

South Asia Biosafety Program

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BANGLADESH

7th Annual South Asia Biosafety Conference: An Experience in Contemporary Genetic Engineering Technology and Biosafety

Dr. Kamrun Nahar, Biotechnology Division, Bangladesh Agricultural Research Institute

It was a great experience attending the 7th Annual South Asia Biosafety Conference, held September 14-16, 2019 in Dhaka, Bangladesh. The conference comprised of comprehensive plenary lectures, workshops, poster presentations, and a Lightning Round with short presentations from early career scientists and students.

Many eminent scientists, renowned researchers, and talented young students attended and shared their knowledge and expertise regarding modern biotechnology.

This was my best opportunity in Bangladesh to reach the largest assemblage of participants from the biotechnology community and learn about the advances of biotechnology research from them.

I enjoyed the plenary session lectures, which were more informative. Special emphasis was given on challenges of development and deployment of biotech products, risk assessment and biosafety regulations, and how to build a biosafety research community in the plenary session lectures. I also got information on world-wide biotechnology research and development and biosafety regulation.

Through this conference, I have gathered knowledge on transgenic mosquito, such as transgenic *Aedes aegypti* resistant to dengue virus

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The inaugural session of the 7th Annual South Asia Biosafety Conference (September 14, 2019) (from left): Dr. Muhammad Abdur Razzaque, MP, Honorable Minister, Ministry of Agriculture, Bangladesh; Dr. Andrew Roberts, Deputy Executive Director, ILSI Research Foundation, USA; Dr. Rob Bertram, Chief Scientist, Bureau for Food Security, USAID, USA; Dr. Aparna Islam, Country Manager, South Asia Biosafety Program, Bangladesh.

transmission, which was an interesting new learning area for me. At this moment, the mosquito-borne disease, dengue, is a burning issue in my country. These advanced technologies could one day help to control the mosquito-borne diseases and improve human health conditions in Bangladesh, as well as other parts of the world.

Presently, genome editing technology, such as Clustered Regularly Interspaced Short Palindromic Repeats-CRISPR associated protein 9 (CRISPR-cas9) is envisioned as a powerful tool for crop improvement. Scientists around the world have started using genome editing techniques for developing crops with desirable traits. A parallel workshop on gene editing and regulation was arranged during the conference. Many participants attended this workshop. Various gene editing techniques, including CRISPR-cas9 and global landscape of regulation of gene edited products, risk assessment elements, and their applicability to gene edited products was discussed in this workshop. The discussion involved regulation or not of gene edited products. I had a fantastic opportunity to discuss whether gene edited plants should be subjected to the same risk assessment and regulatory systems relative to other plant breeding techniques where the edits are similar to naturally occurring mutations. Knowledge gaps related to risk assessment and regulation of gene edited products is an important obstacle in consumer acceptance. It is important to develop communication among the public, developers, stakeholders, and policy makers so that health and environmental risk can be properly addressed. Appropriate regulatory determination and regulatory harmonization is also needed for acceptance of genome edited products.

Lastly, the conference was a valuable platform to meet world leading biotechnologists and biosafety experts and update my knowledge on biotechnology research which will be helpful in my professional development.

Impressions of the 7th Annual South Asia Biosafety Conference (SABC 2019) by BRAC University volunteers and prize winners of the Lightning Round for Students and Early Career Researchers!

<http://sabc.biotech.co.in>



Fall Army Worm: An Emerging Challenge for Agriculture in South Asia

Ms. Afia Nowshen and Ms. Saria Farheen, BRAC University

The 7th Annual South Asian Biosafety Conference, hosted in Dhaka from September 14-16, 2019, became a vibrant and interactive event, with the participation of scientists, policy makers, students, and other stakeholders from across the world. On the second day of the conference, three parallel workshops were organized. One of them was on Fall Army Worm (FAW), a pest that has currently raised concern in South Asia, including Bangladesh.

In Africa, during the year 2017 alone, 13.5 million tons of maize, worth USD 3 billion, was lost due to this pest. Last year, FAW was seen for the first time in Asia, in India and Bangladesh. In Bangladesh, between November 2018 to April 2019, a low infestation was recorded in 23 districts and 74 Upozilas. As we share similar weather with Africa, and since the pest has a vigorous reproductive nature, scientists are now very worried about the magnitude of infestation of this pest in the coming days in South Asian countries. In this context, the workshop *Managing Fall Army Worm in South Asia*, organized by the International Maize and Wheat Improvement Center (CIMMYT), attracted considerable interest.

