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Front Line Demonstrations in Cotton - A Journey of Three Decades of Experiences and Success Stories



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**ICAR - CENTRAL INSTITUTE FOR COTTON RESEARCH
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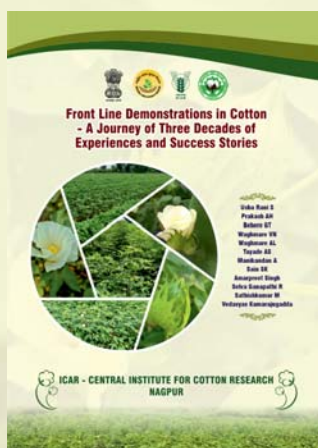


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Foreword

Dr. V.N. Waghmare

Director

ICAR-Central Institute for Cotton Research, Nagpur




Cotton, often hailed as the “white gold,” occupies a unique and indispensable position in Indian agriculture, contributing significantly to the livelihoods of millions of farmers and to the national economy. As one of the largest cultivated crops in the country, its growth has been shaped not only by the development of improved varieties and hybrids but also by the continuous evolution of scientific crop management practices. Over the years, the success of cotton cultivation in India has been closely linked with effective dissemination of technologies that enhance productivity, improve quality, and ensure sustainability. In this context, the role of technology transfer assumes paramount importance. Bridging the gap between research and field level adoption has always been a major challenge in agriculture. Among the various approaches, demonstration-based extension has emerged as one of the most powerful and convincing methods. The concept of Front Line Demonstrations (FLDs), implemented under the National Agricultural Research System, embodies the principle of “seeing is believing.” By showcasing proven technologies directly in farmers' fields under the close supervision of scientists, FLDs not only build confidence among farmers but also facilitate experiential learning, timely feedback, and rapid adoption of improved practices.

The journey of FLDs in cotton over the past three decades reflects a remarkable evolution of extension strategies in India. The program gained strong momentum during the period of the Intensive Cotton Development Program (ICDP) and was further strengthened under the Technology Mission on Cotton – Mini Mission II (TMC-MM II) from 1996 to 2013. During this phase, large scale demonstrations focused on production technologies, integrated pest management, and farm mechanization, significantly contributing to enhanced productivity and better crop protection practices across major cotton growing regions. Building upon this strong foundation, the Front Line Demonstrations have been implemented under the National Food Security Mission (NFSM) – Commercial Crops since 2014-15. Over the past decade (2014-15 to 2024-25), the program has expanded in scope and depth, covering three major components: Integrated Crop Management (ICM), promotion of Desi and Extra Long Staple (ELS) cotton, and intercropping systems. These demonstrations have not only improved yields and profitability but have also emphasized sustainability, resource use efficiency, and diversification, thereby addressing emerging challenges in cotton cultivation.

This publication comprehensively documents the rich experiences of FLDs conducted over three decades under TMC and NFSM, presenting a holistic picture of technological progress and its field level impact. A notable highlight of this book is the inclusion of success stories of more than 40 farmers from different centres across India. These real life narratives vividly illustrate how scientific interventions, when effectively implemented, can transform the livelihoods of farmers by enhancing productivity, reducing risks, and improving income. The compilation serves not only as a valuable record of achievements but also as a source of inspiration for the farming community. It demonstrates that with appropriate guidance, timely adoption of technologies, and strong institutional support, farmers can overcome challenges and achieve sustainable growth. The lessons drawn from these experiences will be immensely useful for researchers, extension personnel, policymakers, and farmers alike.

I commend the authors for their diligent efforts in bringing out this comprehensive yet insightful publication. Their work in documenting the impact of Front Line Demonstrations over the past three decades is highly appreciable and will serve as an important reference for future initiatives in cotton development.


(V.N. Waghmare)

Executive Summary

Cotton is a vital crop in India, contributing significantly to agricultural production and rural livelihoods. The success of the Indian cotton sector is driven by improved varieties and hybrids, advancements in production and protection technologies, supportive policies, and an effective value chain. Among these, the Transfer of Technology (ToT) system plays a critical role in bridging the gap between research and field-level adoption. One of the most impactful and time-tested ToT approaches is the Front Line Demonstration (FLD), implemented under the First Line Extension programs of the Indian Council of Agricultural Research (ICAR).

FLDs are field-based demonstrations conducted under the direct supervision of scientists to showcase the effectiveness of improved crop production and protection technologies in real farming conditions. Built on the principles of “seeing is believing” and “learning by doing,” FLDs provide farmers with hands-on experience, facilitate direct interaction with scientists, and accelerate the adoption of innovations. These demonstrations not only enhance farmers' knowledge and skills but also generate valuable feedback for refining research and developing location-specific technology packages.

The concept of demonstration has its origins in early agricultural extension efforts in the United States and was later adapted in India through initiatives such as the Lab-to-Land Program (1979). In the cotton sector, FLDs were formally introduced during the 1995–96 crop season under the ICAR–All India Coordinated Research Project (AICRP) on cotton. Since then, the program has evolved through various government schemes, including the Intensive Cotton Development Program (ICDP), Technology Mission on Cotton (TMC), and currently the National Food Security Mission (NFSM) – Commercial Crops.

Over the years, FLDs have covered a wide range of components, including cotton production technologies, Integrated Pest Management (IPM), farm implements, Integrated Crop Management (ICM), Extra Long Staple (ELS) and desi cotton, seed production, and intercropping systems. Between 1996 and 2013, more than 17,000 demonstrations were conducted, resulting in an average yield increase of 18.7% over farmers' practices. In the subsequent phase (2014–15 to 2024–25), 8,197 demonstrations covering 8,197 hectares benefited over 15,000 farmers, with average yield gains of about 20.32% under ICM demonstrations. These results clearly highlight the effectiveness of FLDs in enhancing cotton productivity and profitability.

The program is implemented through a strong institutional network involving ICAR institutes, State Agricultural Universities, Krishi Vigyan Kendras, and other stakeholders, supported by government funding mechanisms. It also emphasizes inclusive development by targeting small and marginal farmers, women, and socially disadvantaged groups.

Despite its success, the FLD program faces challenges such as limited coverage, inconsistent adoption of technologies, logistical constraints, and the need for location-specific solutions in diverse agro-climatic conditions. Emerging issues like climate variability and pest resistance further complicate extension efforts. However, significant opportunities exist to strengthen the program. Integration of digital tools, convergence with other agricultural schemes, promotion of climate-resilient practices, farmer-led extension approaches, and improved market linkages can enhance its impact and scalability.

In conclusion, Front Line Demonstrations have proven to be a powerful extension tool in India's cotton sector, effectively bridging the gap between research and practice. By combining scientific expertise, participatory learning, and real-world validation, FLDs continue to play a crucial role in improving cotton productivity, sustainability, and farmers' livelihoods.

Scientists Involved in the Front Line Demonstrations in Cotton under NFSM (CC) from the Participating Centres (2014-15 to 2024-25)

Project Coordinator / Nodal Officer (ICAR-AICRP on Cotton)

- Dr. A. H. Prakash, Project Coordinator and Head, ICAR-CICR, Regional Station, Coimbatore (01.04.2014 to 14.03.2023)
- Dr. K. Rathinavel, Project Coordinator and Head i/c, ICAR-CICR, Regional Station, Coimbatore (15.03.2023 to 13.06.2023)
- Dr. S. Manickam, Principal Scientist, ICAR-CICR, Regional Station, Coimbatore (14.06.2023 to 09.08.2023)
- Dr. G.T. Behere, Head, Division of Crop Protection, ICAR-CICR, Nagpur (10.08.2023 to till date)

Principal Investigator

- Dr. S. Usha Rani, Principal Scientist (Agrl. Extension), ICAR-CICR, Regional Station, Coimbatore (2014-15 to till date)

S.No	Centre	Name of the Scientist(s) involved
1	Punjab Agricultural University, Ludhiana, Punjab	Dr. Kulvir Singh Dr. Harjeet Singh Brar
2	Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana	Dr. Karmal Singh Malik Dr. Anil Kumar Saini Dr. Deepak Kumar
3	Swami Keshwanand Rajasthan Agriculture University, Sriganganagar, Rajasthan	Dr. Raghuvir Singh Meena Dr. Subodh Kumar Bishnoi
4	ICAR - Central Institute for Cotton Research, Regional Station, Sirsa, Haryana	Dr. Amarpreet Singh Dr. S. K. Sain Dr. Debashis Paul Dr. S. L. Ahuja Dr. R. A. Meena

S.No	Centre	Name of the Scientist(s) involved
5	Navsari Agricultural University, Navsari, Gujarat	Dr. M. C. Patel Dr. M. M. Patel Dr. K. B. Sankat Dr. G. R. Bhanderi Dr. D. H. Patel Dr. R. D. Patel Dr. P. R. Parmar Dr. H. R. Ramani Dr. V. K. Vekariya Dr. G. O. Faldu Dr. S. L. Pawar Dr. K.V. Vadodariya Dr. B. G. Solanki Dr. H. R. Desai Dr. V. Kumar Dr. C. K. Patel
6	Junagadh Agricultural University, Junagadh, Gujarat	Dr. D. K. Davara Dr. M. V. Variya Dr. R. K. Vekariya
7	Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra	Dr. Sanjay U. Kakade
8	Vasanrao Naik Marathwada Krishi Vidyapeeth, Nanded, Maharashtra	Dr. Arvind D. Pandagale Dr. Khizer S. Baig Dr. Baswaraj V. Bhede Dr. Vijay N. Chinchane
9	Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, Maharashtra	Dr. N.R. Markad Dr. P.L. Kulwal Dr. S.D. Gaikwad Shri. A.S. Mali Prof. P.H. Deshmukh Dr. R. S. Wagh Prof. N.K. Medhe Dr. D.P. Pacharne Dr. A.K. Kolage Dr. S. M. Dhadge Dr. R.W. Bharud Dr. S. K. Kamble Dr. R.B. Mane
10	ICAR - Central Institute for Cotton Research, Nagpur	Dr. A. Manikandan Dr. S.M. Wasnik
11	Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Khandwa, Madhya Pradesh	Dr. D.K. Shrivastava
12	Odisha University of Agriculture & Technology, Bhawanipatna, Odisha	Jyoti Rekha Mallick Dr. Uttam Behera

S.No	Centre	Name of the Scientist(s) involved
13	Acharya N G Ranga Agricultural University, Guntur, Andhra Pradesh	Dr. Ch. Naga Jyothi Dr. N. Venkata Lakshmi Dr. S. Bharathi Dr. E. Narayana
14	Acharya N G Ranga Agricultural University, Nandhyal, Andhra Pradesh	Dr. K. Ashok Kumar Dr. D. Lakshmi Kalyani Dr. S. Jaffar Basha Dr. A. Sitha Rama sharma
15	Professor Jayashankar Telangana State Agricultural University, Warangal, Telangana	Dr. G. Veeranna Dr. S. Omprakash
16	University of Agricultural Sciences, Dharwad, Karnataka	Dr. Rajesh S Patil Dr. S. R. Kareekatti, Dr. V. R. Kulkarni Scientist Dr. Poornima V. Matti Dr U. K. Shanwad Dr. SMD. Akbar
17	University of Agricultural Sciences, Raichur, Karnataka	Dr. J. M. Nidagundi Dr. S. G. Hanchinal Dr. M. Y. Ajaya Kumar
18	University of Agricultural Sciences, Chamarajanagar, Karnataka	Dr. C. Shashi kumar Dr. Shivaray Navi
19	Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu	Dr. N. Sakthivel Dr. P. Amala Balu, Dr. R. Veeraputhiran, Dr. S. Hari Ramakrishnan Dr. Bharathikumar Dr. R. Vimala Dr. Chelvi Ramesh, Dr. S. Thiruvarasan Dr. N. Vadivel Dr. G. Srinivasan Dr. A. Sheeba Dr. A. Subramanian Dr. N. Chitra Dr. E. Rajeswari Dr. N. Premalatha Dr. C. Vijayaraghavan Dr. M. Raju Dr. R. Thangapandian Dr. R. Ebenezer Babu Rajan Dr. B. Bhakiyathu Saliha
20	ICAR - Central Institute for Cotton Research, RS, Coimbatore, Tamil Nadu	Dr. S. Usha Rani

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Introduction

Cotton is one of the most important crops in India, occupying the largest cultivated area and achieving the highest production levels. The success of the Indian cotton sector can be attributed to the availability of promising varieties and hybrids, along with advancements in production and protection technologies, supportive policies, effective Transfer of Technology (ToT) practices, and a well-established value chain. Among these factors, the ToT system plays a particularly crucial role. Over time, various ToT approaches have been adopted to disseminate cotton technologies, but one of the oldest, most effective, and time-tested methods is field demonstration. In India, such demonstrations are carried out under the First Line Extension programs of the Indian Council of Agricultural Research (ICAR).

The field demonstration conducted under the close supervision of scientists of the National Agriculture Research System in India is called Front Line Demonstration (FLD). It is considered as one of the most effective extension tools ever developed. It is a composite of method and result demonstration as well as a combination of both single practice demonstration and composite demonstration. It provides an effective learning situation as farmers “See the crops themselves”, “interact with the scientists and extension workers on the fields”, and “get doubts clarified then and there”. The intentions of FLD are demonstrating the usefulness of the latest improved crop production and protection technologies to the farmers as well as extension workers with a view to reduce the time gap between technology generation and its adoption. It also enables the scientists to obtain direct feedback from farmers and suitably reorient their research programs, develop appropriate technology packages and to create effective linkage among scientists, extension personnel and farmers. The ICAR has formulated the FLD program to be operated by various ICAR institutes and All India Coordinated Research Projects (AICRP). The concept of the demonstration is that the Scientist shall have a direct contact with the farmers in transferring the

technology packages and latest innovations. On successful demonstration, Krishi Melas (Farmers' Day) are organised giving opportunity for all the neighbouring farmers to see for themselves. FLDs are guided by the principle “seeing is believing,” follow the approach of “learning by doing,” and aim at “enhancing productivity.” These demonstrations help farmers learn through visible results such as increased yields, improved quality, and reduced cultivation costs. The Indian cotton sector underwent significant transformation as a result of implementing this effective extension approach. This book presents various types of FLDs conducted under the ICAR–AICRP on cotton and examines their impact on crop yield improvement and the livelihoods of cotton growers.

Transfer of Technology among Cotton Growers in India

Technology transfer is a multi-layered communication process involving technology developers, diffusion agents, and end users who adopt innovations. In the Indian cotton sector, technologies are primarily developed by scientists from organizations such as the Indian Council of Agricultural Research, State Agricultural Universities (SAUs), and private research and development institutions. Additionally, some cotton technologies are adapted from other countries, refined to suit Indian conditions, and then disseminated for large-scale adoption. At the national level, key diffusion agents include institutions like the ICAR-Central Institute of Cotton Research, ICAR-Central Institute for Research on Cotton Technology, Krishi Vigyan Kendras (KVKs), the Directorate of Cotton Development (DCD), non-governmental organizations (NGOs), and private industries. At the state level, technology transfer is facilitated by State Ministries of Agriculture through their Departments of Agriculture and SAUs. Private companies engaged in cotton seed production and agricultural inputs also contribute through extension activities, often under Corporate Social Responsibility (CSR) initiatives. Non-profit organizations such as the Better Cotton Initiative, Cotton Connect and Textile Exchange further support knowledge dissemination. Across all these actors, the primary beneficiaries are cotton farmers and other stakeholders in the cotton value chain. While a few

technologies reach farmers incidentally, most are delivered through structured interventions led by government and private institutions. Major government initiatives include the Cotton Extension Scheme, Grow More Cotton Program, Intensive Cotton Cultivation Scheme (ICCS), Intensive Cotton Development Program (ICDP), Technology Mission on Cotton (TMC), and the National Food Security Mission – Commercial Crops component. These initiatives employ a combination of traditional and modern extension approaches, such as Front Line Demonstrations, Farmers Field Schools (FFS), print media, radio broadcasts, television programs, video content, exposure visits, cotton fairs and exhibitions, focused publicity campaigns, Kisan Melas, and capacity-building programs conducted both on and off campus. Digital tools also play a growing role, including cotton portals, Decision Support Systems (DSS), interactive multimedia modules, and web- and mobile-based advisory services like the “e-Kapas” platform and mobile applications. Private sector players complement these efforts through contract farming models and CSR-based extension activities. Additionally, collective institutions such as Commodity Interest Groups (CIGs), Farmers Interest Groups (FIGs), Farmers' Associations, Farmer Producer Organizations (FPOs), and Self-Help Groups (SHGs) serve as important platforms for delivering technologies to cotton growers.

Genesis of the Demonstration Concept

“Show me how?” became the guiding principle behind the concept of demonstrations. This idea emerged during the early years (1896–1905) of the Cooperative Extension movement under the Land Grant Commission in the United States. The Commission recognized the public's right to understand the work conducted at research stations, leading to systematic documentation of research outputs and their dissemination to farms, homes, and ranches through extension programs. During this period, hands-on demonstrations took shape and remained central to agricultural extension for nearly a century. The concept was pioneered by Seaman A. Knapp, a special agent of the United States Department of Agriculture, who is regarded as the father of demonstration. In 1903, he established the first demonstration farm at Walter

C. Porter's farm near Terrell in Kaufman County, Texas. This farm became a model for the development of demonstration-based agricultural extension programs. On this farm, Porter strictly followed scientific recommendations provided by the Department of Agriculture, including guidance on fertilizers, cultivation practices, and crop selection. The local community supported the initiative by guaranteeing him against financial loss and allowing him to retain all profits. The demonstration covered multiple crops, including cotton, corn, peas, sorghum, sweet potatoes, and milo maize. By the end of the year, Porter reported earning at least \$700 more than he would have under his usual farming practices. Encouraged by this success, he continued adopting Knapp's scientific methods. Over time, Porter also helped other farmers implement similar demonstration models. His farm eventually became a center for teaching advanced agricultural techniques and played a key role in the development of the agricultural extension service. It is widely recognized as the birthplace of the Cooperative Extension Service. Building on this success, Knapp expanded demonstrations to weevil-infested cotton-growing regions in Texas and neighbouring states. With a budget of \$40,000, he led more than 20 federal agents who collaborated with around 7,000 farmers to establish demonstration plots. Reflecting on his experiences, Knapp famously said, "What a man hears, he may doubt; what he sees, he may also doubt; but what he does, he cannot doubt." This philosophy firmly established him as the father of field demonstration.

The Onset of Demonstrations in India's Cotton Sector

The Indian Council of Agricultural Research introduced the Lab to Land program during its golden jubilee year 1979 for efficient transfer of technology. The idea behind the program was that the viable technologies developed by the researchers should have an on-farm field testing and the farmers should be convinced about the technologies for wider adoption in short span of time. This program was expanded to cotton crop also, implemented by the ICAR – Central Institute for Cotton Research, Regional Station, Coimbatore, India in a big way and gained much popularity in early eighties among cotton growers. Later in the 1995-96 crop season, the Ministry

of Agriculture, Government of India under Intensive Cotton Development Program, sanctioned ₹ 20 lakh for the conduct of cotton demonstrations. The All India Coordinated Cotton Improvement Project (AICCIP) with its headquarters at the CICR, Regional Station, Coimbatore under the aegis of ICAR has been nominated as the nodal agency for implementing the FLD in cotton in the country. In 1995-96, the was conducted extensively covering all the cotton growing states with 812 demonstrations.

