



वार्षिक प्रतिवेदन  
ANNUAL REPORT  
2016-17



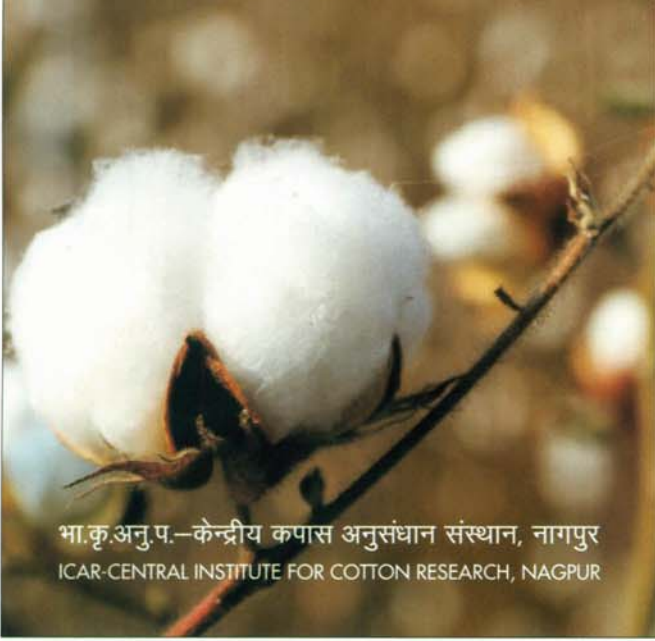
भा.कृ.अनु.प.—केन्द्रीय कपास अनुसंधान संस्थान, नागपुर  
ICAR- CENTRAL INSTITUTE FOR COTTON RESEARCH, NAGPUR



वार्षिक प्रतिवेदन  
ANNUAL REPORT



2016-17



भा.कृ.अनु.प.-केन्द्रीय कपास अनुसंधान संस्थान, नागपुर  
ICAR-CENTRAL INSTITUTE FOR COTTON RESEARCH, NAGPUR

**Published by**

**Dr. M.S. Ladaniya**

Director (Additional Charge)

**Editorial Committee**

Dr. M.S. Ladaniya

Dr. M.V. Venugopalan

Dr. V.N. Waghmare

Dr. D. Blaise

Dr. S.B. Nandeshwar

Dr. (Mrs) Nandini G. Narkhedkar

**Compilation, Collation and Production**

Dr. Mahendra Singh Yadav

Mrs. Vandana Satish

**Correct Citation**

ICAR-CICR, Annual Report 2016-17

ICAR-Central Institute for Cotton Research,  
Nagpur, India

**PP. 116**

**Note**

- No part of this report shall be reproduced without permission of ICAR/CICR.
- The reference to some trade names in this report is in no way an endorsement of or discrimination against these products by the Institute.

Printed At : Surya Offset, Ramdaspath, Nagpur

## PREFACE



The year 2016-17 has been an eventful year on many counts from cotton R&D perspective. It marked the Golden Jubilee year for the AICRP on Cotton. The celebrations were concluded with the approval of a new road map to increase the productivity of cotton to 1000 kg lint/ha in a socially, economically and environmentally responsible manner. The area under cotton declined from 11.88 m ha in 2015-16 to 10.5 m ha in 2016-17. But the cotton production was 351 lakh bales in 2016-17 as compared to 338 lakh bales in 2015-16. This happened only because of increase in productivity from 484 kg/ha to 568 kg/ha. For the first time in the period of this decade the desi, *G. arboreum* cotton was planted on 80,000 ha area replacing hybrids. For the first time, 21 Bt varieties developed by public sector institutes were evaluated across different AICRP centres and ICAR-CICR stations at Coimbatore and Sirsa and promising ones for each state were short listed for approval. The first ever *G. hirsutum* variety, CSH 3075, developed exclusively for planting under High Density Planting System was notified. Additionally, 2 more *G. hirsutum* varieties, CSH 3129 for irrigated north zone and high strength CCH 4474 (Subiksha) variety for irrigated conditions of south zone were released.

The ICAR-CICR has also collected, characterized and preserved for posterity the fast eroding land races and perennials from across the country. A novel protocol for in-vitro culture of cotton ovules of inter-specific (*G. arboreum* x *G. hirsutum*) crosses, embryo rescue techniques and Agro-bacterium tumefaciens mediated in-planta transformation protocol were standardized. A protocol has also been standardized to enable DNA extraction from harvested matured cotton fibre.

