

South Asia Biosafety Program

NEWSLETTER FOR PRIVATE CIRCULATION ONLY – NOT FOR SALE



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ANNOUNCEMENT

A Competitive Grants Program to Strengthen the Biosafety Knowledge Base in Bangladesh

In recent years, there has been significant progress in research on crop biotechnology and the biosafety regulatory system in Bangladesh. The country is also advancing towards the biosafety evaluation of genetically engineered (GE) crops and post-release monitoring. In view of these developments, the USAID-funded South Asia Biosafety Program (SABP) launched, in 2019, a competitive grants program—the **Biosafety Research in Bangladesh Grants Program (BRBGP)**—to improve science-based risk assessment knowledge. 2021 marks the third phase of the grants program under SABP.

The BRBGP will support **laboratory, field, or literature research** that will significantly advance the body of knowledge relevant to biosafety in Bangladesh priority areas. Research or activities included in (but not limited to) one of the following areas are eligible for funding:

- 1. Providing baseline information related to current agricultural practice in Bangladesh to inform future assessments of the likely use of GE plants and their potential impact. This could include:**
 - a. The management and use of pesticides or herbicides.
 - b. Other agricultural management practices, including tillage, crop rotations, etc.
 - c. Characterizing the impacts and interactions of current agricultural practices on surrounding ecosystems.
- 2. Developing effective mechanisms to enhance risk management, including:**
 - a. Understanding how farmers in Bangladesh obtain and use information about agricultural management practices, in order to inform future efforts to support effective stewardship of GE plants.
- 3. Providing baseline information relevant to biodiversity in Bangladesh, including:**
 - a. The presence and compatibility of wild populations of plants that are related to crop species in order to inform future assessments of the possibility and consequences of gene flow from GE plants.
 - b. Characterization of arthropod abundance in and around agricultural fields to inform future assessment of the potential impacts of pest resistant GE plants on arthropod populations.
 - c. Identifying important protected/charismatic species and characterizing their interactions with agricultural production.
- 4. Providing information on the effectiveness of risk management provisions, particularly around confined field trials for GE crops, including:**
 - a. Testing the use of spatial and reproductive isolation methods in the context of Bangladesh's agriculture.

Eligible Institutions and Collaborations

Public and private agricultural research institutions and universities of Bangladesh, or International Agricultural Research Centers (IARCs) involved in research in Bangladesh, may submit pre-proposals. The pre-proposal must include at least one collaborating scientist that resides and works in Bangladesh. **Collaboration between research and regulatory institutions is strongly encouraged.** Consortia comprised of research institutions in Bangladesh and those from developed countries or international institutions are also strongly encouraged. In such cases, complementarity and/or value addition in terms of experience, expertise, and/or facilities should be shown.

Grant Size

In 2021, a number of grants ranging between **US \$15,000** and **US \$25,000** are expected to be awarded to competent institutions to conduct research for one year.

Pre-Proposal Guidelines

The BRBGP Grant Announcement & Pre-Proposal Guidelines may be downloaded at:

foodsystems.org/sabp/#BRBGP

Pre-Proposal Submission Deadline

March 31, 2021, 17:00 hrs BST

Workshop on Writing a Pre-Proposal

Researchers interested in applying for a BRBGP 2021 award are encouraged to attend a virtual workshop on how to write a pre-proposal, which will take place on:

March 6, 2021 (online)

For more information, please email:

biosafetyofficedhaka@gmail.com

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Contacts for more information on the program & pre-proposal format:

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Source: foodsystems.org/sabp

BANGLADESH

Research Projects of the Recipients of the 2020 Biosafety Research in Bangladesh Grants Program Awards

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Dr. Abu Shamim Mohammad Nahiyon, Advance Seed Research and Biotech Center, ACI Agribusinesses, ACI Ltd.



Dr. Md. Fuad Mondal, Sylhet Agricultural University



Dr. Abu Shamim Mohammad Nahiyon, Advance Seed Research and Biotech Center, ACI Agribusinesses, ACI Ltd.

