2nd January, 2009,
Erode, Tamil Nadu.

To,

***Thiru*. Jairam Ramesh,**
Hon'ble Minister of state (independent incharge)
Ministry of Environment and Forests (MoEF),
Paryavaran Bhavan,
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New Delhi – 110 003, India
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Honorable Minister ***Thiru*. Jairam Ramesh**,

Sub: Expressing our concerns over Bt Brinjal to our Environment

We were proud to be the citizens' of democratic India. Hearing your ministry's announcement for a public opinion poll towards the Bt brinjal issue in the last month, we thought of writing this letter of request with our views of Bt brinjal.

We have detailed our point of concerns over the approval of Bt brinjal in the following 13 pages article titled ***"Genetically engineering plants and its effects".*** We hope your ministry's democratic process will continue in reading our opinion to take a justly decision over this issue.

Thanking you,

Yours sincerely,

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Encl.: 13 pages Article on "Genetically engineering plants and its effects"

** Details of these represents will be found inside the article*

Genetically engineering plants and its effects

(Compilation of scientific and the expert views)

*(Compiled by **Yuvasenthilkumar Ramalingam**, Graduate of Organic Agriculture*
E-mail: sryskhtech@yahoo.co.in)

Summary

The 1st decade of 21st century have seen many hot issues like WTO regulation's impact and globalization, Iraq war, climate change issues, bio-fuel surge, global food crisis, economic recession, environmental movement, etc. Among them is the issue of genetically modified food on the public health and environment. Rich to poor nations were debating on this technology for its public safety. Let's see some of the experts, governmental, public and the scientific views about the GMO's or the Genetic engineering technology. This article discusses the general effects of GMO products, than confining to the India's Bt brinjal issue, on which MoEF, GOI is interested for the public opinion. It is very relevant and important to discuss broadly (than only with Bt brinjal), because it will help GOI to for its long term policy decisions like in restructuring the agricultural research, quarantining the GM food imports, updating our food and seed regulations, etc.

Transgenic pollen harms monarch larvae

Although plants transformed with genetic material from the bacterium *Bacillus thuringiensis* (*Bt*) are generally thought to have negligible impact on non-target organisms, *Bt* corn plants might represent a risk because most hybrids express the *Bt* toxin in pollen, and corn pollen is dispersed over at least 60 metres by wind. Corn pollen is deposited on other plants near corn fields and can be ingested by the non-target organisms that consume these plants. In a laboratory assay Losey, 1999 found that larvae of the monarch butterfly, *Danaus plexippus*, reared on milkweed leaves dusted with pollen from *Bt* corn, ate less, grew more slowly and suffered higher mortality than larvae reared on leaves dusted with untransformed corn pollen or on leaves without pollen.

- **Losey, J. E.; Rayor, L. S. & Carter, M. E**., Transgenic pollen harms monarch larvae, *Nature*, **1999**, *399*, 214

- Reported by Mr. **Ram Marimuthu**, Molecular biologist, University of Nottingham, England.

Feeding trials lack short comings in studies:

Many feeding trials have been reported testing GM maize, potatoes, rice, soybeans and tomatoes on rats or mice for prolonged periods, and parameters such as body weight, feed consumption, blood chemistry; organ weights, histopathology etc have been measured. The food and feed under investigation were derived from GM plants with improved agronomic characteristics like herbicide tolerance and/or insect resistance. The majority of these experiments did not indicate clinical effects or histo-pathological abnormalities in organs or tissues of exposed animals. These studies can be used to assist the safety evaluation of GM plant derived food and feed and to reach conclusions on whether they can be considered as safe as their conventional counterpart**. In some cases adverse effects were noted, which are difficult to interpret due to shortcomings in the studies.**

- **EFSA report**, Safety and nutritional assessment of GM plants and derived food and feed: The role of animal feeding trials *Food and Chemical Toxicology,* **2008***, 46,* S2 - S70

GM crops: the unmentionable threat - The World's vanishing Honey bees:

This evidence suggests that Bt genes or their toxins, acting on bee larvae via pollen, could have at least four disastrous outcomes.