Front Line Demonstration in cotton refers to field demonstrations conducted in the cotton growers' fields under the close supervision of cotton scientists from the National Agricultural Research System including the Cotton Scientists from ICAR, State Agricultural Universities, Krishi Vigyan Kendra. It is termed “front line” because the technologies are showcased for the first time by scientists themselves before being transferred to the state agricultural extension system. This innovative program was launched in cotton during the 1995-96 crop season through the ICAR-All India Coordinated Research Project on cotton, along with its network centres, and the ICAR-Central Institute for Cotton Research and its regional stations. The Department of Agriculture, Cooperation and Farmers Welfare (DAC & FW), Ministry of Agriculture and Farmers Welfare, Government of India, serves as the sponsoring agency. Initially, it was supported under the Intensive Cotton Development Program and continued until the launch of the Technology Mission on Cotton. Under TMC, up to 2013, Front Line Demonstrations primarily emphasized Production Technologies, Integrated Pest Management, and Farm Implements through Mini Mission II. Over the past thirteen years, under the National Food Security Mission (NFSM), these demonstrations have broadened to cover integrated crop management, Desi and Extra Long Staple (ELS) cotton, seed production, and intercropping systems. The primary objective of FLDs is to demonstrate newly released crop production and protection technologies, along with their management practices, directly in farmers' fields across diverse agro-climatic regions and farming conditions. As a powerful extension tool, FLDs function as a long-term educational approach carried out systematically to highlight the effectiveness and practicality of new technologies.

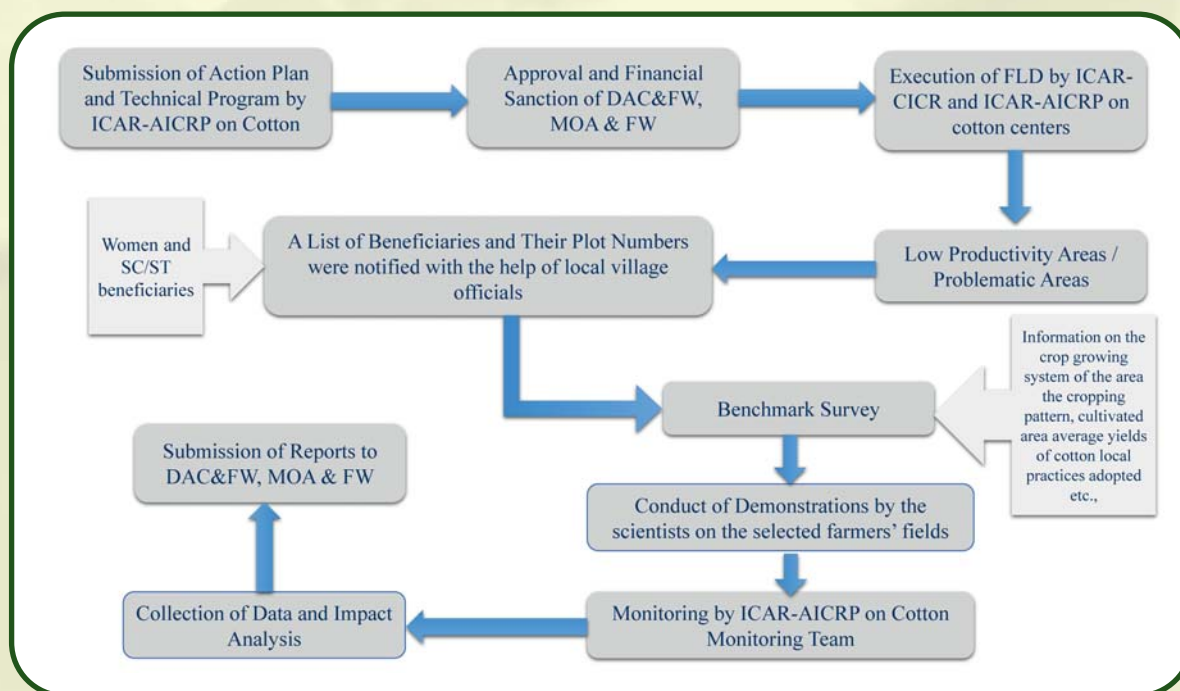
Objectives of FLD

- To demonstrate the usefulness of the latest improved crop production and protection technologies to the farmers as well as extension workers with a view to reduce the time gap between technology generation and its adoption.
- To enable scientists to obtain direct feedback from cotton farmers and suitably reorient their research programs and develop appropriate technology packages.
- To create effective linkage among scientists, extension personnel and farmers.

Procedural Methodology Followed in the Execution of Frontline Demonstrations

Since 1995-96 crop season, the ICAR-AICRP on Cotton has been conducting FLD on cotton through its networking centers and by the ICAR-CICR and its regional stations in Coimbatore and Sirsa. While executing the program, main emphasis was given to the demonstrations for enhancing the production of cotton in low productivity areas / problematic areas, where total improved package was demonstrated. A list of beneficiaries and their plot numbers were notified in the local Block Development / Panchayat Office. Farmers were selected in consultation with local Agricultural Officers and Panchayat Samiti. These officials formed part of the FLD team. Benchmark survey was conducted before taking up the demonstration which included information on the crops and cropping system of the area, inter cropping, the average yields of cotton and the local practices adopted in terms of irrigation, use of fertilizer, plant protection, etc., Information on the cost of cultivation was also collected for the area as a whole (Figure 1).

Figure 1. Methodology adopted in conducting FLDs in India



On successful demonstration, Krishi Melas (Farmers'/Field Days) are organized giving opportunity for all the neighbouring farmers to see for themselves the convincing benefits of the technologies. An impact analysis after the harvest was carried out in the light of reduction in insecticide use, reduction in cost of cultivation, awareness of modern technology etc., Further in accordance with the decision of Government of India (GOI) regarding implementation of Special Component Plan (SCP) for Scheduled Caste and Tribal Sub Plan (TSP) for Scheduled Tribes and Gender Budgeting, the beneficiaries were selected for the year's front line demonstration program.

Implementing Agencies and Fund Flow Mechanism

During 1996 to 2004, the FLDs were funded by Intensive Cotton Development Program and during 2004 to 2013, the TMC MM II funded the program. In 12th Five Year Plan under the National Food Security Mission - Commercial Crops, FLDs on cotton was implemented by Department of Agriculture, Cooperation and Farmers Welfare through Directorate of Cotton Development, Mumbai and ICAR-AICRP on cotton. All the components of NFSM-Cotton FLD were 100% funded.

The funds were released by Department of Agriculture and Farmers Welfare, Ministry of Agriculture and Farmers Welfare. Submission of action plan, physical and financial progress reports to the DA & FW through DCD facilitated the release of fund. Since the inception of the program in 1996, the following institutes have been implementing the program

1. Punjab Agricultural University, Ludhiana, Punjab
2. Chaudhary Charan Singh Haryana Agricultural University, Hisar, Haryana
3. Swami Keshwanand Rajasthan Agriculture University, Sriganganagar, Rajasthan
4. ICAR - Central Institute for Cotton Research, RS, Sirsa, Haryana
5. Navsari Agricultural University, Navsari, Gujarat
6. Junagadh Agricultural University, Junagadh, Gujarat
7. Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra
8. Vasanrao Naik Marathwada Krishi Vidyapeeth, Nanded, Maharashtra
9. Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar, Maharashtra
10. ICAR - Central Institute for Cotton Research, Nagpur
11. Rajmata Vijayaraje Scindia Krishi Vishwavidyalaya, Khandwa, Madhya Pradesh
12. Odisha University of Agriculture & Technology, Bhubaneswar, Odisha
13. Acharya N G Ranga Agricultural University, Guntur, Andhra Pradesh
14. Acharya N G Ranga Agricultural University, Nandhyal, Andhra Pradesh
15. Professor Jayashankar Telangana State Agricultural University, Warangal, Telangana
16. University of Agricultural Sciences, Dharwad, Karnataka
17. University of Agricultural Sciences, Raichur, Karnataka
18. University of Agricultural Sciences, Chamarajanagar, Karnataka
19. Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu
20. ICAR - Central Institute for Cotton Research, RS, Coimbatore, Tamil Nadu

Under Intensive Cotton Development Program and Technology Mission on Cotton - Mini Mission II (1996 to 2013)

Initially, under ICDP (1996-2004), the demonstrations were conducted on cotton production technologies. Newly released varieties / hybrids, yield enhancing agronomic technologies, pest and disease management strategies were demonstrated in the farmers fields. During TMC-MM II (2004 to 2013), the demonstrations were conducted under three different components viz., Production Technology, Integrated Pest Management and on Farm implements. Under FLDs on Cotton Production Technology, each demonstration was conducted in one acre plot. High yielding varieties and hybrids suited for various agro-climatic conditions approved transgenic cotton hybrids, Integrated Nutrient Management (INM), use of bio-fertilizers, bio-pesticides, water management, intercropping system, etc., were the production technologies demonstrated through this component. An amount of ₹2000/- was allocated per demonstration. Out of this, ₹1400/- was used for essential inputs for demonstration and the rest was utilized for POL, hiring of vehicles, kisan melas, printed materials, reports, demonstration boards etc., In order to popularize the location specific IPM modules, demonstrations on IPM were conducted in 10 to 50 hectares with a budget support of one lakh rupees. To popularize the machineries, use in cotton cultivation, demonstrations on farm implements were conducted. Under this type, the area under demonstration was ensured that it should not be less than 25 hectares. Per unit of implement demonstration an amount of one lakh rupees was earmarked. Out of that, ₹ 95,000/- was spent on purchase of implements and ₹ 5000/- for the expenditure on demonstration of the implements. No inputs were provided to the beneficiaries under this component.

A total of Seven hundred and seventy-two lakh rupees had been spent by the Ministry of Agriculture for conducting 17378 FLDs on cotton production technology, 148-unit demonstrations of cotton Integrated Pest Management and 125-unit demonstrations of cotton farm implements in the

ten cotton growing states of India through ICAR-AICRP (Cotton). The total number of demonstrations conducted year wise and the budgetary outlay are given in table 1.

Table - 1. Number of demonstrations conducted under ICDP and TMC - MMII and the budgetary outlay

S. No	Year	Total number of demonstrations			Total Budget outlay (in lakh rupees)
		No. of FLDs on CPT*(in numbers (one acre))	No. of FLDs on IPM (in unit (10-50 ha))	No. of FLDs on FI**(in unit (25 ha))	
1	1996-97	551	-	-	15.00
2	1997-98	760	-	-	20.00
3	1998-99	760	-	-	20.00
4	1999-2000	1065	-	-	30.50
5	2000-01	1750	-	-	87.50
6	2001-02	800	-	-	39.00
7	2002-03	480	-	-	25.00
8	2003-04	380	-	-	18.50
9	2004-05	855	-	-	55.00
10	2005-06	1150	20	16	60.00
11	2006-07	1150	20	16	60.00
12	2007-08	1400	24	22	75.00
13	2008-09	2300	30	24	100.00
14	2009-10	1600	19	19	70.00
15	2010-11	700	14	16	30.00
16	2011-12	995	11	5	35.90
17	2012-13	682	10	7	30.64
	Total	17378	148	125	772.04

(* Cotton Production technology and ** Farm Implements)

(Source: FLD Annual Report published by ICAR-AICRP (Cotton)

(from 1996-97 to 2012-13))

Impact of FLDs conducted under ICDP and TMC - MM II on Yield

The average seed cotton yield obtained from cotton demonstrations since 1997 as against the average seed cotton yield of the farmers' practices are given in table 2. During the year 1997-98, an increase in the seed cotton yield to the tune of 37.4 per cent was obtained in the demonstration as against the local practices of the farmers. In the year 2009-10, the highest average seed cotton yield of 2166 kg/ha was obtained in the FLD. The average seed cotton yield of FLD for the 16 years was 1631 kg/ha as against the average seed cotton yield obtained from farmers' practice of 1386 kg/ha. The average increase in the yield obtained under the FLD was 18.70 % as against the local farmers' practices.

Table - 2. Yield details of FLDs conducted under ICDP and TMC MM II during 1997 to 2013

S. No.	Year	Seed cotton yield of Demonstration (kg/ha)	Seed cotton Yield of Farmers' practice (kg/ha)	Increase of FLD's SCY over farmers' practice (%)
1	1997-98	1326	965	37.40
2	1998-99	1219	932	30.79
3	1999-2000	1605	1283	25.09
4	2000-01	1386	1134	22.22
5	2001-02	1166	938	24.30
6	2002-03	1315	1111	18.36
7	2003-04	1431	1205	18.75
8	2004-05	1572	1364	15.24
9	2005-06	1630	1382	17.94
10	2006-07	1965	1699	15.65
11	2007-08	1971	1712	15.18
12	2008-09	1906	1639	16.29
13	2009-10	2166	1899	14.06
14	2010-11	1764	1452	21.48
15	2011-12	2060	1832	12.44
16	2012-13	1608	1435	12.05
	Average	1631	1374	18.70

(Source: FLD Annual Report published by ICAR-AICRP (Cotton) (from 1997-98 to 2012-13))

Under National Food Security Mission (NFSM) – Commercial Crops

Summary of the demonstrations conducted under NFSM- FLD for the past one decade (2014-15 to 2024-25)

From 2014-15 onwards, the FLD in cotton are being sponsored by National Food Security Mission on Cotton – Commercial Crops, Ministry of Agriculture and Farmers welfare, Government of India with three different components viz., FLD on Integrated Crop Management in Cotton, FLD on ELS/ Desi / Seed Production in cotton and FLD on intercropping in cotton. A total of 8197 demonstrations on cotton FLD on ICM in cotton, Desi / ELS / Seed Production and FLD intercropping in cotton were conducted during the years 2014-15 to 2024-25 with a total budget outlay of ₹ 675.76 Lakhs (Table 3).

Table - 3. Front Line Demonstrations conducted through ICAR-AICRP on Cotton under NFSM-CC (2014-15 to 2024-25)

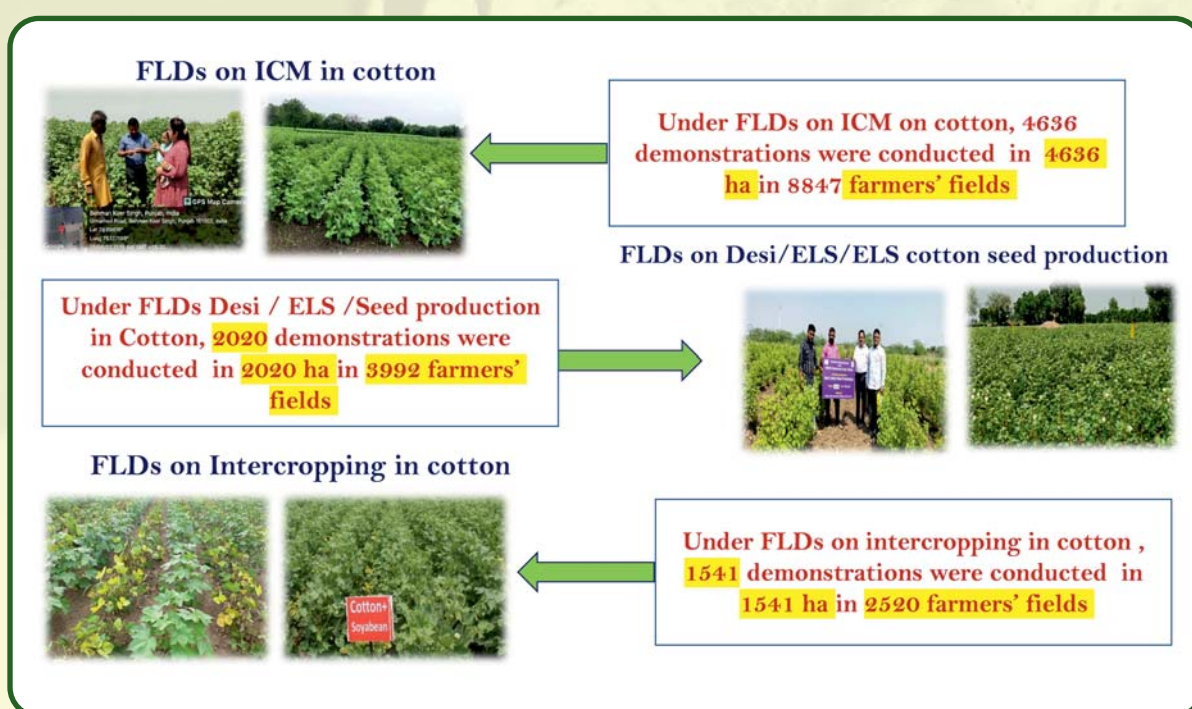
Year	No. of Demonstration	Budget in Lakh Rs
2014-2015	455	38
2015-2016	538	44.52
2016-2017	595	49.85
2017-2018	740	60.9
2018-2019	794	65.16
2019-2020	940	77.63
2020-2021	912	75.7
2021-2022	876	72.25
2022-2023	866	70.84
2023-2024	616	50.12
2024-2025	865	70.79
TOTAL	8197	675.76

(Source: FLD Annual Report published by ICAR-AICRP (Cotton) (from 2014-15 to 2024-25))

Details of FLDs conducted under various components during the years 2014-15 to 2024-25

During the years 2014-15 to 2024-25, a total of 8197 demonstrations in 8197 hectares were conducted on three components like Integrated Crop Management, Desi/ELS/Seed production in cotton and intercropping in cotton. A total of 15359 farmers (until 2024-25) were benefited from the demonstrations.

Figure 2. Details of FLDs conducted under various components from 2014-15 to 2024-25



FLD on Integrated Crop Management

Under FLDs on ICM on cotton, a total of 4636 demonstrations were conducted from 2014-15 to 2024-25 (Figure 2). Each demonstration was conducted in one-hectare plot. High yielding varieties and hybrids suited for various agro-climatic conditions, Integrated Nutrient Management, Integrated Pest Management, use of bio-fertilizers, bio-pesticides, water management etc., were the production technologies demonstrated through this component. An amount of ₹ 8000/- was allocated per hectare of demonstration. Out of this, ₹ 7000/- was used for essential inputs for demonstration and the remaining ₹ 1000/- was earmarked as contingencies

for field day, publicity material, POL, visit of Scientists etc., The critical inputs for FLD included the cost of seed, bio-fertilizer, micronutrients, bio-pesticides, seeds of intercrops, pheromone traps / light traps etc.,



ICM demonstration conducted by PAU, Faridkot at Village Kaler, Faridkot District during 2015-16

Demonstration of CSH-3075 conducted by ICAR-CICR, Sirsa during 2017-18



Demonstration on PDKV-JKAL Bt (BG-II) by PDKV, Akola during 2022-23



**Demonstration on ICM conducted by
PJTSAU, Agricultural Research Station,
Adilabad during 2019-20**



**Demonstration on
ICM by RARS, Nandhyal
during 2022-23**

**Demonstration on
ICM by JAU, Junagadh
during 2022-23**



**Demonstration and Installation of
Pheromone trap by Scientist of OUAT,
Bhawanipatna during 2022-23**

FLD on Extra Long Staple Cotton/Desi Cotton/Seed Production in Cotton

In order to popularize the cultivation of Desi / ELS cotton and produce the seeds of Desi / ELS cotton, this component was implemented in 2020 hectares (Figure 2). An amount of ₹ 9000/- was allocated per hectare of demonstration. Out of this, ₹ 8000/- was used for essential inputs for demonstration and the remaining ₹ 1000/- was earmarked as contingencies for field day, publicity material, POL, visit of Scientists etc., The critical inputs for FLD included the cost of seed, bio-fertilizer, micronutrients, bio-pesticides, pheromone traps/light traps etc.,



**FLD on GJHV 374 by
ICAR-CICR,
Nagpur during 2020-21**

**FLD on ELS cotton conducted by
UAS, Chamarajanagar
during 2019-20**



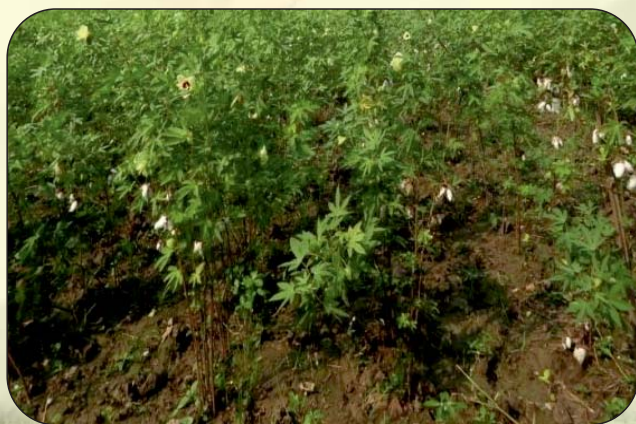
**FLD on Desi Cotton Seed
Production in Jambusar taluka,
Bharuch by NAU, Surat
during 2021-22**

Demonstration on Desi Cotton by VNMKV, Nanded during 2021-22



Demonstration on Desi Cotton - CNA1003 (Roja) by ICAR-CICR Nagpur during 2021-22

Demonstration on ELS Cotton by ICAR-CICR Coimbatore during 2022-23



FLD on Desi cotton - CNA1028 (Ravi) by ICAR-CICR, Nagpur during 2020-21

FLD on Intercropping in Cotton

To increase the production of food crops along with cash crops, this component was introduced. In this component along with cotton crop, various intercrops like cowpea, black gram, green gram, groundnut, soybean, onion etc., were demonstrated. An amount of ₹ 8000/- was allocated per hectare of demonstration. Out of this, ₹ 7000/- was used for essential inputs for demonstration and the remaining ₹ 1000/- was earmarked as contingencies for field day, publicity material, POL, visit of scientists etc., The critical inputs for FLD included the cost of seed, bio-fertilizer, micronutrients, bio-pesticides, seeds of intercrops, pheromone traps/light traps etc., From 2014-15 to 2024-25, a total of **1541** hectares demonstrations were conducted under this component (Figure 2).



