

# **FRONT LINE DEMONSTRATION IN COTTON**

**ANNUAL REPORT (2003-04)**  
**All India Coordinated Cotton Improvement Project**  
**Coimbatore-641 003**

**Published by:**

**Project Coordinator (Cotton) & Head  
Central Institute for Cotton Research  
Regional Station, Coimbatore - 641 003**

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e-publication and Layout: **Mr. M. Sabesh**, Scientist (Computer Applications)

## **FOREWORD**

*Front Line Demonstrations (FLDs) were conducted during 2003-04 Kharif season in fifteen centres to transfer the path-breaking, significant technologies, developed by the centers of the All India Coordinated Cotton Improvement Project as well as the Central Institute for Cotton Research, were organized in order to appraise their practical utility in efficient cotton production by the farmers of the ten. cotton growing states. The significance of these 350 FLDs at an outlay of Rs. 18.50 lakhs is to enable cotton growers of the country to produce good quality cotton fibre.*

*Reduction in cost of cultivation and sustained production of seed cotton through adoption of newer high yielding varieties and hybrids, suitable management of nutrients, weeds, pests and diseases were included as themes of these FLDs. These FLDs also generated good interest in the extension functionaries of the State Agricultural Departments who could transfer such knowledge to larger profile of cotton growers in various districts.*

*The Annual Report for 2003-04 presents the various production technology demonstration activities. The programme also organized Krishi Melas at various centers to ventilate these success stories to larger sections of cotton growers of the state. These FLDs have indeed created good impressions in the cotton growers to practice the demonstrated techniques with zeal.*

Project Coordinator (Cotton Improvement)  
CICR Regional Station, Coimbatore - 641 003

## **ACKNOWLEDGEMENTS**

It is gratifying to note that the fifteen centres of AICCIP could successfully conduct 350 Front Line Demonstrations during 2003-04. I place on record appreciation to the scientists of fifteen centres for wholeheartedly cooperating to achieve the desired objectives. Most deserving are those 371 farmers who participated in this programme to demonstrate various new techniques to produce good quality cotton in a sustainable and cost-effective manner to the villagers of three cotton-growing zones.

I acknowledge Dr. C.D. Mayee, Agricultural Commissioner, Government of India for his thoughtful planning and involvement of this programme. Thanks are also due to Additional Commissioner of Agriculture (Cotton) as well as Director, Directorate of Cotton Development, Mumbai for their unstinted support. The Assistant Director General (Commercial Crops), ICAR and Director of Central Institute for Cotton Research, Nagpur offered their help to manage this programme successfully. The Departments of Agriculture of the various states in which this programme conducted co-operated well to make it successful. Their officials involved deeply in the programme and liaison with farmers and scientists. Recent interest in FLD was shown by Central Institute for Research on Cotton Technology, Mumbai in regard to fibre quality of the farmers' field lint samples.

It is significant to acknowledge the appreciation and gratitude to various scientists of CICR, Regional Station, Coimbatore, viz., Dr. Isabella Agarwal, Mr. A. Kannan and Dr. P. Chidambaram and many others. The successful management of this programme was possible also due to the services of Mr.V: Rathnasabapathy and Mrs. Lakshmi Krishnamurthy and others in PC's Office.

Project Coordinator (Cotton Improvement)  
CICR Regional Station, Coimbatore - 641 003

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# FRONT LINE DEMONSTRATION IN COTTON 2003 – 2004

## INTRODUCTION

The All India Coordinated Cotton Improvement Project (AICCIP) acts as the Nodal Agency for conducting the cotton Front Line Demonstration (FLD) programme in the country to undertake demonstrations of frontier technologies of cotton production through funding from Mini Mission-II (ICDP) of Technology Mission on Cotton. The Project Coordinator (Cotton Improvement) coordinates and monitors the implementation of the FLD Programme with Headquarters at the Central Institute for Cotton Research, Regional Station, Coimbatore. The FLDs are organized through network centers of the AICCIP network spread over ten cotton growing states. Besides, Central Institute for Cotton Research, Nagpur and its regional station at Sirsa also participated actively in the programme.

## OBJECTIVES

- 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 obtain direct feed back from cotton farmers and suitably reorient their research programmes and develop appropriate technology packages.
- To create effective linkage among Scientists, Extension Personnel and Farmers.

## FINANCIAL OUTLAY

The Ministry of Agriculture and Cooperation, Government of India have sanctioned **Rs.20 lakh** for conducting **380 FLDs** for the year 2003-04.

## LINKAGES WITH EXTENSION OFFICIALS

The **FLDs** offer a good opportunity for closer interaction between Scientists of different disciplines and the extension officials of cotton growing states. The coordinating centers organize **Krishi Melas** during the cropping season for highlighting the major achievements, packages of practices and newer technologies ready for transfer to farmers' fields. This has facilitated better feedback from the farmers to the scientists.

## DETAILS OF DEMONSTRATION

Each demonstration is held in an area of 1 ha. The farmers involved in this programme are provided with a subsidy of Rs. 2,500/- worth of inputs per demonstration required for effective implementation of the technologies. Such selected farmers serve as 'Lead Farmers' and guide other farmers in the neighbouring areas for quicker adoption of the improved technologies.

