



**SOUTH ASIA**  
BIOSAFETY PROGRAM

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# NEWSLETTER

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## SABP

The South Asia Biosafety Program (SABP) is an international developmental program initiated with support from the United States Agency for International Development (USAID). The program is implemented in India and Bangladesh and aims to work with national governmental agencies to facilitate the implementation of transparent, efficient and responsive regulatory frameworks for products of modern biotechnology that meet national goals as regards the safety of novel foods and feeds and environmental protection.

SABP is working with its in-country partners to:

- Identify and respond to technical training needs for food, feed and environmental safety assessment.
- Develop a sustainable network of trained, authoritative local experts to communicate both the benefits and the concerns associated with new agricultural biotechnologies to farmers and other stakeholder groups.
- Raise the profile of biotechnology and biosafety on the policy agenda within India and Bangladesh and address policy issues within the overall context of economic development, international trade, environmental safety and sustainability.

## BANGLADESH PROBLEM FORMULATION WORKSHOP ON THE ENVIRONMENTAL RISK ASSESSMENT OF GENETICALLY ENGINEERED PLANTS

The South Asia Biosafety Program (SABP) and the Partnership Program for Biosafety Risk Assessment and Regulation in collaboration with Bangladesh Agricultural Research Council (BARC) and Department of Environment (DoE) organized a Problem Formulation Workshop on the Environmental Risk Assessment of Genetically Engineered Plants at the BRAC-CDM, Rajendrapur, Gazipur, Bangladesh on July 13 and 14, 2012. Twenty-five participants from the National Agricultural Research System (NARS), policymakers, members of the Biosafety Core Committee (BCC) and Institutional Biosafety Committees (IBC) attended. Dr. Raymond Layton of Pioneer Hi-Bred, USA and Dr. Andrew Roberts, Deputy Director, Center for Environmental Risk Assessment (CERA) conducted the workshop.

A brief and informal inaugural ceremony included a welcome and a workshop outline by Dr. Roberts followed by a brief speech by Dr. M. Khalequzzaman A. Chowdhury, Member Director (Crops), Bangladesh Agricultural Research Council (BARC) who expressed his hope that the workshop would be helpful to stakeholders in light of the fact that Bangladesh has been performing confined field trials of Bt brinjal and late blight resistant (LBR) potato.

Dr. Layton gave an introduction to problem formulation that covered its background, the need for protection goals and

the connection to a testable hypothesis. He pointed out that problem formulation is the foundation of the ecological risk assessment. Dr. Layton also described the risk assessment process and, in particular, problem formulation, risk analysis and risk characterization.

Dr. Roberts's presentation, Exemplifying Problem Formulation using *Brassica napus* (Canola) in Canada: 1995 and 2010, reviewed the concepts of problem formulation through a case study on canola in Canada. He concluded with remarks about the role of experience and familiarity in problem formulation and subsequent risk assessment.

Prof. M. Imdadul Hoque, Country Coordinator, South Asia Biosafety Program, gave an overview of the Regulations for Genetically Engineered Plants of Bangladesh. Prof. Hoque described the chronological developments of different biosafety regimes in Bangladesh including the Biosafety Guidelines of Bangladesh, its elements and the functions of the different committees. He also gave the status of transgenic crops in Bangladesh and, more specifically, the status of confined field trials of Bt-brinjal and LBR potato being conducted by the Bangladesh Agricultural Research Institute (BARI).

Mr. Mohammed Solaiman Haider, Deputy Director, Department of Environment (DOE), spoke about the decision making process for the clearance of development projects/industries through environmental impact assessment (EIA) wherein he described the importance and benefits of EIA and its development history in Bangladesh. He also highlighted the assessment parameters for clearing an application for an environmental clearance certificate and briefly described the salient features of Environment Policy of 1992.