Insect Pest Management Practices and Biosafety Status of Country Bean (*Lablab purpureus* L.) in Bangladesh

BACKGROUND

Country bean (*Lablab purpureus* L.), belonging to the Leguminosae family, is a popular vegetable in Bangladesh. This crop is cheap and a readily available source of protein, vitamins, and minerals. However, the production of country bean in Bangladesh is greatly affected by different insects and microbial infections. One of the major diseases is a viral disease, i.e., bean common mosaic. Researchers have found that sucking pests carry the virus and cause mosaic in bean. To control the insects and the secondary microbial infection in bean, huge amounts of pesticides are being used. It has been observed that the farmers of Bangladesh apply pesticides irrationally to their crops. Excess and inappropriate use of pesticides have negative impact on farmer's health, environment, and over all the biodiversity. Therefore, insect or viral disease resistant country bean could be an alternative solution for the sustainable production of country bean for future food and environment security. The baseline information on the pest status along with

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Study on Fertilizer Management and Agricultural Practices in Potato Cultivation in Bangladesh

BACKGROUND

Genetic engineering (GE) possesses great potential to address agricultural issues, particularly, providing resistance against pathogens and tolerance against abiotic stresses. Bangladesh has become one of the major potato producers of the world. Bangladesh is ranked 7th in the world with 9.65 million tons of yield per year (FAOSTAT, Accessed on February 11, 2021). Yet the late blight disease alone results in heavy fungicide input per year worth BDT 100 crores. Michigan State University has developed genetically modified (GM) late blight resistant potato varieties which are planned to be introduced in Bangladesh. Introduction of such GE potato varieties is expected to save 100 crores of taka per year along with 20% more yield (Ahmed, 2020).

However, this technology comes with a great controversy regarding biosafety (e.g., horizontal gene transfer to non-GM crops). Therefore, before introducing GE potato varieties in Bangladesh, obtaining critical baseline information regarding conventional potato growing practices is worthwhile, specially, identifying any practices that are being followed

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its management and use of pesticides in country bean is very crucial to assess the potential of developing genetically engineered (GE) country bean plants. Moreover, this knowledge will help during biosafety assessment when GE crop will be in the field. Therefore, the proposed research aims to study (1) the current insect pest status in the country bean production system, (2) the current management practices of country bean insect pest, and (3) to determine the pesticide residues in country bean to develop baseline data for biosafety assessment of country bean in Bangladesh when the time comes.

METHODOLOGY

The proposed research involves a survey to generate the baseline findings on insect pest status and management practices of country bean in Bangladesh. Considering the country bean production, Shibgonj upazila of Bogra district, Jashore Sadar upazila of Jashore district, Ishwardi upazila of Pabna district, Kaliganj upazila of Gazipur district, Nabiganj upazila of Habiganj district, and Golapganj upazila of Sylhet district will be surveyed. To conduct the survey, a questionnaire will be developed having structured and open-ended questions based on the relevant literature and the information from Department of Agricultural Extension (DAE). A total of 300 farmers, 50 from each upazila, will be selected for the interview with the help of DAE. Insects will be sampled from farmer's fields for further identification and labeling. In addition, country bean samples from all the selected upazilas will be collected for pesticide residue analysis to assess the biosafety of country bean in Bangladesh.

EXPECTED OUTCOME

The proposed research will generate baseline information regarding the pest status and its management practices along with the pesticides used during the cultivation of country bean. The study will thus help to examine the future necessity of GE country bean in Bangladesh. The pesticide residue data of country bean will provide information on potential health hazards as well as its impact on the environment.

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Flowers of *Lablab purpureus* L.

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by the local potato growers which may possess potential environmental threats. Previously it has been demonstrated that some fertilizers play an important role in defense against pathogens, for instance, increased concentration of phosphorus and potassium application tends to reduce the impact of late blight (LB) disease (Awan and Struchtemeyer, 1957) whereas extra boron as basal dose during tillage and foliar spray helps to control scab of potato (Ju *et al.*, 1982, Bergmann, 1984). However, the extent to which LB resistant GE potatoes would decrease the fertilizer input is yet obscure. Therefore, in our study, we aimed to collect data from Bangladeshi potato growers regarding fertilizer management during potato cultivation.

