

# South Asia Biosafety Program

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## INDIA

### Prime Minister Addresses Modern Biotechnology during Indian Science Congress



The 102<sup>nd</sup> session of the Indian Science Congress was held in Mumbai on January 3-7, 2015. The theme of the session was “Science and Technology for Human Development”. The Indian Science Congress is a major event that not only brings together a scientific group within the country but is also attended by international scientists including noble laureates.

Shri Narendra Modi, Prime Minister of India, inaugurated the session. In his inaugural address, the Prime Minister said that more resilient agriculture, appropriate and affordable technologies for rural areas, improving healthcare, making clean technology affordable, and making India a leading manufacturing nation and a hub for knowledge and technology-intensive industries, were some of the key objectives for Indian scientists. He called for intensive research and development

efforts by the scientific community to achieve these goals and stressed streamlining the funding procedures to facilitate ease of doing research in the country. He specifically mentioned the need for clear regulatory policies for research and development in areas like biotechnology, nanoscience, agriculture and clinical research.

A session titled “GM Crops: The Use of Modern Biotechnology in Agriculture” was held. This session was chaired by Dr. R.S. Paroda, former Director General of the Indian Council of Agriculture Research (ICAR). Other distinguished speakers from this event included Dr. Asis Datta, National Institute of Plant Genome Research (NIPGR); Dr. Dilip Kumar, Chief Technical Advisor for FAO; Dr. Deepak Pental, Head of Delhi University Department of Genetics; Dr. Swapan K. Datta, Deputy Director General of ICAR; Dr. Anupam Verma, Indian Agriculture Research Institute (IARI); and Dr. J.L. Karihaloo, Coordinator of the Asia Pacific Consortium on Agriculture Biotechnology (APCoAB). All speakers stressed the need for GM crops, especially considering food security for the increasing population in the country.

In his remarks as the chair, Dr. Paroda said that GM crops are helpful to Indian farmers and we need to encourage the crops by erasing all obstacles. He also called for the need to bring in clarity in policies for GM crops and take forward the Biotechnology Regulatory Authority Bill of India 2013 that intends to regulate organisms and products of modern biotechnology including GM crops.

**The full text of the Prime Minister's speech can be accessed at:** [http://pmindia.gov.in/en/news\\_updates/text-of-pms-address-at-the-102nd-indian-science-congress/](http://pmindia.gov.in/en/news_updates/text-of-pms-address-at-the-102nd-indian-science-congress/)

## SAVE THE DATE

**3<sup>rd</sup> Annual South Asia Biosafety Conference**  
**September 19-20, 2015 in Dhaka, Bangladesh**  
**Registration information to follow.**



Thank you to those who participated in the pre-conference survey mentioned in the last SABP newsletter. Over 170 responses were received, including participation from all of the South Asia Biosafety Program countries as well as Bhutan, Denmark, France, Malaysia, United States and Sri Lanka. This feedback will be incorporated into the agenda by the conference planning committee.



Be sure to follow along to @SAsiaBiosafety on Twitter for updates leading up to September and see live tweets during the conference! **#SABC2015**

## Awareness Workshops on Genetically Modified Crops in Maharashtra



Recognizing the role of state agriculture universities (SAUs) in the development and conduct of confined field trials of genetically modified (GM) crops, three "Awareness Workshops on GM Crops" were organized by the Biotech Consortium India Limited (BCIL) and SAUs in Maharashtra during December 2014 and January 2015. The first workshop was held at Dr. B.S. Konkan Krishi Vidyapeeth, Dapoli on December 11, 2014; the second workshop was held at Vasantnao Naik Marathwada Krishi Vidyapeeth, Parbhani on January 9, 2015; and final workshop was held at the Yashwantrao Chavan Academy of Development Administration, Pune in association with Mahatma Phule Krishi Vidyapeeth, Rahuri, on January 17, 2015. The objective of these workshops was to apprise scientists from various departments in concerned SAUs, agriculture officers to state departments of agriculture and other concerned stakeholders, including farmers, about the regulatory requirements, safety issues and field trial requirements for GM crops. The participants were also apprised about research initiatives at the public sector institutions in the crops relevant to the region.

The workshops were inaugurated by the Vice Chancellors of the respective SAUs. Dr. Anil Kakodkar, former chairperson of the Atomic Energy Commission and the chair of the state level committee for approval of confined field trials (CFTs) in Maharashtra, gave a special address at the workshop in Pune. He mentioned that there are specific

**To access the e-Learning module on Confined Field Trials shared during this meeting, please visit:**  
<http://cft.biotech.co.in/>



concerns related to all technologies, including apprehensions about GM crops. However, such concerns can be addressed by safety data generated through field trials and hence, CFTs of GM crops should be continued.

