

South Asia Biosafety Program

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BSAFE Foundation Organized a Public Dialogue on Biosafety and Bangladesh's Agriculture

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INDIA

Webinar Series on Applications of Gene Editing in Sustainable Agriculture and Food Security in Asia-Pacific Region

Dr. Vibha Ahuja, Biotech Consortium India Limited (BCIL) and Dr. Rishi Tyagi, Asia-Pacific Association of Agricultural Research Institutions (APAARI)

Applications of gene-editing to advance agricultural sustainability and nutrition security is receiving significant interest, with a rich pipeline of gene-edited plants being developed by public and private sector organizations across the Asian continent. In anticipation of large-scale commercialization of gene-edited plants, important regional consultations have been convened to identify and address associated policy and regulatory issues, including the 2nd Asia Forum on Genome Editing, organized in Gangneung, Republic of Korea by Korea Biosafety Clearing House (KBCH) in November 2018, and the Regional Expert Consultation on Gene Editing and its Regulation, organized in Patancheru, India in October 2019 by the Asia-Pacific

Association of Agricultural Research Institutions (APAARI) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in collaboration with other partners. The recommendations from these consultations clearly indicated the need for science-based, predictable, and proportionate regulations to encourage innovations in gene editing. It has also been stressed that the harmonization of approaches within the Asia-Pacific region is important for collaboration in research, capacity development, regulation, and trade. Similar views were echoed during the One CGIAR Webinar Series: Genome Editing in

Association of Agricultural Research Institutions (APAARI) and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), in collaboration with other partners. The recommendations from these consultations clearly indicated the need for science-based, predictable, and proportionate regulations to encourage innovations in gene editing. It has also been stressed that the harmonization of approaches within the Asia-Pacific region is important for collaboration in research, capacity development, regulation, and trade. Similar views were echoed during the One CGIAR Webinar Series: Genome Editing in

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CHAIRPERSON



Prof. Ryo Ohsawa
Dean, Faculty of Life and Environmental Sciences, University of Tsukuba, Japan
Committee member of ERA under the Japanese Ministry of Environment and the Ministry of Agriculture, Forestry and Fisheries
President, Japanese Society of Breeding

WEBINAR SERIES

WEBINAR 1

Genome editing tools and its applications for targeted plant breeding

Date: July 21, 2021
10.30 AM to 12.30 PM ICT (Bangkok time)

Registration
[https://zoom.us/meeting/register/tJAqdumsqDooGNpndwbg1Zt6idYcsrLM5y](https://zoom.us/join/https://zoom.us/meeting/register/tJAqdumsqDooGNpndwbg1Zt6idYcsrLM5y)

Applications of Gene Editing in Sustainable Agriculture and Food Security in Asia-Pacific Region

PRESENTERS



Dr. Hiroshi Ezura
Professor, Fundamental Genetic Engineering and Molecular Breeding Technologies University of Tsukuba, Japan



Dr. Jose (Jimmy) Botella
Professor of Plant School of Agriculture and Food Sciences, University of Queensland, Australia

PANELLISTS



Dr. Zeba Islam Seraj
Professor, Department of Biochemistry and Molecular Biology, University Dhaka, Director, cBLAST, DU (Center for Bioinformatics Learning and Advanced Systematics Training, University of Dhaka), President GNOGB, Global Network of Bangladesh Biotechnologist



Dr. T. R. Sharma
Deputy Director General (Crop Science), Indian Council of Agricultural Research, India



Dr. Donghern Kim
Vice President, Future Food Resources Forum, Korea



Dr. Chwan-Yang HONG
Professor, Department of Agricultural Chemistry, National Taiwan University, Taiwan



Prof. Kok Gan Chan
Deputy Head of Department, Institute of Biological Sciences, Faculty of Science, University of Malaya, Kuala Lumpur, Malaysia

Flier for the first event in the Webinar Series on Application of Gene Editing in Sustainable Agriculture and Food Security in Asia-Pacific Region (July-August 2021).

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Siddique, BSAFE Foundation were present as discussants. Mr. Md. Ataur Rahman Miton, BSAFE Foundation, facilitated the event.

The event started with the welcome address from Mr. Rahman, including a brief description of the BSAFE foundation's objectives, the agenda for the public dialogue, and the introduction of the guests. Prof. Islam, in her keynote, summarized the context of biosafety in agricultural biotechnology. The presentation covered the history of agriculture, the development process of GM crops and finally, the status of biosafety implementation in Bangladesh. Prof. Islam particularly mentioned how biosafety requirements are embedded in each step of GM crop development, starting from laboratory through contained and confined field trials and finally to the farmer's field. The functions of researchers and regulators in these steps were also described. While describing the process of approval of GM crops, Prof. Islam highlighted the science-based case-by-case decision making based on comparative assessment in light of environmental and food safety assessments. The talk ended by mentioning the prevailing regulatory and compliance documents that are in place to ensure the implementation of biosafety in Bangladesh. She also emphasized how Bangladesh's biosafety system complies with the Cartagena Protocol on Biosafety.

