body under the Ministry of Environment and Forests has assessed it to be safe based on bio-safety studies performed in the laboratory, the longest of which is just 90 days on adult rats.

b. Antibiotic resistant genes in Bt Brinjal:

Bt Brinjal carries two antibiotic marker genes, one for Neomycin resistance and the other for Kanamycin resistance. While Mahyco claims and GEAC endorses that there is no reason for concern, scientific studies [ref 1] published in peer reviewed journals point to the

chances of Horizontal Gene Transfer (HGT). This means the human gut bacteria could acquire the gene and become resistant to antibiotics adding to the epidemiological woes of the country.

c. Babies are at a higher risk:

Infants are always considered a high-risk group and the effects of such novel food items like GM food need to be assessed for their effects on infants. No such study exists for Bt Brinjal.

d. Ecological impacts:

The impacts of Cry 1 Ac protein on the non target insect population had been limited to a very few insects and for a very short period of time which leaves behind the question of long-term impacts on a variety of non target insects unanswered. Same is also the case with soil ecosystems. The studies on soil micro-flora were not only for a very short period but the impact of the breakdown products of Cry 1 Ac on them has also not been assessed.

e. Farmers under threat:

India is the center of diversity for brinjal and farmers from last 4000 years have developed more than 2,500 varieties that they used, saved, and exchanged according to their choice and the need of the hour. Bt Brinjal, like any other GM crop, comes with a list of Dos and Don'ts specified by the patent regime. On one side with their aggressive marketing techniques, multinational seed giants and their subsidiaries will lure the farmers into their seed trap, while on the other the farmer will be denied the system of saving and exchanging as this goes against the profit motives of the company. This model will eventually make the Indian farmer dependent on the multinational seed companies for the most important input in agriculture, the seed.

Moreover it has been clear with the Bt Cotton experience, that when the primary pest, in this case, the fruit and shoot borer, is suppressed, the attack by

secondary pests like many of the sucking pests would increase. This leads to the farmer spraying much more pesticides than what he used before. On the Bt Cotton front while the country debates on whether the farmer has benefited or not, Monsanto, the largest seed company in the world and also the patent holder of the genes used in Bt Cotton has been reaping huge profits, thanks to the hundreds of crores of rupees it gets from the poor Indian farmer as royalty. Bt Brinjal is no exception.

e. Consumer choices violated:

If Bt Brinjal is approved, consumer choices will be violated forever. There will be no way of differentiating between a Bt Brinjal and a regular one as all brinjals in the market will look the same. This will be a violation of our right to know, right to safe food and right to informed choices with regard to food. Presently, no labeling regime exists and in any case, in a country like India, labeling cannot cover the majority of consumers since most consumption is from unpackaged foods. Moreover, if approved in a few years, contamination by cross pollination would ensure that there are no non-GM varieties of Brinjal available in our country. This has already happened with cotton after the entry of Bt Cotton, the only GM crop cultivated in India.

f. Is there a need for Bt Brinjal?:

The most important question in the whole controversy around Bt Brinjal is the fundamental one of its very need. It is not clear to this day why we need Bt Brinjal when safer, affordable, sustainable and farmer-controlled alternatives exist for pest management. Reports indicate that the NARS (National Agricultural Research System) studies show that non-chemical IPM (Integrated Pest Management) alternatives exist and work quite well for pest management in brinjal. Further, hundreds of practicing farmers have scores of such practices reported, which should be extended to other farmers. For instance, there is a large programme being run by the Rural Development department of the Government of Andhra Pradesh, implemented through

women's self help groups all over the state, where farming is being done on around 20 lakh acres in 2009-2010 without the use of chemical pesticides at all and with an NPM approach (Non Pesticidal Management of crops) [ref 2].

The question of 'Why do we want a potentially risky Genetically Modified Brinjal, when alternatives exist?' has been left unanswered so far.

BT BRINJAL BIO-SAFETY STUDIES – A SAGA OF SCIENTIFIC FRAUD

Bt Brinjal bio-safety studies so far have been a saga of scientific fraud. Many questions of safety remain unanswered.

No independent bio-safety studies done:

The charade of bio-safety studies begins with GEAC entrusting the bio-safety study to Mahyco. No surprise that Mahyco further sublet the job to laboratories of its own choosing that did not even meet the National Accreditation Board for testing and calibration of Laboratories [NABL] standards set by the government. [ref3] The samples were provided by Mahyco and there was no independent scrutiny on whether they were even the right samples.

