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NEWSLETTER

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SOUTH ASIA
BIOSAFETY PROGRAM

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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.

PATHOGEN DERIVED RESISTANCE TO VIRUSES IN PLANTS

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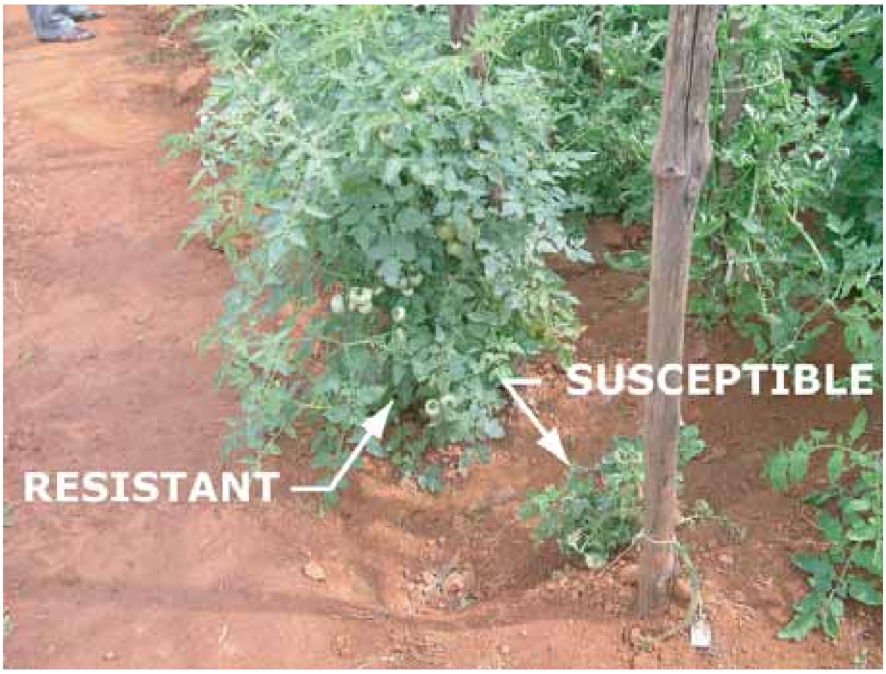
Developing plants resistant to viruses by incorporating genes from other cultivated varieties or wild relatives of the species by conventional breeding has been attempted by breeders worldwide. Such resistant varieties have been considered to be not only economical to cultivate but also to be environmentally friendly because of the reduction in the usage of pesticides that ensues in raising such crops. However, this source of resistance to viruses is not always readily available. Biotechnological tools have been used to widen the scope of sourcing resistance genes. Transfer of resistance genes by mechanisms other than conventional methods constitutes transgenic resistance.

The discovery by Sanford and Johnston in 1985 that the viral genes themselves can confer resistance when expressed by a transgenic plant opened up new possibilities, a mechanism that subsequently came to be referred to as pathogen derived resistance. In a number of cases expression of the coat protein gene constitutively by the plant conferred resistance to the virus from which the gene was derived. One of the most successful examples of this was the development and subsequent release of a papaya variety resistant to Papaya Ring Spot Virus (PRSV) in Hawaii. However, such resistance is often restricted to the strain of the virus from which the coat protein gene is derived thereby necessitating the development of transgenics for each strain. Subsequently several other viral genes that confer resistance have been used such as viral genes involved in: replication, the movement of the virus from cell to cell, the nucleocapsid protein, *etc*.

We, at the Indian Institute of Horticultural Research, Hessaraghatta, Bangalore, have developed a number of transgenic plants. These include, a transgenic tomato with resistance to Tomato Leaf Curl Virus (TLCV) using the replicase gene of the virus; a transgenic tomato with resistance to Peanut Bud Necrosis Virus (PBNV) and transgenic watermelon resistant to Watermelon Bud Necrosis Virus (WBNV) using the nuclepocapsid genes of the corresponding viruses; and, by using the viral coat protein gene, transgenic papaya with resistance to PRSV.

While it was realized that such transgenic plants make proteins that are otherwise present in an infected plant, and therefore, in some sense, do not pose special problems of allergenicity arising from the protein made by the transgene itself, fears of hetroencapsidation and emergence of new strains of viruses have become a concern. To overcome this problem, we have developed transgenic papaya with a non-translatable coat protein gene of PRSV and, in the case of TLCV, PBNV and WBNV, the constructs used are in an anti-sense orientation to the viral genome so as to invoke potential RNA-DNA or RNA-RNA hybrids that are then degraded by the host before they are translated.

