



SABP

The South Asia Biosafety Program (SABP) is an international developmental program initiated with support from the United States Agency for International Development (USAID). The program is implemented in India and Bangladesh and aims to work with the local governments to facilitate implementation of transparent, efficient and responsive regulatory frameworks that ensure the safety of new foods and feeds, and protect the environment.

Over the next three years, SABP will work with its in-country partners to:

- Identify and respond to technical training needs for food, feed and environmental safety assessment.
- Develop a sustainable network of trained, authoritative local experts to communicate both the benefits and the concerns associated with new agricultural biotechnologies to farmers and other stakeholder groups.
- Raise the profile of biotechnology and biosafety on the policy agenda within India and address policy issues within the overall context of economic development, international trade, environmental safety and sustainability.

STRENGTHENING INDIAN EXTENSION SERVICES WITH BIOTECHNOLOGY INFORMATION WORKSHOPS

Purvi Mehta-Bhatt (South Asia Biosafety Program) and Muffy Koch (AGBIOS)

At the start of the South Asia Biosafety Program (SABP) several consultation meetings at the state level and with national and international experts working on agricultural biotechnology in India were conducted. In these discussions the participants expressed a unanimous concern regarding the low level of understanding of agricultural biotechnology among many agricultural extension workers. This was identified as one of the reasons why extension agencies were unable to take accurate information to farmers and as a major cause for misconceptions about the new technology that exist among farmers. In response to these findings, a communication project was developed to strengthening knowledge on agricultural biotechnology and biosafety among state level agricultural extension services in India.

In 2005 the initial training consisted of three state level information workshops for public and private extension

officers and farmer leaders in Gujarat, Andhra Pradesh and Maharashtra. To assess the impact of the workshops on meeting the information needs of state agricultural extension workers, a study was conducted to evaluate the delegates' pre-workshop and post-workshop understanding of agricultural biotechnology. These data were used to determine whether the workshop format helped address knowledge gaps in farm extension services. A report detailing the methodology and results of the study is available on the SABP website.

The State Agricultural Offices assisted in nominating delegates to attend the state workshops and these included public and private extension officers, NGOs and farmer leaders. Workshop materials and questionnaires were presented in local languages (Gujarati, Telugu or Marathi). While presentations were given in the local language or in Hindi, depending on the proficiency of the presenters. The workshops followed a one-day format, except in Andhra Pradesh, where a second day was used to introduce delegates to the research facilities and projects at the international agriculture research center hosting the workshop. The information session consisted of short presentations from local or national presenters. These covered an explanation of what biotechnology and GM crops are; the status of biotechnology crops in India and in the world; the approval process for biotechnology crops in India; safety testing; the relevance of biotechnology to State agriculture; and input from a local farmer on issues and needs at the farm level. Working group sessions followed where delegates listed and prioritized the most common questions farmers ask about GM crops. These questions were presented to the rest of the delegates and were addressed in a question and answer session by a panel composed of the workshop presenters.

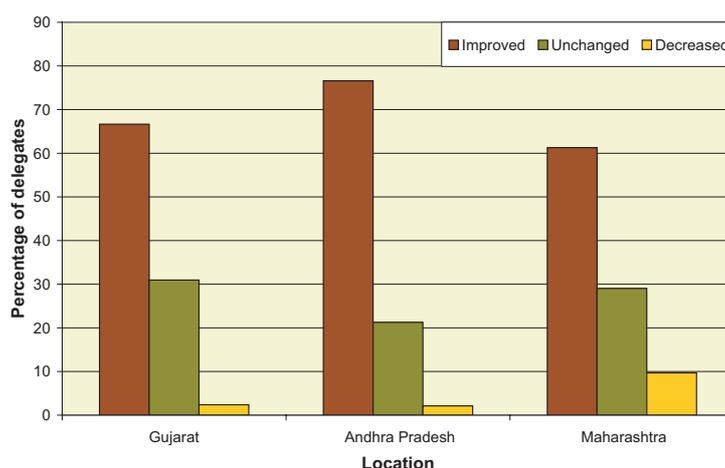


Figure 1. Impact of information workshop on delegates' knowledge of biotechnology at three Indian locations.