Cotton + Groundnut Intercropping demonstrated by JAU, Junagadh during 2017-18 and 2021-22

Cotton + Groundnut Intercropping demonstrated by UAS Dharwad during 2021-22



FLD on intercropping demonstrated by VNMKV, Nanded during 2022-23

**FLD on intercropping demonstrated
by ANGRAU, Guntur
during 2022-23**



**FLD on cotton intercropping with
watermelon by MPKV,
Rahuri during 2020-21**

**FLD on Intercropping Red gram in
Cotton by PJTSAU,
Agricultural Research Station,
Adilabad during 2019-20**



**FLD on Intercropping
conducted by ICAR-CICR,
Nagpur during 2019-20**

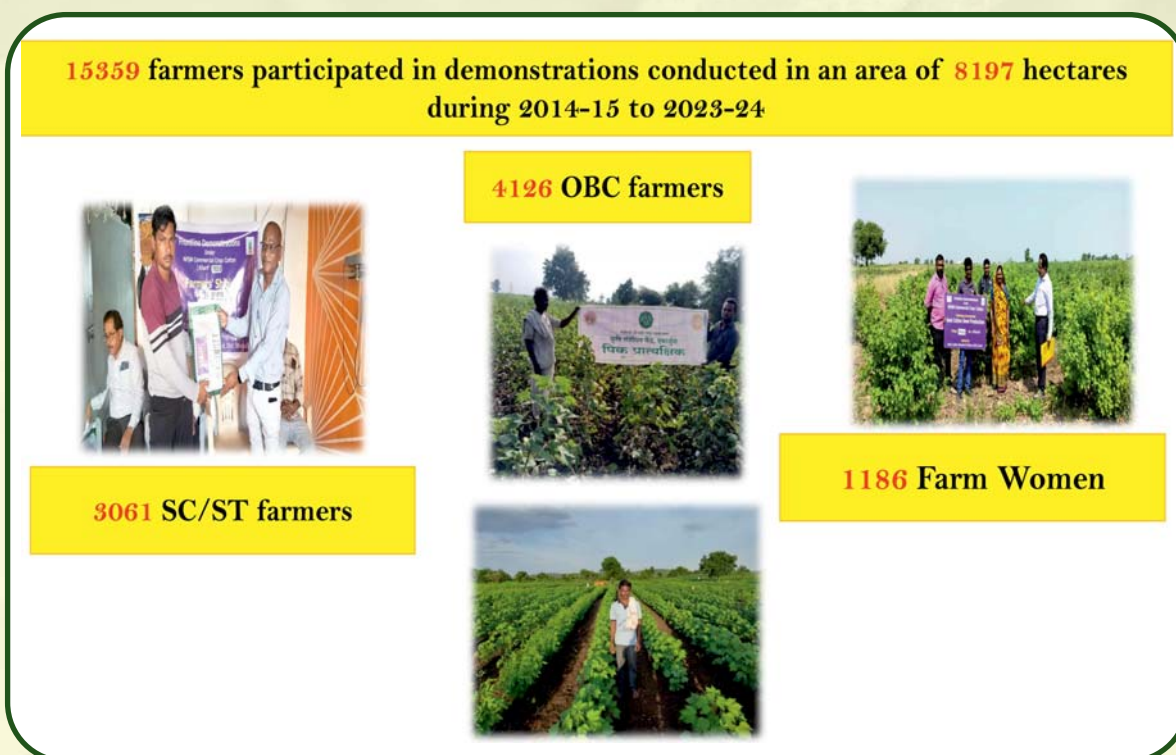
Profile of FLD Beneficiaries

Altogether, 15359 farmers (until 2024-25) participated in demonstrations conducted in an area of 8197 hectares from 2014-15 to 2024-25. In the demonstrations on ICM on cotton 8847 farmers were directly benefited as demonstrators in an area of 4636 hectares, whereas in demonstrations on Desi/ELS cotton 3992 farmers were benefited as demonstrators in an area of 2020 hectares and 2520 farmers were benefited by demonstrations on intercropping in cotton in an area of 1541 hectares.

In accordance with the decision of Government of India regarding implementation of Special Component Plan for Scheduled Caste and Tribal Sub Plan for Scheduled Tribes and Gender Budgeting, the beneficiaries were selected for every year's front line demonstration program.

A total of 3061 SC/ST farmers, 4126 OBC farmers and 1186 farm women were benefited out of this program from 2014-15 to 2024-25 (Figure 3).

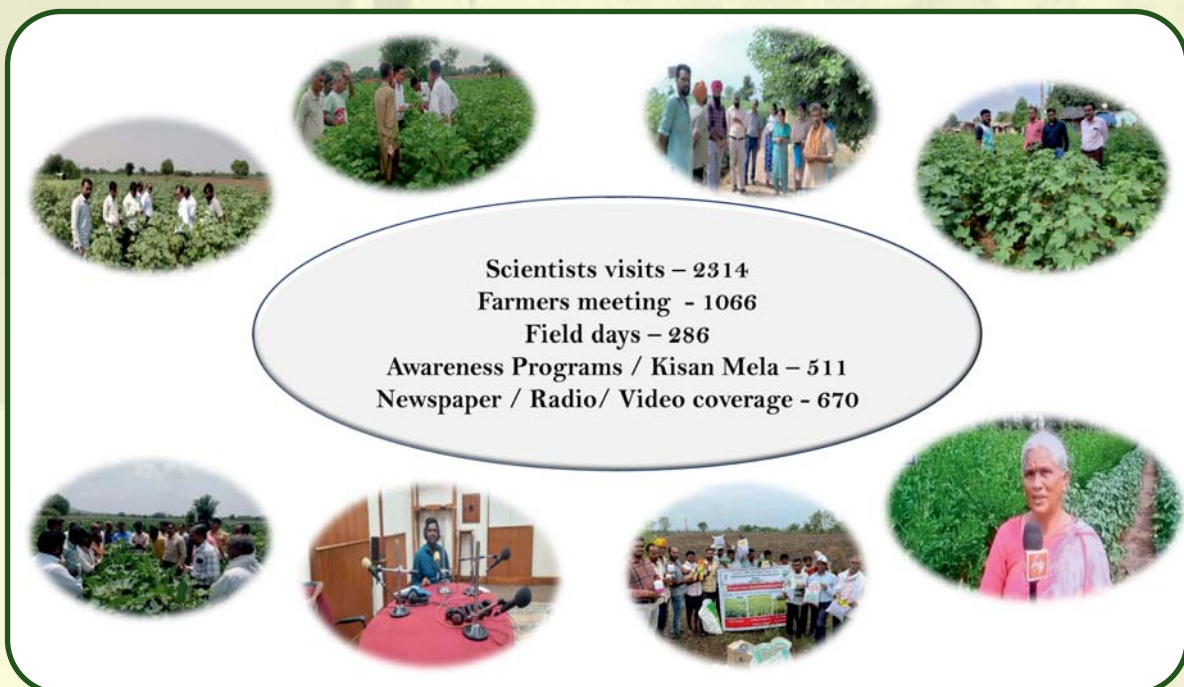
Figure 3. Details of farmers benefitted under NFSM from 2014-15 to 2024-25



Extension Activities

The centers had conducted various extension activities to popularize the cotton production technologies among the cotton growers (Figure 4). A total of 2314 visits by the Scientists, 1066 farmers' meetings, 286 field days, 511 awareness programs and 670 mass media coverage were conducted by the centers from 2014-15 to 2024-25. In addition, some centers disseminated the cotton technological information through radio talks, TV talks, newspaper clippings and voice SMS.

Figure 4. Details of Extension Activities Conducted under NFSM-FLD from 2014-15 to 2024-25



Impact of FLDs conducted under NFSM-Commercial Crops on Yield

The average seed cotton yield (kg/ha) obtained in FLDs conducted nationwide from 2014-15 to 2024-25 were given in table 4. The average seed cotton yield obtained in the demonstrations conducted by ICAR – AICRP centres throughout the country from 2014-15 to 2024-25 on cotton Integrated Crop Management ranged from 1547 kg/ha to 2289 kg/ha. The average seed cotton yield obtained in FLD for the past eleven years was 1940 kg/ha. Similarly, the average seed cotton yield obtained in the farmers' own practices without the advice of Scientists were also collected from 2014-15 to 2024-25.

It ranged from 1176 kg/ha to 1897 kg/ha. The average seed cotton yield obtained in farmers' practices in the past eleven years was 1621 kg/ha. Similarly, under FLDs on Desi Cotton / ELS cotton / Seed Production, an average of 1603 kg/ha seed cotton yield was obtained as against the local farmers' practice (1403 kg/ha). Correspondingly, under FLDs on cotton plus intercrops, an average of 1684 kg/ha seed cotton yield plus 671 kg/ha intercrop yield was obtained as against the local farmers' practice (1611 kg/ha).

Table 4: Average seed cotton yield obtained in FLDs and Farmers' practices from 2014-15 to 2024-25 (SCY kg/ha) in India

Year	FLDs on ICM			FLDs on Desi/ ELS cotton			FLDs on Intercropping			
	No. of FLD	Avg. FLD Yield (Kg/ha)	Avg. Farmers Practice Yield (Kg/ha)	No. of FLD	Avg. FLD Yield (Kg/ha)	Avg. Farmers Practice Yield (Kg/ha)	No. of FLD	Avg. FLD Yield (Kg/ha)	Avg. Yield of inter crops (Kg/ha)	Avg. Farmers Practice Yield (Kg/ha)
2014-15	205	1807	1176	160	1493	1318	90	1526	532	1403
2015-16	245	1547	1352	157	1480	1289	136	1440	395	1478
2016-17	275	2122	1429	225	1429	1241	95	1456	379	1489
2017-18	432	2025	1808	170	1640	1473	138	1666	474	1667
2018-19	437	2045	1808	171	1892	1698	185	1648	488	1656
2019-20	522	2089	1887	243	1555	1354	175	1982	713	1830
2020-21	514	1876	1633	271	1702	1577	128	1706	411	1627
2021-22	514	1770	1614	217	1560	1199	145	1671	2019	1573
2022-23	538	1917	1651	163	1492	1285	165	1938	524	1798
2023-24	397	1857	1689	84	1757	1584	135	1604	780	1548
2024-25	557	2289	1897	159	1630	1413	149	1881	662	1657
Total /Average	4636	1940	1621	2020	1603	1403	1541	1684	671	1611

(Source: FLD Annual Report published by ICAR-AICRP (Cotton) (from 2014-15 to 2024-25))

Figure 5. Number of FLDs conducted under three components from 2014- 15 to 2024- 25

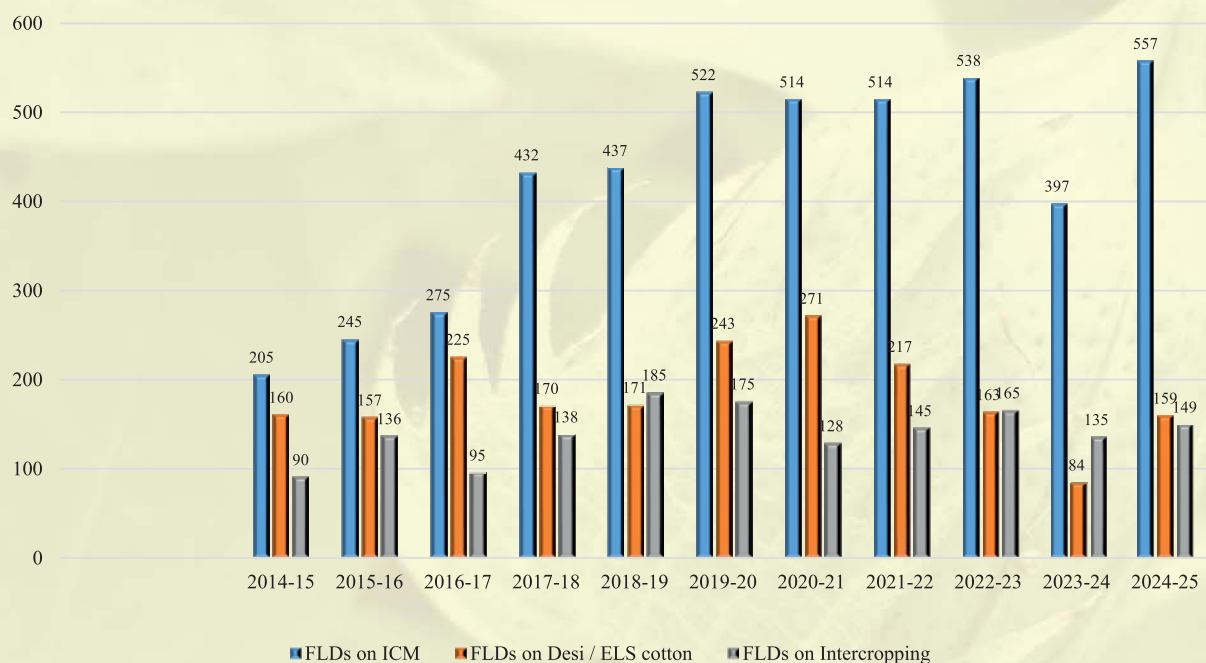


Figure 6. Average seed cotton yield (kg/ha) of FLDs and Farmers practice under ICM

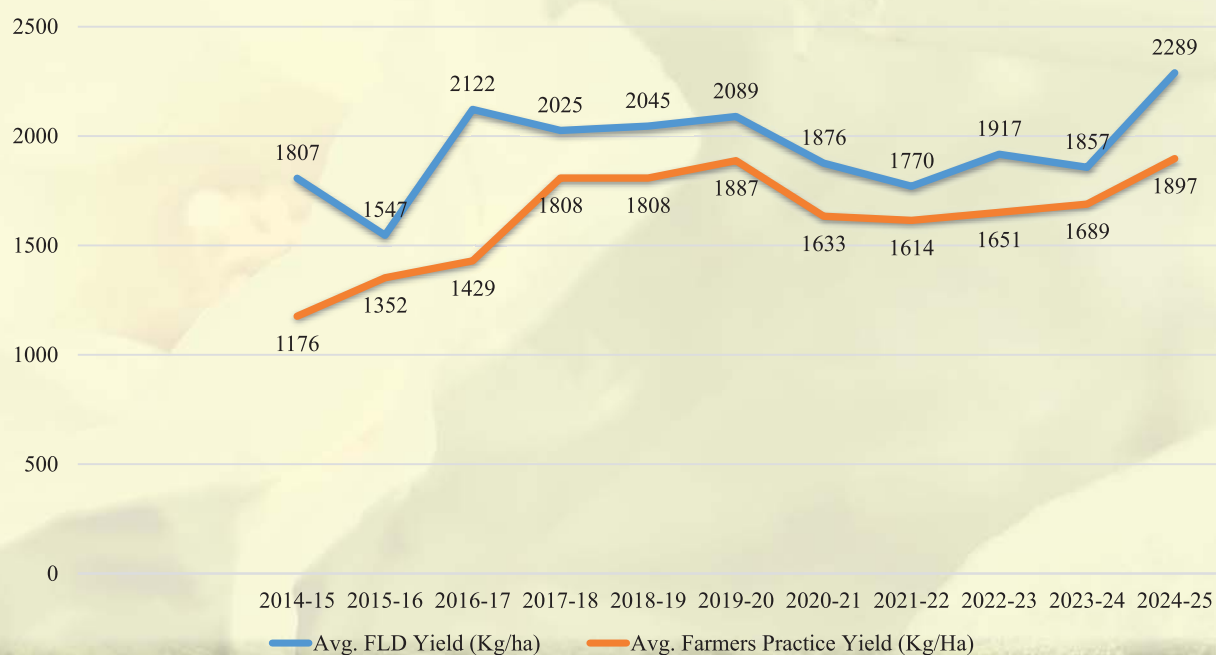


Figure 7. Average seed cotton yield (kg/ha) of FLDs and Farmers practice under Desi/ELS cotton