In conclusion, transgenic technology is a viable alternative for conferring resistance to viruses especially in the absence of a conventional source of resistance. The biosafety concerns if any are minimal and the benefits accrued in terms of increased yield, sustainable agriculture and reduced use of pesticides are immense.



Transgenic tomato resistant to Tomato Leaf Curl Virus along with its susceptible control.

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
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
International Training Programme on Tissue Culture and Cryo-preservation of Plant Genetic Resources	National Bureau of Plant Genetic Resources (NBPGR)	November 2007	New Delhi

Bt COTTON HYBRIDS APPROVED FOR RELEASE BY GEAC FROM MAY – JULY 2007

Genetic Engineering Approval Committee (GEAC) has approved release of 73 new Bt cotton hybrids for commercial cultivation in different zones in India. With this the total number of hybrids available to farmers is 135. These hybrids have the following gene events incorporated: (1) *Cry1Ac* gene (MON 531 event); (2) *Cry1Ac* & *cry2Ab* (MON 15985); (3) *Cry1Ab-cry1Ac* (*GFM Cry1A*) gene; (4) *Cry1Ac* gene (Event 1).

Name of Company	Name of Hybrids	Gene Event	Zone
M/s Ajeet Seeds Ltd.	ACH-21	*cry1Ac* gene (MON 531 event)	South
	ACH-33-2 BG II (Ajeet-33)	*cry1Ac* & *cry2Ab* (MON 15985)	North & South
	Ajeet 155 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	Central
M/s Amar Biotech Ltd.	ABCH-1165 Bt	*cry1Ac* gene (MON 531 event)	Central & South
	ABCH-1220 Bt	*cry1Ac* gene (MON 531 event)	South & Central
M/s Ankur Seeds Ltd.	Ankur 2226 BG	*cry1Ac* gene (MON 531 event)	North
	Jai BG	*cry1Ac* gene (MON 531 event)	Central & South
	Akka BG	*cry1Ac* gene (MON 531 event)	Central & South
M/s Bayer Bioscience Pvt. Ltd.	SP-504 B1	*cry1Ac* gene (MON 531 event)	South
	SP-923 Bt (IT 923 Bt)	*cry1Ac* gene (MON 531 event)	Central
M/s Bioseeds Research India Pvt. Ltd.	6317 Bt	*cry1Ac* gene (MON 531 event)	North
	6488 Bt	*cry1Ac* gene (MON 531 event)	North , Central & South
	563 Bt	*cry1Ac* gene (MON 531 event)	Central
	322 Bt cotton	*cry1Ac* gene (MON 531 event)	Central
	110 Bt cotton	*cry1Ac* gene (MON 531 event)	Central
	340 Bt	*cry1Ac* gene (MON 531 event)	South
	6188 Bt	*cry1Ac* gene (MON 531 event)	South & Central
M/s Ganga Kaveri Seeds Ltd.	GK206 Bt	*cry1Ac* gene (MON 531 event)	North
M/s J.K. Agri Genetics Ltd.	JKCH-666 Bt	*cry1Ac* gene (Event 1)	Central
	JKCH-226 Bt	*cry1Ac* gene (Event 1)	Central
	JKCH-1050 Bt	*cry1Ac* gene (Event 1)	North
M/s Kaveri Seeds Ltd.	KCH-135 Bt	*cry1Ac* gene (MON 531 event)	Central & South
	KCH-707 Bt	*cry1Ac* gene (MON 531 event)	Central & South
M/s Krishidhan Seeds Ltd.	KDCHH 9810	*cry1Ac* gene (MON 531 event)	North
	KDCHB-407 Bt	*cry1Ac* gene (MON 531 event)	South
	621 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	South & Central
	KDCHB-786 Bt	*cry1Ac* gene (MON 531 event)	Central
	KDCHB-786 Bt	*cry1Ac* gene (MON 531 event)	Central

