



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.

BIOTECHNOLOGY RESEARCH ACTIVITIES IN BANGLADESH RICE RESEARCH INSTITUTE (BRRRI)

Dr. Md. Shamsher Ali, Head Biotechnology Division, Bangladesh Rice Research Institute (BRRRI), Joydebpur, Gazipur – 1701, Bangladesh, Email: mds_ali2003@yahoo.com

Bangladesh is a large deltaic plain formed at the confluence of the Ganges, Brahmaputra and Meghna rivers. With its flat topography, abundant water and sub tropical climate, it is an excellent habitat for rice plants. It makes sense then that rice has become the staple food of its people and has been associated historically with their culture, rites, and rituals.

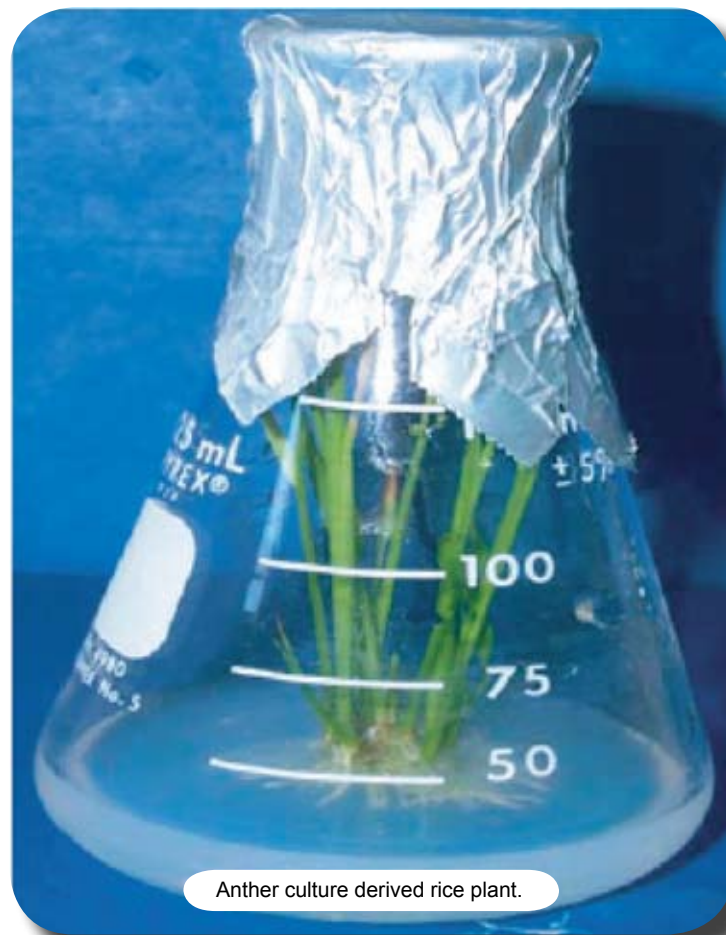
Over time, as its population increased, the gap between rice production and food requirements widened. To feed the increasing population it became essential to make radical changes in rice production, replacing low-yielding traditional varieties and age old production practices with high-yielding varieties and improved production.

Bangladesh Rice Research Institute (BRRRI) is a major component of the National Agricultural Research System (NARS) of Bangladesh. Its focus is research and development for rice production. The institute, formerly known as the East Pakistan Rice Research Institute (EPRI), was established on October 1, 1970 at Joydebpur, a small township 36 km north of the capital city Dhaka. After independence in 1971, the institute was renamed Bangladesh Rice Research Institute (BRRRI). The institute has 18 research divisions, Plant Breeding; Biotechnology; Genetic Resource and Seed; Soil Science; Plant Physiology; Irrigation and Water Management; Agronomy; Rice Farming System; Plant Pathology; Entomology; Adaptive Research; Agricultural Economics; Agricultural Statistics; Training; Farm Machinery and Post Harvest Technology; Workshop and Machinery

and Maintenance; Grain Quality and Nutrition; and Farm Management

BRRRI has a total manpower of 673 of whom 238 are scientists, about one third of which are highly trained professionals with PhDs.