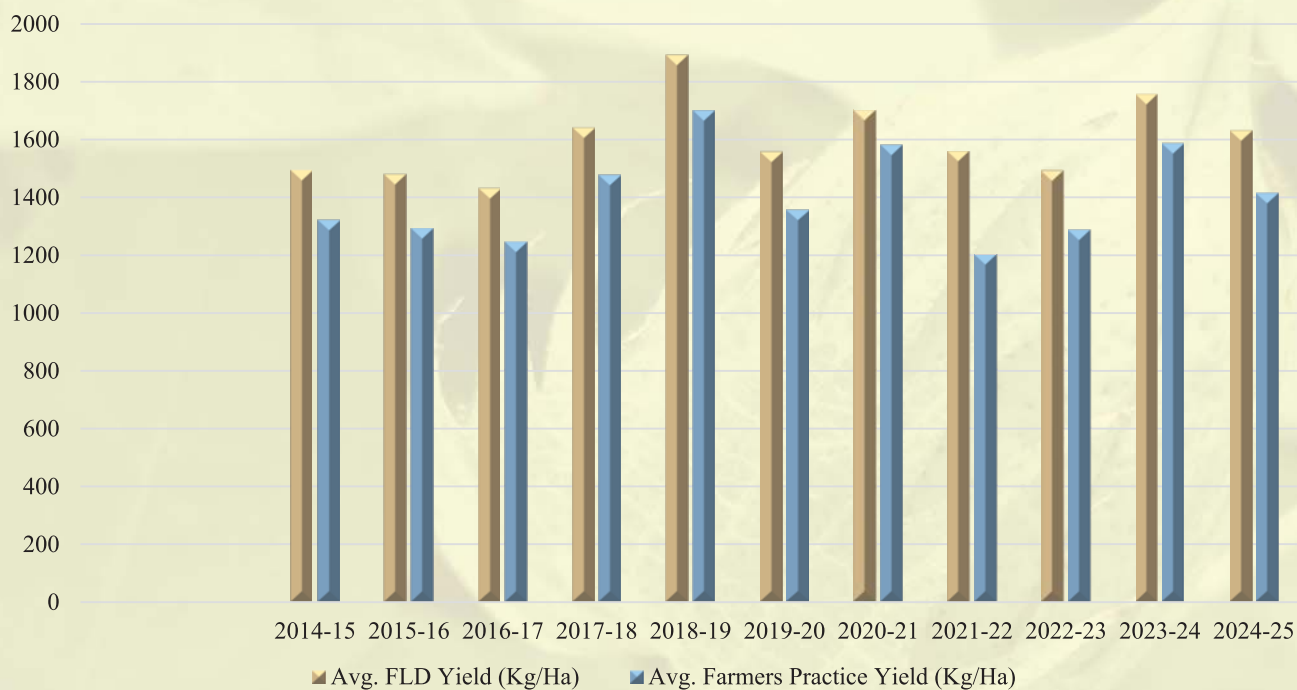
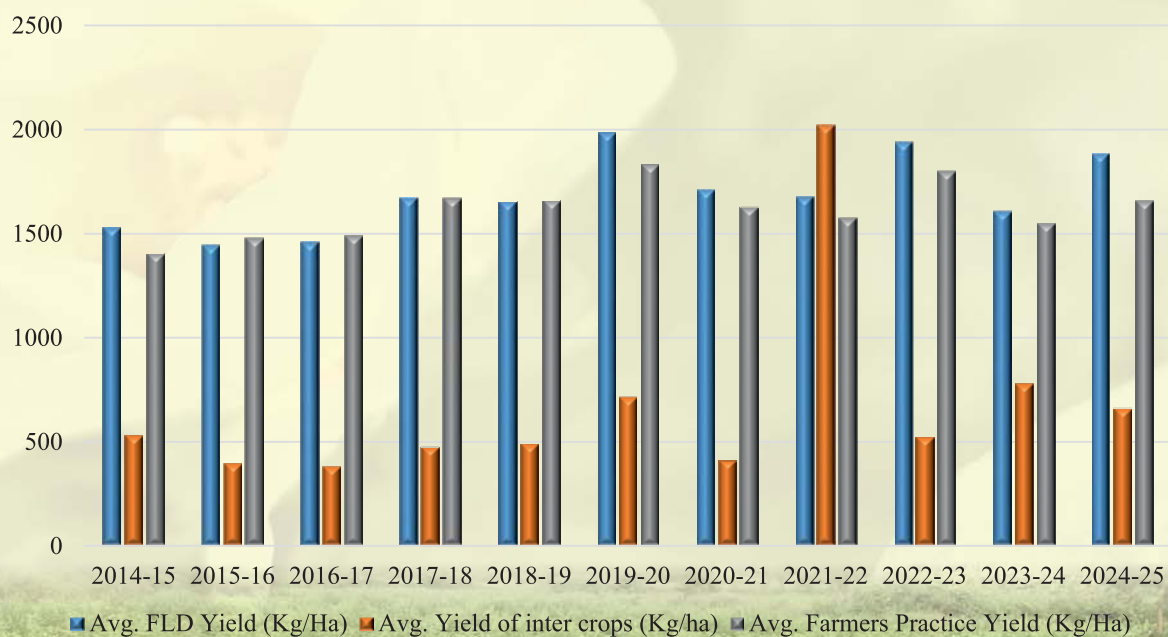


Figure 8. Average seed cotton yield (kg/ha) of FLDs and Farmers practice under Intercropping



Yield advantage of FLDs under ICM over the local farmers practices

The data on seed cotton yield over the period 2014–15 to 2024–25 clearly demonstrate the positive impact of demonstrations compared to farmers' traditional practices (Table 5). On average, the seed cotton yield under demonstration was 1940 kg/ha, whereas farmers' practice recorded 1621 kg/ha, resulting in a mean yield increase of 20.32%. The highest percentage increase was observed in 2014–15 (53.65%), followed by 2016–17 (48.49%), indicating a strong initial impact of improved technologies and practices. In subsequent years, the yield advantage remained consistent but comparatively moderate, generally ranging between 10 and 20%. Notably, the year 2024–25 recorded the highest demonstration yield (2289 kg/ha) with a 20.66% increase over farmers' practice. A gradual decline in the percentage increase in some later years suggests a narrowing yield gap, possibly due to partial adoption of improved practices by farmers. Overall, the results confirm that FLDs are effective in enhancing cotton productivity and serve as a valuable tool for technology dissemination and yield improvement.

Table 5: Yield advantage of FLDs under ICM over the local farmers practices

S. No	Year	Seed cotton yield of Demonstration (kg/ha)	Seed cotton Yield of Farmers' practice (kg/ha)	Increase of FLD's SCY over farmers' practice (%)
1	2014-15	1807	1176	53.65
2	2015-16	1547	1352	14.42
3	2016-17	2122	1429	48.49
4	2017-18	2025	1808	12.00
5	2018-19	2045	1808	13.10
6	2019-20	2089	1887	10.70
7	2020-21	1876	1633	14.88
8	2021-22	1770	1614	9.66
9	2022-23	1917	1651	16.11
10	2023-24	1857	1689	9.95
11	2024-25	2289	1897	20.66
	Average	1940	1621	20.32

(Source: FLD Annual Report published by ICAR-AICRP (Cotton) (from 2014-15 to 2024-25))

Special Features of FLD Program

The Frontline Demonstration program in cotton has evolved into a highly effective extension approach that bridges the gap between research innovations and their practical application in farmers' fields. Over time, it has become a farmer centric model built on scientific accuracy, participatory learning, and clearly visible results. One of its major strengths lies in the direct involvement of scientists in field activities, which ensures that improved technologies are implemented with expert guidance. This close interaction not only enhances the credibility of recommendations but also builds farmers' confidence and improves the overall success of technology dissemination. A defining feature of the FLD program is its focus on validating technologies under real farming conditions across varied agro-climatic regions. By conducting demonstrations on farmers' fields rather than in controlled research environments, the program ensures that innovations are practical, location specific, and economically viable. It also adopts an integrated approach by showcasing improved varieties or hybrids along with comprehensive crop management practices, including nutrient management, pest control, water management, and intercropping. This helps farmers appreciate the collective advantages of a complete production system. The program further emphasizes experiential learning through a “learning by doing” approach, where farmers actively engage in every stage of crop production from land preparation to harvest thereby gaining valuable hands-on experience. In addition, FLDs serve as a strong two-way communication channel, capturing farmers' insights and field level challenges. This feedback plays a crucial role in refining technologies and aligning research with real-world needs. Institutional collaboration is another key strength of the program, involving research institutes, universities, and extension agencies to ensure effective coordination and wider outreach. Continuous monitoring and impact assessment also support evidence based improvements. Importantly, the FLD promotes inclusive agricultural development by focusing on small and marginal farmers, women, and other disadvantaged groups, thereby advancing both technological progress and social equity in cotton cultivation.

Challenges Faced in FLD Program

Despite its demonstrated effectiveness, the Frontline Demonstration (FLD) in cotton encounters several operational and strategic challenges that affect its long term impact and scalability. One key limitation is the relatively limited coverage of demonstrations compared to the vast cotton growing area in the country. While FLDs generate strong localized impacts, their small scale restricts the broader and faster dissemination of improved technologies among farming communities. Another major concern is the inconsistent adoption of technologies beyond the demonstration phase. Although farmers readily adopt practices that yield immediate benefits, sustained use of complete technology packages is often hindered by factors such as inadequate access to quality inputs, market uncertainties, financial risks, and differences in resource availability. The also faces logistical and resource related constraints, including delays in the supply of essential inputs, shortages of skilled personnel, and occasional bottlenecks in fund disbursement. These challenges can affect the timely execution and overall effectiveness of demonstrations across regions. Moreover, the diversity of agro-ecological conditions and farming systems in cotton growing areas makes it difficult to standardize technology recommendations. Practices that perform well in one region may not be equally successful in another, requiring continuous adaptation and location specific refinement. Additionally, the rising incidence of biotic and abiotic stresses such as pest resistance, climate variability, and soil degradation adds further complexity to extension efforts. Ensuring that demonstrations remain relevant by integrating climate resilient and sustainable practices remains an ongoing necessity.

Opportunities for Strengthening the FLD Program

While the Frontline Demonstration program faces certain challenges, it also presents significant opportunities for growth and improvement within an evolving agricultural landscape. One key area of potential is the integration of digital agriculture technologies. Tools such as mobile based advisory services, remote sensing, artificial intelligence, and data analytics can greatly enhance real time monitoring, support better decision making, and extend the

program's reach to a wider farming community. There is also considerable scope for convergence with other government initiatives and private sector efforts. Aligning FLDs with program related to irrigation management, soil health, crop insurance, and market access can help build a more comprehensive support system, thereby improving the effectiveness and sustainability of interventions. The growing emphasis on sustainable and climate-resilient agriculture offers another major opportunity. FLDs can serve as practical platforms to demonstrate resource efficient technologies, environmentally friendly inputs, regenerative farming methods, and climate smart production systems, promoting long term ecological and economic sustainability. Encouraging farmer-led extension approaches can further strengthen the program. Farmers who have successfully adopted FLD technologies can act as local innovators and resource persons, fostering peer-to-peer learning and accelerating the adoption of improved practices within their communities. Additionally, the program can benefit from a stronger focus on value chain integration and market orientation by involving Farmer Producer Organizations (FPOs) and adopting a cluster based approach. Expanding demonstrations to include post-harvest management, quality improvement, and better market linkages can enable farmers to secure higher prices and improve overall profitability.



Success Stories

Success Story - 1

Turning Whitefly losses into cotton profits: The Inspiring Journey



Name of Farmer : Mr. Jagsir Singh
Address : Village: Mansa Khurd, District: Bathinda
Mobile no: 7986526388
Date of Birth / Age : 03-06-1970
Education : 10th
Land holding (ha) : 4 ha

Mr. Jagsir Singh, a farmer from Mansa Khurd village in Bathinda district, owns 10 acres of land, which is the sole source of income for his family. Having been involved in agriculture since childhood, he has gained extensive hands-on experience in crop cultivation. Initially, he followed the conventional cotton wheat cropping system. Due to limited irrigation resources, he could not switch to paddy cultivation like many other farmers in the region. In 2015-16, his cotton crop suffered heavy losses due to a severe whitefly attack, creating a period of financial hardship for his family. Managing household expenses became increasingly difficult. A major turning point came when he attended a Kisan Mela organized by Punjab Agricultural University.

There, he interacted with agricultural experts, discussed his challenges, and received practical advice. Inspired by their guidance, he began attending awareness programs and gradually adopted improved farming practices. He shifted to recommended cotton varieties, maintained proper plant population, used balanced fertilization, and adopted integrated pest management techniques. He started monitoring pest activity using pheromone traps and applied insecticides only when necessary. This scientific approach reduced unnecessary expenses, minimized excessive pesticide use, and improved crop health. Within a year, he saw significant improvements. In his first successful season after adopting these methods, he earned ₹1.87 lakh per hectare from cotton. Even during a pink bollworm outbreak, when many farmers faced heavy losses, he achieved a yield of 21.5 quintals per hectare, demonstrating the effectiveness of scientific farming practices under NFSM FLD.

Recognizing market trends, he also introduced desi cotton, which provided better prices. Additionally, he cultivated pulses and vegetables on a small portion of his land for household consumption, reducing expenses and generating extra income through local sales. Apart from crop farming, he rears four milking animals and earns around ₹15,000 per month from milk sales after meeting his family's needs, further strengthening his income. Today, Mr. Jagsir Singh is known as a progressive and resilient farmer in his village. His journey shows that with determination, scientific knowledge, and timely guidance, even farmers with limited resources can overcome challenges and achieve sustainable success.

Centre : PAU, Faridkot, Punjab
Scientist i/c FLD : Kulvir Singh
Principal Agronomist, PAU,
Regional Research Station,
Faridkot. Email : kulvir@pau.edu



Success Story - 2

A Progressive Farmer's Shift from Conventional to Sustainable cotton farming



Name of Farmer : Mr. Sukhraj Singh
Address : Village: Dunewala, District: Bathinda,
Mobile no: 9872185512
Date of Birth / Age : 36 years
Education : -
Land holding (ha) : 8 ha

Mr. Sukhraj Singh, a resident of Dunewala village in Bathinda district, Punjab, has dedicated nearly 20 years to agriculture. He began helping his father in the fields at a young age and took full charge of farm operations in 2008. Like most farmers in his village, he initially followed the traditional paddy-wheat and cotton-wheat cropping systems. However, his strong inclination toward learning and innovation set him apart. His father's subscription to *Changi Kheti*, a magazine published by Punjab Agricultural University, introduced him early on to improved farming techniques and played a key role in shaping his progressive mindset. Over the years, he actively participated in Kisan Melas and awareness programs organized by Punjab Agricultural University. After understanding the long term advantages of crop diversification, he gradually reduced the area under paddy and increased cotton cultivation. He also diversified into potato, chilli, and other vegetable crops, marking a significant turning point in his farming journey. In 2015, he suffered heavy losses due to a severe whitefly attack in cotton. Rather than being discouraged, he sought expert advice from PAU scientists. From 2016 onwards, he began systematically adopting recommended scientific practices, including the use of suitable Bt cotton hybrids, proper plant spacing, balanced fertilization, and integrated pest management (IPM). He regularly monitored pest levels and applied insecticides only when economically necessary, while rotating chemicals to avoid resistance. These measures greatly improved both his productivity and profitability. During the pink bollworm outbreak in 2021, when many farmers struggled to achieve yields of 15 quintals per hectare, Mr. Sukhraj Singh harvested 20.7 quintals per hectare, demonstrating the effectiveness of his

approach under NFSM FLD program. Additionally, by optimizing the use of fertilizers and pesticides, he managed to cut input costs by nearly 30 percent. In the previous year, his net returns were approximately ₹75,000 per hectare from paddy, ₹60,000 from wheat, ₹85,000 from cotton, and ₹1,20,000 per hectare from vegetables. Alongside crop cultivation, he also maintains seven dairy animals, earning an additional ₹12,000–15,000 per month from milk sales, which adds stability to his income. Today, Mr. Sukhraj Singh is regarded as a progressive and well informed farmer in his region. He actively encourages fellow farmers to adopt scientific practices and diversify their cropping systems to improve profitability, sustainability, and long term resilience.

Centre : PAU, Faridkot, Punjab
Scientist i/c FLD : Kulvir Singh,
Principal Agronomist,
PAU, Regional Research Station,
Faridkot. Email : kulvir@pau.edu



Success Story – 3

A Cotton Revival Story: Harnessing Desi Strengths for Sustainable Gains



Name of Farmer : Shri. Nanasaheb Gorakshanth Dhonde
Address : Village: Jhottianwali, District: Fazilka
Mobile no: 9988373498

Date of Birth / Age : 30 years

Land holding (ha) : 4 ha

Cotton cultivation in the south western districts of Punjab has been facing serious challenges in recent years due to recurring infestations of whitefly, jassid, and pink bollworm, along with limited availability of irrigation water. These constraints have discouraged many farmers, leading them to shift toward paddy or horticultural crops. However, the introduction of improved desi cotton varieties through Frontline Demonstrations has started to rebuild farmers' confidence in cotton farming. Parvinder Kumar, a progressive farmer from Jhottianwali village in Fazilka district, has been engaged in agriculture since the age of 15. He cultivates around 10 acres of land, with cotton traditionally serving as his main crop.

Over time, declining yields of American Bt cotton hybrids and frequent pest attacks significantly reduced profitability. In an effort to stabilize income, his family allocated about two acres to kinnow cultivation. Despite this diversification, cotton remained a key component of his farming system, though it continued to suffer from high pest pressure and rising pesticide costs. During an interaction with Dr. Manpreet Singh, Principal Agronomist at the Regional Research Station, Abohar, Parvinder expressed interest in shifting part of his area to desi cotton to reduce pest incidence and input costs. However, he faced difficulty in obtaining reliable and affordable seed, as commercially available desi hybrids were priced at around ₹4,500 per acre more than double the cost of commonly used Bt hybrids raising concerns about both affordability and reliability.

Recognizing his interest and constraints, Dr. Manpreet Singh provided seed of the desi cotton variety FDK 124 along with technical guidance. Simultaneously, under the FLD program, Dr. Kulvir Singh, Principal Agronomist, supported him with recommended agronomic practices.

With assured seed quality and scientific backing, Parvinder sowed FDK 124 on 2 May 2025 over one acre. He followed improved cultivation practices, including timely sowing, proper plant spacing, balanced nutrient management, and need based pest control. The demonstration plot produced a yield of 2,000 kg of seed cotton per hectare, significantly higher than the 1,520 kg per hectare obtained under his previous practices. The desi variety showed better tolerance to major sucking pests and pink bollworm. Notably, it required only five pesticide sprays compared to the usual 10-12 sprays in American cotton hybrids. This reduction in pesticide use lowered the cost of cultivation and reduced production risks. Encouraged by the performance and profitability of FDK 124, Parvinder Kumar now recognizes desi cotton as a sustainable and economically viable option, particularly under water limited conditions. His success has attracted the attention of neighboring farmers, many of whom are planning to adopt desi cotton in the coming seasons.

Centre : PAU, Faridkot, Punjab
Scientist i/c FLD : Kulvir Singh, Principal Agronomist, PAU,
Regional Research Station
Faridkot. Email : kulvir@pau.edu



Success Story - 4

Turning the tide: How the scientific practices boosted the cotton farmers yield.



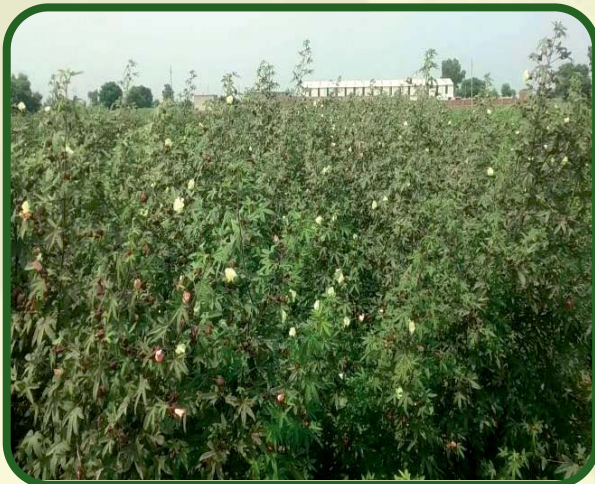
Name of Farmer : Satish
Address : Village Bheria, Hisar
Mobile no: 9467746465
Date of Birth / Age : 10-04-1977
Education : Up to 8th
Land holding (ha) : 4 ha

Satish, a cotton farmer from Bheria village in Hisar district, had been facing recurring problems in his crop due to frequent disease incidence and sudden outbreaks of sucking pests. Even with higher fertilizer application, he experienced poor boll development and inconsistent yields, which adversely affected his profitability. Seeking a solution, he consented to conduct the Front Line Demonstration in his field, which became a turning point in his farming journey. Through the FLD program, Satish received a well structured package of inputs along with expert guidance on their timely and proper use. He was trained in key practices such as maintaining economic threshold levels, following appropriate spray schedules, and adopting stage specific nutrient management.

This scientific approach helped him better understand crop needs and avoid unnecessary input use. The results were clearly evident in his field. The crop showed uniform growth, improved vigour, and better boll retention. Early pest monitoring using pheromone traps enabled timely action, reducing pest damage and preventing severe infestations. By the end of the season, Satish achieved a yield of 22 quintals per hectare about a 25% increase over the previous year. His net income also rose by nearly 20%, driven by higher yields and reduced spending on avoidable pesticide applications.

The benefit cost ratio improved to 1.7, indicating better economic efficiency. Need based and targeted spraying further helped lower input costs while maintaining crop health. Encouraged by these positive outcomes, Satish continues to follow these improved practices and actively encourages other farmers to adopt monitoring tools and scientific crop management methods.