Dr. Dinesh Kumar, from the National Institute of Nutrition, spoke about food safety issues and experiments conducted at his institute on various GM crops. Regulatory requirements for working with GM crops including a detailed overview of products to ensure effective management and monitoring were explained to the participants. Dr. O.P. Govila, Member of the Genetic Engineering Appraisal Committee (GEAC), and Dr. S.J. Rahman, Member of the Review Committee on Genetic Manipulation (RCGM), responded to various queries raised by participants.

Participants were also introduced to an e-Learning module on Confined Field Trials developed under South Asia Biosafety Program.

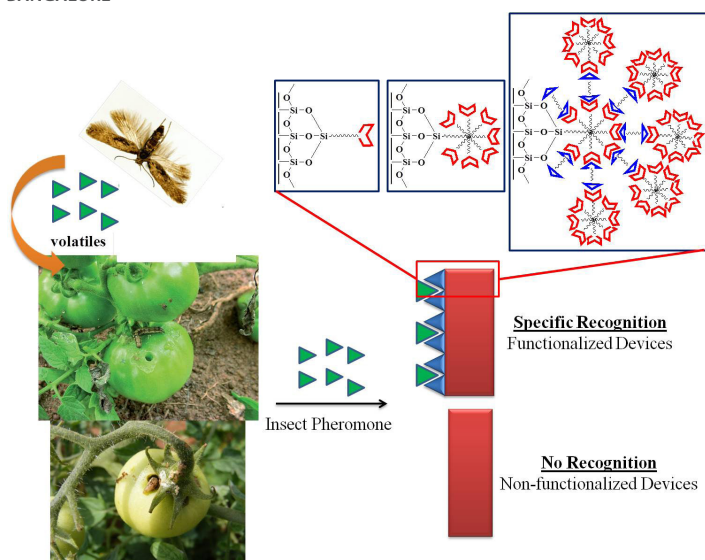
Presentations were made on research initiatives by scientists from various organizations including the Directorate of Rice Research, Hyderabad, National Chemical Laboratory, Pune, Central Institute of Cotton Research, Nagpur and MPKV, Rahuri. Intensive discussions, questions and answers took place at each meeting, many times in Marathi and Hindi.





## A New Pheromone Detector for Pest Control

DEEPA BHAGAT, SENIOR SCIENTIST, NATIONAL CENTRE FOR INTEGRATED PEST MANAGEMENT, NATIONAL BUREAU OF AGRICULTURALLY IMPORTANT INSECTS (ICAR-NBAII), BANGALORE



Control of pest populations in farmers' fields and safe storage of food products will ultimately increase food production and food availability. Nanotechnologies used in the development of carriers for pheromones and nanosensors for the early detection of infestation can be utilized by small and marginal farmers. This is because the cost involved will be very affordable for mass scale administration and the ways of handling are extremely easy, convenient and do not require specialized training.

The need for a sensor that accurately detects a few pheromones in a label free manner has prompted us under the leadership of Prof. Santanu Bhattacharya, Chairman, Organic Chemistry, Indian Institute of Sciences (IISc), Bangalore, with a team of members including Prof. Rudra Pratap, Chairman, CeNSE IISc, Bangalore, Dr. Deepa Bhagat, Senior Scientist, ICAR-NBAIR and Mr. Parikshit Moitra, IISc, Bangalore, to use the functionalized microelectromechanical sensors (MEMS) devices as

pheromone mass sensors. This principle is based on the measurement of change in their natural frequency due to added mass. The relationship between the natural frequency of the MEMS devices and the added mass was derived from Hooke's law. It is this relationship that we have used to detect the mass of pheromones attached to the functionalized MEMS surfaces by measuring the change in the resonant frequency of the experimental devices.

It has been clearly shown that increasing concentration of pheromones is quantitatively sensed by the proportionate change in the frequency of the devices. Again, these optical sensors are used for rapid and energy efficient detection of the volatiles. Hence, we have developed a mass sensor for the pheromones where the detection technique is based on optical means. Therefore, we have demonstrated the use of MEMS devices as the resonant mass sensors for the aerial detection of the female sex pheromone of *Helicoverpa armigera* (Hubner) and *Scirphophaga incertulas* (Walker), lepidopterous pests of cotton, tomato, rice, pigeonpea and chickpea. In addition, we have developed novel methodologies involving covalent functionalization of the metal oxide based MEMS devices and to the best of our knowledge, there is no literature procedure to date on the selective insect/pest pheromone sensing with femtogram level sensitivity.

