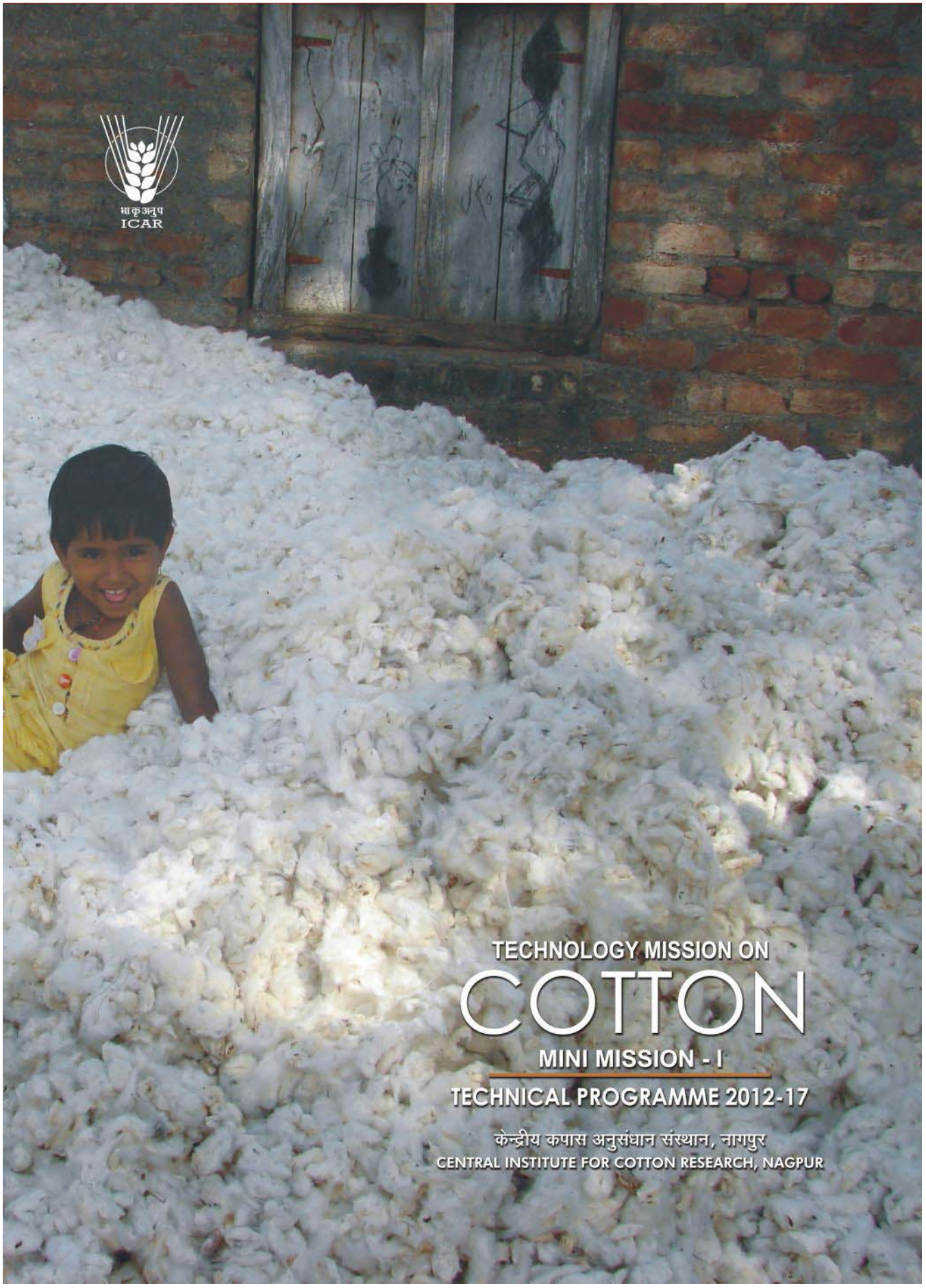

TECHNOLOGY MISSION ON
COTTON

MINI MISSION - I

TECHNICAL PROGRAMME 2012-17

केन्द्रीय कपास अनुसंधान संस्थान, नागपुर
CENTRAL INSTITUTE FOR COTTON RESEARCH, NAGPUR

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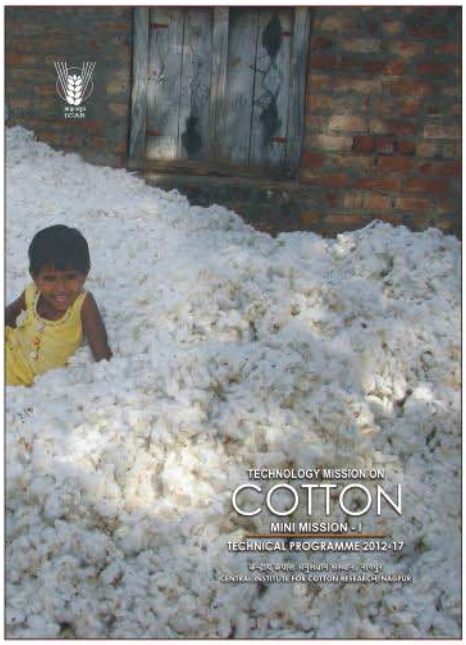