At all workshops, the delegates completed the same questionnaire at the start of the workshop and again at the end of the day. Of the 178 delegates, 120 questionnaires were suitable for the assessment. The answers to the questionnaires were scored to see whether delegates had increased their knowledge on biotechnology and GM crops during the day, or whether their knowledge had stayed the same, or decreased. Questionnaires from delegates whose knowledge remained unchanged by the workshop were further analyzed to determine the starting level of their biotechnology

knowledge. The results of the questionnaire assessments are summarized in Figures 1 and 2.

An assessment of the evaluation forms from the workshops (Figure 1) indicated that the information workshops were

CALENDAR OF EVENTS (INDIA)			
Event	Organization	Date	Place
Communications training for agriculture extension personnel	South Asia Biosafety Program (SABP)	July 4, 2006	Tamil Nadu
Awareness workshops on GM crops regulations with special reference to Bt cotton	BCIL and All India Crop Biotechnology Association	June – August 2006	Bhatinda, Hyderabad and Navsari
Media workshops on biosafety	MoEF and ISAAA	June 2006	TBA
Training workshop for school children	MoEF and Department of Environment, Government of Delhi	July 2006	New Delhi

Workshops - continued from page 2

able to raise the understanding of biotechnology in over 60% of delegates in the three states. The use of local language in the presentations and handouts is believed to have contributed positively to this level of impact. A low percentage of delegates showed a decreased understanding at the end of the workshops. In Gujarat and Andhra Pradesh this group was less than 3%, but was close to 10 % in Maharashtra. The reason for this is not clear. However, there were fewer questionnaires returned at the Maharashtra workshop, because bad weather caused early departure of some delegates. Between 21% and 31% of delegates at the three workshops showed an unchanged level of understanding after the workshops. An assessment of these delegates (Figure 2) indicated that in all three States most of them already had a fair to good knowledge of the subject.

Three common concerns were raised by delegates in the three states. Firstly, the extensions officers were generally unable to explain the high cost of GM hybrid seed to farmers, compared to the cost of

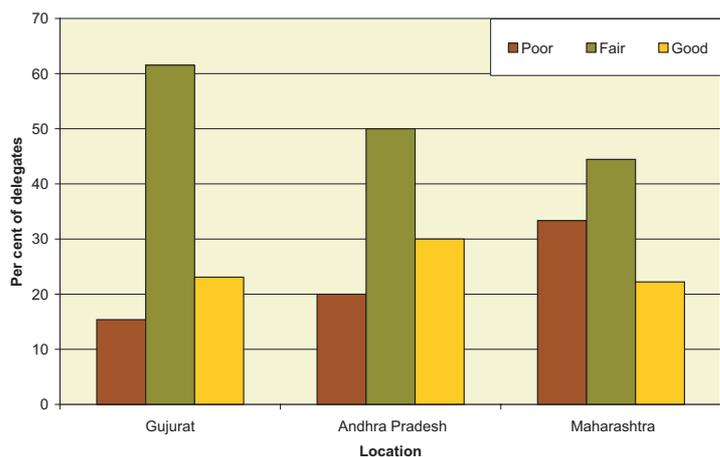


Figure 2. Initial biotechnology knowledge of delegates, whose knowledge level remained unaffected by the information supplied at the workshop.

conventional seed. Secondly, they were unable to explain the need for refugia planting with insect tolerant crops and thirdly, while they were certain that Indian farmers were not the first to plant these crops ('guinea pigs'), they had no information as to which other countries were growing GM crops. The presentations and handout materials addressed each of these issues.

