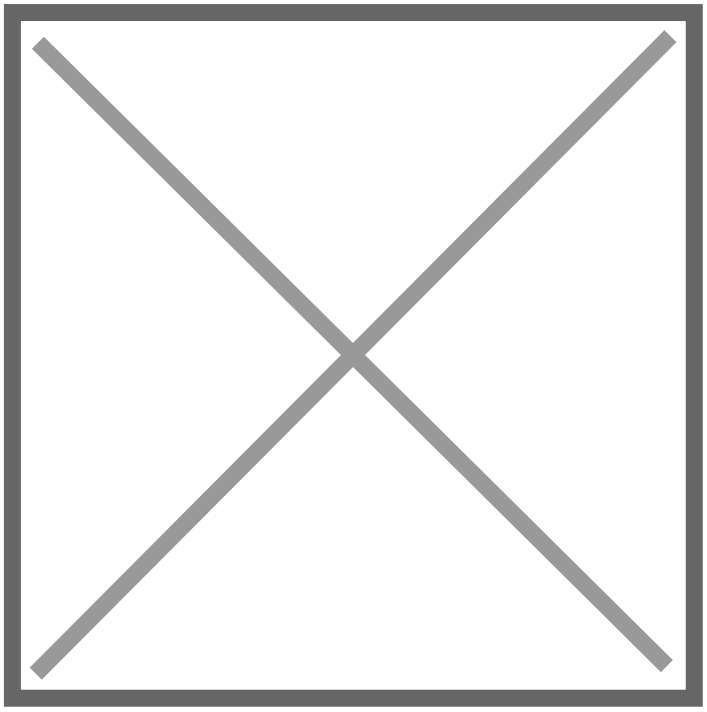
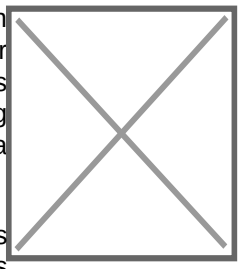


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By 2010, India can become a major grower of transgenic rice and several vegetables.



The commercial approval of the first transgenic crop in this country, Bt-Cotton happened after an unreasonable delay of several years in 2002. Since then, the importance of transgenic crops and other biotechnological tools in improving our crops is being increasingly recognized. While the farmers in this country have always been receptive to new technologies, the perception about transgenic crops among the other sections of the society, as reflected in what appears in the print and visual media, has seen a sea change - from outright cynicism to one of cautious acceptance.

It is clear that in an agrarian economy like ours biotechnology can effectively address the twin challenges of stagnating productivity and poor nutritional quality. The growing population and improving life-styles is pushing up the demand considerably. For e.g., it is estimated that we would need to produce at least 40 million more metric tons of rice by 2020 just to satisfy the internal demand, and this would not be possible with the current levels of productivity increases in rice, which is just under 1.5 percent per year. Infusion of new biotechnological tools in rice improvement programmes that has the potential to break the current productivity barriers is a powerful option.

The area under Bt-Cotton has increased over 20 times in the last three years of its commercial cultivation, in spite of its relatively high price. The tangible benefits conferred by this crop is for everyone to see and this has to a large extend silenced the full-time critics of agricultural biotechnology. The Government has also woken up to the enormous potential of such technologies and is keen to put in place policies and regulations which will promote responsible crop biotechnology. In short, agricultural biotechnology in this country is at the take-off stage.

Between 2002 and now, over a dozen hybrids carrying the Cry1Ac Bt-gene of Monsanto has been given commercial approval. This number will more than double, in the next two years with more licensees of this gene, going through the regulatory process. In parallel, several other organizations have introduced different Bt-genes into cotton and other crop species including rice and these are also under advanced testing. These organizations include several multinational and local companies, and several public research institutes. With increasing choices and the competition, the cost of Bt cotton technology to the farmer is bound to go down, while the area will grow from the present 15-20 percent to more than 90 percent of the hybrid-cotton area in the next five years.

Other crops in which transgenic technologies will be extensively deployed include rice and several species of vegetables and the traits of interest would be insect-protection, tolerance to drought and other abiotic stresses, tolerance to bacterial and fungal diseases, and nutritional enhancement. The research on modified crops expressing proteins of diagnostic and therapeutic value is still in its embryonic stage in the country, however, these efforts can also be expected to reach fruition by 2020.

Many seed companies in the country are beginning to invest significantly in crop biotechnology. Several of them already have capabilities to leverage Marker Assisted Selection technologies to augment their crop improvement programmes. They are now moving towards crop genetic transformation approaches, either by building the capabilities in-house, or by striking partnership with other institutions. Today, meaningful public-private partnerships are too few and far between, but growing need for development and sustained deployment of agricultural biotechnology products will foster many such relationships in the near future.

Today, the world grows over 80 million hectares of transgenic crops with North America leading the world in acreage under such crops. India has been a very recent entrant entrant in this league with the present transgenic-crop acreage constituting less than a percentage of total global acreage. If the current trend of growth of Bt Cotton is any indication, it will not be surprising if India beats North America to the number one position within the next 15 years.

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