These sensors will help to reduce pesticide usage as well as localized application of pesticides. The deleterious health hazards due to pesticides and insecticides residue will not be present. These MEMS nanosensors will keep strict vigilance on even early pest infestation in standing as well as in storehouses, and therefore, there will be no loss of produce due to pest attacks. Consequently, this will help in improving food accessibility. Food decomposition can be detected prior to their consumption.

**These inventions are protected under intellectual property rights.**

Santanu Bhattacharya, Rudra Prathap, Parikshit Moitra, Deepa Bhagat, "A Pheromone detector", PCT, 521/CHE/2014.

## PAKISTAN

## Highlights from the Video Conference Lecture Series Initiated for Grantees in Pakistan

ADNAN BASHIR, IT COORDINATOR, PAKISTAN ACADEMY OF SCIENCES, LAHORE

Through the Biosafety Research in Pakistan Grants Program (BRPGP), a new video conference lecture series has begun. The main objective of the lecture series was to introduce the grantees in Pakistan to the ILSI Research Foundation and to provide information about the recent developments in the regulatory procedures and biosafety aspects of transgenic crops. The audience included grantees from several major cities of Pakistan, scientists, representatives of research and development institutes, researchers, and young scholars.

The first video conference, was held on January 29, 2015. Dr. Anwar Nasim introduced the speakers to the grantees. Prof. Alan Gray gave a comprehensive

account of the International Symposium on the Biosafety of Genetically Modified Organisms (ISBGMO) conference held in South Africa November 9-13, 2014. The theme of the conference was "Advancing ERA of GMOs to Address Biosafety in a Global Society". ISBGMO is a biennial, international meeting organized under the auspices of the International Society for Biosafety Research (ISBR), which has previously been hosted in Germany, Canada, China, France, Korea, New Zealand, Argentina and the United States. It brings together academics, technology developers, regulatory authorities, non-government organizations and other credible stakeholders involved in different aspects of biosafety. It was the first time that



*Continued on Page 4*

an ISBGMO was hosted in Capetown, South Africa and it was attended by approximately 450 delegates from at least 50 countries.

Dr. Andrew Roberts, Director, ILSI Research Foundation Center for Environmental Risk Assessment (CERA) and the Center for Safety Assessment of Food and Feed (CSAFF), talked about international obligations for regulation of genetically engineered (GE) plants. His talk included international obligations, the history of GE plants and regulation, a commercial introduction of GE plants, the Cartagena Protocol and risk management. The grantees came up with a number of questions during the question and answer session which were answered by Dr. Roberts in detail.

**To access the lectures from this event, please go to:**

- [http://bit.ly/BRPGP\\_VLC\\_1](http://bit.ly/BRPGP_VLC_1)
- [http://bit.ly/BRPGP\\_VLC\\_2](http://bit.ly/BRPGP_VLC_2)
- [http://bit.ly/BRPGP\\_VLC\\_3](http://bit.ly/BRPGP_VLC_3)



**To learn more about the grants program, please visit the CERA website at:** [http://cera-gmc.org/index.php/The\\_Biosafety\\_Research\\_in\\_Pakistan\\_Grants\\_Program](http://cera-gmc.org/index.php/The_Biosafety_Research_in_Pakistan_Grants_Program)

## PAKISTAN

### Spotlight on the Biosafety Research in Pakistan Grants Program



The Biosafety Research in Pakistan Grants Program (BRPGP) supports laboratory, field, and literature research that will significantly advance knowledge relevant to environmental risk assessment of genetically engineered plants in Pakistan.

The Biosafety Research in Pakistan Grants Program is managed by the Center for Environmental Risk Assessment (CERA), ILSI Research Foundation, as part of the biosafety component of the Pakistan Strategy Support Program (PSSP). The PSSP is financially supported by the US Agency for International Development (USAID) through the International Food Policy Research Institute (IFPRI), which manages PSSP. The Biosafety Research in Pakistan Grants Program recognizes the need for biosafety research as part of a broader effort to support science-based decision-making and policy development and will fund research aimed at addressing the effects of agricultural biotechnology, particularly transgenic crops, on the environment and biodiversity in Pakistan.

Grantees come from agricultural or environmental research institutions and universities in Pakistan.

All grantees work to:

- Address the effects of genetically engineered (transgenic) crops on the environment.
- Be relevant to Pakistan and take place in Pakistan.
- Demonstrate applicability to environmental risk assessment of transgenic plants and regulatory decision-making in Pakistan.