OBJECTIVES

1. Collect data on fertilizer application status during potato cultivation with an emphasis on LB management.
2. Collect baseline information regarding potato cultivation practices followed by potato growers of Bangladesh that may possess potential environmental and health risks when GE potatoes will be cultivated.
3. To understand farmers' current perception and attitude towards GM crops.

METHODOLOGY

A well-structured and pre-tested questionnaire will be used to gather relevant information and data from local farmers and seed potato producers of Bangladesh. There are 4 major potato growing areas in Bangladesh, namely, (i) Central & Mid-East, (ii) North-West, (iii) Mid-West and (iv) South-West. Two districts will be covered from each zone, and two upazilas will be covered from each district. From each upazila 100 potato growers will be questioned, i.e., data will be collected from total of 1600 potato growers through a field survey-based technique.

For collecting data and information from the potato growers total 16 enumerators have been assigned where each enumerator will cover 2 Upazilas. To prepare questionnaire, data compilation and analysis 2 research associates are appointed. Each of them will be responsible for the overall activities of 2 zones.

EXPECTED OUTCOME

This study will derive baseline information on fertilizer management and different agricultural practices of potato cultivation in Bangladesh, particularly the ones may have potential threats if GE potato is introduced. Such baseline information will help the regulatory decision-making authority to make guidelines for GE potato cultivation in the country. Resultantly, such a guideline will minimize the potential environmental threats of GE potato and make most benefit from it. Also, information from this study will help in future for assessing the extent to which GE potatoes can contribute to reduction in input costs during potato cultivation, particularly, synthetic fertilizer input.

References:

- Ahmed, R, 2020. Goodbye to potato blight. Dhaka Tribune. <https://www.dhaka-tribune.com/bangladesh/2020/12/18/goodbye-to-potato-late-blight>
- Awan, A.B. and R.A. Struchtemeyer, 1957. The effect of fertilization on the susceptibility of potatoes to late blight. *American Potato Journal* 34:315–319.
- Bergmann, W., 1984. The significance of the micronutrient boron in agriculture. *Proceedings of the Symposium held by the borax group in the International Trade Centre of GDR, December, Berlin.*
- FAOSTAT. Accessed on 11 February 2021.
- Ju H.Y., C. Chong and B.B. Bible, 1982. Influence of boron nutrition on glucosinolates and reducing sugars of turnip. *Can. J. Plant Sci.*, 62: 1037-1042.

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1st National Workshop on the Bangladesh Biosafety Clearing House

Prof. Mohammad Nurul Islam, University of Dhaka



Speakers at the 1st National Workshop on the Bangladesh Biosafety Clearing House (January 24-26, 2021)



In-person participants at the 1st National Workshop on the Bangladesh Biosafety Clearing House (January 24-26, 2021)

The 1st National Workshop on the Bangladesh Biosafety Clearing House was organized by the Department of Environment (DoE), Government of Bangladesh (GOB) from January 24-26, 2021 at the DoE's conference room, with support from the UNEP-GEF project for "Sustainable Capacity Building for Effective Participation in BCH (BCH-III)." The workshop, a very successful event, was attended by more than 30 key stakeholders from government, industry, importers, producers, distributors, researchers, and academia. The meeting was held in interoperability mode, where participants and facilitators from home and abroad could join virtually and in person, which is a first of its kind for a meeting organized by GOB. During the meeting, participants used the Virtual Learning Environment (VLE) platform to ask questions on videos and other interactive modules. The Mentimeter was used for responding to quiz questions. The meeting was inaugurated by Mr. Ziaul Hasan ndc, Hon'ble Secretary, Ministry of Environment, Forest and Climate Change (MoEFCC) who graced the occasion as the Chief Guest and Mr. Mahmud Hasan, Additional Secretary, MoEFCC was present as a Special Guest. Dr. A.K.M. Rafique Ahammed, DG, DoE chaired the event.