The participating centers have the mandate to conduct one or two *Krishi Mela* at selected

demonstration fields to enable the farming community to have first hand experience of the new technology working under field conditions. An amount of Rs. 1,000/- per demonstration has been allotted for arranging Krishi Mela. An amount of Rs. 1,500/- per demonstration has been provided for P.O.L. charges and TA for effective monitoring of demonstrations in the organizing centers.

### FRONT LINE DEMONSTRATION IN COTTON (2003-04)

During the year 2003-04, a total of 380 Front Line Demonstrations were allotted to sixteen AICCIP network centers all over the country. 350 demonstrations could be conducted. Break up of Budget allocation for different centers and PC s cell are given in Table 1.

**Table 1: Break up of Budget allocation for different Centers and PC s cell**

CENTRE	No. of demonstration	Area (ha)	Grant for Input @ Rs. 2500 per demn.	Funds for POLand TA @Rs. 1,500 per demn. *	Funds for Krishi Mela @Rs. 1,000 per demn. **	TOTAL Rs.5,000 per demon. (Rs.)
<b>North Zone</b>						
PAU, Faridkot	20	20	50,000	30,000	20,000	1,00,000
CCSHAU, Hisar	30	30	75,000	45,000	30,000	1,50,000
RAU, Sriganaganagar	20	20	50,000	30,000	20,000	1,00,000
MPUAT, Banswara	10	10	25,000	15,000	10,000	50,000
CSAUAT, Kanpur	5	Not Conducted		-	-	-
CICR, Sirsa	20	20	50,000	30,000	20,000	1,00,000
<b>Total</b>	<b>105</b>	<b>100</b>	<b>2,50,000</b>	<b>1,50,000</b>	<b>1,00,000</b>	<b>5,00,000</b>
<b>Central Zone</b>						
GAU, Surat	40	40	1,00,000	60,000	40,000	2,00,000
JNKVV, Khandwa	25	25	62,500	37,500	25,000	1,25,000
Dr.PDKV, Akola	25	25	62,500	37,500	25,000	1,25,000
MAU, Nanded	25	25	62,500	37,500	25,000	1,25,000
MPKV, Rahuri	25	Not Conducted		-	-	-
OUAT, Bhawanipatna	15	15	37,500	22,500	15,000	75,000
CICR, Nagpur	30	30	75,000	45,000	30,000	1,50,000
<b>Total</b>	<b>185</b>	<b>160</b>	<b>4,00,000</b>	<b>2,40,000</b>	<b>1,60,000</b>	<b>8,00,000</b>
<b>South Zone</b>						
ANGRAU, Guntur	30	30	75,000	45,000	30,000	1,50,000
UAS, Dharwad	30	30	75,000	45,000	30,000	1,50,000
TNAU, Coimbatore	30	30	75,000	45,000	30,000	1,50,000
<b>Total</b>	<b>90</b>	<b>90</b>	<b>2,25,000</b>	<b>1,35,000</b>	<b>90,000</b>	<b>4,50,000</b>
Sub - Total	380	350	8,75,000	5,25,000	3,50,000	17,50,000
PC Cell				50,000	50,000	1,00,000
<b>Grand Total</b>	<b>380</b>	<b>350</b>	<b>8,75,000</b>	<b>5,75,000</b>	<b>4,00,000</b>	<b>18,50,000</b>

\* Includes POL, TA, Maintenance of vehicle and if required for vehicle rental for the purpose.

\*\* Includes Krishimela and supply of printed matter, reports etc.,

The centre wise details of the technologies taken up for demonstrations are given in Table 2.

