

# CICR

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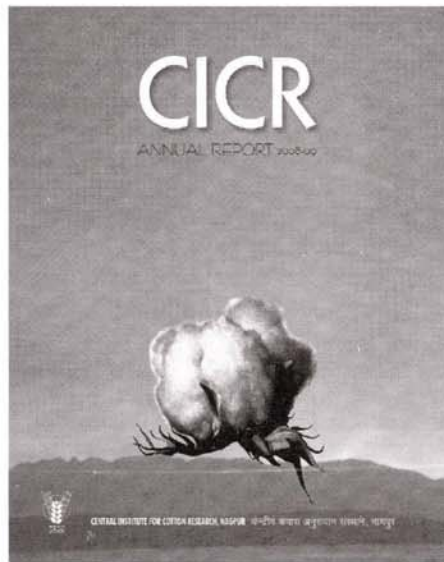
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## PREFACE

*The* cropping season 2008-09, with its unpredictable weather patterns all through, was challenging for all crops in the country. But, despite the vagaries, the cotton farmer still managed to produce a good harvest of 290 lakh bales. Amongst several useful technologies that have been playing an important role in enabling farmers to enhance production; 'Bt cotton' clearly appears to have been playing a key role. The area under Bt cotton reached 76 lakh hectares, thus accounting for nearly 80% of the area under cotton in India. Other crop production constraints such as mealybugs, mirid bugs, leaf retldening, wilt, leaf curl virus etc., were effectively dealt, through technologies developed under the leadership of CICR.. With constant support of the technologies developed under the leadership of the CICR, cotton production in India has progressed immensely in the recent 4-5 years. Apart from emerging as a major producer of organic cotton over the past 5 years, India has also emerged as a major cotton exporter with 85 lakh bales export in 2008 and 35 lakh bales in 2009. Nearly half of the global organic cotton is now produced by India. With the current production at 290 lakh bales in 2009, India ranks second in the world in cotton production after China, but, even its best productivity of 560 kg/ha, it ranks 24<sup>th</sup> rank in the list of 80 cotton producing countries. It is therefore important to address issues related to productivity, especially in the rainfed regions of the country. The Central Institute for Cotton Research has been actively contributing through the technologies developed at the institute for the sustainable progress of cotton production and productivity in the country. The institute continues to provide leadership in nurturing the cotton revolution by providing the much needed technological back up.

This report contains a glimpse of the research and developmental activities undertaken under various programmes during 2008-09. Out of the various research activities carried out during the year, the following achievements have immense potential to contribute towards enhancing cotton production and productivity. The first public sector Bt transgenic cotton variety BN-Bt was developed indigenously and approved for commercial cultivation in the North, Central and South zones on 2<sup>nd</sup> May 2008 after stringent biosafety studies by RCGM and GEAC, New Delhi.. The 'BN Bt' variety was developed through a collaborative effort. The *Cry1Ac* gene construct was made available by NRCPB, New Delhi to UAS, Dharwad, where the transformation and regeneration was carried out in 'BN', which was developed through pedigree breeding as a reselection from the parent variety 'Bikaneri Narma'. The plants were tested and confirmed for the event by NRCPB and biosafety tests were facilitated by the CICR to ensure timely approval by the GEAC. New transgenic events were established with sense and antisense gene constructs in *G. hirsutum* cultivars H 777, F 846 and HS 6 forCICuV resistance. Two bollworm tolerant genotypes 'CINHTi 3' and 'CINHTi 4' were developed by transferring a *trypsin* inhibitor gene (Ti) into two elite genotypes BN and G Cot 10. Immunochromatic 'dip stick' kits were developed for Cry1 F and NPT II. The cotton gene bank of the institute was enriched with 732 exotic accessions and 67 national entries. Culture CCH 5-10-4 was released and notified for commercial cultivation in the south zone under the name 'Suraj'. Six unique germ plasm lines possessing novel traits were registered. Technology for Bt cotton + maize intercropping an shallow black soils and Bt



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cotton + marigold intercropping and medium black soils were standardized. An eco-friendly solar operated knap sack sprayer with a field capacity of 4 hrs/ha was developed (patent pending) and tested. Nutrient management package to reduce premature resources in Bt cotton in south India was developed. Two new lectin genes were identified as potential sources for use in the development of 'sucking pest resistant' GM cotton. The papaya mealy bug, *Para coccus marginatus* Williams and Granara de Willink, was recorded in a severe form for the first time on cotton and also a Lycanid butterfly *Spalgis epius* (West wood) (Lepidoptera: Lycaenidae) was found to feed on the mealybug *P marginatus* on cotton. A novel technique for rearing mealy bugs on sprouted potatoes was also standardized. IRM (Insecticide Resistance Management strategies were developed and implemented on 79,626 ha area of 44,165 farmers from 827 villages from 10 different states. Yields increased by 12-28% and insecticide use reduced by 22-68% in the participating villages due to the technology.

The research achievements were a reflection of the untiring efforts by the entire staff of the institute. The technical and financial assistance from the Indian Council of Agricultural Research and other funding agencies-DBT, DST etc., provided the necessary momentum to accelerate the R&D output. I am highly grateful to Dr. Mangala Rai, Secretary, DARE and Director General, Dr. P L Gautam, Deputy Director General (Crop Sciences) and Dr. K.C.Jain, Assistant Director General (CC), ICAR, New Delhi for the guidance and support provided and also for encouraging new research initiatives. The Annual Report (2008-09) is being presented herewith a sense of satisfaction and pride.

**(K. R. Kranthi)**  
Acting Director



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