The workshop's goals were to 1) define roles and responsibilities for a) Competent National Authority(ies), b) BCH National Focal Point; and 2) define/identify procedures and/or mechanisms for all information providers that allow them to provide appropriate information regularly to the BCH. The workshop followed a two-step training approach. The

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first step involved acquainting key stakeholders with the Cartagena Protocol, the Biosafety Clearing House, and its technical responsibilities through application of case studies on the effective use of BCH management center and the Central Portal. As a result, the participants gained a clear understanding of the format of BCH records, as well as procedures for registering and publishing biosafety related decisions. In the second step, the participants were invited to a brainstorming session on three main issues, such as role and responsibilities of a) Competent National Authority(ies); b) BCH National Focal Point; and c) procedures and/or mechanism that are followed by information providers in order to

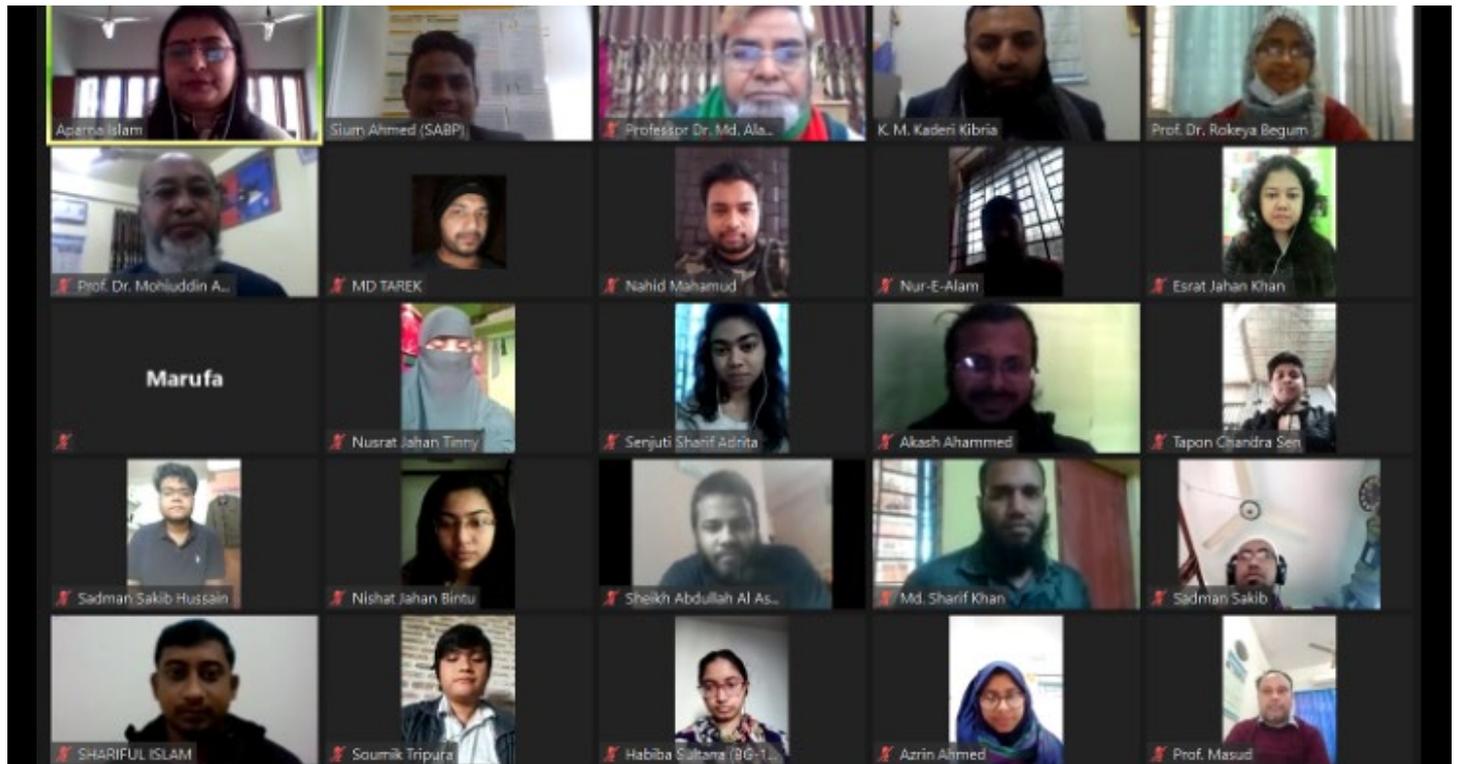
provide appropriate information regularly to the BCH. All participants had to fill in Google forms with their name, affiliation, and role, as well as expectations of and concerns about the meeting. The participants completed the evaluation of their initial knowledge by attending a quiz before joining the meeting and taking another quiz at the end as a final evaluation of their knowledge level about BCH. The training workshop was successful because the participants improved their knowledge of the BCH during the meeting as reflected by their grades in the final evaluation. Up to the second meeting, the facilitators will train the participants and in the final or third meeting, participants are expected to show their competency by doing the activities without assistance from the facilitators. With this, the organizers are looking forward to develop a group of competent master trainers.