One of the main objectives of the workshop was to give the participants a hands-on opportunity to assess the ERA of GE plants through group exercises. Led by Dr. Layton, using MON 15985 insect resistant cotton as a case study, the participants were divided into three separate groups. The groups first discussed amongst themselves the identification of protection goals, relevant for the ERA of GE plants in Bangladesh. The discussions concluded with a PowerPoint presentation given by each group to describe the outcome. The three groups then discussed amongst themselves various aspects of the ERA of GE cotton summarizing the discussions with a PowerPoint presentation. In the final group exercise, conducted in a similar fashion, groups



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worked on the development of an analysis plan for developing the data necessary to complete an ERA based on the case study. The presentations were thoroughly discussed and a common understanding/consensus was reached. Based on the outcome of the group discussions, Dr. Roberts reiterated the relevant protection goals for the ERA of GE plants in Bangladesh that had been identified by the groups.

The workshop ended with brief remarks by the participants as well as by Drs. Layton and Roberts and a vote of thanks by Prof. Hoque.

## INDIA: REPORT RELEASED 'CULTIVATION OF GENETICALLY MODIFIED CROPS – PROSPECTS AND EFFECTS'

Dr. Vibha Ahuja, General Manager, Biotech Consortium India Limited

On August 9, 2012, the Parliamentary Committee on Agriculture (2011-12) released a report on "Cultivation of Genetically Modified Food Crops – Prospects and Effects". The 492-page report has a series of recommendations, which are being extensively debated. The report has received wide publicity, both for and against, in the public press. To illustrate the coverage, a sampling of editorials published in three prestigious business newspapers follows:

BUSINESS LINE (EDITORIAL) — NEW DELHI, AUGUST 13, 2012

### A LUDDITE PRESCRIPTION

The ultimate beneficiary of the field test ban recommendation, if implemented, would ironically be the big agri-biotech MNCs.

The Parliamentary Committee on Agriculture's recommendation that all field trials in genetically modified (GM) crops be "discontinued forthwith" and any further research and development done only "in strict containment", apparently to pose no risk whatsoever to agriculture as currently practiced, is most unfortunate. The panel has rested its case on arguments extending from the bizarre to paranoia that is helpful neither to the cause of scientific research nor to farmers' interests. Take the assertion that "India today is not in a situation of desperation that was obtaining before the Green Revolution". Does the panel really believe in such a comfortable assumption, when consumers are battling persistent double-digit food inflation and farmers are seeking technological options for improving crop yields and reducing cultivation costs? Would Bt cotton acreage have risen from zero to 10.6 million hectares (mh) between 2001 and 2011 — and overall cotton area from 8.7 to 12.2 mh — had farmers not seen some value in growing these hybrids that incorporate alien genes from a soil bacteria conferring resistance to assorted insect pests? Nobody forced farmers; nor could they have been victims of collective delusion season after season.

That said, it is true cotton yields, after climbing from 300 to 550 kg a hectare between 2001 and 2007, have stagnated, if not fallen to 500 levels, since then. Part of it is due to cultivation spreading to marginal lands, thereby bringing down the average at a national level. The regular cotton-growing areas have, however, seen no such yield reductions. The problem has been largely in rain-fed regions with shallow soils, where farmers have opted to plant hybrids requiring more water and nutrients. If yields on these — as opposed to straight (open-pollinated) varieties — have been low because of late

planting, long after the monsoon's arrival, the fault does not lie with Bt technology. The right solution, rather, would be to promote this technology in varieties, whose seeds farmers can themselves multiply and sow early without worrying about buying again in the event of re-sowing.

Instead of cornering the Government on not doing enough to developing Bt non-hybrids best suited for dry-land conditions, which the private seed industry is not interested in, the Parliamentary Committee wants a virtual moratorium on GM research itself. How can any scientist, even in a public sector institution, undertake serious transgenic breeding research without evaluating agronomic performance in field trials! The ultimate beneficiary of all this, ironically, would be the big multinational agri-biotech firms. These are entities with deep pockets, who know that ten years from now — when India's sheer food, feed and fibre needs would have multiplied — there will be only a minority of Luddites still opposing molecular biology, genomics, marker assisted selection and transgenic technologies. By then, though, all indigenous research — whether by the public sector or private Indian seed companies who cannot wait so long — would have died. Is this what our honorary parliamentarians want?