(table continues on page 3)

table continued from page 2

Bt COTTON HYBRIDS APPROVED FOR RELEASE BY GEAC FROM MAY – JULY 2007 (cont'd)			
Name of Company	**Name of Hybrids**	**Gene Event**	**Zone**
M/s Mahyco Seeds Ltd.	MRC 7017 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	North
	MRC 7031 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	North
	MRC-7160 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	South
M/s Namdhari Seeds (P) Ltd.	NAMCOT-402	*cry1Ac* gene (MON 531 event)	North
M/s Nandi Seeds (P) Ltd.	SDS 1368 Bt	*cry1Ac* gene (MON 531 event)	North
	SDS 9 Bt	*cry1Ac* gene (MON 531 event)	North
	NSPL-405 Bt	*cry1Ac* gene (MON 531 event)	Central & South
	NSPL-36 Bt	*cry1Ac* gene (MON 531 event)	Central & South
	NSPL-999 BG I	*cry1Ac* gene (MON 531 event)	Central & South
M/s Nath Seeds Ltd.	Kashinath (NFHB-109BT	(*cry1Ab-cry1Ac*) "*GFM cry1A*" gene	Central & South
	JKCH-634 Bt (JK Iswar Bt)	*cry1Ac* gene (Event 1)	South
M/s Navkar Hybrid Pvt. Ltd.	Navkar 5 Bt	(*cry1Ab-cry1Ac*) "*GFM cry1A*" gene	Central
M/s Nuziveedu Seeds Ltd.	NCS-950	*cry1Ac* gene (MON 531 event)	North & Central
	NCS 145 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	North
	NCS-207	*cry1Ac* & *cry2Ab* (MON 15985)	Central
	NCS-929 Bt	*cry1Ac* gene (MON 531 event)	South & Central
	NCHB-990 Bt	*cry1Ac* gene (MON 531 event)	South
	NCHB-992 Bt	*cry1Ac* gene (MON 531 event)	South
	NCS-145 BG II (Bunny)	*cry1Ac* & *cry2Ab* (MON 15985)	South
	NCS-955	*cry1Ac* gene (MON 531 event)	Central
	NCHB-991	*cry1Ac* gene (MON 531 event)	Central
	NCS-954	*cry1Ac* gene (MON 531 event)	Central & South
	NCHB-992	*cry1Ac* gene (MON 531 event)	Central
M/s Prabhat Agri Biotech Ltd.	PCH 406 Bt	*cry1Ac* gene (MON 531 event)	North
	PCH 115	*cry1Ac* gene (MON 531 event)	Central & South
	PCH 205 (earlier known as PCH-207)	*cry1Ac* gene (MON 531 event)	Central & South
	PCH-923	*cry1Ac* gene (MON 531 event)	Central
	PCH-930 Bt	*cry1Ac* gene (MON 531 event)	South & Central
M/s Pravardhan Seeds Ltd.	PRCH-31 Bt	*cry1Ac* gene (MON 531 event)	Central
	Rudra Bt	*cry1Ac* gene (MON 531 event)	Central & South
M/s Pro Agro Seeds (P) Ltd.	IT 905 BG I	*cry1Ac* gene (MON 531 event)	North
	SP 504BI (Dhanno) Bt	*cry1Ac* gene (MON 531 event)	Central
M/s Rasi Seeds (P) Ltd.	RCH-2 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	Central & South
	RCH-515 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	Central
	RCH 530 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	South
	RCH 533 BG II	*cry1Ac* & *cry2Ab* (MON 15985)	South
	RCH 386 BG I	*cry1Ac* gene (MON 531 event)	Central
M/s Tulasi Seeds (P) Ltd.	Tulasi 9 BG I	*cry1Ac* gene (MON 531 event)	Central
M/s Vibha Agrotech Ltd.	Sigma Bt	*cry1Ac* gene (MON 531 event)	North, South & Central
	Ole Bt	*cry1Ac* gene (MON 531 event)	North & South
M/s Vibha Seeds (P) Ltd.	Dyna Bt	*cry1Ac* gene (MON 531 event)	Central & South
	VBCH-1009 Bt	*cry1Ac* gene (MON 531 event)	Central
	VBCH-1010 Bt	*cry1Ac* gene (MON 531 event)	Central
M/s Vikram Seeds Ltd.	VICH-15 Bt cotton	*cry1Ac* gene (MON 531 event)	Central
M/s Zuari Seeds Ltd.	Dhruv Bt (ZCH-50064)	(*cry1Ab-cry1Ac*) "*GFM cry1A*" gene	Central & South

Source: http://www.envfor.nic.in/divisions/csurv/geac/biosafety.html

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

INDIA ALLOWS FIRST LARGE TRIALS OF GM FOOD CROP

Reuters - August 17, 2007

India has approved the first large-scale field trials of a genetically modified food crop, a senior government official said on Thursday.