They could:

1. Disturb methylation patterns within the bees' immune-system, thereby increasing their vulnerability to disease.
2. Alter the methylation patterns within those genes that are responsible for the manufacture of royal jelly, the critical ingredient in making queen bees and shaping bee society.
3. Disturb the methylation or interact with one or more genes involved in regulating worker-bee behaviour, thereby making them incompetent or dysfunctional during foraging.
4. Increase the natural rate of apoptosis (cell death), leading to accelerated ageing and an abbreviated life-span in the adult bees.

- Morrison, R., regm@optusnet.com.au, http://www.regmorrison.id.au/, **2009**

GM scientists need self realization:

I will give you some brief information about the GM technology.

1. Identification of desirable traits and its genes
2. Isolating the genes for that trait
3. Transferring the genes into same species or in different species (It can be done using different methods either using (Agrobacterium or gene gun method).
4. The transformed plants can be crossed with other plants using conventional genetic methods.

Even though the crossing is going in nature already, but we are aggravating the process by introducing cross between unrelated species. But what I would say is that when its not working , I mean the art of making genetic modification in plants, we have to stop that and try to improve the conventional methods like organic methods. Since we don't know the after effect of introducing the GM crops in the environment, even though we have some reported cases of negative effects, we have to take that into consideration.

We may have two of this possible effect. When we introduce the crop its could mix up with the native varieties and may lead to loss of wild type (brinjal originated in India). May be this gene can no longer stand in the plant and could be lost during the periods of cultivation, which could naturally get away.

Anyway in India since we don't have a framed GM policies and regulations, we have to seriously consider the introduction of GM food crop into public. I will vote and stand for no to GM food.

But, at the end people will not stop doing these things until they start in the path self-realization. Because after all we are chasing behind the shadow of our real nature, which you can never catch.

Aruljothi Mariappan, Ph.D scholar, Bacterial genetics, Institute of biology
Humboldt University Berlin, Chuaseesstr.10117 Tel:.0049-302098129

Fate and effects of insect resistant Bt crops in soil ecosystems:

Recent applications of biotechnology, especially genetic engineering, have revolutionized crop improvement and increased the availability of valuable new traits. A current example is the use of the insecticidal Cry proteins from the bacterium, Bacillus thuringiensis (Bt), to improve crops, known as Bt crops, by reducing injury from various crop pests. The adoption of genetically modified (GM) crops has increased dramatically in the last 11 years. However, the introduction of GM plants into agricultural ecosystems has raised a number of questions, including the ecological impact of these plants on soil ecosystems. Crop residues are the primary source of carbon in soil, and root exudates govern which organisms reside in the rhizosphere. Therefore, any change to the quality of crop residues and rhizosphere inputs could modify the dynamics of the composition and activity of organisms in soil. Insect-resistant Bt crops have the potential to change the microbial dynamics, biodiversity, and essential ecosystem functions in soil, because they usually produce insecticidal Cry proteins through all parts of the plant. It is crucial that risk assessment studies on the commercial use of Bt crops consider the impacts on organisms in soil. In general, few or no toxic effects of Cry proteins on woodlice, collembolans, mites, earthworms, nematodes, protozoa, and the activity of various enzymes in soil have been reported. Although some effects, ranging from no effect to minor and significant effects, of Bt plants on microbial communities in soil have been reported, using both culturing and molecular techniques, they were mostly the result of differences in geography, temperature, plant variety, and soil type and, in general, were transient and not related to the presence of the Cry proteins. The respiration (i.e., CO2 evolution) of soils cultivated with Bt maize or amended with biomass of Bt maize and other Bt crops was generally lower than from soils cultivated with or amended with biomass of the respective non-Bt isolines, which may have been a result of differences in chemical composition (e.g., the content of starch, soluble N, proteins, carbohydrates, lignin) between Bt plants and their near-isogenic counterparts. Laboratory and field studies have shown differences in the persistence of the Cry proteins in soil, which appear to be the result primarily of differences in microbial activity, which, in turn, is dependent on soil type (e.g., pH, clay mineral composition, other physicochemical characteristics), season (e.g., temperature, water tension), crop species (e.g., chemical composition, C:N ratio, plant part), crop management practices (e.g., till vs. no-till), and

other environmental factors that vary with location and climate zones. This review discusses the available data on the effects of Cry proteins on below-ground organisms, the fate of these proteins in soil, the techniques and indicators that are available to study these aspects, and future directions.

