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South Asia Biosafety Program

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PAKISTAN

Agricultural Biotechnology Adoption and Biosafety Regulations in Pakistan

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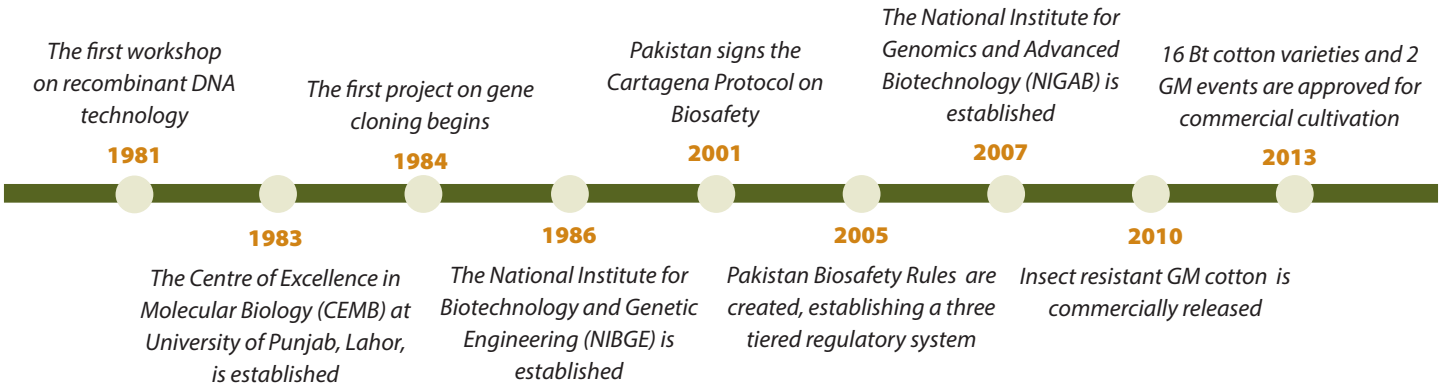


Currently, there are 41 organizations in the country working on modern biotechnology. However, it has taken significant events over the past 30 years to get to this point.

The importance of modern biotechnology was formally recognized in 1981 when the first workshop on recombinant DNA technology was organized at the Nuclear Institute for Agriculture and Biology (NIAB), Faisalabad. This workshop recommended the establishment of an exclusive National Centre of Modern Biotechnology. In 1983-1984, the Centre of Excellence in Molecular Biology (CEMB) at the University of Punjab, Lahore, was established. The first project on cloning insect resistant genes from bacteria in Pakistan was also taken up by CEMB in 1984. Currently, CEMB is employing locally cloned genes of Cry1Ac, herbicide resistance EPSPS, and many other genes for abiotic stress tolerance.

In 1986, the Government of Pakistan approved the establishment of the National Institute for Biotechnology and Genetic Engineering (NIBGE). Both CEMB and NIBGE have well established infrastructures for modern biotechnology. In 2007, at the federal level, the National Institute for Genomics and Advanced Biotechnology (NIGAB) was established at NARC with the mandate of working on cutting edge technologies related to plant and animal biotechnology.

Pakistan celebrated 2010 with the commercial release of insect resistant GM cotton. Nine varieties harboring the Cry1Ac gene were granted approval and with this, Pakistan became the 26th country to grow GM crops. Pakistan is ranked 9th in having the largest area under GM crops in the world. Currently, two patented events, MON531 and a fusion gene from China (Cry1Ab/Ac) are being cultivated, but some local events for Bt and herbicide resistance genes, which have been generated by CEMB and NIBGE, are being evaluated. Despite acquiring capacity to produce transgenic plants in Pakistan, no GM crops except cotton, either produced locally or imported, have been released commercially in the country.

The Cartagena Protocol on Biosafety (CPB) set the framework on trans-boundary movement of living modified organisms (LMOs), which required countries ratifying the protocol as state parties. Pakistan had signed the CPB in 2001, but could not deposit the instruments of ratification until May 2009.