A new hybrid variety of the popular brinjal vegetable, which promises better yields with less intensive use of pesticide, will be tested in the latest GM trials to be held in the country.

"We have allowed large-scale field trials of Bt brinjal," an official at the environment ministry, who could not be named, told Reuters.

India has allowed commercial cultivation of genetically modified cotton since 2002.

That decision led to large-scale protests by voluntary organizations, which said *Bacillus thuringiensis* or *Bt* cotton seeds were a health hazard and harmful for the environment.

But trade experts say the new technology has pushed up production and productivity.

"There has been less opposition to genetically modified seeds now as farmers have experienced higher yield due to *Bt* cotton cultivation," Sharad Joshi, a farmers' leader and lawmaker, said.

India, the world's second-largest cotton producer after China, overtook the United States with estimated output of 28 million bales (1 bale=170 kg) in the year to September 2007.

CLIMATE CHANGE LIKELY TO INCREASE RISK OF HUNGER - INDUSTRIALIZED COUNTRIES COULD GAIN IN PRODUCTION POTENTIAL, DEVELOPING COUNTRIES MAY LOSE

FAONewsroom - August 7, 2007

Climate change is likely to undermine food production in the developing world, while industrialized countries could gain in production potential, FAO Director-General Jacques Diouf said today in a speech at the M.S. Swaminathan Foundation Conference in Chennai, India.

"Crop yield potential is likely to increase at higher latitudes for global average temperature increases of up to 1 to 3°C depending on the crop, and then decrease beyond that," he said. "On the contrary, at lower latitudes, especially in the seasonally dry tropics, crop yield potential is likely to decline for even small global temperature rises, which would increase the risk of hunger."

Greater frequency of droughts and floods would affect local production negatively, especially in subsistence sectors at low latitudes, Dr. Diouf added.

"Rainfed agriculture in marginal areas in semi-arid and sub-humid regions is mostly at risk," he explained. "India could lose 125 million tons of its rainfed cereal production -- equivalent to 18 percent of its total production."

The impacts of climate change on forests and on forest dependent people are already evident in increased incidences of forest fires and outbreaks of forest pests and diseases. Climate change adaptation will be needed in a variety of ecosystems, including agro-ecosystems (crops, livestock and grasslands) forests and woodlands, inland waters and coastal and marine ecosystems, according to Diouf.

Science and technology must spearhead agricultural production in the next 30 years at a pace faster than the Green Revolution did during the past three decades, Dr. Diouf asserted.

"Exploiting the new biotechnologies, including in particular *in vitro* culture, embryo transfer and the use of DNA markers, can supplement conventional breeding approaches, thus enhancing yield levels, increasing input use efficiency, reducing risk, and enhancing nutritional quality," he said.

But, he cautioned, most genetically modified (GM) crops being cultivated today were developed to be herbicide tolerant and resistant to pests. Development of GM crops with traits valuable for poor farmers, especially within the context of climate change -- such as resistance to drought, extreme temperatures, soil acidity and salinity -- is not yet a reality.

"I cannot sufficiently underline the need to also address the needs of resource poor farmers in rainfed areas and on marginal lands," said Diouf. "Ensuring that new biotechnologies help achieve this goal, in full awareness of biosafety, socio economic and ethical concerns associated with the use of some of these technologies remains a challenge for the entire scientific community."

Noting that the theme of this year's World Food Day (15 October) is "The Right to Food," Diouf praised India for playing a pioneering and model role in implementing this right with contributions from all parts of society.

See the full article at: http://www.fao.org/newsroom/en/news/2007/1000646/index.html

PRECAUTIONARY PRINCIPLE LEFT OUT BY CODEX

Nutraingredients.com - July 30, 2007

Codex has agreed to exclude the controversial precautionary principle in its risk analysis standards, marking the end of a long battle between the EU and trade groups.

The final decision was made at the Codex Alimentarius Commission meeting in Rome this month when the 'Working Principles for Risk Analysis for Food Safety for Application by Governments' was finally adopted, excluding the precautionary principle.

See the full article at: http://www.nutraingredients.com/news/ng.asp?n=78594-codex-iadsa-crn-usa

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