- **Icoz, I. & Stotzky, G**., Fate and effects of insect-resistant Bt crops in soil ecosystems, *Soil Biology & Biochemistry,* **2008**, *40,* 559-586

MAHYCO's safety studies - Mockery on science and humanity:

Let me quote some portions from the report submitted by Mahyco to GEAC,

.....because the protein is contained within the plant there is little exposure to the environment until the senesced plants are ploughed into the soil.....it is unlikely that seed or brinjal tissues enter into aquatic habitats... (Page 83 of volume1).But the senesced plants will surely be incorporated into soil and its cumulative effect will be there in the case of monoculture. ,and there are many chances the crop debris entering to water bodies.

….....(as per the study)out crossing of cry1Ac gene from bt brinjal to other related species or genera is low.....(Page84). Means there is outcrossing, which is a threat to the environment. The word will satisfy only the well wishers of the company, since Brinjal is a often cross pollinated plant with cross pollination upto 48%

Mahyco study on the adverse effect of Bt toxin on fishes was from a few days study on common carp fish! They should have titled it as effect of Bt toxin on common carp fish instead of that on fishes, the same was the case with birds.

Everywhere in the report you can see the usage not statistically significant. Is statistical significance the ultimate trump card in the case of biological interactions? (M.Sc. (Ag) people very well know the mantra of making biologically insignificant results into statistically significant!)

Here is one example, when DDT was used first we got highly statistically significant control of mosquitoes. After several rounds of DDT spray the statistically insignificant guys emerged as statistically significant DDT resistant guys...

Further,it is a mockery on science and humanity to complete the studies on environment and biosafety within a period of 3-4 years...

- **Mahesh P P**, Ph.D Scholar, Mycobacteria Research Group, Molecular Microbiology
Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, **India.**

Why not Integrated Pest Management (IPM)?

In the report Mahyco compared the efficiency of Bt brinjal only with the use of chemical pesticides(Page 8,9).There was no mention about the comparative yield advantage when the existing IPM practices are followed.

Any way they made it clear that Bt brinjal will be a fit component in IPM(Page99) but its supporters claim it is the most efficient method to control BFSB!

In my opinion IPM didnt get wide publicity(because there was no company like Monsanto or Mahyco to market IPM!). Many times our agrl.extension is a failure to reach the farmers with scientific practices. Farmers alwaysl chose very handy procedures like spraying chemicals(dose independent!) instead of following scientific pest management. So I am sure, like a magic tablet Bt brinjal will be full heartedly accepted by the farmers .

- **Mahesh P P**, Ph.D Scholar, Mycobacteria Research Group, Molecular Microbiology
Rajiv Gandhi Centre for Biotechnology, Thiruvananthapuram, **India.**

Lessons from the past and others:

Its really painful to hear that "Indian Ministry of Environment and Forests" is seriously preparing to put that slow poison into our own people!!!. I don't think the scientists who are behind this scene are not aware of serious health and environmental problems of GM crops. Do you think people forgot what had happened with GM cotton? India registered highest death rate of farmers in all over the world!!! The cattle died after eating those crops.

We are taking or bringing some technology or any new thing from Western countries, that is ok. But I don't know why we are not looking what had happened to those countries due to those technologies? Little example - Recently I have seen a farmer near Gobichettipalayam, Tamil nadu is using ROUNDUP for his rice field, I don't have any words to express my pain while seeing that act. This Monsanto's product is banned in many countries, even in USA but they are successfully seeing those in INDIA. I don't think our scientists/professional is not aware of its ill effects, I request you why still that product is allowed to market in INDIA?