**Table 2: Technologies demonstrated under FLD during 2003-2004**

Centre	No. of FLD trials	Technologies
PAU, Faridkot	30	<b>NORTH ZONE</b> 1. Demonstration on improved varieties viz., F.1861, F.846, F.1378,LH.1556,LD.694,LD.327 2. Plant population 3. Weed control 4. Balanced nutrition 5. Disease and Pest Management
CCSHAU, Hisar	30	1. Seed production of AAH.1 and HD.123 2. IPM technology on varieties H.1117, HD.123, H.1098 and AAH. 3. Termite control with seed treatment on H.1117 4. Seed treatment with Streptocycline and Emison on AAH.1 and Popularization of varieties and hybrids like AAH .1, HB.123, HHH.223 and HHH.287, H.1098, H.1226, HD.324 H.1117
RAU, Sriganaganagar	20	1. Popularisation of variety RS .2013
MPUAT, Banswara	10	1. Integrated Pest Management (IPM) technology in H.8
CICR, Sirsa	20	1. Demonstration on IPM technology 2. Popularisation of Om Shankar and LHH.144 3. Hybrid Seed Production
GAU, Surat	40	<b>CENTRAL ZONE</b> 1. Popularization of varieties like G.Cot.23, G.Cot.MDH.11, G.Cot.DH.9, G.Cot.21, G.Cot.19, G.Cot.21, G.Cot.19, G.Cot.18 2. Popularization of hybrids like G.Cot.Hy.102, G.Cot.Hy.10(New)
JNKVV, Khandwa	25	1. Demonstration on Arboreum cultivar Jawahar Tapti under rainfed conditions and partially irrigated conditions and <i>Hirsutum</i> variety JK.4 under irrigated conditions
Dr.PDKV,Akola	25	1. Varietal demonstrations, spraying of nutrients and opening of ridges and furrows for moisture conservation
MAU, Nanded	25	1. Demonstrations on intercropping of black gram in rainfed cotton 2. Spraying of micronutrients on cotton crop in relation to seed cotton yield (spraying of MgSO <sub>4</sub> 0.2% at 45 and 75 days after sowing) 3. Time and method of application of balanced fertilizer to rainfed dibbled cotton. 4. Rain water and moisture conservation techniques for rainfed cotton
OUAT, Bhawanipatna	15	1. Popularization of Bunny hybrid 2. IPM technology
CICR, Nagpur	30	1. Use of quality seed 2. Effect of advanced sowing 3. Inter cropping with soybean 4. IPM 5. INM 6. Utility of topping 7. Maintenance of desired plant population 8. Effect of foliar nutrients spray 9. Use of bio fertilizers and bio pesticides
		<b>SOUTH ZONE</b>

ANGRAU, Guntur	30	1. Demonstrations on Integrated Nutrient Management 2. Biodiversity-Popularisation of Desi cotton varieties and Hirsutum Hybrids
UAS, Dharwad	30	1. ICM in hybrid cotton 2. Popularisation of DHH.543 in intercropping 3. IPM 4. Leaf reddening management 5. Use of growth regulators 6. INM 7. Cultivation of DHB.105 8. Popularisation of DHB.290 9. Boll rot management
TNAU, Coimbatore	30	1. Demonstration on hybrid TCHB.213 and variety MCU.12 2. Popularisation of SVPR.2 and SVPR.3

FLD farmers zonewise and under irrigated and rainfed conditions are as enlisted below in Table 3.

**Table 3: Number of FLD farmers in each zone**

S.No.	Centre	No. of FLD farmers	No. of allotted FLD trials
<b>NORTH ZONE</b>			
1.	PAU, Faridkot	28	20
2.	CCSHAU, Hisar	30	30
3.	RAU, Sriganaganagar	20	20
4.	MPUAT, Banswara	10	10
5.	CICR, Sirsa	17	20
<b>Total</b>		<b>105</b>	<b>100</b>
<b>CENTRAL ZONE</b>			
6.	GAU, Surat	44	40
7.	JNKVV, Khandwa	30	25
8.	Dr.PDKV, Akola	25	25
9.	MAU, Nanded	25	25
10.	OUAT, Bhawanipatna	18	15
11.	CICR, Nagpur	30	30
<b>Total</b>		<b>172</b>	<b>160</b>
<b>SOUTH ZONE</b>			
12.	ANGRAU, Guntur	30	30
13.	UAS, Dharwad	29	30
14.	TNAU, Coimbatore	35	30
<b>Total</b>		<b>94</b>	<b>90</b>
<b>Grand Total</b>		<b>371</b>	<b>350</b>

**Table 4: Zonewise Number of FLDs under irrigated and rainfed conditions**

Zones	Irrigated	Rainfed	Total
North	100	-	100
Central	30	130	160
South	-	90	90
Grand Total	130	220	350

## HIGHLIGHTS OF FRONT LINE DEMONSTRATIONS

### Results of Front Line Demonstration Trials

The results of the individual trials are reported in Annexure I, and the impact of cotton Front Line Demonstrations in terms of percentage increase in yield has been furnished in Annexure II. The salient features of the responses obtained in each centre are discussed below.

### NORTH ZONE

#### PAU, Faridkot

Twenty eight Front Line Demonstrations were laid out at farmers' fields during 2003-04 on popularization of improved varieties viz., F.1861, F.846, F.1378, LH.1556, LD.694 and LD.327 with specific package of practices like maintaining plant population, weed control, balanced nutrition and disease and pest management. The FLD farmers had obtained an increased yield of 13.70 to 29.30 per cent by adopting the above mentioned package of practices.

#### CCSHAU, Hisar

Twenty Front Line Demonstrations were conducted on hybrid seed production of AAH.1 in Hisar and Sirsa districts of Haryana State. It has been observed that Desi hybrid (AAH.1) gave average seed cotton yield (2204 kg/ha) which was 9.37 per cent higher than *desi* varieties HD.123 and 17.29 per cent higher than farmers' practice. Two *arboreum* varietal trials have been laid out on farmers' field during this year to popularize the newly developed variety HD.324 against popular variety HD.123 and hybrid AAH.1. It has been observed that HD.324 gave highest seed cotton yield (2,200 kg/ha). The average seed cotton yield of AAH.1 was 1,750 kg/ha as compared to 1,550 kg/ha of HD.123 against local check (1,500 kg/ha) of HD.107. Seven *hirsutum* varietal trials have been laid out on farmers' field during this year. The newly released and pre-released genotypes (H.1117, H.1226 and H.1098) were tested against local check. Average seed cotton yield 2255 kg/ha was obtained from H.1226 *hirsutum* varieties against local check average (1,410 kg/ha) which was 59.9 per cent higher against farmers' practices.