Organizers, speakers, and guests at the 1st National Workshop on the Bangladesh Biosafety Clearing House (January 24-26, 2021)

SABP Webinar Series: Biosafety in Biotechnology - GE Crop Regeneration as a Case Study

Sium Ahmed, Biosafety Support Office, South Asia Biosafety Program



Speakers and participants at the SABP webinar on Biosafety in Biotechnology – GE Crop Regeneration as a Case Study (January 27, 2021)

After organizing eight successful webinars in 2020, the new year started with another impactful webinar which provided biosafety insights in a different context. As part of the South Asia Biosafety Program’s capacity building interventions, the webinars are intended to offer a forum for discussion on the biosafety regulatory system and effective implementation of biosafety requirements in research and development. The ninth event of the SABP Webinar Series was organized jointly with the Department of Biotechnology and Genetic Engineering (BGE), Mawlana Bhashani Science & Technology University (MBSTU) on January 27, 2021. To facilitate better understanding of the overall biosafety system, genetically engineered crop regeneration was presented as a case study so that the participants could fathom and correlate the prevailing biosafety requirements at each stage.

The webinar was attended by 50 participants, including students, early career researchers, and faculty members. Prof. Dr. A. K. M. Mohiuddin, Department of Biotechnology and Genetic Engineering, MBSTU gave the welcome speech. Prof. Dr. Md. Alauddin, honorable Vice Chancellor, MBSTU graced the event as the Chief Guest, while Prof. Dr. Rokeya Begum, Dean, Faculty of Life Science, MBSTU served as the Special Guest. The webinar was chaired by Dr. K. M. Kaderi Kibria, Associate Professor and Chairman, BGE, MBSTU. Prof. Dr. Md. Masuder Rahman of the same department moderated the discussion session.

In his welcome speech, Prof. Dr. Mohiuddin introduced the guests and the Keynote Speaker to the participants. Prof. Dr. Begum, in her remarks, mentioned that the benefits of modern biotechnology can be fully realized if it is accompanied with an efficient biosafety system. While addressing the event as the Chief Guest, Prof. Dr. Alauddin

emphasized the understanding of the biosafety processes at various stages of research and development, as it is an absolute necessity to obey the requirements as per the global and country’s prevailing regulatory systems.

In the Keynote Speech, Dr. Aparna Islam, Country Manager, South Asia Biosafety Program specified the concept of biosafety with a brief historical context. She then gave a clear and concise overview of Bangladesh’s biosafety regulatory system and different regulatory documents. Dr. Islam presented a case study of developing a GE crop while she

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explained point by point how the biosafety practices should flow from laboratory to the field and eventually, to the farmers. A detailed explanation of environmental risk assessment and food safety assessment were given so that the audiences could understand the underlying

integrity of biosafety in biotechnology research. Finally, Dr. Islam introduced the audience to SABP’s first installment of the Biosafety Resource Book Series, which aims to help researchers in agricultural biotechnology in an easy and understandable language.