The institute is equipped with modern research facilities that include laboratories, greenhouses and experimental fields. BRRRI has a modern germplasm bank, eight major laboratories, three greenhouses, four net houses and a 45-ha experimental farm at its headquarter at Gazipur. Seven of its nine regional stations have reasonably good research facilities, particularly at the field levels.



Anther culture derived rice plant.

For the past 37 years BRRRI has served Bangladesh by developing high-yielding rice varieties and improving production practices, which have been instrumental in almost tripling the annual rice production. Consequently, BRRRI has earned an excellent reputation in Bangladesh as well as in the world rice community.

The institute has developed 49 inbred and two hybrid varieties suitable for cultivation in different agro-ecological zones and seasons.

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CALENDAR OF EVENTS

Event	Organization	Date	Place
INDIA			
Bangalore BIO 2009	Department of IT and Biotechnology, Government of Karnataka and the Vision Group on Biotechnology	June 18 - 20, 2009	Bangalore
International Symposium -- Second Green Revolution: Priorities, Programmes, Social and Ethical Issues	School of Biosciences of Mar Athanasios College for Advance Studies, Tiruvalla and Rajiv Gandhi Center for Biotechnology, Thiruvananthapuram	July 2 - 4, 2009	Thiruvananthapura, Kerala
Training Course -- Applications of Biotechnology and Its Regulations (Please see details about this training course on page 4 of this newsletter.)	The Energy and Resources Institute (TERI)	August 4 - 21, 2009	New Delhi
International Conference -- Challenges in Biotechnology and Food Technology	Department of Technology, Annamalai University, Annamalai Nagar	August 26 - 28, 2009	Annamalai Nagar
National Seminar -- Bt Cotton: Opprtunities and Prospects	Central Institute of Cotton Research	September 10-12, 2009,	Nagpur
INTERNATIONAL			
AgriGenomics World Congress 2009	Select Biosciences	July 2 - 3, 2009	London, England
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 - 30, 2009	Department of Molecular Biology and Biotechnology, Faculty of Science, University of Dar es Salaam
International Short Course -- Agricultural Biotechnology	Institute of International Agriculture, Michigan State University	September 13 - 25, 2009	Michigan State University
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
Measures of Hope and Promises Delivered: An International Conference on Socioeconomic and Environmental Impact Assessment of Biotech Crops	South Asian Regional Centre for Graduate Study and Research in Agriculture (SEARCA), International Service for the Acquisition of Agri-biotech Applications (ISAAA) and International Food Policy Research Institute (IFPRI)	September 29 - 30, 2009	Bangkok, Thailand
International Conference -- Knowledge Management in Biotechnology Transfer and Adoption in Southeast Asia: Lessons Learned, Policy Issues and Directions"	SEARCA	October 1 - 2, 2009	Bangkok, Thailand
Biosafety Workshop -- '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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In recognition of its outstanding contribution in the field of rice research and development, BRRRI has been honoured with many national and international awards.

BIOTECHNOLOGY RESEARCH DIVISION OF BRRRI

Biotechnology is a major component of the varietal development program where it can be used to generate materials to suit special demands such as high yield, quality, stress tolerance and bio-fortification. Other techniques in biotechnology are also utilized such as *in vitro* culture, transformation protocols, marker assisted selection (MAS) and DNA finger printing to improve modern varieties and land races.

PRESENT RESEARCH PROJECTS

- Development of stress (biotic and abiotic) tolerant varieties.
- Development of premium quality rice varieties.
- *In vitro* response studies (tissue culture).
- Gene pyramiding through marker assisted selection.
- Rice transformation studies and evaluation of GMOs.

MAJOR ACHIEVEMENTS/FINDINGS

Protocols has been developed for *in vitro* plant regeneration from anthers, young panicles, mature and immature embryos and *in vitro* regeneration systems have been optimized for 20 BRRRI released varieties for future transformation studies. In

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CREAM OF THE (WEB) CROP

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THIS MONTH'S PICK:

GMO Safety

<http://www.gmo-safety.eu/en/>

- Home
- News
- Science live
- Focus
- Coexistence
- Debate
- Maize
- Grain
- Potato
- Oilseed Rape
- Woody Plants
- Monitoring
- Gene Transfer
- Database
- Biosafenet
- Glossary
- Links
- Photos
- New
- Archive

The Internet portal [gmo-safety.eu](http://www.gmo-safety.eu) provides up-to-date clear and intelligible information about current and past biosafety research into genetically modified plants in Germany.