The experts first gave a detailed description of the pest and its nature. FAW is a well studied pest in America, where it became established more than a hundred years ago. However, the pest's behavior is not very similar at other places of its invasion. Therefore, understanding the

biology of FAW is crucial for its management in Asia and particularly the South Asian region. In the workshop, important factors, such as the colonization patterns, key biological attributes of FAW, invasion-outbreak options, and possible long-term management practices were discussed. The speakers introduced many important factors, such as the plant-soil-aerial life cycle of the pest, its relationship with the rainfall pattern and humidity, its reproductive capacity, etc. At the end of the

workshop, significant recommendations came from the experts.

The management practices of FAW were also discussed during the workshop. Traditionally, the most common method to prevent the growth of FAW is by using insecticide, but the results are not very promising. Moreover, the commercial hybrids are highly susceptible to this worm. For managing the ecological balance, it is important to know about the tolerance characteristics of the hybrids, effect of monsoon flooding on populations and larval development, characterization of natural enemies, and labor implications of ecological management strategies. It was recommended that a single tool would not be completely effective against FAW and thus, an Integrated Pest Management approach is required. An alternative way to combat a FAW infestation is through genetic engineering of the host plants. Bt maize has been a success story in the USA, but gene stacking is needed to achieve this. To pursue this

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Dr. Timothy J. Krupnik, International Maize and Wheat Improvement Center (CIMMYT), Bangladesh, speaking at the 7th Annual South Asia Biosafety Conference during the workshop on Managing Fall Army Worm in South Asia (September 15, 2019).

line of approach, the assessment of various genes against the invading pest needs to be done.

Information and possible strategies for combating FAW started a very interactive discussion on this issue, with pros and cons for each strategy. A number of interesting questions were raised. One of such questions was: "Can FAW be completely eradicated?" The experts pointed out that the success depended on strategies of action, as the pest has a complicated relationship with its surroundings. Another question was: "Are maize affected by FAW safe to eat?" The experts said the FAW does not affect the food safety of the maize. This is because FAW eats the leaves and ears of maize—parts that are not consumed by humans. FAW infestation reduces the quality and quantity of the yield.

Concerning points were made by Bangladeshi scientists, such as: "What will happen if FAW gains the ability to infect this region's major crop, like rice?" The experts warned the participants that it is not unlikely, as FAW has a wide host range. That is why this region should take FAW seriously. During this discussion session, all agreed that there is an urgency to respond. Also, there is a need to take positive action at the policy-making level. In a nutshell, the workshop on FAW ended successfully and the participants went back with enlightening insights about the upcoming challenge this country and this region will face in the near future.

IN THE PRESS

The Government is Working to Control the "Army Worm": Minister of Agriculture

Source: *Barta24* (reproduced with permission from the publisher) | Translation: Mr. Sium Ahmed, Biosafety Support Office

Army Worm is the name of one of the most dangerous pests. This insect invades the maize crops. The epidemic has not yet taken place in Bangladesh. The government is working to control the army worm, said Agriculture Minister, Dr. Muhammad Abdur Razzaque, MP.

The Agriculture Minister said this while gracing the occasion as the Chief Guest of the 7th Annual South Asia Biosafety Conference, held at the Westin Hotel in the capital on Saturday (September 14, 2019).

The Minister also said: "If the attack by Army Worm starts in Bangladesh, then the maize cultivation of this country will suffer severe damage." Therefore, Bangladesh is already cautious.

He added: "The disease has spread to maize fields in India. Bangladesh is trying to prevent the attack with assistance from the Food and Agriculture Organization. The farmers of the country will be able to meet the demand of maize within a few years."

Regarding the need for increased research on agriculture, the Agriculture Minister said: "Due to global temperatures rising, Bangladesh's wheat crop has already suffered losses. If the temperature rises more, agriculture in the region, such as in the coastal areas, will suffer. Therefore, the ministry focused on increasing the tolerance of the crop as much as possible through research."

Regarding biosafety in Bangladesh, Dr. Muhammad Abdur Razzaque said: "The government of Bangladesh has long been implementing biosafety in agriculture. The South Asia Biosafety Program is a USAID-funded international development program implemented in Bangladesh and India. Bangladesh and India are working together on biosafety."

Among others present at the conference was Dr. Aparna Islam, Country Manager, South Asia Biosafety Program; Dr. Rob Bertram, Chief Scientist, Bureau of Food Security, USAID; Mr. Md. Nasiruzzaman, Secretary, Ministry of Agriculture.

For links to other media coverage of the 7th Annual South Asia Biosafety Conference, please visit: <http://sabc.biotech.co.in>.



Dr. Muhammad Abdur Razzaque, MP, Honorable Minister, Ministry of Agriculture, Bangladesh, speaking during the inaugural session of the 7th Annual South Asia Biosafety Conference (September 14, 2019).