The keynote speech was followed by a very interactive discussion and question-answer session. Discussions elaborated on the safety of GE crops, antibiotic resistance, and gene transfer to wild species. In response, Dr. Islam talked about the advancement of GE crop development technologies and the rigorous assessment that is done for safety evaluation. She also explained confined field trial (CFT) practices to tackle unwanted gene flow into the wild. The importance of effective communication to the general public, the regulatory aspects and function of committees, and the prevailing biosafety stewardship in Bangladesh were also highlighted in the discussion session.

In the remarks by the Chair, Dr. Kibria thanked the organizers for arranging a time-demanding event despite the critical situation by way of digital communication. He believed that the students would benefit from the information and expressed interest in similar programs in the future.

VIDEO

Watch the Recording:
<https://foodsystems.org/event/sabp-webinar-2021-1/>

Guidelines on Containment Facilities: Biosafety Level 2 (BSL-2) & 3 (BSL-3) and Certification of BSL-3 Facility, 2020

Released by the Department of Biotechnology, Government of India

Guidelines for the Establishment of Containment Facilities: Biosafety Level 2 (BSL-2) & 3 (BSL-3) and Certification of BSL-3 facility have been recently notified by the Department of Biotechnology (DBT), Ministry of Science & Technology, Government of India. The guidelines have been prepared in accordance with the national and international references, guidance and regulations.

The document describes the principle and components of containment and standards for the establishment of biosafety containment level 2 and 3 facilities and also the process of certification of BSL-3 facilities.

It is important to note that specifications for BSL-2 facility are intended for guidance purpose, while those for BSL-3 facility are essential components of compliance required for the certification of the facility.

With this notification, Certification of BSL-3 Laboratories shall be mandatory for all organizations handling hazardous microorganisms for research and development purpose w.e.f. April 1, 2021. Further, all new BSL-3 facilities will undergo certification prior to commencement of facilities operations.

These guidelines shall be binding pan India for all public and private organizations involved in research, development and handling of the genetically engineered (GE) microorganisms and non-GE hazardous microorganisms.

The guidelines can be accessed at: <https://ibkp.dbtindia.gov.in/>



Draft National Biotechnology Development Strategy 2020-25

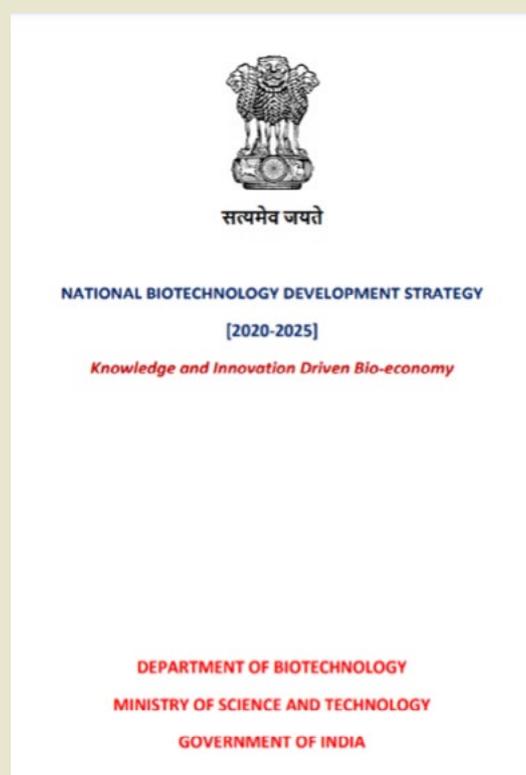
Released by the Department of Biotechnology, Government of India

