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.

# CAPACITY BUILDING OF STATE BIOTECHNOLOGY COORDINATION COMMITTEES AND DISTRICT LEVEL COMMITTEES FOR ENSURING EFFECTIVE REGULATORY COMPLIANCE

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India has a regulatory framework in place for the development and evaluation of GMOs and products thereof. Rules notified in 1989 under Environment Protection Act, 1986 define the competitive authorities and composition of such authorities for the handling of all aspects of GMOs and their products. The six competent authorities notified under these rules are Recombinant DNA Advisory Committee (RDAC); Review Committee on Genetic Manipulation (RCGM); Genetic Engineering Approval Committee (GEAC); Institutional Biosafety Committees (IBSCs); State Biotechnology Coordination Committees (SBCCs) and District Level Committees (DLCs).

Out of the above SBCC and DLC are responsible for monitoring the activities related to GMOs in state/district level. As per rules SBCCs are to be constituted in all states and DLCs in all districts, wherever necessary and are the nodal points for interaction within a state or district. The composition and roles of both the committees are outlined in the tables opposite.

As of now, SBCCs and DLCs are functional in a limited manner only in a few states and districts. With the increase in the number of GMOs and their products released for commercial use as well as undergoing field trials, there is an urgent need to strengthen the functioning of these committees particularly by defining their roles in greater depth and the parameters to be covered in monitoring various activities.

Punjab is one of the few states that has a constituted SBCC under the chairmanship of the Chief Secretary and DLCs chaired by Deputy Commissioners and Chief Agricultural Officers as Conveners in districts where Bt

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### COMPOSITION AND ROLES OF SBCC AND DLC

| Composition* | |
|---|---|
| **SBCC** | |
| i. | Chief Secretary - Chairman |
| ii. | Secretary, Department of Environment - Member Secretary |
| iii. | Secretary, Department of Health - Member |
| iv. | Secretary, Department of Agriculture - Member |
| v. | Secretary, Department of Industries and Commerce - Member |
| vi. | Secretary, Department of Forests - Member |
| vii. | Secretary, Department of Public works / Chief Engineer, Department of Public Health Engineering - Member |
| viii. | State Microbiologists and Pathologists - Member |
| ix. | Chairman of State Pollution Control Board - Member |
| **DLC** | |
| i. | District Collector - Chairman |
| ii. | Factory Inspector - Member |
| iii. | A representative of the Pollution Control Board - Member |
| iv. | Chief Medical Officer (District Health Officer) – Member (Convenor) |
| v. | District Agricultural Officer - Member |
| vi. | A representative of the Public Health Engineering Department - Member |
| vii. | District Microbiologists Pathologist (Technical Expert) - Member |
| viii. | Commissioner Municipal Corporation - Member |

* The Committees may co-opt other members / experts as necessary.

| Role | |
|---|---|
| **SBCC** | |
| ▪ | To act as nodal agency at state level to assess the damage, if any, due to release of GMOs and to take on-site control measures. |
| ▪ | To review the safety and control measures in various industries/ institutions handling GMOs/hazardous microorganisms. |
| ▪ | Powers to inspect and take punitive action in case of violations of statutory provisions through the nodal department. |
| ▪ | To coordinate the activities related to GMOs in the State with the Central Ministries. |
| **DLC** | |
| ▪ | To monitor the safety regulations in installations engaged in the use of GMOs / hazardous microorganisms and its applications in the environment. |
| ▪ | To visit installations engaged in activities involving genetically engineered organisms, hazardous organisms, formulate information charts, find out hazards and risks associated with each of these installations and coordinate activities with a view to meeting any emergency. |
| ▪ | To inspect, investigate and report to the SBCC or the GEAC about compliance or non compliance of r-DNA guidelines or violations under EPA. |
| ▪ | To act as nodal agency at District level to assess the damage, if any, due to release of GMOs and to take on site control measures. |

ACTIVITIES

## CALENDAR OF EVENTS

**INDIA**

| Event | Organization | Date | Place |
|---|---|---|---|
| AgriBio2007 – International Conference on Agricultural Biotechnology | Federation of Indian Chambers of Commerce and Industry (FICCI), Department of Biotechnology (DBT) and Indian Council of Agricultural Research (ICAR) | September 17 and 18, 2007 | New Delhi |
| Advanced Biochemical and Molecular Techniques | Centre of Advanced Studies in Biochemistry Division of Biochemistry Indian Agricultural Research Institute (IARI) | September 18 to October 8, 2007 | IARI, New Delhi |
| National Level "Training Workshop on Biosafety Regulatory Frame Work: Assessment, Decision, Implication and Public - Private Interface" | Madurai Kamaraj University (MKU) and Ministry of Environment and Forests (MoEF) | September, 26 to 28, 2007 | Madurai, Tamil Nadu |
| Farmers Awareness Workshops in Tamil Nadu, Andhra Pradesh and Haryana | Biotech Consortium India Limited (BCIL) and All India Crop Biotechnology Association (AICBA) | October – December 2007 | Tamil Nadu, Andhra Pradesh and Haryana |
| Short Course on Exploitation of Heterosis and Hybrid Seed Production in Major Field Crops | ICAR and Department of Plant Breeding and Genetics, Agricultural College and Research Institute, Killikulam, Vallanad | October 3 to 12, 2007 | Agricultural College and Research Institute, Killikulam, Vallanad, Tamil Nadu |
| International Training Programme on Tissue Culture and Cryo-preservation of Plant Genetic Resources | National Bureau of Plant Genetic Resources (NBPGR) | November 2007 | New Delhi |