Mahyco tries to hide the data:

It took a 30 month RTI battle by Greenpeace and a PIL filed in the Supreme Court to get the bio-safety data into the public domain. Ironically, the regulatory bodies, GEAC and the Department of Biotechnology aligned with Mahyco and resisted from providing the information on the grounds that it was confidential business information, and if made public would jeopardise Mahyco's commercial interest. In a landmark judgment the Central Information Commission [CIC], the apex body on matters related to Right to Information, pronounced that “public interest is bigger than private commercial interest” and hence all of the bio-safety information needs to be made public.

Independent analysis brings out the facts behind Mahyco's bio-safety studies:

Independent analysis by eminent toxicologists and nutritional biochemists like Prof. Gilles Eric Serralini of University of Caen, France and Dr. Judy Carmen of the Institute of Health and Environmental Research, respectively, indicate that whatever little bio-safety studies were done by Mahyco on Bt Brinjal had many discrepancies. The analysis also indicated that the sample sizes were too small and that Mahyco concealed many an important findings like deviations in physiological and biochemical factors in animals fed with Bt Brinjal. Statistically significant differences that were reported were discounted rather than used to raise food safety concerns or as warranting further investigations. [ref 4]

The regulatory system fails the nation:

The Genetic Engineering Approval committee, GEAC, the nodal agency for approving the release of any GMO in to the open has been mired in controversies ever since its inception more than a decade ago, to the extent that the Supreme Court had to install an independent observer in GEAC. Despite the many warnings by this independent observer, Dr P.M Bhargava, one of the eminent molecular biologists in the country, GEAC aligned with the GM seed industry and failed its citizens by approving Bt Brinjal.

A rigged system:

GEAC has been under fire on allegation of serious conflicts of interests that exist in it. Its past shows that, like many other regulatory bodies in the world, it also has a revolving door between developers of GM crops and the Industry. While many of its members themselves are developers of GM crops, at least 2 of them in the past have joined the GM seed industry once done with their roles in GEAC, throwing doubts on their role in the regulatory body. [ref 5]

The best example of the conflicts of interest is also the

expert committee constituted in January 2009, after independent analysis of bio-safety studies done by Mahyco pointed out to grave concerns. This had even led to the then Union Health Minister, Dr Anbumani Ramadoss, endorsing these concerns and questioning the haste in which GEAC is going to approve Bt Brinjal. [ref 6]

The Expert Committee, which is now called EC II had 16 members of whom 3 are directly involved with the development and bio-safety assessment of Bt Brinjal and at least 2 are involved in drafting the bio-safety guidelines with the help of USAID, another stakeholder in the development of Bt Brinjal. There was also one member in the committee, who came under the scanner of the Vigilance department for granting undue favours to Mahyco. [ref 7]

Astonishing facts came out when the Chairman of the Committee, Dr Arjula Reddy himself agreed that with the current set of tests it cannot be said that Bt Brinjal is absolutely safe for human consumption. [ref 8] He also confessed that he was under tremendous pressure from the Ministry of Agriculture to approve Bt Brinjal. It is nothing but an irony that our food safety and that of our future generations has been entrusted in the hands of this kind of an overtly compromised committee.

Indian states say no to Bt Brinjal:

So far 6 Indian states have said no to the Union Government's plan to approve Bt Brinjal. This includes states like West Bengal and Orissa which are the 2 largest producers of brinjal in the country. Other states include [ref 9]. This leads to an interesting situation where the Central Government is trying to push Bt Brinjal down the throat of the citizens while state governments are trying to protect them.

BT BRINJAL - INDIA AT CROSS ROADS

Bt Brinjal is considered as a door opener by the GM seed companies. Information available on the government websites say that 56 different crops of

which 41 are food crops are under different stages of genetic modification. Almost everything that we eat is under threat. Once Bt Brinjal is approved, it would open the door for genetically modified lady's finger, cabbage, cauliflower, tomato, mustard, potato, groundnut and last but not the least GM rice which are all under different levels of field trials.

Although GEAC in its meeting on October 14, 2009 gave approval for the environmental release of Bt Brinjal, continued public resistance against GM food has finally forced Minister for Environment and Forests, under whom comes GEAC, to hold public consultations at seven different locations to understand the concerns of different stake holders. The brief history of GM crops in India with only one crop, Bt Cotton, out in the fields have shown us that we cannot trust the safety of our food in the hands of a few so called experts sitting in committees neither can we trust it with Seed Corporations who have a profit to make. The future of our food safety lies in our hands and it is time that we stand and up and say no to GM food.