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Preface

The Technology Mission on Cotton Mini Mission I is now entering in third phase during the XII plan. The mini-mission-1 effectively achieved the targets set during the XI plan and delivered technologies needed for the improvement of cotton production in India. In the recent past there has been a spate of new challenges, such as, increasing problem of sucking pests, decreased areas under Desi varieties, labour shortages, increased costs of inputs, non availability of public sector GM cotton, fluctuating cotton prices high cost of picking, non availability of forecosting model etc. The technical programme of TMC-MM-I projects during the XII plan period was planned keeping all these problems into account. I earnestly hope that during this plan period also the programme will be implemented with utmost care and precision and will deliver all the stated objectives.

I take this opportunity to place on record our sincere thanks to Dr. S. Ayyappan, Secretary, DARE and Director General, ICAR, Dr S. K. Datta, Deputy Director General (Crop Sciences), ICAR and Dr. N. Gopalakrishnan, Assistant Director General (CC) for their guidance, unstinted support and encouragement.

I am grateful to all PI/CCPIs who contributed to the technical programme plan. I would like to express my heartfelt gratitude to Dr M. V. Venugopalan, and Dr A. R. Reddy for their sincerity, hard work, acumen and leadership in guiding the finalization of technical programme. I am also grateful to the heads of divisions, CICR and heads of regional stations of CICR, who took contributed immensely to finalize the technical programme.

(K. R. Kranthi)
Member Secretary, TMC MM-I &
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Contents

Introduction

The Technology Mission on Cotton has completed its second phase during XI plan period. There have been significant gains in research in a mission approach. This mission effectively addressed the problems emerged after the introduction of Bt cotton in India. The morphological and physiological changes brought in through the introduction of Cry gene into Bt hybrids has necessitated refinement in their agronomic requirements. The research conducted under the sub programme on Natural Resource Management has fine tuned the nutrient and water management schedules for maximizing productivity without compromising the nutrient and water use efficiency. Earliness associated with Bt hybrids could be exploited with more innovative cropping systems. Furthermore, with insurance against risk due to bollworms and abiotic stress in Bt cotton due to its earliness intercropping can now be viewed as a profit maximizing rather that risk minimizing option. Non-traditional inter cropping systems like cotton + maize (green cobs) or vegetables are emerging. Transplanting of Bt seedlings is being commercialized as an option for gap filling. Altering plant morphoframe through Ethrel spray at early squaring is also a promising technique developed to delay square initiation, improve plant architecture and increase yield. Several remedies to mitigate leaf reddening and wilt were discovered and disseminated and research to find out more remedies to leaf reddening and parawilt was also initiated. Several farm implements were developed timely and tested to save labour, improve input use efficiency, reduce drudgery and enable sowing, inter culture and spraying of cotton.

Everything about cotton in India changed. With increase in hybrid area, the need for inputs increased. Insecticides worth Rs 597 crores, fungicides worth 3 crores, herbicides worth 1 crore were used in 2002, but by 2010, the usage increased to Rs 880 crores of insecticides, Rs 67 crores fungicides and Rs 87 crores worth herbicides used. Though exact quantities are unknown, based on primary data collected, fertilizer usage in cotton has been assumed to have doubled. Input costs may have increased but cotton prices have also touched the roof up to an average of Rs 6800.

With all these changes, newer challenges emerged. Area under non-Bt varieties and non-Bt hybrids, area under Desi cottons and the super-fine extra long staple variety Suvin became almost negligible. Varieties suitable to organic cotton cultivation is also not available to the producers. New insect pests, that were not controlled by Bt cotton such as mealybugs, mirid bugs and leaf eating caterpillars started causing economic damage. New problems such as leaf reddening became problematic especially in rain-fed regions. Quality control of Bt cotton hybrids became problematic because of more number of hybrids and increasing number of new genes and new events. Hybrid seed production cost increased. Labor shortages became common. Accurate forecasts of cotton production, pest and disease occurrence as well as prices are increasingly important for decision making to policy makers

as well as other stakeholders. All these needs to be addressed in mission mode to achieve further increase in the production and productivity of cotton. During the XII plan it is proposed to undertake the following projects to address some of these challenges

1. Development of multi-gene constructs and Bt cotton varieties for sustainable pest management.
2. Development of cotton varieties resistant to cotton leaf curl disease (ClCuD), bacterial leaf blight (BLB) and Nematodes through marker assisted breeding.
3. Consolidation of repository of high strength cotton genotypes and evaluation for quality traits and yield in specific agro-eco zones
4. Agrotechniques for high density planting system and surgical cotton varieties
5. Simulation models/Sensor based gadgets for Cotton Protection and Production
6. E- kapas network and technology documentation
7. Development of cotton picking machinery for small scale cotton production systems.
8. Coordination and monitoring cell

Approach to XII plan