**Capacity Building -** *continued from page 1*

cotton trials / cultivation is being carried out and Chief Medical Officers as Conveners in the rest of the districts. Punjab State Council of Science & Technology (PSCST) is the nodal agency for coordinating the meetings of SBCC and capacity building activities for the state.

Biotechnology is, however, a relatively new area. The biosafety issues associated with it are also new not only to the policy makers and public at large but even to the research fraternity. It is, therefore, very important to keep various stakeholders well informed about developments in this sector as well as the concerns involved. This intensive capacity building requires actions such as a series of awareness programmes for different target groups like researchers, farmers, voluntary organizations and media; circulation of published information in the local language; visits to the facilities; *etc*. Various stakeholders in the State should be able to assess risks and benefits in their proper perspective. Handbooks elaborating the role of SBCCs and DLCs should be prepared and widely circulated. The role of each member should be clearly outlined and explained. Proper meeting schedules should be fixed for SBCCs and DLCs as good practices.

Further, it is extremely important to have regular interaction with other regulatory committees *viz*. GEAC, RCGM and IBSCs within the state. PSCST has made some efforts in this direction by seeking regular reporting from IBSCs of the organizations involved in research and development in biotechnology in the state of Punjab and organizing capacity building programmes for varied target groups. The interaction between SBCC / DLCs and state agricultural universities is also extremely important in the case of activities involving GM crops. For this SBCCs and DLCs could co-opt more subject experts including representatives of state agricultural universities.

### SPOTLIGHT ON THE WORDWIDE WEB

Over the next number of newsletters we will be spotlighting some important websites, created by the Department of Biotechnology (DBT) and the Ministry of Environment and Forests (MoEF), that provide information on GMOs.

This month we feature the Indian GMO Research Information System (IGMORIS) (http://igmoris.nic.in). In the months ahead we will look at the websites of the Department of Biotechnology, Government of India; Indian Biosafety Rules & Regulations; Ministry of Environment and Forests, Government of India; Capacity Building on Biosafety; India Biosafety Clearing House; National Research Centre on Plant Biotechnology; Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India; and Biotech Consortium India Limited (BCIL). - Editor

# SPOTLIGHT ON THE WORLDWIDE WEB

## Indian GMO Research Information System (IGMORIS)

### (http://igmoris.nic.in)

Indian GMO Research Information System (IGMORIS) is a web based database on activities involving the use of GMOs and their products in India. It was established by the Department of Biotechnology, Government of India in association with Biotech Consortium India Limited. The primary purpose of this website is to make available objective and realistic scientific information relating to GMOs and their products under research, trials and commercial use pertaining to agriculture, pharmaceuticals, environment and industrial products to all stakeholders including scientists, regulators, industry and the public in general.


The website has brief profiles of all the organizations (institutions, universities and industries) working in the area of GMOs. The approval status of GMOs and their products has been included along with biosafety data of approved genetically modified crops. Information on the locations of field trials of genetically modified crops being conducted in the country is available on the website. It also has information on capacity building activities, funding organizations, documents/publications, *etc*.

Biotechnology research in India is funded primarily by government agencies such as DBT, CSIR, ICAR and ICMR. However, there is no single source from which consolidated information can be sourced for products based on GMOs. IGMORIS proposes to consolidate information on research and development activities throughout the country by incorporating details such as product or process, the institution and scientists, sponsors, *etc*. The information can be accessed through this website by all stakeholders including sponsoring agencies, scientists, regulators, industry and the public in general.

The collection of information for this database is being done by extensive networking and frequent periodic interaction with various public and private institutions and funding agencies all over the country. The information is placed in a user friendly form on the website with a facility to search the database for specific enquiries.

## CROP ENGINEERED TO GROW IN POISONOUS SOIL

Science Daily - August 30, 2007

When soils are too acidic, aluminum that is locked up in clay minerals dissolves into the soil as toxic, electrically charged particles called ions, making it hard for most plants to grow. In fact, aluminum toxicity in acidic soils limits crop production in as much as half the world's arable land, mostly in developing countries in Africa, Asia and South America.

Now, Cornell researchers have cloned a novel aluminum-tolerant gene in sorghum and expect to have new genetically-engineered aluminum-tolerant sorghum lines by next year.

The research, to be published in the September issue of Nature Genetics, provides insights into how specialized proteins in the root tips of some cultivars of sorghum and such related species as wheat and maize can boost aluminum tolerance in crops.

Sorghum is an important food crop in Africa, Central America and South Asia and is the world's fifth most important cereal crop.