One demonstration each on yield maximization, Integrated Plant Nutrient Management and Disease Management were laid on the farmers' field which resulted in 50, 25 and 20 per cent

higher seed cotton yield respectively. Four demonstrations were conducted on IPM technologies. It was observed that nine per cent higher seed cotton yield was recorded in improved technology over farmers' practices. More emphasis was given on use of neem, pheromone traps and monitoring based pesticides application.

### Extension Activities

S.No.	Training / Field day	Location	No. of farmers
1	Training on hybrid seed production of AAH-I during May 2003	Main Campus	625
2	<i>Kapas Mela</i> on 17.09.03	RRS, Sirsa	750
3.	Cotton Field day	Dongli	150

### RAU, Sriganagar

Twenty Front Line Demonstrations were conducted during *Kharif* season of 2003-04 in the farmers' fields of Sriganagar and Hanumangarh district. Variety RS.20 13 was planted in demonstration plots at farmers' field with improved package whereas Bikaneri nerma, RST.9 and F.846 and others were cultivated with local package by the farmers. The yield obtained was 1,807 kg/ha by following the improved package over local package where it was only 1,440 kg/ha. The percentage yield increase was found to be 25.5.

### Extension Activities

S.No.	Date	Training / Field day	Location
1	10.05.2003	Training	A.R.S Sriganagar
2	03.11.2003	Field day	9-LNP, Sriganagar
3	03.11.2003	Field day	2-D Chhoti, Sriganagar

### CICR, Sirsa

A total of twenty Front Line Demonstrations were conducted during the year 2003-04 in three states of Haryana, Punjab and Rajasthan based on the farmers' receptiveness and adoption of technology. Two hybrids Om Shankar and LHH.144 which are high yielding and tolerant to pest and diseases were demonstrated at farmers' fields. IPM practices viz. deep ploughing after the harvest of wheat, application of FYM or decomposed compost, avoiding high doses of nitrogenous fertilizers, growing resistant/tolerant hybrid/variety against insect- pest and diseases, using pheromone or light traps, application of pest management interventions based on pest surveillance and Economic Threshold Levels (ETL) and using plant products and bio-agents depending on availability were demonstrated. IRM strategies like growing resistant/tolerant hybrid/variety against sucking pest and CLCuV, avoid using broad-spectrum Organophosphates like Monocrotophos and Acephate in the beginning, delaying first insecticide spray up to 60 DAS, spraying Endosulfan as first spray between 60-90 DAS, using organophosphates between

90-110 days and Neem/NPV if possible and restricting the use of pyrethroid up to one or two spray after 110 days were recommended to the demonstration farmers.

The average seed cotton in hybrid Om Shankar was 1,843 kg/ha over the check (1,679 kg/ha). The average yield difference between treatments and farmers' practice plots was 164 kg. An amount of Rs. 4,100/- ha was obtained by growing the hybrid Om Shankar.

On an average 110 kg/ha more yield was obtained by following IPM strategy even the number of sprays were less as compared to farmers practice. A maximum yield of 2,000 kg/ha was obtained by following the IPM technology with 6 sprays.

A maximum yield of 240 kg/ha was obtained from hybrid seed production plot of Om Shankar.

### Extension Activities

S.No.	Extension Activities	Village	Date
1	IPM <i>Mela</i>	Panihari	10.07.03
2	Farmers fair on IPM	CICR, RS, Sirsa	26.07.03

### MPUAT, Banswara

A total of ten Front Line Demonstrations were allotted to this centre during the year 2003-04. Seven demonstrations were laid out on Integrated Pest Management practices on cotton hybrid H.8. These demonstrations were conducted in villages Padikala, Survania and Thikaria. The Astha model of IPM was adopted to demonstrate IPM technology. One setaria row after every ninth row of cotton was conducted to attract birds for biological control of insects. The highest seed cotton yield of 2,380 kg/ha was observed followed by 2,275 kg/ha. The highest per cent increase in yield observed was 8.86%.

Three Front Line Demonstrations in village Tamtia were conducted to demonstrate Integrated Nutrient Management practices of cotton on hybrid H.10. Use of chemical fertilizer regularly on cotton field to harness maximum yield potential becomes a regular practice. Use of FYM thrice a year helps to maintain soil health and increase in yield levels. Foliar spray of zinc sulfate was applied for good health of leaves and for micronutrients availability. The highest yield by following INM practices observed was 2,320 kg/ha. The highest per cent increase in yield was 4.39% over the control.

### CENTRAL ZONE

## GAU, Surat

A total of fifty Front Line Demonstrations were laid out in Gujarat state during the year 2003-04. The centre wise and variety wise progress of FLDs have been detailed as follows.