Centre : CCSHAU, Hisar, Haryana
Scientist i/c FLD : Dr Karmal Singh Malik, Head, Cotton Section,
Dept. of Genetics & Plant Breeding, CCSHAU, Hisar.
Email : karmalsingh@gmail.com



Success Story - 5

From Uncertainty to Stability: How Scientific Cotton Farming Transformed a Farmer's Livelihood



Name of Farmer : Balwant Singh
Address : Village Ludas, Hisar
Mobile no: 9991440363
Date of Birth / Age : 12-03-1990
Education : Senior Secondary
Land holding (ha) : 2 ha

Balwant Singh, a small scale farmer from Siwani Bolan village in Hisar district of Haryana, had long depended on traditional methods of cotton cultivation. Despite his experience, he often faced challenges such as unstable yields, heavy pest infestations, and fluctuating market returns. Major pests like pink bollworm, whitefly, and other sucking insects caused considerable crop damage, while imbalanced nutrient use led to poor boll development and reduced fiber quality. These ongoing issues made cotton farming increasingly risky and less profitable. A significant turning point came when Balwant participated in the Front Line Demonstration on Integrated Crop Management. Through this initiative, he received improved production inputs along with scientific guidance on ICM.

Emphasis was placed on balanced nutrient application, timely pest and disease control, and regular pest monitoring. One of the key practices he adopted was the use of pheromone traps to track bollworm activity. This allowed for early detection and enabled him to take need-based plant protection measures instead of relying on indiscriminate pesticide use, thereby optimizing input costs and improving crop health. The benefits of these improved practices were clearly visible in the field. The crop showed better vigor, enhanced boll formation, and improved fiber quality. By the end of the season, Balwant achieved a seed cotton yield of 2,235 kg per hectare, significantly higher than his previous performance. Economic analysis indicated a benefit cost ratio of 1.6, highlighting the profitability of the approach.

Encouraged by these results, Balwant Singh has fully adopted scientific cotton cultivation practices and continues to follow them. He also actively shares his experiences with fellow farmers, motivating them to adopt sustainable and more profitable methods of cotton production.

Centre : CCSHAU, Hisar, Haryana
Scientist i/c FLD : Dr Karmal Singh Malik, Head, Cotton Section,
Dept. of Genetics & Plant Breeding, CCSHAU, Hisar.
Email : karmalsingh@gmail.com



Success Story - 6

Integrated Crop Management Boosts Cotton Yield and Profitability: Success Story of a Progressive Farmer from Sirsa



Name of Farmer : Sh. Bajinder Pal S/o Sh. Madan Lal
Address : Village Chadiwal, District: Sirsa, State: Haryana
Mobile no: 9466591281
Date of Birth / Age : 26-08-1980
Education : College graduate (B.A.) & DCA
Land holding (ha) : 8.8 ha

Sh. Bajinder Pal, a progressive farmer from Sirsa district, has set an inspiring benchmark in cotton cultivation by successfully adopting Integrated Crop Management practices. Managing 22 acres of land with both tubewell and canal irrigation, he has made optimal use of available resources, including a water storage tank (diggi) with a capacity of around 20 lakh litres, ensuring timely irrigation for his crops. With access to a tractor and farm machinery through custom hiring, he exemplifies a well-equipped and forward-looking farmer. He maintains active engagement with leading agricultural institutions such as CCS Haryana Agricultural University, Hisar; ICAR-Indian Agricultural Research Institute, New Delhi; Krishi Vigyan Kendra, Sirsa; and ICAR-Central Institute for Cotton Research, Regional Station, Sirsa.

By regularly participating in Krishi Melas and training programs, he stays updated on the latest advancements in cotton production technologies. During the 2024-25 cropping season, under Front Line Demonstrations on Integrated Crop Management through ICAR-AICRP on Cotton under NFSM, he cultivated the American cotton hybrid ACH 177-2 BG II. By following recommended ICM practices, he achieved a seed cotton yield of 1625 kg/ha, significantly higher than the 1120 kg/ha obtained under conventional farmer practices. His benefit-cost ratio also improved from 1.05 to 1.35 with the adoption of ICM.

Key practices implemented by him included deep ploughing using a sub-soiler or MB plough to break the soil hardpan, timely irrigation using canal water stored in the diggi, foliar nutrient application as recommended by ICAR-CICR, regular monitoring of pink bollworm using pheromone traps and whitefly using yellow sticky traps, and need-based pesticide application following economic threshold levels based on mobile-based advisories from scientists in Sirsa.

Centre : ICAR-CICR, Sirsa, Haryana
Scientist i/c FLD : Dr. Amarpreet Singh; Senior Scientist (Agronomy)
ICAR-CICR, Regional Station, Sirsa.
Email : amarpreet225@gmail.com



Success Story - 7

A success story of demonstration of drip irrigation for cotton cultivation



Name of Farmer : Sh. Krishan Kumar Jiani
Address : Village: Kheri, Tehsil: - Nathusari Chopta, Sirsa
Mobile no: 9416490150
Date of Birth / Age : 25-11-1971
Education : Post graduation (MA)
Land holding (ha) : 3.72 ha

Sh. Krishan Kumar Jiani, a progressive farmer from Sirsa district, achieved notable success in cotton cultivation during the 2024–25 cropping season by adopting Integrated Crop Management practices under Front Line Demonstrations. Managing 9.3 acres of farmland, he effectively utilized advanced irrigation techniques such as drip fertigation and canal irrigation, supported by a water storage tank (diggi) with a capacity of about 20 lakh litres, ensuring efficient and timely water use.

He is well equipped with a tractor and accesses additional farm machinery through custom hiring. He also maintains close interaction with leading agricultural institutions, including CCS Haryana Agricultural University, Hisar; ICAR-Indian Agricultural Research Institute, New Delhi; KVK, Sirsa; and ICAR-CICR, Regional Station, Sirsa.

Under the FLD program on ICM through AICRP on Cotton under NFSM, he cultivated the American cotton hybrid KCH 307 BG II. By following scientifically recommended practices, he achieved a seed cotton yield of 1965 kg/ha, significantly higher than the 1200 kg/ha recorded under traditional farming methods. The benefit-cost ratio improved from 0.92 to 1.24, indicating better economic returns. The ICM practices he adopted included the use of high-yielding and CLCuD-tolerant BG II hybrids, installation of pheromone traps for monitoring pink bollworm, and yellow sticky traps for whitefly management.

He also implemented foliar nutrient application along with integrated weed, disease, and pest management strategies. Additional measures included deep ploughing with a sub-soiler to break the soil hard pan, timely irrigation using stored canal water, and need-based pesticide application guided by regular monitoring and advisories from ICAR-CICR, Regional Station, Sirsa.

Centre : ICAR-CICR, Sirsa, Haryana
Scientist i/c FLD : Dr. Amarpreet Singh; Senior Scientist (Agronomy)
ICAR-CICR, Regional Station, Sirsa.
Email : amarpreet225@gmail.com



Success Story – 8

From Progressive Farmer to Seed Entrepreneur: A Remarkable Success Story in Cotton Cultivation and Hybrid Seed Production



Name of Farmer : Smt. Manju Rani W/o. Sh. Vikram
Address : Village: Shahpur Begu, District: Sirsa
Date of Birth / Age : 01-01-1986
Education : 08th Standard Pass (Matriculation)
Land holding (ha) : 2.2 ha

Smt. Manju Rani is a progressive farmer from Sirsa district, managing 5.5 acres of land equipped with both submersible tube well and canal irrigation facilities. She is an active and well-connected farmer, regularly interacting with institutions such as HAU, Hisar; KVK, Sirsa; and ICAR-CICR, Sirsa. She frequently attends Krishi Melas, farmer trainings, and extension programs organized by these institutions and the State Department of Agriculture. Notably, she has actively participated in all cotton-related programs conducted by ICAR-CICR, Sirsa.

During the 2024–25 cropping season, under FLDs on ICM through AICRP on Cotton under NFSM, she achieved a seed cotton yield of 2050 kg/ha, significantly higher than the farmers' practice yield of 1550 kg/ha. She also recorded an improved benefit-cost ratio of 1.54 compared to 1.12 under conventional practices. She cultivated the RCH 926 BG II cotton hybrid and adopted recommended ICM practices.

In addition to her achievements in cotton cultivation, she is a successful seed producer of CICR-2 (desi cotton hybrid) developed by ICAR-CICR, Sirsa. After receiving training in hybrid seed production, she emerged as a role model and entrepreneur among women farmers in her village. In the 2020–21 cropping year, she produced 275 kg of CICR-2 seed from one acre under FLD, earning a gross income of ₹2,67,100. She began her journey in 2006 with just 2 kanals (about 1/8th acre), producing 90 kg of seed, which she sold at ₹300/kg. With continuous support and guidance from ICAR-CICR scientists, she has sustained hybrid seed production for nearly two decades.

Today, she sells CICR-2 seeds at ₹1000/kg to farmers across regions including Bathinda, Ferozepur, Sirsa, Hisar, Fatehabad, Bhiwani, Mahendergarh, Rewari, Charkhi Dadri, and Hanumangarh. Over the years, she has produced more than 30 quintals of seed and supplied them to farmers across Punjab, Haryana, and Rajasthan. Her success story and experience in hybrid seed production have become a strong source of inspiration for other cotton growers in the region, encouraging them to adopt hybrid seed production and continue cultivating desi cotton.

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Scientist i/c FLD : Dr. Amarpreet Singh; Senior Scientist (Agronomy)
ICAR-CICR, Regional Station, Sirsa.
E-mail: amarpreet225@gmail.com



Success Story - 9

A water saving technology in ICM: A key to boost in cotton productivity



Name of Farmer : Sh. Vijay Singh Budania
Address : Village: Kheri, Tehsil: - Nathusari Chopta, Sirsa
Mobile no: 9996576512
Date of Birth / Age : 25-11-1971
Education : College graduate (BA degree holder)
Land holding (ha) : 6 ha

Shri Vijay Singh Budania is a progressive farmer from Sirsa district, managing 15 acres of agricultural land. His farm is well-equipped with irrigation facilities, including a 10 HP submersible tube well pump, canal irrigation access, and a water storage tank (diggi) with an approximate capacity of 20 lakh litres for storing canal water. He has also installed a 5 HP solar-powered submersible pump along with a mini sprinkler system supported by MICADA, Haryana. He owns a tractor and supplements his mechanization needs by hiring additional farm implements from local sources as required. An active and well-connected farmer, he maintains strong linkages with institutions such as the local Farmer Producer Organization (Sureran FPO, Nathusari Chopta), HAU Hisar, ICAR-IARI, KVK Sirsa, and ICAR-CICR Regional Station, Sirsa.

He regularly attends Krishi Melas, farmer training programs, and other agricultural events organized by these institutions and the State Department of Agriculture. He has actively participated in cotton-related programs conducted by ICAR-CICR, Sirsa. During the 2022-23 cropping season, under Front Line Demonstrations on Integrated Crop Management, he achieved a seed cotton yield of 1875 kg/ha compared to 1420 kg/ha under traditional farmer practices, with an improved benefit-cost ratio of 1.64 over 1.04.

He cultivated the RCH 926 BG II cotton hybrid and adopted improved ICM practices, including the use of pheromone traps for pink bollworm, yellow sticky traps for whitefly, foliar nutrient sprays, and integrated weed, pest, and disease management strategies. Additionally, he carried out deep ploughing using sub-soiler/MB plough to break hard pan layers, ensured timely irrigation using both tube well and canal water, and followed scientific advisories for pest monitoring and judicious pesticide application.

Centre : ICAR-CICR, Sirsa, Haryana
Scientist i/c FLD : Dr. Amarpreet Singh; Senior Scientist (Agronomy)
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Success Story – 10

From Traditional to Profitable: Success of GN.Cot. 25 in Coastal Cotton Farming



Name of Farmer : Mendiwala Zuber Ibrahim
Address : Village: Devala, Jambusar, Bharuch
Mobile no: 9725930678
Date of Birth / Age : 03-07-1980
Education : SSLC
Land holding (ha) : 2.78 ha

A Front Line Demonstration on seed production of the desi cotton variety GN.Cot. 25 was successfully conducted during the Kharif 2025 season at the field of Shri Mendiwala Zuber Ibrahim in Devala village, Jambusar taluka of Bharuch district. The program was jointly organized by the Main Cotton Research Station, Navsari Agricultural University, Surat, in collaboration with the Krishi Vigyan Kendra, Chaswad.

Under this initiative, quality seeds of GN.Cot. 25 were supplied by the Main Cotton Research Station, NAU, Surat. Throughout the cropping season, scientists and extension personnel from NAU and KVK regularly monitored the field and provided timely technical guidance on key crop management practices, including sowing, nutrient management, and pest control. With consistent scientific support and proper adoption of recommended practices, the farmer successfully raised a healthy and vigorous crop. The demonstration yielded 1100 kg of seed per hectare, which was approximately 15% higher than the locally cultivated variety 'Gheti'. Economic analysis indicated a cost-benefit ratio of 2.50, demonstrating the profitability and economic viability of the improved variety.

The farmer reported that GN.Cot. 25 performed exceptionally well under the prevailing agro-climatic conditions, particularly in coastal, rainfed areas with higher soil salinity. Additionally, the variety matured nearly two weeks earlier than the local variety, providing an advantage in crop planning and reducing production risks. The success of the demonstration drew considerable attention from other farmers in Devala village, many of whom visited the field and showed strong interest in adopting the variety.

Motivated by the positive results, the farmer has begun distributing seeds to neighboring farmers, facilitating wider dissemination of the technology. Overall, this successful FLD on seed production of cotton variety GN Cot 25 underscores the importance of scientific intervention, quality seed supply, and effective extension support in enhancing cotton productivity and improving farmer income, particularly under challenging agro-ecological conditions.

Centre : NAU, Surat, Gujarat
Scientist i/c FLD : Dr. M. C. Patel, Research Scientist (Cotton)
Cotton Research Station,
Navsari Agricultural University, Surat.
Email : cottonist@nau.in



Success Story - 11

Integrated Crop Management in Bt cotton hybrid G. Cot. Hy. 8 BG II Enhances Yield and Profitability



Name of Farmer : Ravibhai Babarbai Vasava
Address : Village: Kambodiya, Taluka - Netrang,
Mobile no: 7575826867
Date of Birth / Age : 01-12-1964
Education : Primary Education
Land holding (ha) : 4.57 ha

A Front Line Demonstration on Integrated Crop Management in Bt cotton hybrid G. Cot. Hy. 8 BG II was successfully carried out during the Kharif 2021 season in a farmer's field at Kambodia village, Netrang, Bharuch. The program was jointly organized by the Main Cotton Research Station, Navsari Agricultural University, Surat, in collaboration with Krishi Vigyan Kendra, Chaswad.

The participating farmer was trained in adopting ICM practices from seed to harvest. Essential inputs such as the seeds of public sector Bt cotton hybrid G. Cot. Hy. 8 BG II, biofertilizers, pheromone traps and lures for monitoring and managing pink bollworm, safer insecticides, and banana pseudostem sap as a liquid organic foliar nutrient were provided to ensure the success of the demonstration. Regular field visits and continuous technical guidance from scientists facilitated the proper implementation of recommended practices.

A live demonstration on pink bollworm management, organized by NAU, Surat and KVK, Chaswad, helped Shri Ravibhai and other farmers gain a clear and practical understanding of pest management techniques. The demonstration resulted in a seed cotton yield of 1950 kg/ha, which was 11% higher than the yield under existing local practices (1760 kg/ha). Adoption of ICM practices improved crop health, reduced pest incidence, and enhanced economic returns, achieving a benefit-cost ratio of 2.19.

The success of the demonstration attracted considerable attention from local cotton growers, who appreciated the effectiveness of the demonstrated practices and inputs. Encouraged by these outcomes, the farmer strongly recommends the adoption of Bt cotton hybrid G. Cot. Hy. 8 BG II along with ICM practices for sustainable cotton production.

Centre : NAU, Surat, Gujarat
Scientist i/c FLD : Dr. M. C. Patel, Research Scientist (Cotton)
Cotton Research Station,
Navsari Agricultural University, Surat.
Email : cottonist@nau.in



Success Story - 12

From Chemicals to Conscious Cultivation: A Farmer's Journey to Profitable Organic Cotton Farming



Name of Farmer : Maheshbhai Pragjibhai Domadiya
Address : Village: Vadal, Taluka: Junagadh
Mobile no: 9426834678
Date of Birth / Age : 24-01-1977
Education : 10th
Land holding (ha) : 4 ha

Mr. Maheshbhai Pragjibhai Domadiya, a progressive FLD farmer from Vadal village in Junagadh, has successfully showcased the potential of organic cotton cultivation by completely eliminating chemical fertilizers for the past five years. He adopted a holistic and eco-friendly farming approach with the technical support of Scientists from JAU, Junagadh, relying primarily on well-decomposed farmyard manure from his own cattle as a key nutrient source. This shift not only improved soil health but also significantly reduced input costs. To further support crop growth and resilience, he regularly applied 15 liters of gaumutra (cow urine) per hectare at 15-day intervals through drip irrigation.

For pest management, particularly bollworm control, he used *Trichogramma bactrae* cards as a biological solution, ensuring an environmentally safe and sustainable approach. Additionally, he incorporated traditional organic formulations such as jeevamrut, saptaparni (arca), and buttermilk, which functioned as natural growth enhancers and pest repellents. These practices improved soil microbial activity, strengthened plant health, and helped maintain a balanced agro-ecosystem. In contrast to conventional methods involving multiple pickings, he adopted a single picking system for cotton.

This allowed timely sowing of rabi crops, ensuring efficient crop rotation and optimal land use throughout the year. Notably, his crop showed a lower incidence of pests and diseases, attributed to the enhanced natural resistance developed through consistent organic management.

The outcomes have been highly encouraging, with sustainable yields achieved at reduced cultivation costs. His success has motivated many farmers in the region to adopt organic cotton cultivation, recognizing its dual benefits of improved profitability and environmental conservation. This approach not only supports farmers' economic stability but also contributes to better soil health, biodiversity, and long-term agricultural sustainability.

Centre : JAU, Junagadh, Gujarat
Scientist i/c FLD : Dr. M. G. Valu, Research Scientist (Cotton)
Cotton Research Station. JAU, Junagadh
Email : Cotton@jau.in



Success Story - 13

Doubling Farmers' Income through Intercropping and Eco-Friendly Pest Management in cotton



Name of Farmer : Ashokbhai Batukbhai Movaliya
Address : Village: Chuda, Tal. Bhesan & Dist. Junagadh
Mobile no: 6351036318
Date of Birth / Age : 40 years
Education : BRS
Land holding (ha) : 2 ha

Ashokbhai Batukbhai Movaliya, a farmer from Chuda village in Junagadh district, has successfully transformed his farming system by adopting scientific and sustainable agricultural practices. Earlier, he cultivated only cotton and reared buffaloes, earning an annual income of about ₹1,51,330. However, high plant protection costs and limited returns made it difficult to sustain his livelihood. With support from the FLD program to double the income, Ashokbhai introduced intercropping of cotton with groundnut during the Kharif 2021 season and adopted Integrated Pest Management practices.

Under the guidance of agricultural experts, he implemented eco-friendly pest control measures such as pheromone traps and sticky traps to monitor and manage sucking pests, along with light traps to control pink bollworm. These practices significantly reduced his dependence on chemical pesticides, lowering input costs and minimizing environmental impact. The addition of groundnut as an intercrop improved land use efficiency and provided an extra source of income, enhancing his financial stability. The combined effect of intercropping and IPM practices led to increased farm productivity and profitability. Although labour costs rose slightly, the savings on pesticides and higher yields more than compensated for the increase. As a result, Ashokbhai's annual income rose substantially to around ₹3,01,000 nearly double his previous earnings. His experience highlights the benefits of crop diversification and sustainable pest management.

Today, he serves as a role model for farmers in his region, demonstrating how innovative and eco-friendly approaches can lead to higher income, reduced costs, and long-term agricultural sustainability.