"My lab has been working to identify the physiological mechanisms of plant aluminum tolerance as well as its molecular basis," said Leon Kochian, the paper's senior author, a Cornell adjunct professor of plant biology and director of the U.S. Department of Agriculture--Agriculture Research Service (USDA-ARS) Plant, Soil and Nutrition Laboratory at Cornell. "The reason this is significant is there are extensive areas of the earth's lands that are highly acidic, with pH of 5 or below [pH below 7 is considered acidic]. Most of these areas are in the tropics or subtropics, where many developing countries are located."

Kochian's research shows that in aluminum-tolerant sorghum varieties, special proteins in the root tip release citric acid into the soil in response to aluminum exposure. Citric acid binds aluminum ions very effectively, preventing the toxic metal from entering the roots.

Kochian and colleagues, including the paper's first author, Jurandir Magalhaes, who received his Ph.D. from Cornell in Kochian's lab and now directs his own lab at the Embrapa

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**Soil -** *continued from page 3*

Maize and Sorghum Research Center in Brazil, used genetic mapping to identify a single gene that encodes a novel membrane-transporter protein responsible for the citric acid release. The gene, they discovered, is only turned on to express the protein and transport citric acid when aluminum ions are present in the surrounding soil.

The researchers have now used the sorghum gene to engineer transgenic aluminum-tolerant *Arabidopsis thaliana* (a small mustard plant used in plant research because of its small genome and short life cycle) and wheat plants. Sorghum is harder to genetically transform, Kochian said.

The map-based cloning of this agronomically important gene in sorghum is helping advance this species as a model for further exploring the mechanisms of aluminum tolerance and discovering new molecular genetic solutions to improving crop yields, Kochian said.

"This research also has environmental implications for badly needed increases in food production on marginal soils in developing countries," said Kochian. "For example, if we can increase food production on existing lands, it could limit encroachment into other areas for agriculture."

The research is supported in part by the McKnight Foundation Collaborative Crop Research Program, the Generation Challenge Program, the National Science Foundation and the USDA-ARS.

## AGRI BIOTECH ON FAST TRACK IN INDIA

Economic Times - July 27, 2007

A recent report from the U.S. Department of Agriculture (USDA) says that agricultural biotechnology has emerged as one of India's fastest-growing biotechnology sectors. The USDA report said total Indian revenues from agricultural biotechnology rose to more than US$229 million during the 2006-07 fiscal year, "registering a growth of 55 per cent." Export revenue from agricultural biotechnology is said to have grown from US$8 million to US$11.6 over the same period. The report also states that the adoption of Bt cotton by Indian farmers has surged over the past five years, so that Bt cotton now makes up 70 per cent of the nation's cotton crop. The article says this figure conflicts with official data available from the Indian Agriculture Ministry. The ministry says that Bt cotton is planted on only 2.4 million hectares out of a total of 7.2 million hectares planted with cotton.

## GMO CROP LAUNCH DELAY HURTS SEED INDUSTRY

Economic Times of India - August 6, 2007

MUMBAI: India's hesitation to allow sale of genetically modified food and cash crops other than cotton is cramping growth of the biotech-based seed industry, players said.

After Bt cotton received the nod in 2002, the federal government has withheld approval for the commercialisation of any other genetically modified (GMO) crop.

Civil protests led to the Indian Supreme Court staying multi-location trials of GMO food crops. India's stringent bio-safety norms have also been partly blamed for the delay.

In the past, several state governments, including Andhra Pradesh, Tamil Nadu, Gujarat, Maharashtra and Karnataka have tried to control Bt cotton seed prices as cotton seed was an essential commodity.

However, the central government's decision to remove cotton seed from the list in February prompted the Andhra Pradesh government to introduce an ordinance to regulate prices in the state last week.

The ordinance aims to cut prices of the new Bt cotton seed variety, Bollgard II, by 21 per cent to 750 rupees per 450-gram packet. Other states may follow suit, say industry watchers.

"No clear policy directive, and state intervention into seed marketing, has affected the revenue of seed companies drastically," said S. Raghuraman, head of research with agri-sector research firm, Agriwatch.

The largest Indian GMO seed company, Mahyco-Monsanto Biotech (MMB), a joint venture between the Indian arm of Monsanto and privately held Mahyco, reported a revenue decline of 62 per cent to 1.5 billion rupees in 2006/07.

Monsanto India, which sells Bt technology to seed companies, has seen revenues erode since 2004/05. Last year its revenue fell seven per cent to 3.09 billion rupees.

Bt cotton has found favour with a section of the farmers due to higher yields and reduced pesticide costs. However, there is opposition to GMO crops on several counts, including higher cultivation costs. Trade sources said more than half of the cotton area is expected to be under GMO cotton in 2007 crop season, but a high adoption rate will not be enough for growth.

State intervention in fixing Bt cotton seed prices is to blame, said M.K. Sharma, managing director of MMB.

"Although adoption has been higher, earnings will be comparatively lower, thereby impacting new investments."

See the full article at: http://www.agbios.com/sabp_main.php?action=ShowNewsItem&id=8696

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