Training on Agri-Biotechnology: Engaging the Nutrition and Medical Community

Mr. Sadique Uddin, Farming Future Bangladesh

With an aim to raise awareness of agri-biotechnology among the nutrition and medical communities, Farming Future Bangladesh (FFB) organized a training on the applications of agri-biotechnology in ensuring nutrition and food security on September 22, 2019.

The training, "Knowledge Sharing and Capacity Building on Applications of Agri-biotechnology for Nutrition and Food Security", was hosted in collaboration with the Bangladesh Institute of Research and Training on Applied Nutrition (BIRTAN) at the head office of BIRTAN in the capital. Attendees included, among others, nutrition experts of BIRTAN, representatives of the medical community, and prominent scientists and officials working in the agriculture sector.

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Over the past few decades, agricultural biotechnology has helped improve food quality, quantity, and production costs. Biotechnology contributes to both environmental and economic sustainability. Social acceptance is a crucial factor when it comes to successfully implementing the applications of agri-biotechnology, and the nutrition and medical community can make big contributions to achieving that acceptance.

Emphasizing the importance of genetically modified (GM) crops in boosting the nutritional content of the staple foods, Zharna Begum, Additional Secretary & Executive Director, BIRTAN said, "We need more

efforts like this to make people aware of the scopes and benefits of agricultural biotechnology. GM crops can make a significant impact on meeting nutritional needs of the mass people."

"We should invest more resources in knowledge sharing and capacity building programmes, engaging the key stakeholders to improve our agriculture sector," said Dr. Md. Abdur Rouf, Additional Secretary, Ministry of Agriculture.

"We are committed to sharing evidence-based information about the social, economic and environmental benefits of using agricultural biotechnology by engaging the key influencer groups such as nutrition and medical communities. We hope to raise awareness among people about the benefits of breeding improved crops, especially those that can boost the nutritional content of staple foods, such as rice enriched with vitamins and minerals," said Md. Arif Hossain, CEO and Executive Director of Farming Future Bangladesh.

Farming Future Bangladesh (FFB) is a comprehensive communications initiative funded by the Bill & Melinda Gates Foundation to help improve awareness about modern agricultural innovations, including crop biotechnology, in Bangladesh. Based in Dhaka, the initiative operates under the auspices of Cornell University's Alliance for Science, USA.



Participants at the training event: Knowledge Sharing and Capacity Building on Applications of Agri-biotechnology for Nutrition and Food Security (September 22, 2019).



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CALENDAR OF EVENTS

EVENT	ORGANIZED BY	DATE	WEBSITE
BANGLADESH			
4 th IPFS-ICBHA 2019-GNOBB Conference	Global Network of Bangladeshi Biotechnologists (GNOBB)	November 11-13, 2019 Dhaka	http://gnobb.org/conference/IPFS-ICBHA-2019
9 th International Plant Tissue Culture & Biotechnology Conference	Bangladesh Association for Plant Tissue Culture and Biotechnology (BAPTC&B)	February 8-10, 2020 Dhaka	http://baptcb.org/conference/
INDIA			
5 th International Conference on Plant Genetics and Genomics: Germplasm to Genome Engineering	Select Biosciences India Pvt Ltd. (supported by the National Academy of Agricultural Sciences)	October 17-18, 2019 New Delhi	http://www.selectbioindia.com
Asian Solanaceous Round Table III	The Asia and Pacific Seed Association, Indian Council of Agricultural Research, Indian Institute of Horticultural Research, and Society for Promotion of Horticulture	October 22-25, 2019 Bengaluru	https://www.apsaseed.org/events/asian-solanaceous-round-table-3-bangaluru-india/
National Symposium on Breeding for Biotic Stress Resistance in Potential Crops	Indian Society of Genetics & Plant Breeding and Indian Council of Agricultural Research-Indian Agricultural Research Institute Regional Station, Wellington	December 7-8, 2019 Wellington, The Nilgiris, Tamil Nadu	http://www.isgpb.org/
Global Potato Conclave 2020	Indian Council of Agricultural Research-Central Potato Research Institute, Shimla and Indian Potato Association, Shimla	January 28-31, 2020 Gandhinagar, Gujarat	http://gpc2020.in/
Training Programme on Genomics for Improvement of Horticultural Crops	Indian Council of Agricultural Research-Indian Agricultural Research Institute	February 24-March 5, 2020 New Delhi	https://www.iari.res.in/files/Latest-News/Brochure_Genomics_for_Improvement_of_Horticultural_Crops_02092019.pdf
INTERNATIONAL			
Asian Seed Congress	The Asia and Pacific Seed Association	November 25-29, 2019 Kuala Lumpur, Malaysia	http://www.apsacongress.com/



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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