New Delhi, Jan 2008: Greenpeace activists/volunteers quarantined a field trial of Bt Brinjal at Hamidpur, 16 kms away from New Delhi. This field was in the middle of a village and neigbouring farmers had no clue about the field trial.

GEAC, Jan 2009: Youth protesting against Bt Brinjal outside GEAC while it sat for the first time to review the bio-safety and agronomy documents on Bt Brinjal.

Kolkata, 13 Jan, 2010 - Shri Jairam Ramesh, Union Minister of State for Environment and Forests meets members of the public

Kolkata, 13 Jan, 2010 - Paschim Banga Khet Mazdoor Samiti being stopped from going inside for the consultation with Shri Jairam Ramesh, Union Minister of State for Environment and Forests.

BT BRINJAL - CHRONOLOGY OF DEVELOPMENT AND APPROVAL

2000 - Transformation and greenhouse breeding for integration of *cry1Ac* gene into brinjal hybrids and seed purification.

2001-2002 - Preliminary greenhouse evaluation to study growth, development and efficacy of Bt Brinjal.

2002-2004 - Confined field trials to study pollen flow, germination, aggressiveness and weediness; biochemical, toxicity and allergenicity studies and back-crossing into the regular breeding program.

2004-05 - Data on the effects of Bt Brinjal on soil microflora efficacy against fruit-shoot borer, pollen flow and chemical composition submitted to the Review Committee on Genetic Modification (RCGM)

2004 - RCGM approves conducting multi-location research trials of eight Bt Brinjal hybrids

2005 - Through a MoU under the aegis of Agribiotechnology Support Programme II [ABSP II] of USAID Mahyco shares the technology with TNAU, DAU and IIVR to develop open pollinated verities of Bt Brinjal. Back crossing and integration of EE1 into 4 verities of TNAU and 6 verities of DAU is done.

2004-07 - Multi-location research trials conducted by Mahyco and All India Coordinated Vegetable Improvement Project under the Indian Council of Agricultural Research

2006 - Mahyco submits bio-safety data to Genetic Engineering Approval Committee (GEAC) and seeks permission for Large scale trials.
- GEAC constitutes a sub committee to look into the concerns raised by civil society.
- Supreme Court stops large scale trials of Bt Brinjal due to a PIL filed by civil society representatives

2007- The subcommittee [expert committee 1] submits its report, recommends 7 more studies on bio-safety but

gives a green signal for large scale trials.
- Supreme Court permits large-scale trials but forbids it from being conducted in farmers' fields.
- Indian Institute of Vegetable Research [IIVR] takes up the coordination responsibility of LSTs of Mahyco's Bt Brinjal trials conducted in 10 research institutions across the country in 2007 and 11 in 2008.

2008 August - Due to orders from Central Information Commission and Supreme court GEAC publishes the full bio-safety data on Bt Brinjal submitted by Mahyco.

December - The Union health Minister Dr Anbumani Ramadoss endorses the concerns raised by public and asks GEAC not to approve Bt Brinjal in a haste.

2009 January - IIVR submits the results of the LSTs. Due to concerns raised by many members, especially from the health ministry, GEAC constitutes a 2nd sub-committee [Expert committee 2 or EC2] to look into all concerns raised by all stake holders

2009 October 14 - the Subcommittee submits its report based on which GEAC gave an approval for environmental release of Bt Brinjal containing the event Ee1.

2009 October 15 - Owing to concerns raised by scientists and general public, the Minister of State [i/c] for Environment and Forests under whose ministry comes GEAC announces a nationwide consultation in January and February of 2010, before the final approval for commercialisation of Bt Brinjal.

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GREENPEACE
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Greenpeace is a global organisation that uses non-violent direct action to tackle the most crucial threats to our planet's biodiversity and environment. Greenpeace is a non-profit organisation, present in 40 countries across Europe, The Americas, Asia and the Pacific.
It speaks for 2.8 million supporters worldwide, and inspires many millions more to take action every day. To maintain its independence, Greenpeace does not accept donations from governments or corporations but relies on contributions from individual supporters and foundation grants.

Greenpeace has been campaigning against environmental degradation since 1971 when a small boat of volunteers and journalists sailed into Amchitka, an area north of Alaska, where the USGovernment was conducting underground nuclear tests.This tradition of 'bearing witness' in a non-violent manner continues today, and ships are an important part of all its campaign work.

Greenpeace India Society
#60, Wellington Street, Richmond Town,
Bengaluru 560025, India.
t +91 80 41154861
www.greenpeaceindia.org