**2014 GRANTEE:** Dr. Bushra Mirza

**JOB TITLE:** Professor and Chairperson, Department of Biochemistry

**ORGANIZATION:** Quaid-i-Azam University

**PROJECT TITLE:** "Evaluation of Potential Gene Flow from *Bt* Cotton in Pakistan"

**PROJECT DESCRIPTION:** *Bt* cotton is the only approved transgenic crop being cultivated in Pakistan. The popularity of *Bt* cotton has grown at an exponential rate in the last few years. The primary goal of this project is to evaluate the extent of gene flow from transgenic *Bt* cotton to other non-transgenic cotton varieties and wild cotton species (non-target taxa) growing in these areas. The specific objectives of this project include: a) information gathering about varieties of *Bt* cotton, conventional varieties and close wild relatives growing at main cultivation locations in Southern Punjab, cultivation practices and presence of the pollinator(s), b) collection of ethnobotanical data of these cultivated or wild plants and c) evaluation of presence of transgene and its protein in the non-*Bt* plants identified. The outcome of this project will provide base line information about the extent of gene flow if any, from *Bt* cotton to its close relatives growing in the same region. It will also help to design appropriate confinement measures required in this region to limit dispersal of transgenic pollen. This information will be a source of science advice to policy makers in Pakistan to formulate guidelines for the release of future *Bt* cotton varieties and their corresponding buffering requirements, for ensuring conservation of biodiversity.



# Lessons Learned from the Seminar on Biotechnology and Its Contribution to Food Security

A seminar on the global perspective of biotechnology, genetically modified (GM) crops, and its contribution to food security and poverty alleviation was jointly organized by the International Services for the Acquisition of Agri-Biotech Applications (ISAAA), the Bangladesh Agricultural Research Council (BARC) and the Bangladesh Agricultural Research Institute (BARI) at the auditorium of BARC in February 2015. Begum Matia Chowdhury, MP, Hon'ble Minister for Agriculture, Government of the People's Republic of Bangladesh, graced the occasion as the Chief Guest. Dr. Md. Abul Kalam Azad, Executive Chairman, BARC, and Dr. Md. Rafiqul Islam Mondal, Director General, BARI, were present as the Guests of Honor. Dr. Clive James, Founder and Emeritus Chair, ISAAA, and Mr. Bhagirath Choudhary, Director, ISAAA, were the main speakers of this seminar. Mr. Md. Eunusur Rahman, Secretary, Ministry of Agriculture, chaired the seminar. Approximately 250 participants from different NARS Institutes, universities, policymakers, journalists and post-graduate students were in attendance.

After the welcoming address, Dr. Clive James gave his presentation on the global status of biotechnology and its future prospects. In his address, Dr. James mentioned that in 2014, global biotech crop hectareage continued to grow for the 19<sup>th</sup> consecutive year of commercialization. He shared that 18 million farmers in 28 countries planted more than 181 million hectares in 2014, up from 175 million in 27 countries in 2013. He also pointed out that Bangladesh approved *Bt* brinjal for the first time on October 30, 2013, and within the shortest possible time frame, small farmers commercialized *Bt* brinjal on January 22, 2014. Dr. James thanked and congratulated the Bangladesh Government, especially the Hon'ble Minister for Agriculture, for taking this bold decision to release the first biotech derived food crop in the country.

Dr. James also highlighted on other significant global developments of biotech crops. He mentioned that Innate<sup>™</sup> potato was approved in the United States in November 2014. This GM potato has lower levels of acrylamide, a potential carcinogen in humans, and suffers less wastage from bruising. A new GM alfalfa (event KK179) was also approved for planting in the US. This crop has about 22% less lignin and leads to higher digestibility and productivity. Dr. James disclosed that the first biotech drought tolerant maize, planted in the US in about 50,000 hectares in 2013, has increased to over 275,000 hectares in 2014, reflecting a high acceptance by US farmers.

He pointed out that a new 2014 comprehensive global meta-

analysis, on 147 published biotech crop studies over the last 20 years worldwide, confirmed the significant and multiple benefits that biotech crops have generated over the past 20 years since 1995 to 2014. According to their studies, on average GM technology adoption has reduced chemical pesticide use by 37%. These findings corroborate earlier and consistent results from other annual global studies which estimated increases in crop productivity valued at US \$133.3 billion during the timeframe of 1996 to 2013.