THE FINANCIAL EXPRESS (EDITORIAL) — NEW DELHI, AUGUST 13, 2012

### BT BRINJAL'S BOXED IN

Politicians over-ride scientists, farmers.

In February 2010, when the then environment minister Jairam Ramesh announced a moratorium on the commercial release of Bt brinjal despite the unequivocal approval it had received from the Genetic Engineering Approval Committee (GEAC), a decade's worth of agronomic and biosecurity testing had already been put into the crop. He then appointed a committee representing six of India's top science academies to examine the matter, which reiterated that this genetically modified (GM) crop is safe and fit for human consumption. More than two years later, the concerned scientists have been firmly told their voices are inconsequential by a Parliamentary committee on agriculture, which is now demanding not only a ban on field trials of all GM crops but also a thorough probe into why Bt brinjal first came to be approved by GEAC. Surely, it's implied, the concerned scientists were colluding with the seed and biotechnology industry. Farmers don't get much respect either; they should have known better than to embrace Bt cotton. Basudeb Acharia, chairman of the Parliamentary standing committee and CPI(M) MP, has pronounced that a country full of small farmers and biodiversity should not go for GM crops. Further, India may need more food but should only use "indigenous" ways to grow it. This is the "greater public good"? Ideology masquerading as objectivity?

Sure, there are legitimate concerns that Bt cotton's yields are plateauing and pest resistance developing. But by Acharia's logic, India's first Green Revolution is a write-off because it left problems like groundwater exhaustion and pesticide pollution in its wake. The work of hundreds of scientists hasn't been able to persuade him that although GM technology today is not a panacea, it's increasingly a necessity. China has embraced it. In the US, 90% of maize, soybean, cotton and canola are GM. In Brazil, a fast-track regulatory system has approved eight new crops between 2010-11. Over in that isle of popular resistance, the EU spent more than \$425 million on an exhaustive assessment that concluded GM technology is not more risky than conventional plant breeding technologies. The world is looking forward to drought-resistance maize and beta-carotene-fortified rice. And here, Parliamentarians are

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busy overriding scientific institutions, defending status quo, and versifying an idealised past when the Indian farmer was self-sufficient and hadn't heard of mono-cropping.

THE ECONOMIC TIMES (EDITORIAL) — NEW DELHI, AUGUST 13, 2012

### INDIA NEEDS GM CROPS

**We** must develop the capacity for independent testing and regulation.

**T**he parliamentary standing committee on agriculture wants a retreat on genetically-modified (GM) food crops. That is a bad idea. India needs genetically-engineered crops to meet the demand for both food and non-food industrial crops that will vastly increase as the population grows and incomes rise. Committee chairman Basudeb Acharya asks why we should worry about future output "if India could raise its grain output from 56 million tonnes to 254 million tonnes"? Valid point. India could raise its food output because India adopted the best biotechnology had to offer in terms of high-yielding varieties. The point is not to run scared of possible harm from new technology but to create the institutional capacity to produce safe technology, assess technology for safety, manage its benign adoption and extension and do all this with

integrity. So, the country must have the capacity to carry out independent testing of GM crops and assess all the negative implications. Also, those in charge of regulation must be people who have no conflicts of interest by way of financial interests in the GM industry. This is why the Biotechnology Regulatory Authority of India Bill that has been in the works for a decade must be introduced without further delay, debated within Parliament and outside and an acceptable version adopted at the earliest. Such an institutional body would be beyond the criticism that the present apex body for approval of GM crops — the Genetic Engineering Approval Committee (GEAC) — attracts. The parliamentary panel's finding that GEAC had been pressured to approve Bt Brinjal in 2010 calls for a probe. The point is to fix the regulatory system, not discontinue field trials in all GM crops. India must have independent testing facilities in universities and dedicated laboratories.

**T**he committee also wants labelling of GM food. Will the committee also support consolidation of small holdings into large farms, corporatisation of food handling and the supply chain and organised retail? Without such transformation of Indian agriculture, we cannot have credible labelling. Let the committee also engage with the organisation of the food economy to enable labelling.