Nowadays our country is fastly catching up many of those Western cultures in the name of modernization and killing our traditional, valuable life style and losing our originality. But we are not supposed to look and follow how they are reacting against this silent killer GM crops. Look at Germany they have completely banned GM Maize and France a step ahead, they ordered to all schools to use only organic foods to the children.

Leave this health risks behind, we have lost almost 3 lakh indigenous rice varieties mainly due to Green revolution and now because of this GM rice. We had 4,00,000 native rice varieties all over India before 1950's but now having only less than 1,00,000. and the second was Cotton, now GM ghost likes to destroy most common food Brinjal! I seriously oppose this act to avoid the loss of several regional Brinjal varieties. (there is plenty of facts to say...)

I think the important lesson for us is to move back to the work of the Creator and away from ways which destroyed it. If people don't find a larger purpose for their lives than *collecting material goods*, everyone has to suffer in this hard world. Yet if we don't stop these Creator's (means GOD) work in the name of Science, if we don't have a spirit rich enough to live with love and respect for God's creations, we have no future.

Even a common people now understands the ill effect of those GM crops but I wonder why not our scientists and politicians (who are meant to serve for the people). As a Organic Agriculture graduate I feel very bad and will fight against GM to stop its arrogance.

-Rajasekaran M., Graduate Student, International Organic Agriculture,
Faculty of Organic Agricultural sciences, University of Kassel, Germany.
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GMO banned in Indian organic regulations NPOP

India has introduced the National Programme for Organic Production (NPOP), the Indian standard for organic production. It was formed under and administrated by Agricultural and processed food export development authority (APEDA), Ministry of Commerce, GOI in the year 2002.

Indian organic regulations say in the *article 5.1.7.*

"Organic products shall not be labelled as GE (genetic engineering) or GM (genetic modification) free in order to avoid potentially misleading claims about the end product". ….and in the list of approved ingredients for processing agricultural products it says, "*Preparations of micro-organisms accepted for use in food processing. Genetically modified organisms are excluded"* (Appendix 4 NPOP, 2002)

APEDA has involved in helping the organic products to be exported world wide and have gone for the world wide negotiations to get the Indian organic farming standards to that EEC 2092/91 of European Organic standard, US NOP, JAS standard of Japan and Swiss ordinance for Organic production. All the International standards have banned GM technology in organic production and processing except US. Incase of approval of Bt crops widely for many crops and regions, India may face serious threat to get not certified for it organic farms for the exports. The Agricultural exports will get hampered in future. This kind of double strand from GOI ministries shows its lack knowledge for its decision process over B.t. brinjal and also its non-cooperation between different ministries i.e. Ministry of commerce, Food processing and Environment respectively.

- **Yuvasenthilkumar Ramalingam,** Graduate of Intl.Organic agriculture**,**
Member of Organic Farmers Association India, Erode, Tamil nadu, India.
Blogspot: www.agriculturetheaxisoftheworld.com

GM Crop, Will it sustain?

The food security through the GM Crop appears to be not sound as they may behave like the non GM crop in the long run and may result in irrevocable changes in our

system. The food security with out the essential nutrient security is of no use to the population .If GM crops provide requisite nutrients may be of some use provided they should not have any adverse effects on the health of soils, biodiversity and living beings including various metabolisms in the living systems. It is a common hypothesis that production of crops can be increased by combating insect pests by using toxic gene.But it is not so as the processes of removal of one species of insect pest from the given eco niche either by nature or man (growing Btcrop) will pave the way for an Ecological Succession of another one as evidenced earlier in our cotton system. The second such Succession has already set in our cotton growing regions where the crop is devastated by the mealy bugs. A similar succession will follow in the Brinjal cropped eco niche.In this context it is wise to heed the advice given by a world renowned humanitarian.