Exercising the powers conferred by Section 31 of Pakistan Environment Protection Act (XXXIV of 1997), the Ministry of Environment, Government of Pakistan promulgated the Pakistan Biosafety Rules 2005 (14) in April 2005. These rules available online at: http://www.pakbiosafety.com/BiosftyrulesPAK.pdf

Under the Pakistan Biosafety Rules, a three tiered regulatory system i.e., the Institutional Biosafety Committee (IBC), the Technical Advisory Committee (TAC) and the National Biosafety Committee (NBC) has been established. The National Biosafety Centre (NBC), currently under administration by the Ministry of Climate Change, has been set up for the implementation of National Biosafety Guidelines. At present, there are 41 notified Institutional Biosafety Committees. Two expert sub committees at Technical Advisory Committee (TAC) have been appointed to review the submitted cases for cotton and maize. So far, sixteen Bt cotton varieties and two GM events have been approved for commercial cultivation. A number of GM events in other crops are waiting for their commercial release.

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.

Over the next several newsletters, we will be introducing each of the grantees that are part of BRPGP. In this month's newsletter, learn about Khadim Hussain and Dr. Habib Iqbal Javed.

2012 GRANTEE: Khadim Hussain

JOB TITLE: Scientific Officer

ORGANIZATION: Central Cotton Research Institute, Pakistan Central Cotton Committee

PROJECT TITLE: "Biosafety, risk assessment and management with reference to GM (Cry1Ac) cotton"

PROJECT DESCRIPTION: The main objectives of this project are to quantify the level of Cry1Ac toxin protein in *Bt* varieties approved for general cultivation at different growth stages and to determine the optimum level to control insects through in-vitro insect bioassays. Through this project, 8 approved *Bt* cotton varieties will be tested. Experiments will be carried out in glass houses.

2012 GRANTEE: Dr. Habib Iqbal Javed

JOB TITLE: Scientific Officer

ORGANIZATION: Pakistan Agricultural Research Council

PROJECT TITLE: "Prevalence of insect pests, predator, parasitoids and their survival in GE corn fields in Pakistan"

To view all grant projects, visit the CERA website at:

http://bit.ly/1hVizAM

INDIA

Highlights from the Awareness Workshop on Issues Related to GM Crops

The state agricultural universities and research institutions under the National Agricultural Research System (NARS) have an important role to play in conducting confined field trials of GM crops in India. These scientists are engaged in the development of GM crops and also engaged members of regulatory committees and monitoring teams.

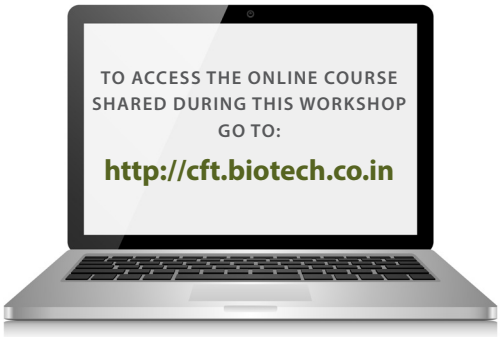
The "Awareness Workshop on Issues Related to Genetically Modified (GM) Crops" was held on November 28, 2013, at Acharya N.G. Ranga Agricultural University (ANGRAU), Hyderabad. This workshop was organized by ANGRAU and Biotech Consortium India Limited (BCIL) as part of communication and outreach efforts. A total of 155 participants including scientists, extension department scientists, agricultural officers, farmers, research scholars from various departments and constituent colleges of ANGRAU attended the workshop.

The university officials, including Dr. E. A. Siddiq, Honorary Professor and Member Board of Management, Dr. P. Ananda Kumar, Director of the Institute of Biotechnology, Dr. R. Ranga Reddy, Director of Research, Dr. S. Sokka Reddy, Professor from the Institute of Biotechnology, and Dr. S. J. Rahman, Principal Scientist and head of the AICRP on Biocontrol, addressed the participants in the opening session and gave presentations in the technical sessions.