## The Reading List

... new and notable articles

### WIDESPREAD ADOPTION OF BT COTTON AND INSECTICIDE DECREASE PROMOTES BIOCONTROL SERVICES

Lu Y, Wu K, Jiang Y, Guo Y, Desneux N

Over the past 16 years, vast plantings of transgenic crops producing insecticidal proteins from the bacterium *Bacillus thuringiensis* (Bt) have helped to control several major insect pests and reduce the need for insecticide sprays. Because broad-spectrum insecticides kill arthropod natural enemies that provide biological control of pests, the decrease in use of insecticide sprays associated with Bt crops could enhance biocontrol services. However, this hypothesis has not been tested in terms of long-term landscape-level impacts. On the basis of data from 1990 to 2010 at 36 sites in six provinces of northern China, we show here a marked increase in abundance of three types of generalist arthropod predators (ladybirds, lacewings and spiders) and a decreased abundance of aphid pests associated with widespread adoption of Bt cotton and reduced insecticide sprays in this crop. We also found evidence that the predators might provide additional biocontrol services spilling over from Bt cotton fields onto neighbouring crops (maize, peanut and soybean). Our work extends results from general studies evaluating ecological effects of Bt crops by demonstrating that such crops can promote biocontrol services in agricultural landscapes.

NATURE (2012) JUN 13. DOI: 10.1038/NATURE11153. [EPUB AHEAD OF PRINT] [http://www.nature.com/nature/journal/vaop/ncurrent/full/nature11153.html?WT.ec\\_id=NATURE-20120614](http://www.nature.com/nature/journal/vaop/ncurrent/full/nature11153.html?WT.ec_id=NATURE-20120614)

### RNA INTERFERENCE-MEDIATED GENE KNOCKDOWN WITHIN SPECIFIC CELL TYPES

Zhang C, Galbraith DW

In plants, RNA interference (RNAi)-induced gene silencing can spread from the initiation site to nearby cells. The silencing signal moves from cell-to-cell through plasmodesmata and, over long distances, through the phloem. In this study, we employed a nuclear-localized GFP fusion protein to visualize the pattern of gene silencing induced by three different transgenes expressing double-stranded RNA (dsRNA) in *Arabidopsis* root tips. In all cases, we found that dsRNA-induced silencing did not spread from the silencing initiation site to adjacent cells. In the first set of experiments, in a transgenic background expressing nuclear-localized GFP within a contiguous cell layer that included endodermis, cortex/endodermis (joint) initial (CEI) cells and the quiescent center (QC) cells, expression of the marker gene was silenced specifically in the QC cells without affecting gene expression in the adjacent CEI and endodermal cells. The next two sets of experiments examined the knockdown of two endogenous genes. We observed that silencing was completely restricted to the QC and endodermal cells within which the dsRNA transgenes were expressed. Overall, these results accentuate one important aspect of RNAi-induced gene silencing, that it can be cell autonomous, and demonstrated the feasibility of selective gene knockdown within specific cell types.

PLANT MOLECULAR BIOLOGY. (2012) JUN 28. [EPUB AHEAD OF PRINT] <http://www.springerlink.com/content/33214543011x415/>



