SOUTH ASIA
BIOSAFETY PROGRAM

Fourth Anniversary Edition

April 2009
Vol.5 No.4

NEWSLETTER

for private circulation only - not for sale

www.agbios.com/sabp

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.

BIOTECHNOLOGICAL RESEARCH ACTIVITIES AT BANGLADESH AGRICULTURAL RESEARCH INSTITUTE (BARI)

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Institutional Background

Bangladesh Agricultural Research Institute (BARI) is Bangladesh's largest multiple crop research institute dealing with most crops except those handled by specific research institutes that focus on rice, jute, sugarcane, cotton, tobacco and tea. BARI's scientists work in its administrative divisions, centers and stations as well as in its field facilities. With its broad mandate to conduct research in diverse agro-ecological disciplines, BARI's work ranges from cutting edge learning science to participatory research with the farmer. At present BARI deals with over 100 crops and has developed 547 technologies. These technologies include high-yield crop varieties, disease and pest management, fertilizer management, socio-economic studies, post-harvest processing and handling and farming systems.

Plant Biotechnology Research

In its endeavour to branch into emerging areas of agriculture, BARI initiated plant biotechnology research over 15 years ago. Its first step, taken in 1992-1993 with the financial support of the Food and Agriculture Organization of the United Nations, was to establish a tissue culture laboratory. Within six years, in spite of inadequate technical support, scientists were able to develop micro-propagation protocols for several fruits and ornamentals. In April 1998, to strengthen its ongoing plant biotechnology research activities, a full fledged Biotechnology Division was established. Divided into three sections, micro-propagation, cell and organ culture and molecular genetics and genetic engineering, ten scientists do advanced research on crop improvement through genetic transformation at its laboratory facility.

Plant Biotechnology Development

In addition to the research work being done at the Biotechnology Division BARI established three other tissue culture laboratory facilities:

- The Tuber Crops Research Centre (TCRC) for virus elimination program for potato.
- The Micro-Propagation Laboratory for Horticultural Crops at the Horticultural Research Center (HRC).
- The Oil Seed Research Project for the microspore culture of *Brassica* spp.

With financial support from the Agriculture Research Management Project an additional tissue culture research facility was established at the Agricultural Research Station, Pahartali, Chittagong in 2001. Recently the laboratory started micro-propagation of banana and jackfruit, meristem culture of local potato varieties for virus elimination and local orchid embryo culture.

The biotechnology work being conducted under the Biotechnology Division of BARI is mainly confined to development of *in vitro* regeneration protocols and genetic transformation of different cereals, pulses, vegetables and fruits. For the past few years the Biotechnology Division has been involved in developing bio-engineered crops with the technical assistance of Cornell University under a USAID grant. To develop shoot and fruit borer (*Leucinodes orbonalis* Guen.) resistant brinjal, the *Bt* gene has been introduced in nine of BARI's brinjal varieties. With the application of this technology it may be possible to save the approximately 32 per cent on total production cost that is currently being spent to purchase insecticides to control brinjal fruit and shoot borer (Tk.60 thousand per ha). After getting permission from the government, the confined field trials in three locations were completed in 2008.

In the same program the two most adapted potato varieties (Cardinal and Diamant) have been transformed with the RB gene expressing resistance against Late Blight (Phytopthora infestans). Confined trials of transformed potato at two locations were held from November, 2008 to February, 2009.

BARI scientists have developed *in vitro* regeneration protocols of the following crops:

- Cereal: anther culture of barley and maize.
- Oilseed: *Brassica* spp.
- Tuber Crop: potato.
- Fruit Crops: banana, jackfruit, pineapple, watermelon, strawberry, grapes, papaya, orange, pummelo and plantain.
- Vegetables: eggplant, teasle gourd, pointed gourd, okra, sweet gourd.