Mr. Bhagirath Choudhary, Director, ISAAA, mentioned in his presentation that India recently has become the number one global exporter of cotton and the second largest cotton producer in the world. He also pointed out that *Bt* cotton continues to deliver significant and multiple agronomic, economic and environmental benefits to Indian farmers and society including significant reduction of insecticide requirements and increasing the yields.

Dr. Md. Rafiqul Islam Mondal highlighted the recent developments of agri-biotechnological research in BARI, especially the work on *Bt* brinjal.

He mentioned that this year *Bt* brinjal will be cultivated by 108 farmers in 17 different districts in Bangladesh. Each farmer will grow in about one bigha of land.

Dr. Md. Abul Kalam Azad, Executive Chairman, BARC, thanked the Hon'ble Minister for Agriculture for taking appropriate steps towards self sufficiency in food production in the country. Her directions have always encouraged agricultural scientists to develop newer and newer crop varieties.

The Chief Guest of the seminar, Begum Matia Chowdhury,

highlighted the importance of agricultural biotechnology towards economic development and food security of the country. She pointed out that Bangladesh used to be a food deficit country. But now, due to the government appropriate policy on the agriculture sector, Bangladesh has become a food surplus country. The government has decided to export coarse rice to Sri Lanka. However, since the population is increasing and the cultivable land is decreasing every year, Minister Chowdhury shared that Bangladeshis need to take advantage of modern biotechnology to develop abiotic and biotic stress tolerant crop varieties.

The Hon'ble Minister asked the scientists not to receive or work on any materials which are harmful for the country. She also asked that scientists working on *Bt* brinjal perform continuous monitoring so that all biosafety measures can be ensured. The seminar ended with the concluding remarks given by the Secretary of the Ministry of Agriculture.

**“This year, *Bt* brinjal will be cultivated by 108 farmers in 17 different districts in Bangladesh.”**



EVENT	ORGANIZED BY	DATE	WEBSITE
<b>INDIA</b>			
Conference on Food & Nutritional Security	Confederation of Indian Industry (CII)	March 17, 2015 Chennai	<a href="http://www.cii.in">www.cii.in</a>
<b>INTERNATIONAL</b>			
Theoretical and Practical Course on Molecular Plant Breeding for Crop Improvement	Agricultural Genetic Engineering Research Institute (AGERI)	March 8-19, 2015 Giza, Egypt	<a href="http://www.icgeb.org/meetings-2015.html">www.icgeb.org/meetings-2015.html</a>
The 2 <sup>nd</sup> Plant Genomic Congress: Asia	Global Engage	March 19-20, 2015 Kuala Lumpur, Malaysia	<a href="http://www.globalengage.co.uk/plantgenomicsasia.html">www.globalengage.co.uk/plantgenomicsasia.html</a>
International Conference on Biotechnology and Agriculture Engineering (ICBAE 2015)	CBEEs	April 6-7, 2015 Kyoto, Japan	<a href="http://www.icbae.org/index.html">www.icbae.org/index.html</a>
IOSBC/WPRS Group "GMOs in Integrated Plant Production"	Agroscope	June 1-3, 2015 Sofia, Bulgaria	Contact: <a href="mailto:michael.meissle@agroscope.admin.ch">michael.meissle@agroscope.admin.ch</a>
7 <sup>th</sup> Asia Pacific Biotech Congress	Omics International	July 13-15, 2015 Beijing China	<a href="http://www.biotechnologycongress.com/asia-pacific/">www.biotechnologycongress.com/asia-pacific/</a>
3 <sup>rd</sup> Annual South Asia Biosafety Conference	South Asia Biosafety Program (SABP)	September 19-20, 2015 Dhaka, Bangladesh	<a href="http://www.cera-gmc.org/Upcoming_Meetings_&amp;_Events">www.cera-gmc.org/Upcoming_Meetings_&amp;_Events</a>

## Interested in contributing to the SABP Newsletter?

The SABP Newsletter, published monthly, is distributed to over 4000 regulators, scientists, policy makers and other stakeholders interested in agricultural biotechnology in South Asia. Each edition includes editorials, information about biosafety regulation and policy developments in India, Bangladesh and Pakistan, SABP and other capacity building activities in the region, and related science or news stories.

All contributions to the newsletter should have a clear connection to the mission of SABP, relate to South Asia and cannot be promotional. For more information or for your article to be considered, please email Libby Williams at [libbywilliams@ilsr.org](mailto:libbywilliams@ilsr.org).



**The South Asia Biosafety Program (SABP)** is an international developmental program implemented in India, Bangladesh and Pakistan with support from the United States Agency for International Development. SABP aims to work with national governmental agencies and other public sector partners 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.



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