Centre : JAU, Junagadh, Gujarat
Scientist i/c FLD : Dr. M. G. Valu, Research Scientist (Cotton)
Dr. D. K. Davara,
Cotton Research Station. JAU, Junagadh
Email : Cotton@jau.in



Success Story - 14

High Density, High Returns: Redefining Cotton Farming in Akola



Name of Farmer : Shri. Pandurang Gayki
Address : Village: Kadoshi, Ta: Balapur, District: Akola
Mobile no: 9881459756
Date of Birth / Age : 19-01-1962
Education : 10th Passed
Land holding (ha) : 8 ha. (Irrigated)

Under NFSM Front Line Demonstrations, advanced cotton production technologies have been systematically promoted since 2018-19 across the jurisdiction of Dr. Punjabrao Deshmukh Krishi Vidyapeeth, Akola. These demonstrations covered key components such as Integrated Crop Management, High Density Planting System, intercropping, and improved Bt and hirsutum genotypes developed through public private partnerships. Each year, 50-60 FLDs are successfully conducted in farmers' fields, enhancing productivity and profitability.

One notable success story is that of Mr. Pandurang Gaiki, a progressive farmer from Kadoshi village in Balapur taluka of Akola district. Cultivating cotton on his 8 hectares of irrigated land, he has consistently embraced scientific recommendations. Since the introduction of Bt technology in 2002, he has shifted from traditional varieties to high yielding Bt hybrids, regularly consulting scientists from the Cotton Research Unit of PDKV for improved agronomic practices.

Recognizing the potential of HDPS, Mr. Gaiki adopted this technology under NFSM-FLDs from 2022-23 onwards on one hectare of his land. With guidance from university experts, suitable hybrids such as Vijeta, RCH-971, US-4823, and Ankur Kirti were cultivated at a spacing of 90 × 30 cm, maintaining an optimal plant population of about 14,000 plants per acre. Scientific crop management practices, including the application of mepiquat chloride for canopy regulation, were followed meticulously.

The results have been remarkable. His seed cotton yields steadily increased from 2840 kg/ha in 2022-23 to 3485 kg/ha in 2025-26, compared to his earlier yields of 1800-2000 kg/ha under conventional methods. This represents a yield improvement of 25-30 percent. Economically, the net returns increased by ₹75,000 to ₹1,10,000 per hectare, with the benefit cost ratio rising from 2.53 to 3.65 under HDPS.

Centre : PDKV, Akola, Maharashtra
Scientist i/c FLD : Dr. Sanjay U. Kakade,
Professor of Agronomy & Cotton Agronomist,
Cotton Research Unit, Dr. PDKV, Akola.
Email : snjyakakade@gmail.com



Success Story - 15

From Wider Rows to Winning Rows: Transforming Cotton Productivity through HDPS



Name of Farmer : Shri. Rameshwar Lalabhau Undal
Address : Village: Chelka, Ta.Barshitakali, Akola
Date of Birth / Age: 25-08-1973
Education : B.A.
Land holding (ha) : 1.95 ha

The Cotton Research Unit of Dr. Punjabrao Deshmukh Krishi Vidyapeeth, Akola, identified Chelka village with the objective of enhancing cotton productivity and profitability through the adoption of improved technologies, particularly Integrated Crop Management and High Density Planting System. Under the Indian Council of Agricultural Research-NFSM Frontline Demonstrations, the village was selected for cluster-based interventions to promote scientific cotton cultivation practices. A comprehensive baseline survey was conducted by scientists through direct interaction with farmers to understand their socio-economic conditions, landholding patterns, and existing agricultural practices. The study revealed that most farmers followed wider spacing (120 × 60 cm or 120 × 90 cm), resulting in suboptimal plant population and lower yields. Based on these findings, targeted strategies were developed to address the gaps and improve productivity.

To facilitate this transition, the Cotton Research Unit organized extensive awareness programs, group discussions, field visits, and hands-on training sessions. Demonstrations on HDPS, ICM, moisture conservation through ridge and furrow systems, and canopy management practices were conducted across 18 farmers' fields in 2023-24 and 10 farmers' fields in 2024-25. Among the beneficiaries, Mr. Rameshwar Lalabhau Undal emerged as a leading example of successful adoption. Cultivating 1.95 hectares of irrigated land, he implemented HDPS with a spacing of 90 × 15 cm on one acre, replacing the conventional wider spacing. With scientific guidance, he adopted practices such as canopy regulation using mepiquat chloride,

de-topping, monopodia removal, and integrated pest management. The results were highly encouraging. His seed cotton yield increased from 1865 kg/ha under traditional methods to 2987 kg/ha, marking a 37.56% improvement. The gross and net returns rose significantly to ₹2,30,298/ha and ₹1,70,598/ha, respectively, with a benefit cost ratio of 3.86, compared to 2.53 under conventional practices. The additional profit of ₹83,676 per hectare highlighted the economic viability of HDPS. Inspired by these outcomes, farmers across Chelka village have begun adopting HDPS technology, expanding its coverage to over 150 hectares. In recognition of his outstanding contributions to enhancing agricultural productivity through the adoption of university-recommended technologies, he has received several prestigious accolades. He was honored by the Central Research Institute for Dryland Agriculture under the aegis of Indian Council of Agricultural Research, Hyderabad. Additionally, he has been felicitated by reputed organizations such as the Pani Foundation, PDKV, Akola and the State Department of Agriculture. Through his progressive outlook and successful adoption of innovative farming practices, he has emerged as a role model, inspiring farmers in neighboring villages to embrace modern agricultural technologies for improved productivity and profitability.

Centre : PDKV, Akola, Maharashtra
Scientist i/c FLD : Dr. Sanjay U. Kakade,
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Cotton Research Unit, Dr. PDKV, Akola
Email : snjyakakade@gmail.com



Success Story - 16

Integrating Intercropping and IPM for Sustainable Cotton Farming



Name of Farmer : Mrs. Swati Kamaji Pawar
Address : Village: Pardi Tq. Loha Dist. Nanded
Mobile no: 7620302544
Date of Birth / Age : 31 years
Education : 9th
Land holding (ha) : 1.2 ha

Mrs. Swati Kamaji Pawar, a progressive woman farmer, successfully showcased the advantages of integrating intercropping with eco-friendly pest management practices in improved cotton cultivation. She adopted key technologies such as intercropping Bt cotton with green gram in a 1:1 ratio and implementing Integrated Pest Management strategies to effectively control pink bollworm. Compared to the conventional practice of sole cotton cultivation with excessive pesticide use, her approach proved to be both economically rewarding and environmentally sustainable.

The inclusion of green gram as an intercrop functioned as a “bridge crop,” offering multiple benefits. It led to a 17.63% increase in overall productivity, as indicated by a higher Land Equivalent Ratio (LER), meaning greater output from the same land area. Additionally, green gram provided an early harvest in September, ensuring timely income during the cotton season. This immediate cash flow enabled the farmer to meet input costs without depending on high-interest loans, thereby reducing the risk of falling into debt. Beyond production, she improved profitability by adding value to her produce. Instead of selling raw green gram, she processed it into dal, significantly enhancing its market price. By collaborating with a Self Help Group, she utilized shared labor and collective marketing. Branding the product as unpolished dal allowed her to tap into health-conscious urban markets and secure premium prices. The adoption of IPM practices further strengthened sustainability while lowering costs.

The use of neem and dashparni extracts reduced initial expenses and preserved beneficial bio-agents that naturally control pests. Pheromone and light traps were effectively used to manage pink bollworm, while sticky traps helped control sucking pests. By keeping pest populations below the Economic Threshold Level, she ensured efficient and judicious pest management. Overall, this integrated approach demonstrated higher productivity, increased profitability, and improved sustainability compared to conventional cotton farming practices.

Particulars	Improved practice (ICM)	Farmers practice
Seed cotton yield (kg/ha)	Cotton - 1150 + Green gram - 580 Equivalent yield - 1794	Sole cotton - 1525
NMR (Rs/ha)	62861	45639
Additional returns over FP	17221	-
BCR	2.00	1.74

Centre : VNMKV, Nanded, Maharashtra
 Scientist i/c FLD : Dr. Arvind D. Pandagale,
 Associate Agronomist
 Cotton Research Station, Nanded
 Email : arvindpandagale@yahoo.co.in



Success Story - 17

Smart Spacing and Eco-Friendly Pest Management: Transforming Cotton Productivity through HDPS and IPM



Name of Farmer : Shri Ratnakar Gangadhar Dhage
Address : Village: Sayala Tq. Loha Dist. Nanded
Mobile no:8208639235

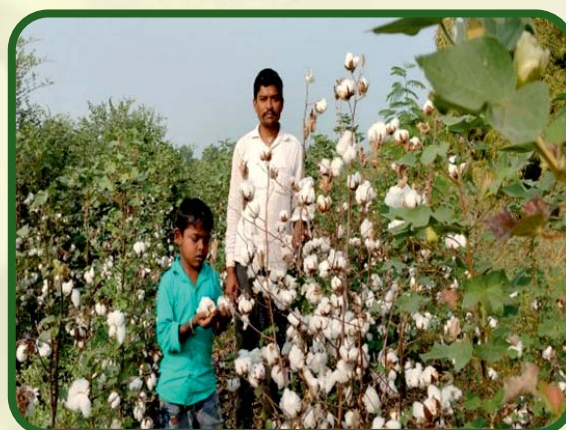
Shri Ratnakar Gangadhar Dhage, a progressive farmer, significantly improved cotton productivity and profitability by adopting the High Density Planting System along with Integrated Pest Management practices. Moving away from the traditional approach of wider spacing (120 × 45 cm) and indiscriminate pesticide use, he implemented closer spacing of 90 × 30 cm combined with scientific crop and pest management strategies. A key factor behind this success was the optimization of plant population through HDPS. By maintaining uniform and ideal spacing, he ensured efficient use of land resources, leading to a notable increase in seed cotton yield.

Unlike conventional practices where uneven spacing often results in underutilization, HDPS promoted better canopy management and increased boll formation. In addition, timely application of basal nutrients at sowing provided early nourishment to seedlings, supporting strong root development and improving tolerance to mid season stress. Balanced nutrient management also played an important role in enhancing productivity. Previously, excessive nitrogen application caused lush vegetative growth with fewer bolls and increased pest incidence. By integrating potassium with controlled nitrogen use, the farmer improved water-use efficiency, strengthened plant health, and enhanced fibre quality. This balanced nutrient approach ensured that plant energy was directed more toward reproductive growth rather than excessive foliage. Furthermore, the shift from calendar-based pesticide application to IPM practices reduced both costs and environmental impact. The farmer adopted a layered pest management strategy, using pheromone traps to control pink bollworm and light and sticky traps to monitor pest populations.

These tools served as early warning systems, keeping pest levels below the Economic Threshold Level. The use of homemade neem extracts in the initial stages replaced expensive chemical pesticides, helping conserve beneficial insects and maintain ecological balance. As a result, pesticide applications were significantly reduced, lowering input costs and labor requirements.

Particulars	Improved practice (ICM)	Farmers practice
Seed cotton yield (kg/ha)	2525	2150
NMR (Rs/ha)	92954	74029
Additional returns over FP	18925	-
BCR	2.19	2.04

Centre : VNMKV, Nanded, Maharashtra
Scientist i/c FLD : Dr. Arvind D. Pandagale,
Associate Agronomist
Cotton Research Station, Nanded
Email : arvindpandagale@yahoo.co.in



Success Story - 18

Precision Planting and Growth Regulation to enhance Cotton Productivity: Adoption of HDPS



Name of Farmer : Shri Sarjerao Sahebrao Kharwade
Address : Village: Rui, Taluk: Georai, District: Beed
Mobile no:9823519552
Date of Birth / Age : 51 years
Education : S.S.C.
Land holding (ha) : 3.2 ha

Shri Sarjerao Sahebrao Kharwade, a progressive farmer, significantly enhanced cotton productivity by adopting the High Density Planting System along with the careful use of Plant Growth Regulators. Moving away from the traditional practice of wider spacing (120 × 45 cm) and heavy nitrogen application, he introduced closer spacing of 90 × 30 cm, which optimized plant population and improved overall crop performance. The adoption of HDPS proved transformative cotton cultivation. With a higher number of plants per hectare, the system increased the Leaf Area Index (LAI), enabling better light interception and greater biomass production.

While individual plants grown at wider spacing may yield more bolls, the total boll count per unit area was considerably higher under HDPS due to increased plant density. This led to a notable rise in overall yield, highlighting the effectiveness of scientific spacing over conventional methods. Recognizing that high density planting can sometimes promote excessive vegetative growth leading to shading of lower bolls and higher pest incidence the farmer implemented a balanced strategy combining growth regulation and nutrient management. He applied Mepiquat Chloride as a plant growth regulator to control vegetative growth by suppressing gibberellic acid synthesis. This resulted in shorter internodes, a more compact plant structure, and improved allocation of energy toward boll development rather than leaf growth. Additionally, nitrogen application was carefully managed to prevent excessive foliage and reduce pest attraction. This integrated approach ensured better aeration, improved sunlight penetration, and more efficient crop management practices, ultimately contributing to higher productivity and sustainability.

Particulars	Improved practice (ICM)	Farmers practice
Seed cotton yield (kg/ha)	1565	1275
NMR (Rs/ha)	37513	23411
Additional returns over FP	14103	-
BCR	1.54	1.37

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Success Story – 19

Optimizing Plant Density and Balanced Nutrition: A Pathway to Enhanced Cotton Productivity



Name of Farmer : Shri Vishnu Kashinath Vadhekar
Address : Village: Chincholi, Taluk: Fullambri, Aurangabad,
Mobile No. : 8888019199
Date of Birth / Age : 46 years
Education : B.A.,
Land holding (ha) : 2.2 ha

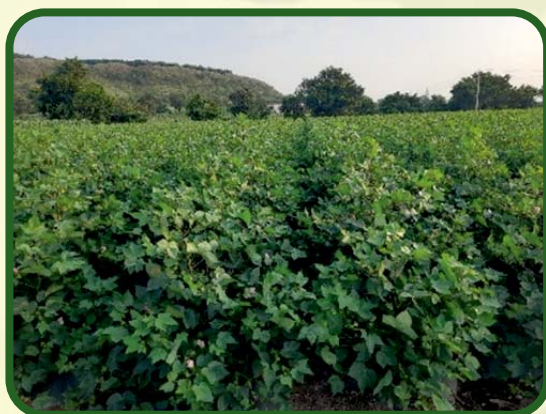
Shri Vishnu Kashinath Vadhekar, a progressive farmer, significantly enhanced cotton productivity by adopting scientific crop management practices. His approach emphasized optimum plant density, Integrated Nutrient Management, and Integrated Pest Management. Moving away from traditional methods – such as wider spacing (150 × 45 cm), excessive nitrogen application, and heavy dependence on chemical pesticides, he implemented the recommended spacing of 120 × 45 cm along with a balanced fertilizer dose of 120:60:60 kg NPK/ha and eco-friendly pest control strategies. A key factor in this improvement was the optimization of plant density.

By adopting the recommended spacing of 120 × 45 cm, he increased the number of plants per hectare, leading to more efficient use of sunlight and soil nutrients. Although plants grown at wider spacing appeared larger and bushier, the total boll production per unit area was significantly higher under the improved spacing. The crop canopy also developed more quickly, which helped suppress weeds and enhanced light interception, ultimately boosting photosynthesis. Balanced nutrient management played an equally important role. Applying basal doses at sowing ensured the immediate availability of phosphorus and potassium, supporting strong root development and improving early-stage stress tolerance. Unlike the earlier practice of excessive nitrogen use which resulted in tall, leafy plants vulnerable to pest attacks judicious nitrogen application promoted compact growth, improved boll formation, and reduced pest incidence.

Furthermore, the adoption of IPM practices such as the use of botanical pesticides, traps, and need based insecticide application helped reduce chemical dependency while maintaining ecological balance. Together, these improved practices led to a more sustainable and productive cotton cultivation system.

Particulars	Improved practice (ICM)	Farmers practice
Seed cotton yield (kg/ha)	2292	1935
NMR (Rs/ha)	82978	60880
Additional returns over FP	22098	
BCR	2.04	1.80

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 Scientist i/c FLD : Dr. Arvind D. Pandagale,
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Success Story – 20

Enhancing cotton production through Drip irrigation: A progressive farmer journey



Name of Farmer : Shri. Babasaheb Jijabapu Chavan
Address : Village: Barahanpur, ta. Rahuri. Dist. Ahilyanagar
Mobile no:9850546612
Date of Birth / Age : 34 years
Education : B.A.
Land holding (ha) : 16.8 ha

Mr. Babasaheb Jijabapu Chavan, a progressive horticulturist, has achieved notable success in cotton cultivation by adopting modern, science-based practices with guidance from experts at the Cotton Improvement Project, Mahatma Phule Krishi Vidyapeeth, Rahuri. Out of his total 42 acres, he dedicated 8 acres to cotton, reflecting his commitment to diversification and improved farm productivity. To manage water efficiently, he constructed farm ponds for irrigation. Of the cotton area, four acres were equipped with drip irrigation, while the remaining four acres followed conventional flow irrigation. In the drip-irrigated fields, cotton was planted at a spacing of 6 × 2 feet to optimize growth and resource use.

Throughout the season, he remained in close contact with project scientists and followed their technical advice. Mr. Chavan adopted an integrated approach that combined proper nutrient, fertilizer, weed, and pest management practices. This scientific method resulted in a higher yield of 28.75 quintals per ha under drip irrigation, compared to 20 quintals per ha in flow irrigated fields. The clear yield advantage demonstrates the effectiveness of drip irrigation when combined with comprehensive crop management. Encouraged by these results, he plans to expand cotton cultivation more intensively in the future. He has also shown leadership in community development by inviting experts to conduct training programs and crop demonstrations in his area, aiming to share modern cotton production technologies with fellow farmers and serve as a role model in the region.

Particulars	Improved practice (ICM)	Farmers practice
Seed cotton yield (kg/ha)	2292	1935
NMR (Rs/ha)	82978	60880
Additional returns over FP	22098	
BCR	2.04	1.80

Centre : MPKV, Rahuri, Maharashtra
 Scientist i/c FLD : Dr. P. L. Kulwal, Cotton Breeder,
 Cotton Improvement Project,
 MPKV, Rahuri
 Email : cotton_mpkv@rediffmail.com



Success Story - 21

Reviving Saline Soils through Scientific Cotton Cultivation



Name of Farmer : Shri. Nanasaheb Gorakshanth Dhonde
Address : Sade, ta. Rahuri. Dist. Ahilyanagar
Mobile no: 9766402481

Date of Birth / Age : 40 Years
Education : D. Pharm
Land holding (ha) : 3.2 ha

Shri Nanasaheb Gorakshnath Dhonde, a D. Pharmacy graduate and progressive farmer from Sade village, has successfully transformed his farming system by adopting scientific cotton cultivation practices. Earlier, sugarcane was his primary crop. However, continuous cultivation without crop rotation resulted in increased soil salinity, deterioration of soil structure, and a decline in both crop quality and productivity. Recognizing the need for change, Shri Dhonde shifted to cotton cultivation about eight years ago. He sought technical guidance from the Cotton Improvement Project at Mahatma Phule Krishi Vidyapeeth, Rahuri.

With support from scientists, he adopted improved and modern farming techniques. Soil analysis of his field indicated high salinity and pH imbalance caused by excessive irrigation. To restore soil health, he introduced green manuring practices. After each cotton harvest, he incorporated crop residues into the soil using a rotavator, which helped improve organic carbon levels and overall soil fertility. Throughout the cropping season, Shri Dhonde maintained regular interaction with agricultural experts to ensure timely implementation of recommended practices. His farm also became a demonstration site for knowledge sharing. On August 4, 2024, a Cotton Farming School and crop demonstration were organized under the Cotton Improvement Project, where scientists guided farmers on advanced cotton production techniques and the effective use of pheromone traps for pest management. As a result of these efforts, Shri Dhonde achieved a yield of 20 quintals per acre in 2024, totaling 45 quintals per hectare.

This led to a net income of approximately INR 2.0 lakh after accounting for cultivation costs.