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CALENDAR OF EVENTS

Event	Organization	Date	Place
INDIA			
Emerging Issues in Food safety and Nutrition	International Life Sciences Institute - India	April 24, 2009	Hotel Le Meridien, New Delhi
One-day seminar on Biodiversity and Agribiotechnology	DBT and Jaypee Institute of Information Technology University, Noida	April 25, 2009	Jaypee Institute of Information Technology University, Noida
National Consultation on Access to Patented Knowledge in Biotechnology	The Energy and Resources Institute	May 1, 2009	TERI, New Delhi
A practical training course on "Genomics, transformation and molecular marker tools for crop improvement"	Department of Biotechnology & Molecular Biology, CCS Haryana Agricultural University	May 19 - June 9, 2009	CCS HAU, Hisar
A practical training course on "Techniques in plant tissue culture, genetic engineering and molecular biology"	Department of Biotechnology & Molecular Biology, CCS Haryana Agricultural University	May 19 - June 9, 2009	CCS HAU, Hisar
Bangalore BIO 2009	Department of IT and Biotechnology, Government of Karnataka and the Vision Group on Biotechnology	June 18 - 20, 2009	Bangalore
Applications of Biotechnology and Its Regulations	The Energy and Resources Institute (TERI)	August 4 - 21, 2009	New Delhi
INTERNATIONAL			
Measures of Hope and Promises Delivered: An International Conference on Socioeconomic and Environmental Impact Assessment of Biotech Crops	Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)	April 21 - 22, 2009	Bangkok, Thailand
4th Asia Pacific Biosafety Association Scientific Conference: Biosafety Without Borders	Asia Pacific Biosafety Association, Philippine Biosafety and Biosecurity Association and Temasek Lifesciences Laboratory	April 29 - 30, 2009	Hyatt Hotel & Casino, Manila, Phlippines
The Analysis of Agricultural Products for the Presence of Genetically Modified Organisms	National Institute of Genetic Engineering and Biotechnology (NIGEB), Tehran, Iran	May 10 - 12, 2009	NIGEB, Theran, Iran
Theoretical and practical course 'Developments in Biosciences for Enhanced Food and Environmental Biosafety'	Department of Molecular Biology and Biotechnology, Faculty of Science, University of Dar es Salaam, Dar es Salaam, Tanzania	August 18 to 30, 2009	Department of Molecular Biology and Biotechnology, Faculty of Science, University of Dar es Salaam
ABIC 2009: Agricultural Biotechnology for Better Living and a Clean Environment	National Center for Genetic Engineering and Biotechnology (BIOTEC), National Science and Technology Development Agency (NSTDA), Ministry of Science and Technology (MOST) and ABIC Foundation	September 22 - 25, 2009	Queen Sirikit National Convention Center, Bangkok, Thailand
Biosafety workshop on 'Theoretical Approaches and Their Practical Application in the Risk Assessment for the Deliberate Release of Genetically Modified Plants'	Wendy Craig (Biosafety Unit, ICGEB, Trieste, Italy)	October 12 - 16, 2009	ICGEB Conference and Meetings, Padriciano 99, I-34012 Trieste, Italy

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- Ornamentals: gladiolus, tuberose, orchid, rose, chrysanthemum and gerbera.
- Spices: ginger.
- Medicinal Plant: stevia.

Training organized by BARI

The following technology transfer and skills development training on plant tissue cultures for public and private sectors was organized by BARI:

- In 2000, under UTFANET, ten scientists, mainly from India, Nepal, Vietnam, Thailand and Sri Lanka, learned *in vitro* propagation techniques for jackfruit and pummelo.

