



SOUTH ASIA
BIOSAFETY PROGRAM

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NEWSLETTER

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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.

SABP is working 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.

NIN HOSTS GM FOOD SAFETY SYMPOSIUM

The National Institute for Nutrition (NIN), Hyderabad, recently hosted the symposium "GM Food Safety Assessment in India: Taking Stock and Planning for the Future". The symposium was convened by the Indian Council of Medical Research (ICMR) in association with Biotechnology Consortium India Ltd. and the South Asia Biosafety Program on July 7, 2008 at NIN. More than 50 participants from research institutions, industry and contract research organizations attended the symposium.

Dr. B. Sesikeran, Director, NIN, welcomed the participants and thanked ICMR and Department of Biotechnology (DBT) for their initiatives in the development of up-to-date guidelines and protocols for safety assessment of foods derived from genetically engineered (GE) crops. Providing an overview of the new "Guidelines for the Safety Assessment of Foods Derived from Genetically Engineered Plants", Dr. Vasantha Muthuswamy, Senior Deputy Director General, ICMR informed that ICMR had initiated the process to develop the guidelines in 2005 with the organization of an international conference on "Foods Derived from GM Crops: Issues for Consumers, Regulators and Scientists". A multi-stakeholder consultation was simultaneously organized during which the consensus was reached that guidelines for the safety assessment of foods derived from genetically engineered (GE) plants should be consistent with the Codex Alimentarius guidelines on the same topic. The *Guidelines* were drafted by a committee convened by ICMR, subsequently reviewed by the Review Committee on Genetic Manipulation (RCGM) and the Genetic Engineering Approval Committee (GEAC), and then posted for public review and comments on the ICMR website. The final version of the *Guidelines* was approved by RCGM in May and GEAC in June of 2008.

Dr. K.K. Tripathi, Advisor, DBT introduced the audience to newly published protocols for the safety assessment of GE plants that were developed by a sub-committee of RCGM. The five protocols, which are available at <http://igmoris.nic.in> and <http://dbtbiosafety.nic.in> are companion documents to the *National Guidelines for the Safety Assessment of Foods Derived from Genetically Engineered Plants*. These protocols will be reviewed annually by DBT and updated accordingly to ensure that they reflect the most current science related to GE food safety assessment.

A technical session followed, with presentations about the experiences of three Norman Borlaug Fellows who had recently returned from their fellowships in the United States. Dr. A.B. Singh, Scientist, Institute of Genomics and Integrative Biology, Dr. V.L. Maheshwari, Professor and Director, School of Life Sciences, North Maharashtra University and Dr. Vasanthi Siruguri, Senior Research Officer, NIN, each un-



Dr. S. Vasanthi, Senior Research Officer, National Institute for Nutrition, Hyderabad

Dr. A.B Singh, Scientist, Institute of Genomics and Integrative Biology, New Delhi



Dr. V.L. Maheshwari, Prof. & Director, School of Life Sciences, North Maharashtra University, Jalgaon

Norman Borlaug Fellows make presentations at technical sessions during NIN GM food safety symposium.

(continued on page 2 - see NIN)

CALENDAR OF EVENTS

Event	Organization	Date	Place
INDIA			
Workshop for Capacity Building in Allergenicity Assessment of GM Foods	National Institute of Nutrition in collaboration with Department of Biotechnology (DBT)	August 20 - 22, 2008	National Institute of Nutrition, Hyderabad
One day session on Clinical and Laboratory Safety Assessment of GM Food	Indian College of Allergy and Immunology	August 28, 2008	Institute of Genomics and Integrative Biology, New Delhi
Workshop on Guidelines for Conducting Confined Field Trials of GE Crops and Standard Operating Procedures (SOPs)	National Seed Association of India and Biotech Consortium India Limited (BCIL)	August and September, 2008	Hyderabad and Aurangabad
SAU Workshops on Management and Monitoring of Field Trials of Genetically Modified Crops	Ministry of Environment and Forests, DBT and BCIL	June to August, 2008	State Agricultural Universities in 12 States
GLOBAL			
10 th International Symposium on the Biosafety of Genetically Modified Organisms	International Society for Biosafety Research (ISBR)	November 16 to 21, 2008	Wellington, New Zealand