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Scientist i/c FLD : Dr. P. L. Kulwal, Cotton Breeder,
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Success Story - 22

From Monocrop to dual crop: A Smart Intercropping Success story in Cotton Farming



Name of Farmer : Chandrashekhar Bhanji Dharapure
Address : Thanegaon, Taluka-Karanja, District-Wardha
Date of Birth / Age : 01-07-1976
Education : 12th Standard
Land holding (ha) : 0.6 ha

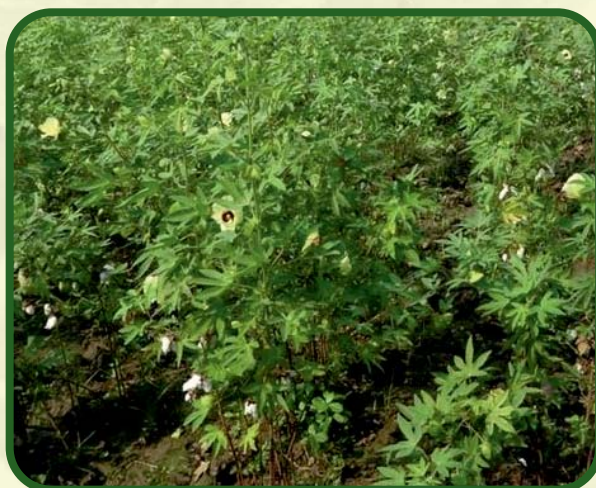
Under the NFSM Front Line Demonstration program, a scientific intervention was carried out in the field of Shri Dharapure to enhance productivity and sustainability. Soil samples from his farm were analyzed, revealing suitability for cotton cultivation at an optimal spacing of 90 × 60 cm with balanced nutrient management. The analysis also indicated declining soil health due to continuous cotton cropping, prompting the recommendation of legume intercropping to restore fertility. Acting on these recommendations, he cultivated Rasi Swift-779 BG-II hybrid cotton on 20 June 2025 using the prescribed spacing.

To improve system productivity, one row of pigeon pea (Godawari variety) was introduced after every five rows of cotton. A separate plot with sole cotton was also maintained for comparison. The results demonstrated clear advantages of improved practices. The intercropping system yielded 19 quintals of cotton and 5 quintals of pigeon pea, while the improved sole cotton plot produced 20 quintals, compared to 18 quintals under traditional methods. Economically, the conventional practice generated a net return of ₹68,800 with a B:C ratio of 2.01. Improved sole cotton cultivation increased net returns to ₹82,000 with a B:C ratio of 2.17.

However, the cotton + pigeon pea intercropping system proved most profitable, generating a gross income of ₹1,75,600 and a net return of ₹1,06,600, with a higher B:C ratio of 2.54. This resulted in an additional income of ₹37,800 over traditional practices.

Beyond profitability, the system provided multiple benefits, including improved soil fertility through legume integration, reduced production risk, and enhanced nutritional security, as one quintal of pigeon pea was reserved for household consumption. This success highlights the effectiveness of integrating soil test based nutrient management, optimum spacing, and intercropping for sustainable and profitable cotton farming.

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Success Story - 23

Two Crops, One Strategy: Unlocking Hidden Value in Cotton Fields



Name of Farmer : Pravin Rekhchand Fulkar
Address : Umari, Taluka-Hinganghat, District-Wardha
Date of Birth / Age : 05-10-1982 and 43
Education : 12th Standard
Land holding (ha) : 0.5 ha

In the shallow soils of Wardha district, Shri Fulkar's farming journey reflects a remarkable shift from traditional practices to science-based cultivation. Earlier, he cultivated sole cotton at wider spacing (90 × 90 cm) without assessing soil fertility. Continuous monocropping over the years led to declining soil health and limited productivity, restricting his yield to only 15 quintals per hectare. Under the NFSM Front Line Demonstration program, soil samples from his field were analyzed to develop a site specific strategy.

The findings recommended closer spacing and balanced nutrient management, along with legume intercropping to restore soil fertility and improve sustainability. Adopting these recommendations, Shri Fulkar cultivated Sriram-639 BG-II hybrid cotton at improved spacing and introduced a cotton pigeon pea intercropping system, planting two rows of pigeon pea (Ankur Charu variety) after every six rows of cotton. A separate plot under sole cotton was maintained for comparison. The outcomes were highly encouraging. While his traditional practice yielded 15 quintals per hectare, the improved sole cotton plot produced 20 quintals. The intercropping system further enhanced returns by yielding 20 quintals of cotton along with 6 quintals of pigeon pea. Economically, his earlier net return of ₹47,500 (B:C ratio 1.73) increased to ₹80,000 (B:C ratio 2.14) under improved sole cotton.

However, the intercropping system proved most beneficial, generating a net return of ₹1,18,000 with a higher B:C ratio of 2.69 an increase of ₹70,500 over his previous practice. In addition to higher income, the system ensured household nutritional security through pigeon pea consumption, improved soil fertility through legume inclusion, and reduced production risks. This success clearly demonstrates that integrating soil test based nutrient management, optimum spacing, and cotton legume intercropping offers a sustainable and profitable solution for farmers cultivating in shallow soils.

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Success Story - 24

Strip Intercropping Strategy: Turning Cotton Fields into Multi-Income System



Name of Farmer : Aniket Devaji Pande
Address : Patansavangi, Taluka-Saoner, District-Nagpur
Date of Birth / Age : 11.08.1998
Education : B.Sc.,
Land holding (ha) : 2 ha

In the medium deep soils of the Nagpur region, Shri Pande's farming journey reflects a progressive shift from conventional monocropping to a more diversified and sustainable system. Despite being aware of his soil fertility status, he previously cultivated sole cotton at a spacing of 90 × 90 cm. Continuous monocropping over the years led to stagnation in productivity, limiting yields to around 20 quintals per hectare. Seeking improved productivity and long term sustainability, he approached scientists of the ICAR-CICR for technical guidance. Based on their recommendations, he adopted a strip intercropping system involving cotton and pigeon pea, along with crop rotation.

He sowed Ankur 3028 BG-II hybrid cotton at a spacing of 90 × 60 cm, followed by a strip arrangement of 10 rows of cotton alternated with 10 rows of pigeon pea (Ankur Charu variety). Additionally, he planned a green gram crop after cotton harvest to enhance soil fertility and generate additional income. A separate plot under sole cotton cultivation was maintained for comparison. The results clearly highlighted the benefits of diversification. While the sole cotton plot yielded 20 quintals, the intercropping system produced 15 quintals of cotton along with 10 quintals of pigeon pea. Economically, sole cotton cultivation generated a net return of ₹87,000 with a B:C ratio of 2.34. In contrast, the intercropping system recorded a higher net return of ₹1,23,300 and an improved B:C ratio of 3.06, resulting in an additional income of ₹36,300.

Beyond higher profitability, the system ensured multiple advantages, including improved soil health through legume integration, reduced production risk, and enhanced nutritional security, as a portion of pigeon pea was retained for household consumption. The standing green gram crop further adds to income prospects and sustainability. This success story demonstrates that strip intercropping combined with crop rotation is a resilient and profitable alternative to continuous cotton monocropping, offering a practical pathway for sustainable farming in medium deep soils.

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Success Story - 25

Replacing Risk with Reliable Income through Cotton-Pigeon Pea Intercropping



Name of Farmer : Champat Vishram Kohale
Address : Rajani, Taluka Katol, District Nagpur
Date of Birth / Age : 1944 :82
Education : Uneducated
Land holding (ha) : 1.5 ha

In the rainfed, shallow soils of the Nagpur region, Shri Champat Vishram Kohale transformed his farming system by adopting scientific intercropping practices under the guidance of ICAR-CICR. Earlier, he cultivated sole pigeon pea at very close spacing (90×5 cm), which resulted in excessive plant population, poor crop performance, and low yields of about 9 quintals per hectare. This long duration monocrop provided limited income and failed to meet his household needs, especially during peak expenditure periods like the Diwali season.

To overcome these challenges, he adopted a Cotton + Pigeon Pea intercropping system under the NFSM-FLD program. He sowed Ajeet-155 BG-II hybrid cotton at a spacing of 90×60 cm, maintaining a 5:2 row ratio with pigeon pea (Ankur Charu variety). Despite rainfed conditions, he managed one supplementary irrigation through furrows, ensuring better crop establishment. The improved system delivered significant economic gains. He harvested 16 quintals of cotton and 5 quintals of pigeon pea, generating a total gross income of ₹1,59,600 per hectare. With a total cultivation cost of ₹61,000, the net return reached ₹98,600, resulting in a Benefit Cost ratio of 2.62.

In comparison, sole cotton cultivation yielded a net return of ₹87,000 with a B:C ratio of 2.34. Although sole cotton produced slightly higher cotton yield, the additional income from pigeon pea made intercropping more profitable and stable. Beyond economic gains, the system offered multiple advantages.

It ensured nutritional security through household consumption of pigeon pea, improved soil fertility due to the legume component, and reduced production risks under rainfed conditions. Importantly, it provided partial income before cotton harvest, helping the farmer manage financial needs more effectively. This success story clearly demonstrates that cotton pigeon pea intercropping is a resilient, profitable, and sustainable farming strategy, particularly suited for rainfed shallow soils. It highlights how scientific interventions can enhance income, strengthen livelihood security, and promote long term soil health.

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Success Story – 26

Balanced Nutrition, Better Profits: A Scientific Farming Success Story



Name of Farmer : Vinod Sheshraoji Marbate
Address : Malegaon (T), Taluka Saoner, District Nagpur
Date of Birth / Age : 25-05-1978 and 48
Education : 12th Standard
Land holding (ha) : 4 ha

A progressive Scheduled Tribal farmer from Malegaon demonstrated remarkable success by adopting Integrated Crop Management combined with Nutrient Expert for Cotton during Kharif 2025. With technical guidance from the ICAR-CICR, he implemented soil test based, site-specific nutrient management to enhance cotton productivity and profitability. The farmer cultivated Dhandev + BG-II hybrid cotton on 15 June 2025 at a spacing of 90 × 60 cm. Unlike conventional practices, fertilizer application was guided by Nutrient Expert®, which provided precise recommendations based on soil fertility status and targeted yield levels.

Scientific crop monitoring and need-based plant protection measures were also followed as part of the ICM approach. The results clearly highlighted the effectiveness of this technology. Under traditional practices, the farmer harvested 2,457 kg of seed cotton, whereas the ICM with Nutrient Expert approach increased the yield to 3,287 kg of seed cotton, an additional gain of 830 kg. Economically, the gross income increased from ₹1,89,404 to ₹2,53,427. After accounting for cultivation and picking costs, the net profit rose significantly from ₹1,13,835 to ₹1,69,558.

The benefit cost ratio also improved from 2.51 to 3.02, demonstrating higher returns per rupee invested. The adoption of this technology resulted in an additional net profit of ₹55,723, underscoring the economic advantage of balanced and scientific nutrient management. Beyond yield improvement, the approach ensured efficient use of fertilizers, better crop growth, and sustainable soil health. Encouraged by these outcomes, the farmer has expressed strong willingness to continue this practice in future seasons and to promote it among fellow farmers.

This success story highlights the transformative potential of site specific nutrient management tools like Nutrient Expert in improving cotton productivity and farm profitability, particularly in the Nagpur region.

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Success Story - 27

Smart Inputs, Strong Outputs: A Journey to Higher Cotton Productivity



Name of Farmer : Ketan Babarao Wankhede
Address : Village Hatala, Taluka Katol, District Nagpur
Date of Birth / Age : 20-08-1987 and 39
Education : Graduation
Land holding (ha) : 1.7 ha

Shri Ketan Babarao Wankhede, a progressive farmer from Hatala village in the Nagpur region, was cultivating cotton on medium shallow soils with irrigation facilities. Despite access to irrigation, his productivity remained limited to 23 quintals per hectare due to improper nutrient management. Fertilizers were applied without soil testing, in only two splits, and the crop was maintained at a wider spacing of 90 × 90 cm conditions that were not suitable for his soil type.

Under the NFSM-FLD program, scientists from Central Institute for Cotton Research assessed his field and introduced the Nutrient Expert for Cotton software application. Soil analysis revealed deficiencies in nitrogen, phosphorus, sulphur, and organic carbon, while potassium and zinc levels were adequate. Based on this diagnosis and a target yield of 35 quintals per hectare, site specific recommendations were provided.

The farmer adopted Moksha BG-II hybrid cotton with an optimized spacing of 90 × 60 cm. Balanced fertilization was ensured through four split applications of nitrogen, along with appropriate phosphorus, sulphur, and micronutrient management. Improved agronomic practices were also followed under scientific supervision. The results were transformative. Cotton yield increased from 23 to 33 quintals per hectare, registering an additional gain of 10 quintals. Economically, the gross income rose from ₹1,74,800 to ₹2,50,800. After accounting for cultivation and picking costs, net returns improved significantly from ₹1,01,800 to ₹1,62,800 per hectare.

The benefit cost ratio increased from 2.39 to 2.85, demonstrating the clear advantage of scientific nutrient management. Beyond yield and income enhancement, the intervention strengthened the farmer's livelihood. With the additional income, he established a wooden cold-pressed oil extraction unit, creating an alternative revenue stream. Today, Shri Wankhede stands as a role model in his village, inspiring others to adopt soil test based fertilization and improved agronomic practices. This success story highlights that precision nutrient management, combined with appropriate spacing and scientific guidance, can significantly enhance cotton productivity, profitability, and sustainability in medium shallow soils.

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Success Story – 28

Balancing the Soil, Boosting the Harvest: A Cotton Farmer's Turnaround through Precision Nutrition



Name of Farmer : Ashwin Devendra Kamble
Address : Village Palwadi, Taluka Tiwasa, District Amravati
Date of Birth / Age : 18-11-1988 and 37
Education : 12th Standard
Land holding (ha) : 1.2 ha

Shri Ashwin Devendra Kamble, a cotton farmer from the Vidarbha region, cultivated cotton on medium deep black soils with supplementary irrigation. Despite favorable conditions, his productivity remained low at 16 quintals per hectare due to improper crop and nutrient management. He relied mainly on DAP as a basal dose and urea for top dressing, assuming it was sufficient, which led to imbalanced fertilization particularly potassium deficiency. Additionally, wider spacing (120 × 90 cm) and limited split applications of fertilizers resulted in poor nutrient availability during critical growth stages, affecting boll development and yield.

Under the NFSM-FLD program, scientists from ICAR-CICR assessed his field using the Nutrient Expert for Cotton tool. Soil analysis revealed medium levels of nitrogen, phosphorus, and potassium, and a clear deficiency of Sulphur also. Based on this assessment and a target yield of 26 quintals per hectare, site-specific nutrient recommendations were provided. The farmer adopted Ankur Kirti BG-II hybrid cotton with an improved spacing of 90 × 60 cm. A balanced fertilization schedule was followed, including four split applications of nitrogen and two splits each of phosphorus and potassium, along with Sulphur containing fertilizers.

All agronomic practices were implemented under scientific supervision. The impact was significant. Cotton yield increased from 16 to 25 quintals per hectare. Gross income rose from ₹1,20,000 to ₹1,87,500, while net returns more than doubled from ₹49,000 to ₹1,12,500.

The benefit cost ratio improved markedly from 1.69 to 2.50, reflecting enhanced profitability and efficient resource use. This transformation highlights the importance of soil test based nutrient management, proper spacing, and balanced fertilization. Shri Kamble's success serves as a strong example of how precision agriculture tools like Nutrient Expert can improve productivity, profitability, and sustainability in cotton farming systems of the Vidarbha region.

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Success Story - 29

From Excess to Excellence: Rebalancing Cotton for Higher Gains



Name of Farmer : Ghanshyam Narayan Pande
Address : Village Khandala (BK), Taluka Narkhed, Nagpur
Date of Birth / Age : 23.07.1990
Education : M.A.,
Land holding (ha) : 14 ha

Shri Ghanshyam Narayan Pande, a cotton farmer cultivating deep black soils with assured irrigation in the Nagpur region, experienced a remarkable turnaround in productivity through scientific intervention. Despite having ideal soil and irrigation conditions, his cotton yield remained limited to 22 quintals per hectare due to improper agronomic practices. Excessive fertilizer application without soil testing, closer spacing (90 × 30 cm), and limited split application led to dense crop growth, shading, poor boll retention, and inefficient nutrient utilization.

Under the NFSM-FLD program, scientists from ICAR-CICR introduced the Nutrient Expert for Cotton tool. Soil analysis revealed medium levels of nitrogen and phosphorus, very high potassium, but deficiencies in sulphur and boron. Based on these findings and a targeted yield of 35 quintals per hectare, site specific nutrient recommendations were provided. The farmer adopted Rasi 659 BG-II hybrid cotton with optimized spacing of 90 × 60 cm. A balanced fertilization strategy was implemented, including four split applications of nitrogen, two splits of phosphorus and potassium, and the inclusion of sulphur and boron.

Timely crop management practices were also ensured under expert guidance. The results were highly encouraging. Cotton yield increased from 22 to 34 quintals per hectare, registering an additional gain of 12 quintals. Economically, the gross income rose from ₹1,65,000 to ₹2,55,000 per hectare. Net returns nearly doubled from ₹88,000 to ₹1,71,000, while the benefit cost ratio improved significantly from 2.14 to 3.04.

This transformation highlights that even in resource rich conditions, scientific nutrient management and proper agronomic practices are critical for maximizing productivity. Shri Ghanshyam Narayan Pande's success stands as a model for irrigated cotton farmers, demonstrating that precision in input management can unlock the full potential of cotton cultivation.

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Success Story – 30

Cotton–Pigeon pea Intercropping Improves Productivity and Income



Name of Farmer : Sri. Dillip Majhi
Address : Village: Payarmal, Block: Bhawanipatna, Kalahandi
Mobile No. 8144886359
Date of Birth / Age : 35
Education : Graduation
Land holding (ha) : 1.2 ha

Cotton cultivation is a key source of livelihood for farmers in Kalahandi district of Odisha. However, productivity is often constrained by challenges such as pest infestations, declining soil fertility, and unstable yields under monocropping systems. To address these issues and promote sustainable cotton production, scientists from AICRP on Cotton, RRTTS Bhawanipatna, demonstrated a cotton–pigeon pea intercropping system along with integrated crop management practices in farmers' fields.

A successful demonstration was carried out on one hectare of land in the field of Sri Dillip Kumar Majhi from Payarmal village under Bhawanipatna Block. The program introduced intercropping of pigeon pea with cotton, along with the use of biofertilizers and eco-friendly pest management practices. The cotton hybrid Super 544 BG-II was cultivated using recommended agronomic practices, with critical inputs—including pigeon pea seeds—provided by AICRP on Cotton. Pigeon pea was sown between cotton rows in a 2:8 row ratio, ensuring better utilization of land, sunlight, and soil nutrients.

With continuous technical guidance and regular field monitoring by scientists, the farmer successfully adopted the improved practices. As a result, the cotton crop exhibited better growth and reduced pest incidence. At harvest, the farmer achieved a yield of 27 quintals of seed cotton per hectare, along with about 4 quintals of pigeon pea grain from the intercrop. With an average market price of ₹7,000 per quintal, cotton generated a gross income of approximately ₹1,89,000 per hectare.

The pigeon pea, valued at around ₹8,000 per quintal, contributed an additional ₹32,000. Thus, the total gross income from the intercropping system reached about ₹2,21,000 per hectare. After accounting for a cultivation cost of approximately ₹80,000 per hectare, the net income was around ₹1,41,000 per hectare, with a benefit-cost ratio of 2.76. This successful demonstration clearly highlights that cotton-pigeon pea intercropping, combined with integrated nutrient and pest management practices, can substantially improve farm productivity, profitability, and sustainability.