World-renowned humanitarian Stephen Lewis said that leaders should proceed cautiously in using genetically modified organisms to combat the agricultural crisis in Africa. According to Professor Watson, the chief scientific adviser at the Department for Environment, Food and Rural Affairs (Defra), "It is similar to nuclear power," and "We have to look at all the risks and benefits, real and perceived.." Let us not use toxic alien gene as they bound to cause health and ecological hazards. Let us try to get the desirable genes from the same species/allied species and use for solving the crisis in Agriculture.

-**Sundaramurthy Thimmaiah**, Environmentalist, Coimbatore, Tamil nadu.

Chemical application could grow with GM

Dr. Maarten Stapper has been presenting real facts on GM for the past several years. He will address audiences in Leongatha, Victoria this Friday the 30 May, as well as presenting at the BFA Brisbane roadshow on the 11 July 2008. Dr. Stapper says arguments that GM crops can benefit the environment do not take an ecological approach. "GM is a single gene 'solution' to a problem. But isolated genes can't fix soils degraded by modern farming – they're simply a tiny part of a highly complex production system" says Mr. Stapper. will make a difference".

“Studies returning positive data on GM were conducted in controlled laboratory environments with results that "disappeared when the genes are put out into the real world". And he says GM can increase chemical dependence. "For example plant genes modified to become resistant to specific types of herbicides or pesticides could lead to resistant 'superweeds' which would require more of a different type of chemical application".

False claims of food security through GM

Recently, honorable agricultural minister of Tamil Nadu Mr.Veerapaandi Arumugam have said, “If we don’t go for GM crops we will looseour food security. Therefore, it is must we need GM crops”. Is he ignorant or mislead by his bureaucrats?

The report found the world already produces enough food for everyone, yet more than 800 million people go hungry. "Food is cheaper than 40 years ago but malnutrition and food insecurity threaten millions," it stated. Mr. Watson said governments and industry focused too narrowly on increasing food production, with little regard for natural resources or food security. "We have to make food more affordable and nutritious without degrading the land", he said highlighting the importance of environmental preservation in combating world hunger.

The report found the present system of food production and trade has had serious adverse ecological effects and is now contributing to climate change. It said science and technology targeted towards raising yields also needed to protect soils, water and forests. The report has been backed by sixty countries and most UN bodies but has not been endorsed yet by the US, UK, Australia or Canada because of its negative stance on GM technology and growing of biofuel crops.

-**THE GAURDIAN MAGAZINE**, April 16th Issue, 2008,
http://www.guardian.co.uk/environment/2008/apr/16/food.biofuels

Study shows Mahyco's Bt brinjal is unsafe

The study noted, "The parameters affected in animals fed with Bt brinjal are in blood cells or chemistry, but in different manners according to the period of measurement during the study or sex. In goats, the prothrombin time is modified and biochemical parameters such as total bilirubin and alkaline phosphates are also changed, as well as feed consumption and weight gain. For rabbits, less consumption was noted and also prothrombin time modification, higher bilirubin in some instances, albumin, lactose dehydrogenase and the hepatic markers alanine and aspartate aminotransferases. Sodium levels were also modified, as well as glucose, platelet count, mean corpuscular haemoglobin concentration and haematocrit value. In cows, milk production and composition changed by 10%-14% ." "Rats which were GM-fed had diarrhoea, had higher water consumption, suffered from decrease in liver weight as well as decrease in the relative liver to body weight ratio. Feed intake was modified in broiler chickens with glucose in some instances. Average feed conversion and efficiency ratios are changed in GM-fed fish. All that makes a very coherent picture of Bt brinjal to be potentially unsafe for human consumption. It will be also potentially unsafe to eat animals who have these problems. These differences are most often not reported in the summaries of different experiments, but are present in the raw data, "the study added.

According to the study, these differences were, when discussed, disregarded often on the grounds that they were within the range of a wide "reference" group. The reference group represents a wide range of brinjal types and is not a strict comparison. Other reasons for disregarding the differences were that they did not show linear dose response or time response, or that they were only present in either males or females, but not both. Such declarations that the differences seen were not of biological relevance and unsubstantiated by the data presented from the feeding trials.