## CALENDAR OF EVENTS

Event	Organized by	Date and Venue	Website
<b>INDIA</b>			
TERI-ITEC Courses 2012-13 Course II - Applications of Biotechnology and its Regulation	The Energy and Resources Institute and Indian Technical and Economic Cooperation (ITEC), Ministry of External Affairs	August 13 - 31, 2012 Gurgaon	<a href="http://www.teriin.org/index.php?option=com_events&amp;task=details&amp;sid=505">http://www.teriin.org/index.php?option=com_events&amp;task=details&amp;sid=505</a>
Agritech Asia 2012 National Convention – The Next Frontier of Agri-Business and Technology	Organized under the aegis of Government of Gujarat	September 3 - 5, 2012 Gandhinagar	<a href="http://www2.kenes.com/agritech-asia/Pages/Home.aspx">http://www2.kenes.com/agritech-asia/Pages/Home.aspx</a>
6th International Congress on Legume Genetics and Genomics	International Crops Research Institute for the Semi-Arid Tropics	October 2 - 7, 2012 Hyderabad	<a href="http://www.icrisat.org/gt-bt/VI-ICLGG/homepage.htm">http://www.icrisat.org/gt-bt/VI-ICLGG/homepage.htm</a>
Silver Jubilee International Symposium on "Global Cotton Production Technologies vis-à-vis Climate Change"	Cotton Research and Development Association and CCS Haryana Agricultural University, Hisar	October 10 - 12, 2012 Hisar	<a href="http://crdaindia.com/?view=news&amp;page_id=16">http://crdaindia.com/?view=news&amp;page_id=16</a>
International Symposium on New Paradigms in Sugarcane Research	Society for Sugarcane Research and Development and Sugarcane Breeding Institute	October 15 - 18, 2012 Coimbatore	<a href="http://www.sugarcane.res.in/images/sbi/Centenary/1st_circular_int_symposium.pdf">http://www.sugarcane.res.in/images/sbi/Centenary/1st_circular_int_symposium.pdf</a>
Third National Symposium on Agriculture Production and Protection in Context of Climate Change	The Society of Agricultural Professionals, Chandra Shekhar Azad University of Agriculture and Technology and Birsa Agricultural University	November 3 - 5, 2012 Ranchi	<a href="http://www.baujharkhand.org/Downloads/online%20circular%20for%203rd%20national%20symposium.pdf">http://www.baujharkhand.org/Downloads/online%20circular%20for%203rd%20national%20symposium.pdf</a>
44th Annual National Conference of the Nutrition Society of India (NSI)	Nutrition Society of India	November 16 - 17, 2012 Tirupati	<a href="http://www.nutritionocietyindia.org/">http://www.nutritionocietyindia.org/</a>
Winter school on "Molecular breeding approaches for genetic enhancement in oilseed crops"	Directorate of Oilseeds Research	December 1 - 21, 2012 Hyderabad	<a href="http://dor-icar.org.in/media/docs/winter-school-dec-2012.pdf">http://dor-icar.org.in/media/docs/winter-school-dec-2012.pdf</a>
AgTech Global Summit – 2012	Bejo Sheetal Bio-Science Foundation and Maryland India Business Round Table	December 9 - 13, 2012 Aurangabad	
<b>INTERNATIONAL</b>			
ABIC 2012: The XII International Conference for Agriculture Biotechnology	ABIC Foundation	September 2 - 5, 2012 Rotorua, New Zealand	<a href="http://www.abic2012.com/">http://www.abic2012.com/</a>
Commercialization of Biotech Crops: Learning from Asia	Asia BioBusiness Pte. Ltd., the Southeast Asian Regional Center for Graduate Study and Research in Agriculture and the International Service for the Acquisition of Agri-Biotech Applications	September 3 - 7, 2012 Los Baños, The Philippines	<a href="http://www.asiabiobusiness.com/?page_id=335">http://www.asiabiobusiness.com/?page_id=335</a>
12th International Symposium on Biosafety of Genetically Modified Organisms (ISBGMO12)	International Society for Biosafety Research	September 16 - 20, 2012 St Louis, Missouri, USA	<a href="http://www.isbgmo.com/">http://www.isbgmo.com/</a>
Sixth meeting of the Conference of the Parties serving as the meeting of the Parties to the Cartagena Protocol on Biosafety (MOP-6)	Convention on Biological Diversity (CBD) and MoEF	October 1 - 5, 2012 Hyderabad	<a href="http://www.cbd.int/doc/?meeting=MOP-06">http://www.cbd.int/doc/?meeting=MOP-06</a>
Eleventh meeting of the Conference of the Parties to the Convention on Biological Diversity (COP-11)	CBD and MoEF	October 8 - 19, 2012 Hyderabad	<a href="http://www.cbd.int/doc/?meeting=cop-11">http://www.cbd.int/doc/?meeting=cop-11</a>

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### Others

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