NIN - continued from page 2

dertook fellowships that related to some aspect of GE food safety assessment. Drs. Singh and Siruguri worked with Dr. Richard Goodman, Professor, Food Allergy Research & Resource Program at the University of Nebraska (<http://www.farrp.org>). Dr. Maheshwari was mentored by Dr. Jeff Wolt, Biosafety Institute for Genetically Modified Agricultural Products, University of Iowa (<http://www.bigmap.iastate.edu>). The Norman E. Borlaug International Agricultural Science and Technology Fellows Program helps developing countries strengthen sustainable agricultural practices by providing short-term scientific training and collaborative research opportunities to visiting researchers, policymakers and university faculty while they work with a mentor (<http://www.fas.usda.gov/icd/borlaug/borlaug.htm>).

The final session of the symposium was a panel and open floor discussion chaired by Dr. Sesikera to identify capacity building priorities in the area of GE food safety assessment for the next five years. After a dynamic exchange between audience and panel members some key priorities were identified to ensure the effective implementation of the new guidelines and protocols. These included:

- Accreditation of public and private sector labs undertaking specific safety studies for pre-market assessment of GM foods (*e.g.*, acute oral toxicity study, pepsin digestion, *etc.*);
- Implementing a competitive grants program to support research that will help inform GM food safety assessment. This could be jointly funded by DBT and ICMR;
- Extensive capacity building efforts are needed to train scientists and technicians (public and private) in the area of GM food safety assessment; and
- Outreach and communication is critical to ensure that the regulatory and regulated communities understand the guidelines and protocols so that they can be implemented.

In her closing comments to the audience, Dr. Muthuswamy encouraged the audience members to continue to share their ideas for capacity building in this area with ICMR and DBT.

BILL TO SET UP BIOTECH REGULATORY AUTHORITY SOON

July 10 - Thaindian News

Bangalore - A bill to set up a National Biotechnology Regulatory Authority (NBRA) is likely to be introduced soon in parliament, eminent agriculture scientist Dr. M.S. Swaminathan said Wednesday. "The draft bill, prepared by the Department of Biotechnology, for setting up the NBRA is ready. I hope the bill will be introduced in the monsoon session of parliament commencing next month," Swaminathan told reporters on the sidelines of a public lecture at the Indian Institute of Science (IISc) here.

A task force on application of agriculture biotechnology, constituted under the chairmanship of Swaminathan in 2004, has recommended to the science and technology ministry to set up NBRA to regulate research, manufacture, import and marketing of genetically modified organisms.

The NBRA is set to replace the Genetic Engineering Approval Committee, which is under the Ministry of Environment and Forests.

"The government made a commitment two years ago to establish an autonomous statutory body (NBRA) in conformity with the agricultural biotechnology policy for the well being of farm families, food security of the nation, health security of the consumer and security of trade in farm commodities," Swaminathan pointed out.

Though the ministry held widespread consultations on the draft bill with stakeholders over the months, a similar exercise with the legal fraternity on the regulatory mechanism is scheduled this month.

"As I believe that the process is as important as the end product (that is, Act), the next consultation is due with lawyers to evolve a consensus on the regulatory mechanism. Hopefully, this process will be completed by the end of this month to introduce the bill soon in parliament to enact the Act," Swaminathan noted.



CREAM OF THE (WEB) CROP

harvesting the best from the worldwide web

This month we feature the **Agbioforum** website (<http://www.agbioforum.org/>).

THIS MONTH'S PICK:

Agbioforum

<http://www.agbioforum.org/>

AgBioForum is the website for the publication of the Journal of Agrobiotechnology Management and Economics; an on-line journal focusing on the interactions of agrobiotechnology with economics and with sociopolitical processes. Both invited and submitted articles are published and the Journal is intended to provide a forum where academics, private and public sector analysts, and decision makers can present timely scientific evidence to enrich the ongoing public debate regarding the economic and social impacts of agricultural biotechnology. Towards this goal, the Journal is available for free via the website as it is hoped this will ensure a wide readership. The website states that the aim is leading the way to socially responsible and economically efficient decisions in science, public policy and commercialization.