The focus is on projects supported by the German Federal Ministry of Education and Research (BMBF).

The sections 'Maize', 'Grain', 'Potatoes', 'Oilseed rape', 'Woody plants', 'Monitoring' and 'Gene transfer' provide comprehensive basic information about the key BMBF-funded research areas. A database with summaries of research topics, methods and results ('Database') is supplemented by exciting insights into the everyday working lives of researchers ('Science live'), background reports on individual topics ('Focus') and news stories on everything to do with biological safety research both in Germany and at international level ('News'). The 'Debate' section is designed to enliven the discussion about green genetic engineering by offering new perspectives and surprising points of view – this section regularly presents interesting texts on scientifically and socially relevant topics. There is also a glossary with key terms, a photo database and a schools

portal (German only) with suggestions for teachers.

The information portal is designed to make research findings on the environmental safety of genetically modified plants accessible to the interested public and to contribute towards objective, responsible opinion-forming. The site is run on behalf of the



BMBF by an independent editorial team consisting of Genius GmbH – Wissenschaft & Kommunikation (Darmstadt), TransGen (Aachen) and the TÜV Nord Group. The content is produced in close collaboration with the scientists in the research groups. The summaries of research projects in the database are approved for publication by the scientists concerned to ensure that the results are presented correctly.

Bacillus thuringiensis (Bt)

Soil bacterium used for biological pest control - produces a crystalline protein toxic to certain types of insects.



Bt toxin is produced by *Bacillus thuringiensis* in an inactive form (protoxin), which is transferred to its active form (delta-endotoxin) in the guts of certain insects. The active toxin binds to receptors in the gut, killing the insect.

E. coli bacteria

Gut bacterium that plays an important role in genetic engineering



The bacterium *Escherichia coli*, found in the gut flora of humans and animals, is the "pet" of microbiologists.

Genetically engineered *E. coli* strains are used for the production of many proteins - e.g. insulin and other pharmaceutical agents. *E. coli* is also used as a system for multiplying gene sequences or vectors in laboratories (cloning).

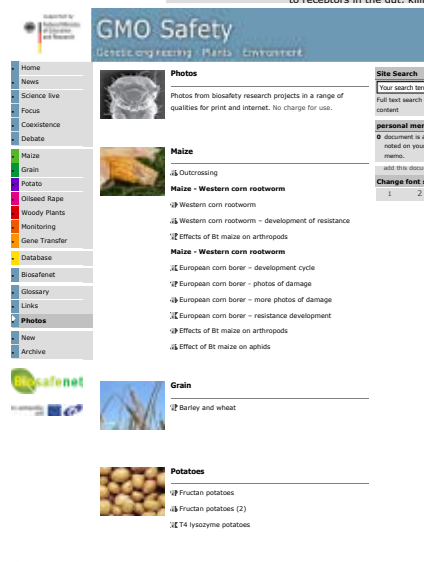
Plant genetic engineering also uses *E. coli*. The bacteria are often used to make many copies of a gene construct that will eventually be transferred into a plant.

E. coli has historically been the most researched organism in molecular biology and genetics. Its genome has completely been sequenced and the functions of most of its 4,288 genes have been characterised.

See also

- Gene Construct
- Plasmid
- Proteins
- Transformation
- Vector

close window



BRRRI - continued from page 2

particular, BR5 has been established as a highly responsive variety for both culture and regeneration, and can be used as standard for rice *in vitro* culture. Through this work, tissue culture and regeneration ability of some aromatic and fine grain rice varieties (BR5, BRRRI dhan28, Hasansarai, Kalizeera and Kataribhog) was found to be inversely proportional to the concentration of different salts with sodium salts at lower levels (0.5 - 2.4 g/l) found as an effective trigger of callus induction.