Scientists from two research institutions in Hyderabad, specifically the Directorate of Rice Research and the Directorate of Sorghum Research, spoke about research on transgenic rice and sorghum underway in their respective institutions. Participants were told about the regulatory and scientific considerations in the safety assessment of GM crops by scientists from DBT, NIN and BCIL.

One of the most important components of the workshop was an introduction to the online course on guidelines for conducting confined field trials. This e-module has been developed under the South Asia Biosafety Program to familiarize all those associated with conducting confined field trials including trial incharges, members of regulatory committees and monitoring teams.

The meeting ended with an hour long discussion between the participants and faculty to address concerns about the regulatory processes and scientific issues on GM crops.



Key Messages from the SAARC SAC and BARI Regional Expert Consultation Meeting

DR. ABUL KALAM AZAD, DIRECTOR, SOUTH ASIAN ASSOCIATION FOR REGIONAL COOPERATION (SAARC) AGRICULTURE CENTRE (SAC), DHAKA

The South Asian Association for Regional Cooperation (SAARC) Agriculture Centre (SAC), Dhaka, in collaboration with the Bangladesh Agricultural Research Institute (BARI), Gazipur, organized a regional expert consultation meeting on "Prospects, needs, benefits and risk assessment of agriculture related to genetically modified (GM) products in SAARC countries." The meeting was held at the Bangladesh Agricultural Research Council (BARC) in Dhaka on December 6-7, 2013. The objectives of this meeting were to assess the status of the available resources related to the GM sector in the SAARC region, to create an awareness for obtaining necessary scientific skills and to utilize the modern advancement of GM products in agriculture towards achieving food security in the SAARC region. Approximately 40 professionals from SAARC countries comprising scientists from the NARS Institutes, universities and 15 local organizations participated in this consultation meeting.

The meeting was inaugurated by Dr. S. M. Nazmul Islam, Honorable Secretary, Ministry of Agriculture, Government of the People's Republic of Bangladesh. Dr. Wais Kabir, Executive Chairman, BARC graced the inaugural session as a special guest and Dr. Md. Rafiqul Islam Mondal, Director General, BARI chaired the inaugural ceremony. The inaugural ceremony was started with the welcoming address of Dr. Abul Kalam Azad, Director, SAARC SAC.

Professionals from six SAARC member countries (Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka) presented their respective country status reports in two sessions on December 6. In the first session, country papers on Bangladesh and India were presented by Dr. M. Khalequzzaman Akhond Chowdhury and Tayan Raj Gurung (in absence of Dr. K.V. Prabhu).

In the second session, papers from Bhutan, Nepal, Pakistan and Sri Lanka were presented. Dr. Tashi Yangzom, Regulatory and Quarantine Officer of Bhutan, Dr. Bindeshwar P. Sah of the Biotechnology Division, Nepal Agricultural Research Council, Khumaltar, Lalitpur and Dr. Shahid Mansoor, Director, National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan, presented for their countries. The final country paper was presented for Sri Lanka by Dr. Malima Perera.

The third technical session of the meeting was held on December 7. Altogether three papers were presented by Prof. Dr. Rakha Hari Sarker of the Department of Botany, University of Dhaka, Dr. Md. Al-Amin, Head, Biotechnology Division, BARI, and Dr. G.P. Das, Country Coordinator, ABSP II, Bangladesh.

The fourth and final technical session discussed recommendations from the meeting. Participants were divided into groups to work on three thematic areas, specifically, "Research and Development Issues", "Extension and Marketing Issues" and "Policy Issues". Afterwards, these three thematic group reports were discussed and recommendations were finalized. These recommendations were presented during the closing ceremony. Mr. Abdul Motaleb Sarker, Director General (SAARC & BIMSTEC), Ministry of Foreign Affairs, Government of Bangladesh, was present as the chief guest. Dr. Md. Rafiqul Islam Mondal, DG, BARI, chaired the closing ceremony. Recommendations were presented for approval by Dr. M. Musa, SPS Crops, SAC.