AgBioForum is edited at the University of Missouri-Columbia with the assistance of advising editors from all areas of its intended audience, including academia, private sector, and government. The editorial board is mainly comprised of senior academics, most from universities in the United States and Canada, but with representation from Europe as well. Government and private sector groups are also represented on the editorial board, providing an insight into the areas of commercialization and public policy that are central to the Journal's core aim. With ten years of history since beginning publication in 1998, the Journal has gained a reputation as a source of unbiased discussion of the issues surrounding the introduction of agricultural products developed through the use of biotechnology.

The focus on policy and economics makes the Journal somewhat different from the usual scientific publications that address scientific breakthroughs and treat research and development as the ultimate goal. By considering economic impacts, a successful product is defined more by

the adoption at farm level than by the science underlying its development, something that can be lost in scientific articles written by the scientists who develop the technology. Similarly, the intended and realized outcomes of policies for both supporting and regulating agrobiotechnology are rarely included in scientific journals, often instead being the subject of press releases from groups with set agendas. As such, the Journal provides a forum which, if not unique, is certainly rare in at the present time.

A quick review of the titles of articles in back issues reveals a strong focus on public perception and communication issues in addition to discussions of product labeling. Early volumes were themed, but as both the field and the Journal have grown, there is now more variety in the papers, although some themed volumes are still published, the most recent being a special issue on biofortified crops and the progress and prospects for these crops in developing countries.

Readers are encouraged to supply feedback or comments through two different types of electronic forms: (1) feedback to specific articles and (2) feedback to AgBioForum as a whole. Any comment submitted to AgBioForum through the first form is automatically posted in a password-protected area, in which the corresponding authors have exclusive access. In this way, AgBioForum facilitates communication between readers and authors. Any comment submitted through the second form is solely used for improving AgBioForum.

AgBioForum is offered free of charge, but membership is available. Membership to AgBioForum is available free of charge and members receive occasional Delphi and expert forecasts on key trends in the agrobiotechnology industry. Members also receive e-mail notifications when new issues of AgBioForum are published. In addition, members influence the content of AgBioForum by receiving priority on their comments and suggestions in designing special issues and, more broadly, in determining topical coverage.

AgBioForum is indexed/abstracted in AGRICOLA, BIOSIS Previews, Biological Abstracts, CAB International (CABI), EconLit, Journal of Economic Literature

The screenshot shows the AgBioForum website interface. At the top, it displays the logo 'AgBioForum' and the subtitle 'The Journal of Agrobiotechnology Management & Economics'. Below this, there is a search bar with a 'Go' button. The main content area features a highlighted article snippet: 'Biotechnology research has already revolutionized agricultural production for many crops around the world and is expected to ultimately change the way food is produced and distributed. For those who have observed its thirty-year history, it has been also clear that agrobiotechnology is not an abstract technical process.' To the right of the main content, there is a sidebar with various navigation links including 'About AgBioForum', 'Welcome to ABF', 'Editorial Board', 'Privacy Policy', 'Copyright Policy', 'Author Services', 'Submission Guidelines', 'Manuscript FastTrack™', 'Member Services', 'Become a Member', 'Membership Benefits', 'Feedback', 'Contact Us', and 'Comment on ABF'. At the bottom of the page, it shows the ISSN number 1522936X and a copyright notice for 2007.

The following papers were published recently and may be of interest to readers of the SABP newsletter.