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CREAM OF THE (WEB) CROP

harvesting the best from the worldwide web

THIS MONTH'S PICK:

Generation Challenge Programme (GCP)

http://www.generationcp.org/index.php

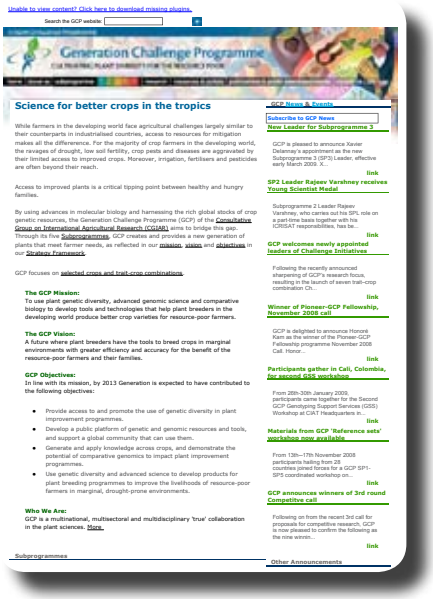
The Generation Challenge Programme (GCP) is a network of partners from advanced research institutes and national agricultural research programmes collectively working to improve crop productivity in drought-prone environments. GCP partners draw on plant diversity and new technologies to improve crops with desired traits, focusing on drought tolerance. Through its partners, GCP links basic science with applied research and helps to weave an effective and interactive community of crop researchers at both global and regional level. GCP is a programme of the Consultative Group on International Agricultural Research (CGIAR).

The GCP's mission is to use plant genetic diversity, advanced genomic science and comparative biology to develop tools and technologies that help plant breeders in the developing world produce better crop varieties for resource-poor farmers.

The GCPs vision is of a future where plant breeders have the tools to breed crops in marginal environments with greater efficiency and accuracy for the benefit of the resource-poor farmers and their families.

By 2013 GCP is expected to have contributed to the following objectives:

- Provide access to and promote the use of genetic diversity in plant improvement programmes.
- Develop a public platform of genetic and genomic resources and tools, and support a global community that can use them.
- Generate and apply knowledge across crops, and demonstrate the potential of comparative genomics to impact plant improvement programmes. Use genetic diversity and advanced science to develop products for plant breeding programmes to improve the livelihoods of resource-poor farmers in marginal, drought-prone environments.



The five GCP subprogrammes are:

- Crop Genetic Diversity
- Genomics towards gene discovery
- Trait Capture for Crop Improvement - The primary purpose of this subprogramme is to increase the efficiency, speed and scope of plant breeding.
- Bioinformatics and Crop Information Systems
- Capacity Building and Enabling Delivery

The GCP website is divided into five areas, each of which is further broken down as follows:

Subprogrammes

- Gives a summary of the focus and purpose of each programme along with links to recent news about subprogramme activities.

Research

- GCP project management policies and templates.
- A full list of GCP publications, sorted into programme publications and project publications, including reports, workplans, briefs, brochures, posters, learning materials, books, book chapters, journal articles, workshop proceedings, workshop papers, working papers, discussion papers, media coverage, academic dissertations and theses.
- Information about current, forthcoming and recent calls.
- Tropical Legumes 1 Project, which gives a history of and links to this special research project's plans, events and publications.

Resources and Portals

- Links to resources such as programme partner websites, crop and research resources, interactive help desks, journals, news sites, glossaries and training/employment opportunities.
- Bioinformatics portal, with links to public bioinformatics products of the Generation Challenge Program.
- Capacity Building Corner: Information about GCP training events, fellowship and grant opportunities, and other human resource development activities in the fields of plant genetic resources, genomics, and molecular breeding.
- Project Development Guide: Geared to GCP researchers and researchers considering submitting a proposal to GCP.

Publications & Public Awareness

- GCP news: Links to current and past issues of the GCP newsletter, GCP announcements and news items.
- Public awareness: Links to media coverage and press releases about GCP programmes.

Events

- Calendar of events includes detailed information and links to current and past GCP meetings and events as well as other relevant meetings and events.
- Detailed reports from past annual research meetings.