As the first discussant, Prof. Siddique shared his experience regarding farmer's expression as he has been engaged for a long time in communicating with farmers at the field level. He shared that the farmer's only concern is getting high productivity and profit by employing less cost, labor, and time. Despite some confusion, the desired objective is to ensure increased productivity so that it can satisfy farmers and contribute to food security. While modern biotechnology is contributing, good science should be appropriately communicated to the farmers. The challenges and limitations should be adequately addressed so that the benefits can be harnessed.

Prof. Seraj started her discussion by explaining the questions raised by some participants regarding the progress and prospects of crop biofortification in Bangladesh, the definition of genetic engineering as a tool of biotechnology, and Bangladesh's compliance with international conventions and protocols. She further explained the relevance of genetic modification to achieve food security and why scientists choose this technique over conventional methods. She also described the science behind the development of some GM crops, e.g., Bt eggplant and Pro-Vitamin A enriched rice. Prof. Seraj, while discussing the impeding or delaying of the biosafety approval, raised her opinion that the government should define a dedicated department for biosafety so that the process could be smooth and efficient.

Dr. Salimullah discussed the update on the National Biotechnology Policy that is being finalized and highlighted the role that NIB could play with the stakeholders to ensure biosafety in biotechnology. He further clarified the policy regarding labeling issues, NIB's mandates, and how the organization acts as the focal point for implementing biotechnology research in Bangladesh.

In the final question and answer session, Prof. Islam explained the fact that Bangladesh already has sufficient regulatory documents, and the current need is the capacity development of researchers and regulators, as well as the definition and division of responsibilities to the appropriate authorities.

In the concluding remarks, Prof. Siddique expressed that the communication and awareness activity should go on with frequent arrangement of this type of public dialogue so that the population can easily realize the benefits.

In the final question and answer session, Prof. Islam explained the fact that Bangladesh already has sufficient regulatory documents, and the current need is the capacity development of researchers and regulators, as well as the definition and division of responsibilities to the appropriate authorities.



Discussants at the Public Dialogue on Biosafety and Bangladesh's Agriculture (August 22, 2021).

Webinar on Translating Genomics for Next Generation Crop Improvement

Dr. Jyoti Batra, Biotech Consortium India Limited

The webinar *Translating Genomics for Next Generation Crop Improvement* was organized on June 10, 2021 by the Tata Institute for Genetics and Society (TIGS) in partnership with Biotech Consortium India Limited (BCIL). The webinar was chaired by Prof. Deepak Pental, Former Vice-Chancellor, University of Delhi. The event featured talks by leading scientists working in the area of genomics and a panel discussion. The webinar was attended by more than 600 participants representing a cross section of stakeholders, including scientists, regulators, industry, research students, etc.

Dr. Vibha Ahuja, Chief General Manager, BCIL, welcomed the speakers and attendees and moderated the proceedings.

Initiating the deliberations, Dr. Rakesh Mishra, Director, TIGS, talked about the significance of genomics in healthcare and agriculture. He also spoke about the importance of efficient communication and education about available technologies and the benefits of adopting them. In his opening remarks, Prof. Deepak Pental emphasized the importance of protecting crops from pests and infections, improving crop yields in the country, and reducing the dependence on natural resources, especially water. He also spoke about the need for utilizing new technologies at an accelerated pace in overcoming these challenges. Dr. Rajeev Varshney, Research Program Director, ICRISAT elaborated on the innovative genomics approaches being undertaken for chickpea, pigeon pea, and groundnut at ICRISAT, particularly the development of pangenomes and super pangenomes, genotyping platforms, trait mapping approaches, and translational research based on genomic breeding approaches. Dr. A.K. Singh, Director, ICAR-Indian Agricultural Research Institute talked about

the importance of rice breeding programs and new varieties of rice being developed. Dr. Swarup K. Parida, Staff Scientist-IV, National Institute of Plant Genome Research, focused on next-generation molecular breeding methods for genetic improvement of chickpea.

Eminent experts, including Dr. Kuldeep Singh, Director, ICAR-National Bureau of Plant Genetic Resources, Dr. Ramesh V. Sonti, Professor of Biology, IISER, Tirupati, Dr. R.M. Sundaram, Director, ICAR-Indian Institute of Rice Research, and Dr. Parveen Chhuneja, Director, School of Agricultural Biotechnology, Punjab Agricultural University participated in the panel discussions.