The pre- and post-workshop assessment forms indicated that the level of knowledge increased significantly as a result of the workshops. However, this is not necessarily an indication that the knowledge will be successfully transferred to the farmers. An assessment process is underway to review whether the delegates have used the information and teaching materials they received at the workshop in their dealings with farmers. This evaluation will also assess whether the materials should be revised to better meet the needs of the extension officers.

BOLLGARD-II COTTON HYBRIDS APPROVED IN INDIA

CropBiotech Update - May 19, 2006

The Genetic Engineering Approval Committee (GEAC), India's biotech regulatory body, recently approved the commercial release of four varieties of Bollgard-II cotton hybrids belonging to three Indian seed companies for planting in the country's central cotton growing zone.

The Bollgard-II (commonly referred to as BG-II) cotton hybrids were developed by Mahyco, and contain stacked *Cry X* (*Cry I Ac* and *Cry 2 Ab*) genes (event MON 15985) developed by Monsanto. The hybrids provide season-long control of key lepidopteran pests. A significant advantage of the BG-II cotton hybrids is that they aid in delaying the development of pest resistance to the *Cry1Ac* protein.

This is the fourth biotech cotton event approved in India since the commercialization of the first genetically modified cotton in the 2002-2003 planting season. So far, 40 varieties of Bt cotton hybrids have been released. Another important development is the approval for the export of transgenic eggplant (Brinjal) seeds containing the *Cry1Ac* gene (MAHYCO EE-1 event), from India to Bangladesh and the Philippines.

Decisions from the GEAC meeting are available at: <http://www.envfor.nic.in/divisions/csurv/geac/geac-66.pdf>

See the full CropBiotech Update at: <http://www.isaaa.org/kc/Bin/cbtupdate/index.htm>

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ISAAA GIVES TRANSGENIC CROP SEMINAR

A day-long seminar on "Transgenic Crops Alleviating Hunger and Malnutrition" was organized by the International Service for the Acquisition of Agri-biotech Applications (ISAAA) at the auditorium of Bangladesh Institute of Nuclear Agriculture (BINA) on April 30, 2006.

The seminar was inaugurated by Professor Dr. Md. Amirul Islam, Vice Chancellor, Bangladesh Agricultural University (BAU). Special guests included Prof. Dr. M.A. Halim Khan, Former Vice Chancellor, Bangabandhu Sheikh Muhibur Rahman Agricultural University (BSMRAU); Prof. Dr. Nazrul Islam, Coordinator, Committee for Advanced Studies and Research (CASR), BAU; Prof. Dr. Rafiqul Islam Sarker, Director, BAURES, BAU; Dr. M.A. Hamid, Director General, BINA and Mr. A.R. Malik, Managing Director, Alpha Agro Ltd. (Biotech Bangladesh Limited). The seminar was chaired by Prof. Dr. Shahidul Haque, Head, Department of Biotechnology, BAU.

About 150 participants including teachers and students from BAU, researchers from BINA (FRI) and representatives from the private sector attended the seminar. There were four presenters who spoke about issues related to agricultural biotechnology. Professor Dr. M. Imdadul Hoque, Country Coordinator, South Asia Biosafety Program (SABP) gave an overview of SABP activities including their impact in Bangladesh. He also spoke about the activities of other USAID-funded projects, namely, ISAAA, ABSP-II and the PRSV resistant transgenic papaya project.

Dr. Craig A. Meisner presented his paper on the development history of papaya ring spot virus (PRSV) resistant transgenic papaya. In his presentation he highlighted the constraints of papaya production and the potential benefits of transgenic papaya for developing countries like Bangladesh. He indicated that an application had been submitted to the Ministry of Agriculture for the field trials of transgenic papaya in Bangladesh and, once approved by the government, transgenic papaya seeds would be available within the shortest possible time.