FORBIDDEN FRUIT: TRANSGENIC PAPAYA IN THAILAND

Plant Physiology - Volume 147 Issue 2 Pages 487-493, June 2008

Dressed in white, hooded "personal protection suits," Greenpeace activists donned goggles, gloves, and respiratory masks—the kind of dress you expect to see in the clean zone of a nanotechnology laboratory, not in a field in bucolic northeast Thailand. Easily bridging a barbed wire fence with a stepladder, they began pulling transgenic papaya (*Carica papaya*) from the trees, throwing the fruit into biohazard waste bins. The protestors stood for photographs—the press had been alerted—before a large yellow banner printed both in Thai and English that read: "Stop GMO Field Trials."

It was July 27, 2004—doomsday for agricultural biotechnology in Thailand. The protest at the Thai Department of Agriculture's (DOA) confined field trial set into motion a countrywide moratorium on all field testing of transgenic crops. Since the 1980s, the country had been a regional leader in developing a competitive biotechnology sector.

What went wrong? This is not an exceptional case. Since 1998, virus-resistant papaya had been grown widely in Hawaii, but had failed to be commercialized in many other places. This is despite the fact that genetically engineered or genetically modified (GE or GM) virus-resistant papaya is close to an ideal "pro-poor" GE crop.

The aim of this essay is to contrast the rapid and widespread adoption of transgenic papaya in Hawaii, where it saved an industry, with that of Thailand, where it has yet to be approved for commercialization—even though in some regions virus infection rates are as high as 100% and yields are dramatically reduced. Understanding the political and social factors that stymied this promising technology in Thailand may help in devising better strategies for introducing the next generation of biotechnology crops to other countries.

To read the full article go to <http://www.plantphysiol.org/cgi/content/full/147/2/487>

**GLOBAL IMPACT OF BIOTECH CROPS:
SOCIO-ECONOMIC AND ENVIRONMENTAL EFFECTS
1996-2006**

A report published in June 2008 by PG Economics Ltd, UK

Biotech crop commercialization has resulted in significant global economic and environmental benefits and is making important contributions to global food security.

"Since 1996, biotech crop adoption has contributed to reducing the release of greenhouse gas emissions from agriculture, decreased pesticide spraying and significantly boosted farmers' incomes," said Graham Brookes, director of PG Economics, co-author of the report. "The technology has also made important contributions to increasing the yields of many farmers, raising global production and trading volumes of key crops. World price levels of crops like corn and soybeans would also probably be higher than the current (record high) levels if this technology had not been widely adopted by farmers. These economic and environmental gains have also been greatest in developing countries"

Some of the findings of the comprehensive study are:

- Biotech crops have contributed to significantly reducing the release of greenhouse gas emissions from agricultural practices;
- Biotech crops have reduced pesticide spraying by 286 million kg (-7.8%: equivalent to about 40% of the annual volume of

pesticide active ingredient applied to arable crops in the European Union);

- There have been substantial net economic benefits at the farm level amounting to nearly \$7 billion in 2006 and \$33.8 billion for the eleven year period;
- Farmers in developing countries obtained the largest share of the farm income gains in 2006 (54%) and over the eleven year period obtained 49% of the total (\$33.8 billion) gains;

GM Crop farm income benefits 2006: developing versus developed countries: million US \$.

	Developed	Developing	% Developed	% Developing
GM HT soybeans	1,263	1,828	40.9	59.1
GM IR maize	992	139	87.8	12.2
GM HT maize	274	22	92.7	7.3
GM IR cotton	434	1,715	20.2	79.8
GM HT cotton	12	9	57.4	42.6
GM HT canola	227	0	100	0
GM VR papaya and squash	26	0	100	0
Total	3,228	3,713	46.5	53.5

Developing countries include all countries in South America

- The cost farmers paid for accessing GM technology in 2006 was equal to 28% of the total technology gains; and
- For farmers in developing countries the total cost of accessing the technology in 2006 was equal to about 17% of total technology gains, whilst for farmers in developed countries the cost was 38% of the total technology gains;

Full report available to download at: <http://www.pgeconomics.co.uk/pdf/globalimpactstudyjune2008PGEconomics.pdf> . A shorter version will soon be available in the scientific journal AgBioforum (currently in press). www.agbioforum.org

We welcome reader comments or suggestions.

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