- Gilles-Eric Séralini, Committee for Independent Research and Information on Genetic Engineering (CRIIGEN), France.

Reported by **Financial express**, Ashok Sharma, January 10, 2009

Misguiding younger Generation towards GM fantasy:

The following words are from the Botany Textbook of First Year of Higher Secondary of Tamil Nadu state board (Standard Eleven in Indian System of Schooling). The textbooks are released by the Tamil Nadu government. The very first words from the textbook written by Dr A, Jaffar Hussain (Chairperson, Text Book Writing Committee) are exactly quoted below. *"We are passing through an "Era of Biology". Words like "Biotechnology','Bioremediation", "Biochips", Biomineralization","Bioinformatics" etc. have become familiar even with "common man".Certainly there is a new unusual never-before tried approach to address and solve many problems associated with modern life and to enhance the quality and standard of living by application of modern tools of Biology; particularly the Genetically Modified Foods (GM Foods) and other GM Products have revolutionized our Life"*.

We are preparing the young generation by brainwashing them into thinking that everything about modern life and new technologies are good and better in life. We are looking at a situation where these students are going to demand GM Foods in their table just because they assume it is going to "revolutionise" their life.

Krishna Kumar,Ph.D scholar, Institute for Neuro and bioinformatics,
University of Luebeck, Germany Tel:.0049-4515005683

What's all at the end?

When the green revolution was introduced the agricultural extension people went to farmers' field at nights, to apply urea fertilizer to make the farmers to believe that the fertilizers will boost the yield. Slowly they started corrupting farmers with all technologies right from fertilizers, herbicides, hybrid seeds, heavy machineries, non-native species of trees and crops, etc. It is like a story of Adam and Eve, where Eve corrupted the minds of human species by eating the apple with help of Adam without obeying the rules of God (Nature). That kind of satanic revolution was created among the farmers mind with in a short period. Do the technologies of green revolution tested in country in long term for is effects before introducing it? There were no debate, no questions; it was simply introduced using farmer's ignorance. Such kind of happening is

encouraged in this country again in the form of biotechnological introduction. Here we don't want to shut our mouth, since we believe that, our country is little democratic than those periods of green revolution.

We were little bit late even, failed to stop Bt cotton. Now our country has become the leader in the area of Bt cotton in the world. The effect of Bt is evident socially and economically in many parts of Maharashtra and Andhra Pradesh (DDS report). The Bt toxin's effect on eco system is something long-term, which was revealed through above references. Now, the Bt brinjal, Bt toxin direct in to our mouth (after cooking!!) should not be encouraged. Many of the reports show the possibility of horizontal transfer of Bt genes to gut bacteria and indigestible nature of Bt toxin in our stomach. Moreover, flaws in the biosafety studies to detect the Bt toxin effects in the human beings (ICMR) brings more suspicions to trust it.

The alternatives for Bt is available in the form of Integrated pest management, Organic farming, etc to control the fruit borer, on which the Bt brinjal was synthesized. Why didn't government concentrate on those technologies to reduce pesticide spray instead of going to Bt brinjal manufacturing? Is it laborious? Labour!! Do labour scarcity is a problem in this surplus populated country? We are wondering, if the farmers experience labour scarcity means, then there is a problem somewhere in the designs of our economy, to promote labour less agriculture or migrate rural to urban way of employment. Government has to concentrate in such basic economic designs to alleviate the problem of laborious nature of farming, food distribution problems, etc., instead of entering to change the design of genome to change the expressions of plant species, thinking that technological innovation will drive our economy. It is like "going to the carpenter for your stomach ache". Since, government don't have collective thinking, even between their own ministries, it seem to lack its credibility to make policies for the welfare of the people. Bt case is an classical example.

We are happy that, our government has atleast came to the people get their opinion on this issue. This makes us to believe that we still have democracy, apart from many of the autocratic structures. It may be because of the nature of the ministry and its function or maybe the nature of the minister. Thanks for giving opportunities to express

and we hope that this article will be read by the concern representatives of MoEF and others.

-Contributors

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