Professor Dr. A.S. Islam of the Department of Botany, Dhaka University, currently working at the University of Texas at

Austin, gave an overview of the status of transgenic crop research being conducted at different universities and research institutes in Bangladesh. He outlined transgenic crop research's benefits for alleviating poverty and malnutrition in developing countries, especially in Bangladesh. Prof. Islam, who introduced plant biotechnology to Bangladesh for the first time in the late seventies with barely any facilities and began with conventional tissue culture at the Department of Botany, University of Dhaka, summarized the development of plant biotechnology in Bangladesh. Through his initiatives and continuous support plant biotechnology laboratories have been established in most of the universities and research institutes in Bangladesh, some of which have the capacity to conduct research on plant genetic engineering.

The final speaker was Prof. Dr. Hans-Joerg Jacobsen of the Institute of Plant Genetics, University of Hannover, Germany who presented a paper on the application of biotechnology for the production of pharmaceuticals including edible vaccines. Professor Jacobsen explained that the transgenic apples containing the resveratrol gene, which had been developed in his laboratory and reported in *Plant Cell Reports* 22(2): 141-149 in September 2003, would soon be ready for marketing. Professor Jacobsen also spoke about the bright prospects of oral vaccines, referring to an article published February 14, 2006, in the *Ithaca Journal* at theithacajournal.com.

There were open discussions after each presentation. Participants raised several questions related to the benefits and possible risks associated with transgenic crops. Participants showed a keen interest in edible vaccines and their usefulness and asked how long they would have to wait until edible vaccines would be available.

In his conclusion, the Vice Chancellor opined that, for practical reasons such as food security and combating malnutrition, transgenic crops would be coming to Bangladesh, which the citizens of Bangladesh would have to accept. He encouraged the scientific community and the government of Bangladesh to take the necessary steps to finalize the biosafety guidelines and all documents required for field trials of transgenic crops to ensure the safety of the transgenic crops for animal and human health. He also thanked the organizers for arranging such an important and timely seminar.

The session chair, Professor Shahidul Haque, thanked the speakers and participants for their contributions to the seminar and urged that more awareness-building seminars be given for concerned stakeholders. The day ended with Prof. K.M. Nasiruddin offering a vote of thanks to the participants. He gave special thanks to Professor Hans-Joerg Jacobsen for taking the time to speak.



Seated on the dias (from left): Prof. Dr. Md. Shahidul Haque (Head, Dept. of Biotechnology, BAU and Chairperson of the Seminar), Prof. Dr. A.S. Islam (Botany Department, Dhaka University), Prof. Dr. M.A. Halim Khan (Former Vice Chancellor, BSMRAU), Prof. Dr. Md. Amirul Islam (Vice Chancellor, BAU and Chief Guest), Prof. Dr. Hans-Jörg Jacobsen (University of Hannover, Germany), Mr. A.R. Malik (Managing Director, Biotech Bangladesh Ltd.) and Dr. Craig A. Meisner, Professor Adjunct, Cornell University

WORKSHOP FEEDBACK

Abdullahel Baki, Upazilla Agriculture Officer, Satkania, Chittagong

I attended a workshop organized by SABP in collaboration with BARC at BARD, Comilla February 5 and 6, 2006. It was not only a workshop; it was a workshop-cum-train-

(continued on page 4 - see Feedback)

Feedback - continued from page 3

ing. The theme for the workshop was "Awareness Building on the Recent Advances of Agricultural Biotechnology and Biosafety"; a burning job for these days and, no doubt, an attractive subject for me.

Biotecnology or gene engineering for crop improvement or animal development is a modern science. To stay on top of it a person in my job needs to gather knowledge thoroughly about the subject both theoretically and practically.

A two or three day workshop is not sufficiently long enough for this purpose. I think the workshops should be designed in such a way that every point related to biotechnology and genetic engineering is covered more or less. It would most likely mean the training duration would have to be a minimum of seven days and topics would include cell, nucleus, chromosome, gene, Mendelism, meiosis, mitosis, cytogenetics, plant breeding, crossing, hybridization, hybridization techniques, genetic engineering, etc. To effectively implement the national framework on biotechnology, extension workers would benefit from and be encouraged by a foreign training-cum-study tour with in-country training.