### Centre wise and variety wise progress of Front Line Demonstrations

S.No	Centre	No. of FLD allotted					Successful
		Variety / Hybrid	Varietal	Agronomical	IPM	Total	
1.	GAU, Surat	G.Cot.Hy.10 (New)	2	2	-	4	3
2.	GAU, Hansot	G.Cot.MDH.11 G.Cot.Hy.10 (New)	1 -	- -	- 1	1 1	- -
3.	GAU, Bharuch	G.Cot.MDH.11 G.Cot.23 G.Cot Hy.102	2 8 2	- - -	- - -	2 8 2	2 2 2
4.	GAU, Devgadbaria	G.Cot.23 G.Cot.MDH.11	1 1	- -	- -	1 1	1 1
5.	GAU, Talod	G.Cot Hy.102	2	-	-	2	2
6.	GAU, Khedbrahma	G.Cot Hy.102 G.Cot.MDH.11 G.Cot.23	1 1 1	- - -	- - -	1 1 1	1 1 1
7.	GAU, Viramgam	G.Cot.21 G.Cot.MDH.11	3 2	4 -	- -	7 2	6 2
8.	GAU, Arnej	G.Cot.21 G.Cot.MDH.11	3 1	1 -	- -	4 1	2 1
9.	GAU, Dhanduka	G.Cot.21 G.Cot.MDH.11	1 1	1 -	- -	2 1	1 1
10.	GAU, Bhachau	G.Cot.MDH.11	1	-	-	1	1
11.	GAU, Junagadh	G.Cot.18 G.CotHy.102	1 1	1 -	- -	2 1	2 1
12.	GAU, Amreli	G.Cot.MDH.11 G.Cot.19	2 1	- 1	- -	2 2	1 2
		<b>Total</b>	<b>39</b>	<b>10</b>	<b>1</b>	<b>50</b>	<b>41</b>

From the demonstrations it could be seen that G.Cot.23 obtained a maximum yield of 2,000 kg/ha under rainfed conditions whereas the check variety obtained 1,275 kg/ha. Under irrigated conditions G.Cot.Hy.102 and G.Cot.Hy.10 (New) obtained a maximum yield of 2,600 kg/ha and 2,000 kg/ha respectively as against the check G.Cot.Hy.8. Heavy and continuous rainfall during kharif season affected the yield and a yield loss of 20 to 40 per cent was observed.

### Extension Activities

A total of 24 *Krishi Melas*, farmers' day and field days were conducted during the year 2003-04 in the districts of Narmada, Rajkot, Surat, Vadodara, Bharuch, Sabarkantha, Junagadh, Surendranagar, Bhavnagar, Anand and Ahmedabad.

### **JNKVV, Khandwa**

Thirty front line demonstrations on cotton were carried out during the crop season 2003-04 on performance of newly released *G.hirsutum* variety JK.4 under irrigated conditions, performance of improved *G. arboreum* variety Jawahar Tapti under rainfed conditions and performance of improved *G.arboreum* variety Jawahar Tapti under partially irrigated conditions. *G.hirsutum* variety JK.4 proved superior over farmers' variety / hybrid and its seed cotton yield obtained by the farmers ranged from lowest of 1,245 kg/ha. to highest of 1,575 kg/ha. as compared with the farmer's variety / hybrid which yielded from 850 to 1,204 kg/ha. This performance of variety JK.4 recorded minimum 11.43 to maximum 41.09 per cent increase over farmer's variety/hybrid. *G. arboreum* variety Jawahar Tapti stood far ahead of farmer's variety /hybrid both under rainfed as well as partially irrigated conditions. Jawahar Tapti recorded a seed cotton yield of 960 to 1,060 kg/ha. under rain fed and 1,080 to 1,170 kg/ha. under partially irrigated conditions as compared to that of farmer's variety/ hybrid 750 to 1,000 kg/ha.under rainfed and 704 to 1,080 kg/ha. under irrigated conditions. The result revealed that Jawahar Tapti exhibited 3.58 to 21.88 per cent under rainfed and 6.42 to 36.75 per cent increase in seed cotton yield over farmer's variety/hybrid.

### **Extension Activities**

A cotton day was organized at Singot village of Pandhana block on 26<sup>th</sup> December, 2003. About 350 farmers attended the Cotton Day.

### **Dr.PDKV, Akola**

A total of 25 Front Line Demonstrations were conducted during the year 2003 - 04 on varietal demonstrations of *desi* cotton hybrid PKV.DH.1, American cotton hybrid PKV Hy.4, spraying of nutrients and opening of ridges and furrows for soil moisture conservation.

Six demonstrations were conducted to test the potential of PKV.DH.1 against the *desi* cotton variety AKA. 7 and *desi* cotton hybrid Chamatkar and found that the increased yield was 16.00 and 9.09 per cent respectively.

Eleven demonstrations on newly released cotton hybrid PKV.Hy.4 with its recommended production technology were conducted on farmer's fields to test the yield potential in comparison with farmers practice. On an average 11.51 per cent increased seed cotton yield was obtained over farmers' practice.

Four demonstrations on foliar application of 2% urea at flowering and 2% DAP at boll development stage in PKV.Hy.2 and NHH.44 were conducted. An increased seed cotton yield of 10.46 per cent was realised in the demonstration plots.

