

**Regional Consultation on Biotech Cotton for Risk Assessment and Opportunities
for Small Scale Cotton Growers
(CFC/ICAC 34FT)**

**National Institute for Biotechnology and Genetic Engineering, Faisalabad, Pakistan
March 6-8, 2007**

Summary Report

The Common Fund for Commodities approved the project 'Regional Consultation on Biotech Cotton for Risk Assessment and Opportunities for Small Scale Cotton Growers -CFC/ICAC 34FT' in July 2006 for a period of one year to end on June 30, 2007. The main objective of the project was to organize a consultation aimed at discussing all aspects of biotech cotton. The International Service for the Acquisition of Agri-biotech Applications served as the Project Executing Agency. The National Institute for Biotechnology and Genetic Engineering (NIBGE), Faisalabad, Pakistan hosted the consultation. Forty-three international participants from 27 countries plus 73 participants from Pakistan attended the meeting. A summary of the meeting is presented below.

1. Crop biotechnology applications and uses include tissue culture/embryo culture, DNA marker assisted technologies, diagnostics and genetic engineering tools. However, genetic engineering is the most popular commercial use of the technology in agriculture. Nine countries have commercialized biotech cotton so far, and around 36% of the world cotton area in 2006/07 was planted to biotech varieties.
2. Acceptance of biotech cotton depends on a range of issues related to agronomic factors, environmental concerns, farming systems and long-term sustainability of the technology. The technology developers and users have a challenge to maintain high quality stewardship programs to protect sustained use of the technology. Political support and national investment in biotechnology are also crucial for safe and economical use of biotechnology applications.
3. Concerns and apprehensions about the safety and sustainability of currently available biotech products in cotton have been raised. Most safety issues have been adequately addressed at the scientific level. Continuing research and integrating public awareness into the scientific process from the very beginning can effectively address many other concerns.
4. The first generation products have agronomic benefits in the form of lower insecticide use and better weed control, although better weed control may be accompanied by increased herbicide use. The second-generation products are expected to bring premium prices to cotton producers with products that benefit consumers too. Technology developers will benefit by gaining market share. The future traits for potential improvement in cotton include improved photosynthetic efficiency for achieving higher yield, improved tolerance to drought conditions, tolerance to high temperature, tolerance to chilling temperatures, improved salt tolerance and better fiber quality characteristics.
5. The regulatory process for development, approval, testing and commercialization of biotech products is cumbersome and expensive and limits the spread of the technology to developing countries. Countries like China (Mainland), India and Pakistan have developed their own genes against bollworms and sucking insects and are developing genes against other pests. The developed infrastructure may lower the cost of the technology. China (Mainland) already has 80% of the biotech cotton area under a locally developed Bt gene. It is important to incorporate the technology into locally adapted germplasm, as locally developed varieties are usually the

most suited to the prevailing environmental conditions, cropping systems and biotic constraints such as pests, and have production of higher quality. Also, more researchers need to be involved in the regulatory bodies set up by governments.

6. China (Mainland) and India have seen tremendous increases in yields since the adoption of biotech cotton. Small growers in South Africa have equally benefited from this technology, as did the growers in areas of Colombia with a high incidence of target pests. However, the insect resistant biotech varieties may not bring the same benefits to growers in areas/countries where the cost of controlling the targets insects is lower than the cost of the technology fee.

7. Transformation of traditional varieties for insect resistance and/or herbicide tolerance does not alter the fiber characteristics and spinning qualities desired by traditional markets. In practice markets do not identify biotech cotton contents in products but have interests in product properties based on cotton fiber characteristics. Safety studies on non-allergenicity and non-toxicity of biotech cotton DNA and proteins have alleviated fears about biotech bi-products, such as cooking oil and livestock feed cakes from cotton.

8. Only South Africa has commercialized planting of biotech crops in Africa, while five other countries, i.e. Burkina Faso, Egypt, Kenya, Mauritius and Zimbabwe, are field-testing biotech crops. Twenty African countries are engaged in biotechnology research. However, only Burkina Faso, Egypt, South Africa and Zimbabwe have functioning regulations and/or legislations to import, test and use biotech products. There is a need to improve strategic policy making for advancing sustainable production, research, trade and other biotechnology uses.

9. The experience in India shows that the Bt expression decreases as the crop matures, so the level of protection by the transgene decreases at later stages of plant development. The expression decrease needs to be monitored, particularly in long-duration varieties or growing conditions similar to Northern India and Pakistan.

10. Biotechnology research in cotton is limited due to a lack of technical staff, high cost of research and development work, controversies and opposition from policy makers, lack of financial support from governments, political skepticism that biotechnology is an economic maneuver by developed countries and private companies, costly risk management studies, narrow scope of Cry genes and inability to modify single cell (fiber) growth. Limitations could be alleviated through regional and international cooperation and networking.

11. The Government of Pakistan established the 'Pakistan Biosafety Rules' in April 2005. The Government also published the 'National Biosafety Guidelines' in May 2005. Roles of various organizations have been established, setting the stage for commercial use of biotechnology applications. Local researchers have developed a modified form of the Cry1Ac gene that has been extensively tested throughout the main cotton growing areas. The data show significant savings to growers in insecticide applications in spite of the fact that drought and temperature affected expression of the transgene. Farmers are demanding biotech varieties, but the government is still considering commercial release of biotech varieties.

12. 97% of the biotech cotton area in 2006/07 was located in three cotton producing countries. Six other countries are commercially growing biotech cotton and several others are testing or growing biotech cotton without the benefits of official regulatory approval. Unregulated use of biotech cotton is a major stewardship challenge that needs to be addressed to assure seed and product quality to cotton growers and sustainability of the technology.

13. The rate of adoption of biotech cotton in producing developing countries is slow due to various policy-related, regulatory, technical, and trade constraints. Partnerships and

international cooperation could help allow stakeholders to work more effectively for improving understanding of the technology and its commercial use.

Participation

Countries

Bangladesh, Bangladesh, Belgium, China (Mainland), Colombia, Egypt, Ethiopia, India, Indonesia, Kenya, Kazakhstan, Myanmar, Nigeria, Pakistan, South Africa, Sudan, Syria, Tanzania, Thailand, Turkey, Uganda, USA, Vietnam, Zambia and Zimbabwe

International Organizations

CIRAD-CA, France

Common Fund for Commodities

European Consortium for Agricultural Research in the Tropics -ECART

International Cotton Advisory Committee

International Service for the Acquisition of Agri-biotech Applications

Monsanto Company