As well as the methodological improvements noted above, four advanced salt tolerant breeding lines were identified and it is hoped that these will be released as future varieties. Also, three homozygous awnless lines have been regenerated from BR4828-54-4-1-4-9 that may also be developed as future varieties. All BRRRI released varieties are now characterized using molecular markers, which will aid both identification and further breeding.

As part of the international collaborative effort on Golden Rice, BRRRI has carried out confined glasshouse evaluation of the agronomic performance of two Golden BRRRI dhan29 lines (Event #1).



Contained greenhouse trial of Golden rice.

In addition to the present projects, in the future research is expected to focus on the isolation of useful genes and their characterization, especially genes underlying quantitative traits. Further development and evaluation of transgenic plants, including safety assessment will also be an important research area. Molecular characterization of local germplasm to protect against loss of this resource through bio-piracy is also of interest in Bangladesh and will be undertaken.

Scientific manpower of the Biotechnology division includes Dr. Md. Shamsher Ali, Chief Scientific Officer; Dr. Md. Enamul Hoque, Principal Scientific Officer; Mrs. Shahanaz Sultana, Senior Scientific Officer (now abroad for higher studies); Mrs. Jannatul Fredous, Senior Scientific Officer; Dr. Nilufar Yasmin Sheikh, Senior Scientific Officer; and S.M. Hisam Al Rabbi, Scientific Officer.

We welcome reader comments or suggestions.

E-mail your letters to: nringma@agbios.com **Mail**

your letters to: The Editor, SABP Newsletter, P.O. Box 475, Merrickville, Ontario, K0G 1N0 Canada

TRAINING PROGRAMME FOR ITEC/SCAAP NATIONALS TO BE HELD AT TERI UNIVERSITY

TERI University is pleased to announce a training course for early/mid-career government/non-government professionals from the 156 ITEC/SCAAP countries. The course, 'Application of Biotechnology and its Regulation', will be conducted at TERI from August 4 to 21, 2009.

The course will combine classroom lectures with field visits and study tours. It will be held at the TERI complexes in the National Capital (Delhi) region and TERI regional centers in India.

The course aims to provide a unique blend of theory and practice in biotechnology. It provides a basic understanding of biotechnology, environmental and bio-ethical concerns of new technologies and legal framework for biosafety regulations and risk assessments and management. It also looks at international frameworks to regulate trans-boundary movements of living modified organisms.

The course will include an overview of biotechnology; an introduction to traditional biotechnologies and basic scientific concepts of biotechnology; *in vitro* method of cloning; rooting of shoots; application of biotechnology in agriculture; molecular markers for DNA fingerprinting and molecular breeding; biofertilizer concept, biopesticide; biofuels; bioinformatics; biosafety issues and regulatory guidelines; a visit to IARI (Indian Agricultural Research Institute); a visit to micro propagation technology park/visit to a seed company/transgenic trial.

To apply, fill in the ITEC/SCAAP application form (downloadable from <http://itec.nic.in/form.htm>) and submit it to the nodal government department/agency designated to nominate candidates. The nodal department/agency will in turn forward the applications to the embassy/high commission of India. Selected participants will be informed by the Indian embassies of the respective ITEC/SCAAP countries.

For further information, please contact

Course Coordinator: Dr. Vibha Dhawan
E-mail: Vibhad@teri.res.in

ITEC Coordinator: Ms Swati Ganeshan
E-mail: swati.ganeshan@teri.res.in

For more information go to: http://www.teriin.org/index.php?option=com_events&task=details&sid=225.

SABP CONTACTS

South Asia

Dr. Vibha Ahuja
Deputy General Manager
Biotech Consortium India Limited
Anuvrat Bhawan, 5th Floor
210, Deendayal Upadhyaya Marg
New Delhi 110 002 India
Tel: 23219064-67
Email: vibhaahuja@biotech.co.in

Others

AGBIOS
106 St. John Street
P.O. Box 475
Merrickville, Ontario
K0G 1N0 Canada
Tel: +613-269-7966
Email: info@agbios.com

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