Four demonstrations were conducted on opening of ridges and furrows for soil moisture conservation in PKV.Hy.2 and NHH.44 and obtained 12.21 and 19.86 per cent increased seed cotton yield respectively over framers' practice.

### **Extension Activities**

A *Krishi Mela* was organized at Bhaurad on 6<sup>th</sup> October, 2003. A total of 200 farmers attended the *mela*.

### **MAU, Nanded**

Twenty five Front Line Demonstrations were conducted on farmers' field on inter cropping of black gram in rainfed cotton, red gram intercropping system in cotton in comparison with sole cotton crop, spraying of micro-nutrients  $MgSO_4$  @ 0.2%, adoption of recommended plant population of 27,777 pl./ha (60cm x 60cm) over adoption of plant population 12,345 pl/ha (90x90cm) and rain water conservation techniques for rainfed cotton.

Five demonstrations were conducted on inter cropping of black gram in rainfed cotton. On an average additional monetary return Rs.1,099/ha has been obtained due to adoption of intercropping of black gram in cotton over sole crop of cotton. Five demonstrations were conducted on redgram intercropping in cotton. Results showed that the additional monetary returns ranging from Rs.975 to Rs.1,960/ha has been obtained without affecting seed cotton yield by adopting strip cropping of red gram in cotton. On an average additional monetary returns Rs.1,274/ha has been obtained to the farmers by adopting strip cropping of red gram in rainfed cotton over sole cotton crop.

Five demonstrations were conducted on spraying of micro-nutrients  $MgSO_4$  @ 0.2% at 45 and 75 days after sowing. On an average 10.62 per cent increased seed cotton yield was obtained over farmers' practice.

### **OUAT, Bhawanipatna**

Out of the fifteen Front Line Demonstrations conducted during the year 2003-04, nine were conducted to study the profitability and production potential of new hybrid Bunny in cotton over the prevailing variety MCU.5 and hybrid Savita in real farm situation. Eighteen beneficiaries were selected with the consultation of Dept. of Agriculture personnel from village Nagupala of Bhawanipatna block of the Kalahandi district and Chikalpadar, Sanbharandi Sahebaguda and Dhadra of Umerkote block of the Nabarangpur district.

The percent increase in yield of seed cotton of Bunny over Savita and MCV.5 ranged from 333 to 630 kg/ha. The additional returns obtained varied from Rs.7,980/- to Rs.15,120/- per ha. Considering the entire village on an average the increase in seed cotton yield was 35.19 percent or 523 kg/ha. resulting in an average additional return of Rs.12,552.00 per ha.

The average additional increase in seed cotton yield in Bunny over MCU.5 was 40.03% or 576 kg/ha. with an average return of Rs.13,824/-. The average additional increase in seed

cotton yield in Bunny over Sativa was 22.61 % or 3.87 q/ha. with an average return of Rs.9,288/-

Six Front Line Demonstrations were successfully conducted to study the profitability and production potential of IPM technologies in cotton over the prevailing farmers' practice in real farm situation. Eight beneficiaries were selected with the consultation of Dept. of Agriculture personnel from village Khajuripada of Bhawanipatna block of the Kalahandi district. The beneficiaries also cultivated cotton in their usual practice.

The percent increase in yield of seed cotton of IPM plots over non - IPM plots ranged from 1.42 to 14.29 percent. The additional returns obtained varied from Rs.480.00 to Rs.4,800.00 per ha. On an average the increase in seed cotton yield was 6.19 percent or 867 kg/ha. resulting in an average additional return of Rs.2,080/- per ha.

### Extension Activities

One *Krishi Mela* was conducted on 17<sup>th</sup> December, 2003 at Bhawanipatna.

### CICR, Nagpur

Thirty demonstrations on NHH.44 with the technologies like Integrated Nutrient Management in cotton, Cotton based inter - cropping system (cotton + soybean), Use of zinc sulphate as soil application and DAP as foliar spray, Maintenance of desired plant population, Integrated Pest Management in cotton, Need based supplementary irrigation in cotton, Use of ridges and furrows for moisture conservation and use of detopping for improvement of cotton yield. The cotton seed of hybrid NHH.44 was supplied to the farmers. In addition, the seed of soybean JS.335 for inter cropping, *Rhizobium* for soybean and *Azotobacter* for cotton as bio-fertilizer, Zinc Sulphate and Suphala as basal dose of nutrient, Urea for top dressing and DAP for foliar application were provided to the farmers. The pesticides were also provided for protecting the crop from the damage of insect pest and diseases.

During the year 2003-04, the onset of monsoon was normal and the rainfall distribution was satisfactory in this area. However, continuous rains during July and August with more number of rainy days hampered the intercultural operations resulting in suppression of cotton growth. However, 2-3 times hand weeding and then intercultural operations helped in management of weeds. The farmers were advised to drain out the excess stagnated water from their fields and also advised to maintain the crop free from weed by regular intercultural operations as well as hand weeding.