The panelists discussed the importance of genomics research and gene banks in crop biotechnology, central core facility for genotyping, and mapping complex genomes by advanced technologies. They also deliberated on the slow pace of adoption of new genetic technologies in crop improvement, challenges faced, and the need for co-ordinated efforts in the future. This webinar highlighted the need for international, national, and local government support and a conducive policy environment to realize the potential of these innovations through efficient management, agronomy, and market access.

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VIDEO

A recording of the webinar can be accessed at:
<https://tigs.res.in/2021/06/22/webinar-highlights-6/>

ANNOUNCEMENT

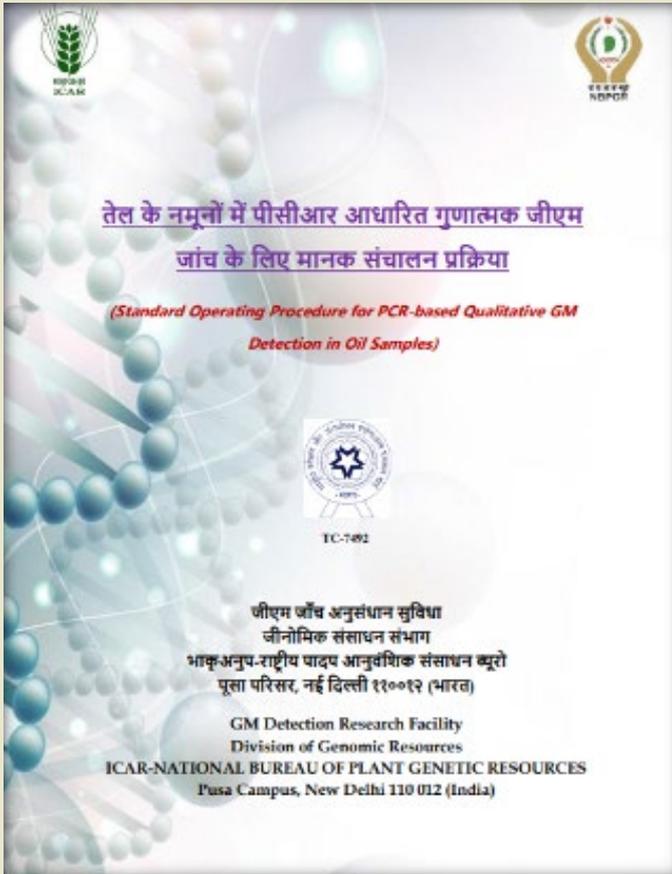
ISO/IEC17025:2017 Accredited GM Detection Research Facility at ICAR-National Bureau of Plant Genetic Resources, New Delhi: Expansion of Scope from Seeds to Processed Food Products



The GM Detection Research Facility (GDRF) is a designated National Referral Laboratory to detect the presence or absence of Living Modified Organisms and Genetically Modified Organisms under sub-section (1) of Section 4 of the Seeds Act, 1966, as published in a Gazette of India: Extraordinary Notification (Department of Agriculture, Cooperation and Farmers Welfare, Ministry of Agriculture & Farmers Welfare, Government of India) dated November 15, 2017. The GDRF was accredited as per the international standard ISO/IEC 17025:2005 by the National Accreditation Board for Testing and Calibration Laboratories (NABL), a Constituent Board of Quality Council of India from June 2018, and since December 2019, as per the ISO/IEC 17025:2017.

Recently, the scope of accreditation has been enhanced to GM testing of ten GM crops, namely, apple, brinjal, cotton, flax, Indian mustard/canola, papaya, maize, rice, soybean, and wheat, along with oils of canola, cottonseed, Indian mustard, and soybean. Nine of these crops, except cotton, also come under the 24 selected food crops covered under Food Safety and Standards Authority of India (FSSAI) Order No. 1-1764/FSSAI/Imports/2018 (Part-1) dated August 21, 2020 and 1-1764/FSSAI/Imports/2019 (Part-1) dated February 8, 2021 and effective from March 1, 2021, as per which every consignment of imported food products of the 24 crops would be accompanied with the non-GMO certification. The tolerance limit of adventitious presence of GMOs at 1% is permissible in the consignments of imported food crops (<https://www.fas.usda.gov/data/india-india-clarifications-fssai-genetically-modified-free-certificate-order-imported-food>).

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The eight targets covered under the scope of accreditation include promoters (*P-35S*, *P-FMV*), terminator (*T-nos*), marker genes (*aadA*, *nptII*, *pat*), and genes (*cry1Ab/Ac*, *cry1Ac*, *cry2Ab2*) for GM detection using PCR or Real-time PCR with LOD ranging from 1% to 0.01%, depending on the target.