The Department of Biotechnology (DBT) has released Draft National Biotechnology Development Strategy 2020-25 for public consultation. This strategy document follows the Biotechnology Strategy in 2007 and then the Biotech Strategy-II (2015-2020) released in 2015. The vision of the document is to harness the potential of biotechnology as a premier precision tool for national development and well-being of society and the mission is to make India globally competitive in biotechnology research, innovation, translation, entrepreneurship, and industrial growth and be a USD 150 billion Bioeconomy by 2025. Future efforts proposed in the strategy for streamlining biosafety regulations include:

- Develop regulatory guidelines for plants, microbes, insects, poultry, livestock, gene editing, and other cutting edge technologies
- To streamline the policy and regulatory framework for genome edited products, particularly those generated through SDN1 and SDN2, which are considered to be almost equivalent to those generated through conventional breeding.
- Developing a "Network of Infrastructure under Biosecurity and Biosafety" across the country to strengthen the nation on biosecurity and biosafety front and for preparing the country for future epidemic/pandemic.
- Policy on the ethics and usage of Synthetic Biology and Emerging Technologies.

It has also been proposed to set up a Mission Programme on Improved Crop Varieties through Gene Editing. Establishment of Centres of Excellence centred on New Emerging technologies (CONEs) includes reference to gene editing, speed breeding platforms & precision agriculture.

Download the "Draft National Biotechnology Development Strategy 2020- 25" at: <http://dbtindia.gov.in/latest-announcement/draft-national-biotechnology-development-strategy-2020-25>



CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE/CONTACT
BANGLADESH			
International Biotech Symposium 2021	Community of Biotechnology, in collaboration with the Institute of Biotechnology and Genetic Engineering, Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU)	February 13-20, 2021 Virtual	https://www.ibs2021.info/
Workshop on Writing a Pre-Proposal for the Biosafety Research in Bangladesh Grants Program (BRBGP) 2021	South Asia Biosafety Program	March 6, 2021 Virtual	biosafetyofficedhaka@gmail.com
INDIA			
Webinar on Gene Editing Research in Agriculture: Key Initiatives in India	Tata Institute for Genetics and Society and Biotech Consortium India Limited	February 17, 2021 Virtual	https://us02web.zoom.us/join/register/WN_qsnqjDTKQD20CSSI2NShfQ
Indian Seed Congress 2021	National Seed Association of India	February 24-26, 2021 Bengaluru	https://isc2021.nsai.co.in/
21 Days Faculty Training Programme: Advances in Plant Tissue Culture Techniques	Odisha University of Agriculture and Technology	February 23-March 15, 2021 Bhubaneswar	http://www.ouat.nic.in/
ICGEB-DBT Workshop: Re-Designing Smart Crops for Sustainable Agriculture - Dynamics of CRISPR-Cas Breeding, NGS, and Beyond	International Centre for Genetic Engineering and Biotechnology (ICGEB) and Department of Biotechnology	April 26-30, 2021 Virtual	https://www.icgeb.org/re-designing-smart-crops-for-sustainable-agriculture-workshop-2021/
International Conference on Sugarcane Research	ICAR-Sugarcane Breeding Institute, Tamil Nadu Agricultural University, and Society for Sugarcane Research and Development	June 19-22, 2021 Coimbatore	https://tnau.ac.in/wp-content/uploads/2020/10/1601938688.pdf
INTERNATIONAL			
7 th Plant Genomics and Gene Editing Congress: Asia	Global Engage Ltd.	April 20-21, 2021 Virtual	http://www.global-engage.com/event/plant-genomics-asia/
Hands-on Course: CRISPR/Cas9 Genome Editing: A New Approach for Therapeutics	ICGEB	September 6-8, 2021 Cairo, Egypt	https://www.icgeb.org/activities/meeting-and-courses/
Workshop: Genome Editing to Generate Cellular and Animal Models of Human Diseases	ICGEB	September 7-10, 2021 Cape Town, South Africa	https://www.icgeb.org/activities/meeting-and-courses/



SOUTH ASIA
BIOSAFETY PROGRAM

The South Asia Biosafety Program (SABP) is an international developmental program implemented in India and Bangladesh 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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