Incidence of jassids, aphids and thrips were observed during the early stage of the crop. The severity of damage from jassids was more than the other sucking pests. Among bollworms, low incidence of *Earias* was observed where as, the occurrence of *H armigera* was less to moderate. *H armigera* population declined from the cotton crop since the first fortnight of October. Pink bollworm damage was observed during the November and December months to a higher degree.

The incidence of bacterial blight was observed during the month of August and

September. From the month of October the incidence of bacterial blight declined. However, severe incidence of grey mildew was observed due to cloudy weather, intermittent rains and night cooling from the month of October.

Use of normal dose of chemical fertilizers and soil application of zinc sulphate with 2% DAP as foliar application has increased the yield up to 12.00 per cent. However, Integrated Nutrient Management approach in cotton with the use of bio fertilizer and two sprays of 2% DAP has increased the yield up to 21 per cent over farmers' practice. An increase of profitability by 20 per cent over sole cotton crop was observed in soybean as intercrop in cotton.

During November and December under the moisture stress condition, the life saving irrigation 1-2 times, gave 11 per cent more profitability over farmers' practice of cotton crop without any irrigation.

Productivity of cotton is increased up to 13 per cent by maintaining desired plant population. With the application of complete module of Integrated Pest Management, the profitability in cotton production increased up to 17 per cent. Opening of ridges and furrows at first inter cultural operation has increased the productivity of cotton up to 8 per cent over farmers practice. Use of detopping also helped for the increase of 7 per cent production in cotton.

### Extension Activities

S.No.	Training / Field day	Location	No. of farmers
1	Training on "Integrated Nutrient Management"	Tumgaon	50
2	Training on "use of cotton based inter-cropping with soybean for higher returns"	Tumgaon	50
3	<i>Krishi Mela</i> on 12.3.04	Tumgaon	300

## SOUTH ZONE

### ANGRAU, Guntur

Thirty Front Line Demonstrations were laid out on Integrated Nutrient Management, Popularisation of *G. arboreum* and new *hirsutum* hybrids. Out of the total 20 FLDs were conducted in RARS, LAM, Guntur and 10 FLDs in RARS, Nandyal.

### RARS, LAM Farm

Out of twenty FLDs a total of four demonstrations on INM involving the application of 15 cart load FYM/ha and 120-60-60 NPK/ha, Foliar spray of Boron 1.5%, MgSO<sub>4</sub> 1.0% and ZnSO<sub>4</sub> 0.2% foliar spray at fortnight intervals with variety Bunny (HH) were conducted. An

additional *kapas* yield of 170 kg/ha was obtained from demonstration plot over control plot.

Three demonstrations on *desi* varieties viz., MDL.2468 and LAS.2 against Narasimha with 15 rounds of pesticide sprays in control plot as against six rounds of spray in demonstration plot were conducted. The *desi* cotton varieties recorded an average yield of 1,240 kg/ha against Narasimha (1,387 kg/ha). Though the *kapas* yield recorded was lower in *desi* cotton varieties, the net return (Rs. 28,500.10) was higher than Narasimha.

A total of 13 demonstrations on hirsutum hybrid LAHH.5 against the local check Bunny were conducted. The *kapas* yield, net returns and CB ratio were higher in the demonstration plot (2,248 kg/ha, Rs. 28,027/- and 1: 1.99 respectively) as against the check (2,022 kg/ha, Rs. 22,546/- and 1: 1.80 respectively).

### RARS, Nandyal

A total of 10 demonstrations were conducted on popularization of *desi* cotton variety, Aravinda against the check variety Pandaripur Mungari. An average *kapas* yield of 1,099 kg/ha for Aravinda against 650 kg/ha of local check was obtained. Net returns and CB ratio were also higher (Rs.18, 050/- and 1:3.92 respectively) for Aravinda than the check (Rs. 8,838/- and 1:2.52 respectively).

### Extension Activities

S.No.	Date	Training / Field day	Location
1.	04.09.03	Identification of Mg and Boron deficiency in cotton	Vinjanampadu
2	04.10.03	Integrated Nutrient Management	Edlapadu
3.	13.11.03	Importance of <i>desi</i> cotton varieties in sustainable cotton production	Peesapadu
4	09.12.03	Integrated Nutrient Management	Thimmapuram
5	08.01.04	Recently released cotton hybrids and their performance	Badepuram

### UAS, Dharwad

A total of thirty Front Line Demonstrations (FLDs) were conducted with new hybrids/varieties viz., DHH.11, DHH.543, DHB.105, DHB.290 and Sahana variety in different districts of Dharwad, Raichur, Bellary and Uttar Karnataka, representing different agro-climatic regions coming under the jurisdiction of University of Agricultural Sciences, Dharwad. Recent agricultural technologies developed on new varieties/hybrids, Integrated Pest Management (IPM), Integrated Nutrient Management (INM), leaf reddening management, boll rot management and growth regulator have been demonstrated in comparison with the conventional methods of crop production.

Thirteen Front Line Demonstrations were taken up during 2003-04 to show the

superiority of newly released high yielding hybrids / varieties over local genotypes pre-dominant in cultivation at the farmers' fields.