'EVENT-BASED' CLEARANCE FOR GM CROPS LIKELY

Condensed from an article in The Hindu Business Line - June 5, 2006

In what could expedite release of new genetically modified (GM) crops into the market, the Union Government is considering 'event-based' clearance against the existing system of approving each individual hybrid or variety.

In the current system of commercial release approvals, every GM hybrid/variety has to undergo a minimum three years of official trials, irrespective of whether it incorporates an existing or new 'event'.

The proposal under consideration now is to do away with the multi-stage clearance mechanism for GM crops incorporating existing events, whose bio-safety, environmental and agronomic suitability has already been demonstrated before. "In such cases, we would only ascertain whether the said event is present in the particular hybrid, there is adequate expression of protein produced by the gene and the crop is morphologically the same even after transformation. All this can be done through simple DNA fingerprinting and a one-year confirmatory field experiment in any State Agricultural University. Once this basic data is known, the GEAC will register the hybrid for commercial release," officials told Business Line.

See the full article at: http://agbios.com/sabp_main.php?action=ShowNewsItem&id=7582

NOD LIKELY FOR FIELD TRIALS OF THREE GM CROPS

Financial Express - June 1, 2006

Genetically modified (GM) versions of three food crops, namely brinjal, mustard and potato, are awaiting permission for large-scale field trials before the final approval for commercial sale.

The secretary, department of biotechnology, MK Bhan said, "Transgenic mustard and potato have completed the requisite rounds of field trials under the Review Committee for Genetic Manipulation RCGM). These two crops are awaiting the nod of the Genetic Engineering Approval Committee (GEAC) for large-scale field trials, before they get the final approval for commercial sale."

Mustard and potato are winter crops, and its field trials are expected from October this year. Comparatively, brinjal is a summer crop and GEAC is likely to give approval for large-scale field trial in this kharif season. (* see news item "Bt Brinjal Trials have to Wait" for update - Ed.)

See the full article at: http://agbios.com/sabp_main.php?action=ShowNewsItem&id=7573

BT BRINJAL TRIALS HAVE TO WAIT

Financial Express - June 5, 2006

The Genetic Engineering Approval Committee (GEAC) on Thursday deferred its decision of allowing large-scale field trials of four varieties of Bt brinjal hybrids, developed by Mahyco. It decided to post on its website details of biosafety studies relating to Bt brinjal, conducted by the company at the insistence of the Review Committee on Genetic Manipulation (RCGM). It also intends to invite comments on these biosafety studies within 15 days from all concerned.

Thereafter, the GEAC will take up the issue of allowing large-scale field trials of Bt brinjal in its next meeting. Mahyco has developed MHB-4 Bt, MHB-9 Bt, MHB-80 Bt and MHB-99 Bt varieties of Bt Brinjal hybrids and has sought permission for large scale field trials and seed production in this kharif (summer) season.

See the full article at: http://agbios.com/sabp_main.php?action=ShowNewsItem&id=7584

GEAC SPARES REFINED GM OILS MANDATORY PRE-IMPORT TEST

Financial Express - May 31, 2006

The Genetic Engineering Approval Committee (GEAC) has decided to allow imports of refined soyabean oil extracted from genetically modified (GM) sources without any tests. But such refined oil imports should carry a certificate from the exporting country stating that it is derived from GM sources.

GEAC, in giving its interim decision, however, said tests were necessary for imported crude soyabean oils. The importer is required to submit analytical reports from either of the three designated laboratories on the composition of the crude oil both at pre and post processing stages, determination of glyphosate in the oil and its residues.

See the full article at: http://agbios.com/sabp_main.php?action=ShowNewsItem&id=7567

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