GDRF has developed well-defined procedures to extract detectable amount of DNA with acceptable purity and amplifiability from oils (canola, cottonseed, mustard, and soybean), and food products, including apple (juice and green apple), corn (popcorn, flakes, soup, flour, biscuits, puff corn, packed corn, baby corn, milk powder with corn oil, and infant cereal), potato (chips), soy (chunks, sticks, milk, and tofu), tomato (soup and sauce), and the study was published in the peer-reviewed international journal *Food Analytical Methods* (<https://doi.org/10.1007/s12161-021-02051-y>). These procedures could be efficiently employed as a part of GMO testing to trace GM contamination, if any, in both imported as well as domestic oils and food products.

An internationally accepted SOP for GM detection in oils was also translated into Hindi and released along with the handing over of the NABL certification valid until June 28, 2023 by Shri Narendra Singh Tomar, Hon'ble Union Minister of Agriculture & Farmers Welfare, Government of India at ICAR-NBPGF on August 16, 2021.

The ISO/IEC17025:2017 accredited GDRF is prepared as per international standards to serve for the country by GM testing for checking the unauthorized GM events in the marketplace and in the supply chain for regulatory requirement.



Release of internationally accepted SOP for GM detection in oil by Shri Narendra Singh Tomar, Hon'ble Union Minister of Agriculture & Farmers Welfare, Government of India on August 16, 2021 at ICAR-NBPGF, New Delhi.

CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
INDIA			
International FDP Programme on Recent Trends Transforming Life Sciences - Focus on Academia & Industry Symbiosis	Department of Biotechnology, Nizam College, Osmania University	September 13-18, 2021 Hyderabad (Virtual)	http://nizamcollege.ac.in https://forms.gle/whWVbMrXRkYg4eh76 (registration)
Training on Biosecurity and Biosafety: Policies, Diagnostics, Phytosanitary Treatments and Issues	ICAR-National Bureau of Plant Genetic Resources	September 15-24, 2021 Coimbatore (Virtual)	http://www.nbpgr.ernet.in/
International Horticulture Conference – Next Generation Horticulture (NEXTGEN – HORT)	Tamil Nadu Agricultural University	September 16-19, 2021 Coimbatore	https://tnau.ac.in/news-events/
Virtual Workshop on Applications of Bioinformatics Tools in Agricultural Research	ICAR-Uttar Banga Krishi Viswavidyalaya	September 20-30, 2021 Pundibari (Virtual)	https://www.ubkv.ac.in/ https://forms.gle/bPN3LH2eLxH4daro8 (registration)
Global Rice Conference	Tamil Nadu Agricultural University	September 24–25, 2021 Thanjavur, Tamil Nadu	https://tnau.ac.in/news-events/
International Conference on Future Challenges and Prospects in Plant Breeding	Tamil Nadu Agricultural University	October 6-7, 2021 Coimbatore	https://tnau.ac.in/news-events/
International Soy Conclave	The Soybean Processors Association of India	October 9-10, 2021 Indore	http://www.sopa.org/event/international-soy-conclave-2021-9th-and-10th-october-2021/
International Conference on Agricultural Genomics - Progress and Prospects	Tamil Nadu Agricultural University	October 21–23, 2021 Coimbatore	https://tnau.ac.in/news-events/
International Symposium on Plant Biotechnology Towards Improving Agri-Food Industry and Healthcare Products (ISPB-2021)	Birla Institute of Technology, Mesra, Ranchi	October 27-30, 2021 Ranchi	https://www.bitmesra.ac.in/ispbdefault?page=adminispb&pid=home
INTERNATIONAL			
10 th Meeting of the Conference of the Parties Serving as the Meeting of the Parties to the Cartagena Protocol on Biosafety	Secretariat of the Convention on Biological Diversity (SCBD)	October 11-15, 2021 and April 25-May 8, 2022 Kunming, China (tentative dates)	https://www.cbd.int/meetings/?thm=CPB



SOUTH ASIA
BIOSAFETY PROGRAM

The South Asia Biosafety Program (SABP) is an international development program implemented in India and Bangladesh with support from the United States Agency for International Development (USAID). 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.



Agriculture &
Food Systems
Institute


CONTACT SABP
BANGLADESH

Sium Ahmed
Biosafety Support Officer
South Asia Biosafety Program
c/o CIMMYT
House-10/B, Road-53, Gulshan-2
Dhaka-1212, Bangladesh
Email: sahmed@southasiabiosafety.org

UNITED STATES

Layla Tarar
Manager, Communications & Digital Learning
Agriculture & Food Systems Institute
1010 Vermont Avenue NW, Suite 202
Washington, DC, 20005, USA
Twitter: @AgFoodSystems
Email: ltarar@foodsystems.org

INDIA

Vibha Ahuja, Ph.D.
Chief General Manager
Biotech Consortium India Limited
Anuvrat Bhawan, 5th Floor
210, Deendayal Upadhyaya Marg
New Delhi 110 002, India
Email: vibhaahuja@biotech.co.in

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