Centre : OUAT, Bhawanipatna, Odisha
Scientist i/c FLD : Mrs. Jyoti Rekha Mallick, Scientist (Entomology)
AICRP on Cotton, RRTTS, Kalahandi, Bhawanipatna.
Email: jyotirekhamallick@gmail.com



Success Story – 31

From pest challenges to prosperity: An ICM success story



Name of Farmer : Sri. Nilakantha Majhi
Address : Village: Kitpadar, Block: Bjawanipatna, Kalahandi,
Mobile no: 9348311062
Date of Birth / Age : 44
Education : 5th Class
Land holding (ha) : 0.8 ha (Own Land) 0.2 ha (Leased)

Cotton cultivation is a major source of livelihood for farmers in Kalahandi district of Odisha, but productivity is often limited by challenges such as severe infestations of sucking pests and pink bollworm, imbalanced nutrient use, and indiscriminate application of pesticides. To overcome these constraints and encourage sustainable farming, scientists from AICRP on Cotton, RRTTS Bhawanipatna, conducted Integrated Crop Management demonstrations in farmers' fields.

Under the Front Line Demonstration, one hectare of land belonging to Sri Nilakantha Majhi was selected to showcase improved cotton production practices using the hybrid Rasi 569. The demonstration followed a holistic approach, integrating scientific agronomic practices with eco-friendly pest management strategies. Key interventions included the cultivation of maize as a border crop to reduce pest entry and the installation of pheromone traps for continuous monitoring of pink bollworm. The farmer was also provided with critical inputs and regular technical guidance from AICRP scientists, ensuring timely and effective implementation of recommended practices throughout the season.

The results were highly promising. The crop remained healthy with minimal pest damage, leading to a seed cotton yield of 25 quintals per hectare—significantly higher than the 16–18 quintals typically achieved under conventional practices, representing an increase of about 47 percent. Economic returns also improved substantially.

With an average market price of ₹7,000 per quintal, the farmer achieved a gross income of ₹1,75,000 per hectare. After deducting the cultivation cost of approximately ₹70,000, the net income was around ₹1,05,000 per hectare, with a benefit-cost ratio of 1:2.5. This successful demonstration has motivated farmers in Kitpadar and nearby villages, clearly illustrating the potential of ICM practices to enhance cotton productivity, profitability, and long-term sustainability.

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AICRP on Cotton, RRTTS, Kalahandi, Bhawanipatna.
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Success Story – 32

From conventional to scientific practices: A success story of ICM in cotton farming



Name of Farmer : Gaddam Haribabu
Address : Ponnekallu (V), Guntur (Mandal)
Mobile no: 9703758709
Date of Birth / Age : 01-01-1979 and age :47
Education : 8th standard
Land holding (ha) : 3 ha

In Guntur, cotton is predominantly grown under rainfed conditions in traditional black cotton soils. A common issue in the region is the excessive use of fertilizers beyond recommended levels, along with the overuse of insecticides to manage complex pest problems. During the 2025–26 season, farmers also faced challenges due to intermittent heavy rainfall followed by prolonged dry spells, which adversely affected crop performance. To address these issues, FLD on Integrated Crop Management practices was conducted along with awareness on Pink Bollworm management.

Mr. Gaddam Haribabu adopted these scientific practices effectively. He selected a suitable medium-duration cotton hybrid for closer spacing and ensured timely sowing during the first week of July, completing sowing within a short window of one week. He followed improved agronomic practices, including the application of pre-emergence herbicide pendimethalin @ 1 L/acre, and applied nitrogen fertilizers in three splits – at sowing, 30 days after sowing, flowering, and boll formation stages. Phosphorus was applied during the last ploughing, while potash was given in two splits.

He also sprayed boron at 100 DAS and applied 2% urea + 1% KNO_3 during drought conditions. Timely inter cultivation, manual weeding, and the use of post-emergence herbicides at 25 DAS further supported crop growth. For pest management, he installed pheromone traps @ 4 per acre from 45 DAS to monitor PBW activity.

When pest levels crossed the economic threshold level (8 moths for three consecutive nights), he applied ovicidal insecticides such as azadirachtin 3000 ppm @ 1 L/acre. Need-based insecticides like Profenophos (400 ml/acre), chlorpyriphos (500 ml/acre), or quinalphos (400 ml/acre) were used from 75 DAS at 15-day intervals. Synthetic pyrethroids were applied only after 120 DAS. Additionally, yellow and blue sticky traps were installed to manage sucking pests. The adoption of ICM practices led to a significant improvement in productivity and profitability. Yields increased by 19% compared to the previous year. Farmers following ICM recorded a net return of ₹48,778 per hectare, whereas those using conventional methods earned only ₹20,448 per hectare—resulting in an additional profit of ₹28,330 per hectare. The benefit–cost ratio also improved to 1.40 under ICM, compared to 1.12 in non-ICM fields, clearly demonstrating the economic advantage of scientific crop management practices.

Centre : ANGRAU, Guntur, Andhra Pradesh
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Cotton section, RARS, Lam, Guntur.
Email: ch.nagajyothi@angrau.ac.in



Success Story – 33

Management of Leaf Reddening, Flower drops, bad boll opening and leaf reddening in Bt Cotton under HDPS system



Name of Farmer : Shri. Ningappa Y Halyal
Address : At Post: Shanwad Tq: Navalagund Dt: Dharwad
Mobile no: 8217201832
Date of Birth / Age : 08-11-1991 ; 34
Education : B.Sc. (Agri.)
Land holding (ha) : 20 ha

Shri Ningappa Y. Halyal, a B.Sc. (Agriculture) graduate from the University of Agricultural Sciences, Dharwad, is a progressive farmer from Shanwad village in Navalagund Taluka. With strong technical knowledge and entrepreneurial vision, he established the Navalagund Taluka Raitha Mitra Farmers Producers Organisation, which has achieved an annual turnover of about ₹2.0 crores.

During 2024 and 2025, Ningappa cultivated the Bt cotton hybrid RASI SWIFT (RCH 9292) under the High Density Planting System on 4 acres of land. One of his notable innovations was the use of a low-cost, manually operated seed drill costing ₹6,000, sourced from Bengaluru and modified to suit his field requirements. This affordable mechanization ensured precise sowing and optimal plant population. With technical support from Front Line Demonstrations conducted by the Dharwad Centre, he adopted scientific crop management practices to effectively manage pests and diseases. As a result, he achieved a seed cotton yield of 20 quintals per hectare, significantly higher than the 13.75 quintals per hectare recorded under conventional practices.

This increase in productivity led to higher profitability, with net returns of ₹90,775 per hectare compared to ₹63,400 per hectare under traditional methods. Ningappa's achievement clearly demonstrates how the integration of scientific knowledge, innovative tools, and institutional support can transform cotton cultivation into a more productive and profitable enterprise.

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Success Story – 34

Improving Cotton Productivity through Integrated Pest Management

Name of Farmer : Shanthareddy Koppar
Address : B. Shantha Reddy, S/O Sharnappa, 124,
Kopper, Raichur, Karnataka-584111
Mobile : 9901648982
Date of Birth / Age : 22-07-1968
Land holding (ha) : 24 ha

Under the NFSM–FLD program, Shri Shanthareddy Koppar received training on Integrated Pest Management practices and the use of advanced insecticides for effective control of sucking pests in cotton. Previously reliant on older insecticides, he was introduced to newer and more effective molecules during the training.

He was also provided with pink bollworm pheromone traps and lures developed by the University of Agricultural Sciences, Raichur, which helped in mass trapping and monitoring of the pest. In addition, he was educated on key crop management practices, including de-topping of cotton at 100 days after sowing to enhance boll development and yield, as well as the judicious use of pyrethroids after 120 DAS for managing pink bollworm. The importance of crop residue management, particularly the use of shredders immediately after harvesting to minimize pest carryover, was also emphasized.

Furthermore, he was trained in selecting suitable hybrid cotton seeds available in the market, especially those recommended for the High-Density Planting System, to achieve optimal plant population, improved productivity, and higher profitability. The program also covered the application of foliar nutrients such as 19:19:19, potassium nitrate (13:0:45), and magnesium sulphate to support better crop growth and yield.

These inputs were provided to him during the training. As a result of adopting these improved practices and inputs, he achieved an average seed cotton yield of 30 quintals per hectare with a benefit–cost ratio of 2.15, demonstrating the success and effectiveness of the interventions.

Centre : UAS, Raichur, Karnataka
Scientist i/c FLD : Dr J M Nidagundi, Cotton Breeder & Head,
(AICRP-Cotton) & Professor & University Head (GPB),
Raichur. Email: jaysun050@uasraichur.edu.in



Success Story – 35

Technology Demonstration Leading to Higher Cotton Yield and Profit

Name of Farmer : Basana Gouda
Address : Basana Gouda, S/O Mallappa Gouda,
142 Manvi, Goldinni, Raichur Karnataka-584111
Mobile no: 9845809972
Date of Birth / Age : 01-05-1986
Education : Degree
Land holding (ha) : 4 ha

Under the NFSM-FLD program, Shri Basana Gouda was trained in Integrated Pest Management practices and the use of advanced insecticides for effective control of sucking pests in cotton. Earlier dependent on conventional insecticides, he gained exposure to newer and more efficient molecules through the training.

He was also supplied with pink bollworm pheromone traps and lures developed by the University of Agricultural Sciences, Raichur, which supported effective pest monitoring and mass trapping. The training further emphasized important crop management practices such as de-topping of cotton at 100 days after sowing to improve boll formation and yield, and the careful use of pyrethroids after 120 DAS for managing pink bollworm.

He was also made aware of the importance of proper crop residue management, particularly the use of shredders immediately after harvest to reduce pest carryover. In addition, he received guidance on selecting appropriate hybrid cotton seeds suited for the High-Density Planting System, ensuring optimal plant population, enhanced productivity, and improved profitability. The program also included the application of foliar nutrients like 19:19:19, potassium nitrate (13:0:45), and magnesium sulphate to promote better crop growth and yield, and these inputs were provided to him during the training.

By adopting these improved practices and inputs, Shri Basana Gouda achieved an average seed cotton yield of 28 quintals per hectare with a benefit-cost ratio of 2.01, highlighting the effectiveness and success of the interventions.

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Success Story – 36

Increase in Cotton Productivity through Scientific Crop Management Practices



Name of Farmer : Mr. Siddappa S/o Basavarajappa
Address : Village: Taggaluru village,
Gundlupet taluk, Chamarajanagara district
Mobile no:8277387759
Date of Birth / Age : 39 years
Education : 8th std
Land holding (ha) : 1.5 ha

Cotton is a major commercial crop cultivated by farmers in Taggalur village of Gundlupet taluk. However, its productivity in the region is often constrained by the non-adoption of recommended agronomic practices, imbalanced nutrient use, and inadequate pest management. To overcome these challenges and showcase the benefits of improved technologies, a Front Line Demonstration under the National Food Security Mission was conducted on the field of Shri Siddappa, a progressive farmer of the village. Under this demonstration, several improved crop production practices were demonstrated.

These included maintaining proper crop spacing, adopting balanced nutrient management, application of foliar nutrients, de-topping to control excessive vegetative growth and enhance boll development, and the use of Integrated Pest Management practices. The adoption of these scientific interventions resulted in better plant growth, efficient nutrient uptake, improved canopy management, and reduced pest damage, ultimately leading to enhanced crop performance. The demonstration plot recorded a notable improvement over the farmer's conventional practice. A yield of 17.15 quintals per hectare was achieved in the demonstration, compared to 15 quintals per hectare under the existing practice.

This increase was mainly due to proper spacing, balanced fertilization, and timely pest management. Economic analysis further highlighted the advantages of the improved practices.

The gross returns from the demonstration plot were ₹1,45,563 per hectare, while the farmer's practice yielded ₹1,27,500 per hectare. After accounting for the cost of cultivation, the net returns were ₹74,563 per hectare in the demonstration, compared to ₹61,250 per hectare under conventional methods resulting in an additional income of ₹13,313 per hectare. The benefit cost ratio was also higher in the demonstration (2.05) than in the farmer's practice (1.92), clearly indicating that the adoption of improved technologies is both economically viable and profitable.

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Principal Investigator, AICRP-Cotton, Chamarajanagar.
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Success Story - 37

ICM Practices in Cotton: A Pathway to Enhanced Yield and Returns



Name of Farmer : K. Duraisamy
Address : S/o. Kandasamy 2/105, South thottam
Senthapalayam, Masakavundanchettipalayam,
Annur, Coimbatore - 641107
Date of Birth / Age : 07-10-1953
Education : 8th Std
Land holding (ha) : 1.44 ha

Mr. K. Duraisamy of Masakavundan chettipalayam village in Coimbatore district faced several challenges in cotton cultivation prior to the implementation of the Front Line Demonstration program. His crop was often affected by pest and disease incidence, imbalanced nutrient management, and severe weed competition, resulting in reduced yield and overall productivity. With the introduction of the FLD, he was guided by scientists to adopt Integrated Crop Management practices to enhance crop performance.

Continuous technical support was provided throughout the cropping period, from land preparation to harvest. Necessary inputs were also supplied to ensure the proper implementation of recommended practices. Effective weed management was achieved through timely inter cultivation and manual weeding, along with mulching to suppress weed growth and conserve soil moisture. For pest and disease management, the farmer adopted integrated approaches that included biological control methods and appropriate cultural practices, which helped reduce crop losses.

As a result of these improved practices, Mr. Duraisamy achieved a seed cotton yield of 2,150 kg per hectare. The gross income realized was ₹1,82,750 per hectare, while the total cost of cultivation was ₹76,220 per hectare. After deducting expenses, the net income amounted to ₹1,06,530 per hectare. The benefit-cost ratio was calculated at 2.39, clearly indicating that cotton cultivation under integrated crop management practices was both productive and economically profitable.

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Centre for Plant Breeding and Genetics,
TNAU, Coimbatore
Email : cotton@tnau.ac.in



Success Story – 38

Enhancing Cotton Productivity and Profitability through Integrated Crop Management: A Farmer's Success Story



Name of Farmer : S. Velusamy
Address : S/o. Subbana gowendar, East street,
Kailkolapalayam, Vellanaipatti,
Mylampatti, Coimbatore
Date of Birth / Age : 14-07-1954
Education : 8th Std
Land holding (ha) : 1.66 ha

Mr. S. Velusamy, a small-scale cotton farmer, adopted Integrated Crop Management practices for the first time with guidance from scientists to address recurring problems of pests, diseases, and weed infestation. Under the Front Line Demonstration program, he received timely technical support along with essential inputs, which were applied at appropriate crop stages as per scientific recommendations. Proper nutrient management played a key role in improving crop performance.

Application of fertilizers at critical growth stages promoted better vegetative growth, enhanced the development of sympodial branches, and improved boll formation. Weed management was effectively carried out through regular inter-cultural operations and manual weeding, reducing competition and ensuring healthy crop establishment.

The adoption of integrated practices also helped in minimizing pest and disease incidence through a balanced and need-based approach, leading to improved overall crop health. As a result, the farmer achieved a seed cotton yield of 2,057 kg per hectare. Economically, the results were encouraging. The gross income realized was ₹1,70,250 per hectare, while the total cost of cultivation was ₹77,000 per hectare. After deducting expenses, the net income was ₹93,250 per hectare. The benefit-cost ratio was calculated at 2.21, indicating good profitability.

The farmer expressed satisfaction with the improved practices, as they resulted in higher yield and income compared to conventional methods followed earlier.

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Email : cotton@tnau.ac.in



Success Story – 39

A Step Towards Sustainable Cotton Farming: Success of ELS Cultivation under NFSM-FLD



Name of Farmer : Mr. Srinivasan
Address : Village: Vengayapalli, Block: Tirupathur, Tirupathur
Mobile no: 9996576512
Date of Birth / Age : 45
Education : M.Com., B.Ed.
Land holding (ha) : 1.2 ha

A successful demonstration was carried out in the field of Mr. Srinivasan, S/o Natarajan, a progressive farmer from Vengayapalli village in Tirupathur block of Tirupathur district, Tamil Nadu. Under the NFSM-FLD program, one acre of land was selected to demonstrate ELS cotton cultivation along with scientifically recommended crop management practices. In this demonstration, the ELS cotton hybrid Puli was cultivated by following recommended Best Management Practices at different crop stages. Essential inputs were provided by ICAR-CICR, Regional Station, Coimbatore to ensure balanced crop growth and effective pest management.

Prior to the FLD intervention, farmers in the area often applied pesticides indiscriminately, even before pest populations reached the Economic Threshold Level, leading to increased cultivation costs without effective pest control. With regular field monitoring and technical guidance from ICAR-CICR scientists, Mr. Srinivasan was trained in scientific pest management. He adopted need based application of insecticides, applying only recommended chemicals and quantities when pest populations reached ETL. This approach resulted in lower pest and disease incidence while significantly reducing pesticide use, thereby lowering production costs and promoting a more sustainable farming system.

At harvest, the demonstration plot yielded 17.5 quintals of seed cotton per hectare, compared to about 13.75 quintals per ha under earlier practices. With a market price of approximately ₹10,500 per quintal, the gross income reached around ₹183750 per hectare.

After accounting for cultivation costs of about ₹75,000 per ha, the farmer realized a net income of nearly ₹108750 per ha, achieving a benefit-cost ratio of 2.45. The success of this demonstration clearly demonstrates the potential of ELS cotton cultivation with Best Management Practices to improve productivity, reduce input costs, and enhance farm profitability. Encouraged by these results, Mr. Srinivasan plans to continue these practices and share his experience with other farmers. The demonstration has also generated strong interest among farmers in Vengayapalli and nearby villages, promoting wider adoption of sustainable ELS cotton cultivation in the Tirupathur region.

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Agricultural Extension, ICAR-CICR, RS, Coimbatore.
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Success Story – 40

Transforming Cotton Cultivation: A Woman Farmer's Success with Sustainable ELS Practices



Name of Farmer : Mrs. Kaliyammal
Address : Village: Dhamalerimuthur, Jolarpet, Tirupathur
Date of Birth / Age : 60
Education : 5 th Standard
Land holding (ha) : 1.2 ha

Mrs. Kaliyammal, a progressive woman farmer from Thamalerimuthur village in Jolarpet block of Tirupathur district, Tamil Nadu, successfully participated in the NFSM-FLD program to demonstrate the potential of ELS cotton cultivation under improved management practices. An area of one acre was selected for this demonstration, where the ELS cotton hybrid MRC 6918 was grown following recommended agronomic and crop protection practices. Critical inputs and continuous technical support were provided by ICAR-CICR, Regional Station, Coimbatore to ensure balanced nutrient management and effective pest control.

Prior to this intervention, farmers in the area generally followed conventional practices such as wider spacing (90 × 60 cm), excessive application of nitrogen fertilizers, and indiscriminate use of pesticides and weedicides. These practices often increased the cost of cultivation without delivering effective pest and weed control. With regular field visits and expert guidance, Mrs. Kaliyammal adopted improved practices including closer spacing of 90 × 30 cm, careful pest monitoring, and need-based application of insecticides only when pest populations reached the Economic Threshold Level. She also followed recommended doses of crop protection chemicals and integrated pest and weed management strategies. As a result, the demonstration plot recorded reduced pest, disease, and weed incidence, along with a significant reduction in chemical usage, leading to lower production costs and a more sustainable farming system.

At harvest, the demonstration plot yielded 6 quintals of seed cotton per acre, compared to an average of 4.5 quintals per acre obtained by neighbouring farmers under conventional practices. With a market price of about ₹10,000 per quintal, she realized a gross income of approximately ₹60,000 per acre. After deducting the cultivation cost of around ₹26,000 per acre, the net return was about ₹34,000 per acre, with a benefit–cost ratio of 2.3. This Front Line Demonstration clearly highlights the effectiveness of ELS cotton cultivation combined with integrated pest and weed management in improving yield, reducing input costs, and enhancing profitability. The success of this initiative has created strong awareness among farmers in Thamalerimuthur and nearby villages, encouraging many to adopt sustainable ELS cotton cultivation practices and contributing to improved livelihoods in the Tirupathur district.

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