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â€œIt is the right time to repeat the success of Bt technologyâ€?

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“It is the right time to repeat the success of Bt technology”

– Clive James, founder and chairman, ISAAA

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The Bt technology is enhancing the progress of agriculture sector and is catering to the needs of the growing population. Clive James, the founder and chairman of International Service for the Acquisition of Agri-biotech Applications, gives his insights on the Bt crops.

What was the status of Bt cotton in India in 2008?

In 2008, India planted Bt cotton on 7.6 million hectares of land equivalent to 82 percent of the total cotton area, up from 6.2 million hectare equivalent to 66 percent of the total cotton area in 2007. A record five million small and resource-poor farmers planted Bt cotton in 2008, which is significantly up from 3.8 million farmers in 2007. It is noteworthy that for a period of seven years (2002-2008), there was a 150 fold increase in Bt cotton cultivation in India.

On an average, cotton farmers increased their yield by 31 percent, reduced insecticides application by 39 percent and thenet profit increased by $250 (Rs 10,000) or more per hectare due to Bt technology. It is important to note that lepidopteron insects cause heavy losses to crops such as cotton, brinjal, okra and rice. Farmers apply heavy insecticides spray to control these insects but they escape repeated sprays as they bore into different parts of plant and live a concealed life. Bt technology is meant to effectively control lepidopteron insects and is completely safe for other non-target organisms, animals and human being.

What is the status of research on crops other than cotton?

Research is being done on cotton which is affected by lepidopteron insects such as American bollworm and pink bollworm and also brinjal that is attacked by fruit and shoot borer. Maize(European corn borer) and Rice(stem borer) are being developed with Bt technology to provide an alternate method for controlling extensive damage caused by borer insects in

these crops. Herbicide tolerant (effective weed management) crops such as cotton, maize, wheat, nutritional-enhanced potato and golden rice are also in line.

Can you brief us on the timelines for Bt crops other than cotton?

Bt brinjal is at the most advance stage of approval and the Genetic Engineering Approval Committee (GEAC) has approved experimental seed production in 2008. Other crops close to approval process include Bt rice, Bt okra, GM Potato, GM maize etc. It is important to note that these crops are strictly regulated and have to undergo rigorous science-based risk assessment which takes around 5-7 years along with preparation of extensive regulatory package prior to commercial approval. Bt brinjal, since its development in 2000, has undergone rigorous scientific tests, including toxicity and allergenicity evaluation as well as nutritional studies on rabbits, rats, carps, goats, broiler chickens and dairy cows to validate its safety as compared to its non-Bt counterparts. Further studies on pollen escape, effects on soil microflora and non-target organisms, agronomy, invasiveness and Bt protein degradation demonstrated that Bt brinjal does not affect beneficial insects such as aphids, leafhoppers, spiders and lady beetles.

What is the role of Bt crops in reducing the usage of pesticides?

Bt cotton is a good example of evidence. Traditionally, cotton consumed more insecticides than any other crop in India. The total pesticide market in India in 1998 is valued at $770 million, about 30 percent was dominated by cotton insecticides. This got reduced to 18 percent of the total pesticide market in 2006 whereas the market share for cotton insecticides declined from 42 percent in 1998 to 28 percent in 2006. This saving in insecticides between 1998 and 2006 coincided with the introduction of Bt cotton which occupied 3.8 million hectares equivalent to 42 percent of the hectarage of the cotton crop in 2006. More specifically, the sharpest decline in insecticides occurred in the bollworm market in cotton, which declined from $147 million in 1998 to $65 million in 2006, a 56 percent decrease, equivalent to a saving of $82 million in the use of insecticides to control cotton bollworm in 2006. Thus, insecticides used for controlling bollworm dropped by half when approximately half the cotton area (3.8 million hectares) was benefiting from controlling bollworm using Bt cotton. The introduction of Bt brinjal, Bt rice and Bt maize will further help farmers halve pesticides usages and it also brings the benefits to farmers, consumers and environment.

Which companies are presently involved with Bt research? How do you see the potential of Bt crops in India?

There are about 30 Indian private companies and many other public sector institutions are conducting research, focused on Bt and genetically modified crops, in India. The top indigenous companies that have been making substantial investment in R&D and establishing world class seed processing plants for various crops include Mahyco, Rasi Seeds, Vibha Seeds, JK Agrigenetics, Nath Seeds, Bejo Sheetal, Krishidhan Seeds, Bioseeds Research etc. Multinational companies like Monsanto, Bayer, DevGen, Syngenta, Dow AgroScience, Pioneer/Dupont etc. have also been developing collaborations with Indian companies. Bt cotton has doubled cotton production, halved insecticides usages and increased net profit to farmers thus making India the second largest cotton producer in the world. It is the right time to repeat the success of Bt technology in other important food crops.

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