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- Several training courses were conducted for individuals and for researchers and technicians of different private and NGO sector biotech laboratories, namely, PROSHIKA, Grameen Krishi Founadation (GKF), Alpha Agro. The courses included introduction to laboratory design and construction, glassware and chemicals, media preparation, explant preparation of different fruits, vegetables and ornamentals, culture and subculture, medium term conservation of banana, and *ex vitro* plant establishment.
- BARI scientists have also supervised the work of two Ph.D. and 15 MS students of different universities.

Training received by BARI scientists:

- FAO and BARC training for the growth of biotechnology in NARS system.
- ABSP II training at foreign institutes in the development of transgenic brinjal and potato crops.
- South Asia Biosafety Program (SABP) in-country and foreign training workshops on conducting confined field trials of transgenic crops as well as their risk assessment and management.

Production trial activities have included:

- Banana plantlets derived from tissue culture were distributed among the progressive farmers of Jhenidha, Jessore, Narshindi, Agricultural Research Station, Pahartali, Chittagong, Sripur, Gazipur, Savar and Jamalpur. The performance was impressive and they were free from diseases. Fruit yield from tissue cultured plantlets was free from disease and better than the conventional suckers.
- TCRC tissue culture laboratory production of microtubers and disease free parental lines of true potato seed that are being supplied regularly to the government seed-supplying agency (BADC) as pre-foundation seed for the Bangladesh potato seed production program.
- The tissue culture part of the International Network for the Improvement of Banana and Plantain (INIBAP) and Coconut Genetic Resources Network (COGENT) research program is ongoing.

Future Thrust Area

In view of socio-economic improvement in Bangladesh, the following BARI mandated crops will be given priority for biotechnological improvement:

Crop	Characteristics to be improved
VEGETABLES	
Potato	Virus resistance
Tomato	Virus resistance and shelf-life
Eggplant	Shoot and fruit borer
Okra	Virus and shoot borer
FRUITS	
Banana	Bunchy top virus, Panama and Sigatoga
Papaya	Mosaic and Ring Spot virus
Cucurbits	Virus
CEREALS	
Wheat	Abiotic stress resistance

LUGAR/BORLAUG: A NEW GREEN REVOLUTION

The Washington Times - April 5, 2009

The world is not producing enough food, and many poor families cannot afford to buy the food that is available. As a result, nearly a billion people, a sixth of the Earth's population, do not have enough to eat.

This global food crisis erupted into public view last year when food prices spiked around the world and food riots and demonstrations rocked 19 countries, from Bangladesh to Egypt. Today's worldwide economic collapse threatens to push millions more into poverty, making them unable to buy enough food to feed their families.

The long-term prospects for global food supplies are equally troubling. Based on expected population growth, rising incomes and wider meat consumption, it is estimated that the world's farmers will have to double their output by 2050. They will have to do so in the face of rapidly depleting water supplies and the impact of climate change, which threatens altered weather patterns and droughts. Moreover, rising sea levels could submerge river deltas that are among the most agriculturally productive regions on Earth.

Attempting to double food production by increasing the acreage under cultivation would cause widespread deforestation and put significant stress on local ecologies. Farmers will have to get much higher yields from land already in production, requiring major investments in infrastructure and agricultural technology.

The hunger and related diseases resulting from food insecurity are a humanitarian tragedy: An estimated 25,000 people per day die of malnutrition-related causes. Hungry children suffer worst, with low survival rates, stunted bodies and impaired cognitive development. Moreover, hunger has profound implications for peace and U.S. national security. Hungry people are desperate, and desperation often sows seeds of conflict and extremism.

The causes of this calamity are many. Acute factors such as soaring energy prices, local droughts and bad decisions by food-exporting countries led to last year's price spike and exposed structural weaknesses in the world agriculture system. After the green revolution of the 1960s and 1970s seemingly vanquished the specter of world famine, the international community prematurely declared victory over hunger and let down its guard.

The world needs a new green revolution. The Lugar-Casey Global Food Security Act, S. 384, introduced in February, could help launch one.

See the full article at http://www.agbios.com/sabp_main.php?action=ShowNewsItem&id=10598

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