The recommendations adopted during the meeting were as follows. Keeping in view research and development issues, it was recommended that trait specific genes for biotic and abiotic stress tolerance might be identified and isolated by using genomics and bioinformatics. Sharing of technology and collaboration of research among SAARC countries with respect to virus, fungus, insect and bacterial resistance in field crops and abiotic stresses like salinity, heat, cold, submergence and waterlogging may be enhanced. Exchange of expertise among SAARC countries in molecular breeding, MAS and transformations was also recommended.

In regards to extension and marketing, institutional capacity building and training of trainers for adoption of tools and techniques of modern biotechnology were recommended. It was also put forward that creation and strengthening of research-extension-farmers-consumers linkages are needed.

Regarding policy matters, it was recommended that uniform GMO policy and networking among biotech scientists through meetings and visits in member countries might be made to facilitate GMO research and sharing of released GM crop varieties for testing and adoption. Members who do not have biotech research centres are encouraged to establish centres of excellence on biotechnology in their respective countries. To promote GM products, it is imperative to create public awareness among all stakeholders including policymakers, NGOs, media with the inclusion of farmers, farmer groups and end-users through education and campaigns on the usefulness of GM technology. Finally, it was suggested that existing biosafety rules and regulation in member countries should be documented by SAC and posted on the SAC website.

The vote of thanks was offered by Dr. Tayang Raj Gurung, SPS (NRM), SAC, to close the meeting

CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
INDIA			
Winter School on "Molecular Breeding Approaches for Genetic Enhancement of Millet Crops"	Directorate of Sorghum Research	January 6-26, 2014 Hyderabad	http://www.sorghum.res.in/ad/Winter_school_DSR_Brochure.pdf
National Seminar on Recent Advances and Challenges in Sugarcane Research	Directorate of Research & Zonal Agricultural Research Station, Mandya and University of Agricultural Sciences, Bangalore	January 17-18, 2014 Bangalore	http://www.uasbangalore.edu.in/images/attachments/home/nssr-2014.pdf
National Symposium on Emerging Trends in Eco-Friendly Insect Pest Management	Tamil Nadu Agricultural University & Sun Agro Biotech Research Centre	January 22-24, 2014 Coimbatore	http://www.uasbangalore.edu.in/images/attachments/home/national-seminar-on-sugarcane-2014.pdf
2nd International Conference on Agricultural & Horticultural Sciences	Omics Group	February 03-05, 2014 Hyderabad	http://www.omicsgroup.com/conferences/agricultural-horticultural-2014/
Bangalore India Bio	MM Activ Sci Tech Communications Pvt. Ltd.	February 10-14, 2014 Bangalore	http://www.bangaloreindiabio.in/Index_New.php
International Conclave on Sugar Crops & SugarFest 2014: "Sweeteners and Green Energy from Sugar Crops : Emerging Technologies"	Society for Sugar Research and Promotion	February 15-17, 2014 Lucknow	http://www.iisr.nic.in/download/InternationalConclave.pdf
Biennial Conference of Indian Society of Weed Science - Emerging Challenges in Weed Management	Indian Society of Weed Science and Directorate of Weed Science Research	February 15-17, 2014 Jabalpur	http://isws.org.in/Bc2014/default.html
INTERNATIONAL			
"Risk Assessment: The Role of Science in GMO Decision-Making"	ICGEB Biosafety Unit, Trieste, Italy	June 30 – July 4, 2014 Trieste, Italy	http://www.icgeb.org/meetings-2014.html
Theoretical and Practical Course "Plant Tissue Culture: Tool for Genetic Engineering of Plants"	ICGEB and National Biotechnology Development Agency, Abuja, Nigeria	August 10-23, 2014 Abuja, Nigeria	http://www.icgeb.org/meetings-2014.html
13th International Symposium on the Biosafety of Genetically Modified Organisms (ISBGMO13)	International Society for Biosafety Research (ISBR)	November 9-13, 2014 Cape Town, South Africa	http://isbr.info/ISBGMO13

SOUTH ASIA BIOSAFETY PROGRAM

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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