The institute provided leadership and coordinated the implementation of strategies to manage whiteflies in the north zone. The proactive strategies devised helped to minimize losses due to pink bollworms in Gujarat, Maharashtra, Telangana and Andhra Pradesh. A protocol using LAMP for diagnosis of cotton leaf curl virus was developed. Technologies for managing multiple nutrient deficiencies on calcareous soils through seed treatment of chelated micronutrients and humic-acid were developed. A brush type harvester with pre-cleaner was developed and evaluated in collaboration with Mahendra & Mahendra and ICAR-CIRCOT. Through the e-kapas, voice mail service, the institute issued regular advisories and reached out to 1.59 lakh cotton farmers. 'Cotton Doctor' a decision support system for pest management was developed. Our efforts to reach out to the farmers were further intensified through the 'Mera Gaon Mera Gaurav' (MGMG) programme and Tribal Sub Plan (TSP). Weekly articles on various production and protection technologies for the benefit of cotton farmers were disseminated through the most popular agricultural daily news paper in Marathi language in Maharashtra.

I am grateful to Dr Trilochan Mohapatra, Secretary DARE & DG ICAR; Dr J. S. Sandhu, DDG (CS) and Dr R. K. Singh, ADG (CC) for their constant encouragement, guidance and support. The dynamic leadership



provided to the Institute by Dr. K. R. Kranthi, Former Director, who joined the International Cotton Advisory Committee as the Head, Technical Information Section is fondly acknowledged. The Heads of Divisions Dr Sandhya Kranthi, Dr Blaise Desouza, Dr V. N. Waghmare and Dr Suman Bala Singh and Dr D. Monga, Head, Regional Stations, Sirsa, and Dr A. H. Prakash, PC and Head, Regional Station, Coimbatore have contributed immensely to the execution of research programmes and their documentation in this report. I thank them all for the excellent camaraderie and support. Dr M. V. Venugopalan, Dr M. S. Yadav and Mrs Vandana Satish deserve to be commended for their outstanding inputs and commitment to all aspects related to this annual report.

Cotton farming is on a threshold of a new revolution. With a vision and the roadmap for the future of cotton industry in India, innovative and appropriate technologies can be developed.

**(M. S. Ladaniya)**  
Director (Additional Charge)  
ICAR-CICR, Nagpur

# CONTENTS

<b>1. EXECUTIVE SUMMARY</b>	<b>1</b>
<b>2. INTRODUCTION</b>	<b>10</b>
<b>3. RESEARCH ACHIEVEMENTS</b>	<b>12</b>
3.1 : Cotton Genetic Resources	12
3.2 : Hybrid Cotton	15
3.3 : Genetic Improvement	15
3.4 : Genetic Diversity through Introgression	25
3.5 : Development of variety and Multi-location testing	27
3.6 : State Multi-location Varietal Trial	29
3.7 : Genetic diversity	29
3.8 : Development of Transgenic Cotton	34
3.9 : Seed Production and Technology	36
3.10: Integrated Crop Nutrition Management	39
3.11: High Density Planting System (HDPS) for Maximizing Productivity	40
3.12: Weed Management	41
3.13: Soil Biology and Biochemistry	41
3.14: Abiotic Stress Management	42
3.15: Cropping Systems	43
3.16: Conservation Agriculture	44
3.17: Water Management	45
3.18: Cotton Mechanization	45
3.19: Socio Economic Dimensions of Cotton Farming	46
3.20: Seasonal Dynamics of Insect Pests and Diseases	50
3.21: Biological Diversity of Insect Pests and Pathogens	54
3.22: Isolation and Identification of New Genes and Gene Sources	55
3.23: Development of New Methods, Tools and Protocols	56
3.24: Biological Control	59
3.25: Integrated Pest Management	64
3.26: Event Based Approval Mechanism	69
<b>4. TECHNOLOGY ASSESSED AND TRANSFERRED</b>	<b>71</b>
<b>5. TRAINING AND CAPACITY BUILDING</b>	<b>74</b>
<b>6. AWARDS AND RECOGNITIONS</b>	<b>81</b>
<b>7. LINKAGES AND COLLABORATIONS</b>	<b>82</b>
<b>8. AICRP ON COTTON</b>	<b>83</b>
<b>9. KRISHI VIGYAN KENDRA</b>	<b>85</b>
<b>10. GENERAL</b>	<b>92</b>
10.1 : Research Papers Published in refereed Journals	92
10.2 : List of On-going Projects	94
10.3 : Consultancy, Patents, Commercialization of Technology	98
10.4 : Significant Decisions of RAC and IRC	98
10.5 : Other Important Workshop/Symposia/Meetings	100
10.6 : Participation of Scientists in Seminars/Symposia/Workshops/Meetings	105
10.7 : Distinguished Visitors	108
10.8 : Personnel	109
10.9 : Other Information	110
10.10: Weather	115
10.11: Cotton Scenario	116