Performance of cotton hybrid DHH.543 from seven locations clearly revealed its superiority over DHH.11 by registering higher seed cotton yield to an extent of 11-18 per cent with an average of 16 per cent. Similarly *intrahirsutum* hybrid DHH.11 super seeded NHH.44 in terms of yield unit area with an extent of 11.11 per cent.

Interspecific hybrid DHB.290 from two locations showed its superiority over DHB.105 by registering higher seed cotton yield to an extent of 17.6 per cent.

The hybrid DHB.105 was compared with DCH.32 in the farmers' field. It has recorded highest seed cotton yield of 1,500 kg/ha as compared to DCH.32 (1,375 kg/ha). The yield advantage under DHB.I05 was 9.09 per cent over DCH.32. In another trial *hirsutum* variety Sahana was compared with Abhaditha in one location and 19.04 per cent yield increase was observed.

Demonstration of IPM technology over 8 locations played significant role in convincing farming community from the point of view of its effectiveness, reduced usage of pesticides and cost of production, conservation of natural enemies, higher seed cotton yield with more cost benefit ratio. Front Line Demonstration on IPM technology was demonstrated with varied components like, use of pest tolerant genotypes, seed treatment with Imidacloprid, bhendi as trap crop, release of tricho parasitoids, pheromone traps, spraying of NSKE and HaNPV and finally with need based application of selective insecticides.

In NHH.44 hybrid cotton the IPM components were quite effective in checking the insect pest incidence, which resulted in more number of good open bolls and higher seed cotton (1,800 kg/ha) compared to non-IPM components (1,500 kg/ha). The increase in the seed cotton yield was to an extent of 20.00 per cent.

Bunny cotton hybrid in two locations recorded higher yield of 2,180 kg/ha as compared to non-IPM technology (1,580 kg/ha). The seed cotton yield to an extent of 38.0 per cent was obtained.

Similarly, DCH.32 and DHH.11 cotton hybrids registered higher yield through IPM as compared to sole dependence on insecticides. In DCH.32 cotton hybrid management of leaf reddening with spraying of 2% DAP was demonstrated in one location in comparison with no correction measures (check). The application of DAP-2% in DCH.32 cotton hybrid registered superiority in its yield (287 kg/ha) as compared to check (256 kg/ha). The per cent seed cotton yield increase over check was to the tune of 12.10 per cent.

One demonstration in DHH.11 cotton hybrid on application of growth regulator (Planofix spray) @ 5 ml/ 18 lit of water for two times during the reproductive phase of cropping season showed 10.23 per cent more seed cotton yield. This might be due to the prevention of square shedding and also retention of newly formed bolls. The cotton hybrid recorded higher yield with planofix spray (1,045 kg/ha) as compared to without planofix spray (948 kg/ha).

Integrated Nutrient Management was demonstrated in NHH.44 in comparison to application of only RDF (150:75:75 kg/ha). The highest seed cotton yield of 1,540 kg/ha was registered with INM practice as against the application of only RDF (1,290 kg/ha). The per cent increase in yield was to an extent of 19.37 per cent under INM system.

Likewise, DCH.32 hybrid cotton recorded higher yield in INM technology (1,950 kg/ha) as compared to check (1,650 kg/ha). An increase in the seed cotton yield to an extent of 18.18 per cent was observed.

In DCH.32 hybrid, only two rounds of sprays for boll rot resulted in 9.37 per cent yield advantage over check. Since, there were no much rains during October-November the incidence of boll rot itself was less. Through this technology the yield under boll rot management was 1,925 kg/ha as compared to the check (1,760 kg/ha)

### Extension Activities

S.No.	Date	Training / Field day	Location	No. of Farmers
1	08.12.03	Field day	Lokur	300
2	30.06.03	Training on IPM and IDM and Kurubagatti	Mangalagatti	20
3	22.08.03	Demonstrations on release of Tricho Parasitoids & installation of Pheromone traps	Ramankoppa	30
4	27.08.03	Demonstrations on release of Tricho Parasitoids & installation of Pheromone traps	Kubaragatti	30
5	21.10.03	Field day	Sanavalli	

### TNAU, Coimbatore

Five Front Line Demonstrations each on hybrid technologies in the hybrid TCHB.213 and popularization of high yielding variety MCU.12 respectively were organized during the year 2003-04 in the farmers holding at Perianaickenpalayam block in Coimbatore District. The adoption of improved technologies like adequate quantity of fertilizers, timely weeding, adoption of Integrated Pest Management measures etc. led to an increased yield in demonstration plots over the farmers' method of adoption.

The seed cotton yield recorded by TCHB.213 ranged from 2,050 kg/ha to 3,100 kg/ha. The seed cotton yield recorded by the variety MCU.12 was 2,050 kg/ha which was 12.3 % higher than local variety. The yield increase in the demonstration plot was from 13.4 % to 43.2 % over local variety.

Five Front Line Demonstrations were laid out under rainfed conditions to popularise SVPR.2 instituting the interventions like installation of pheromone trap for bollworms @ 12/ha, spraying on NAA @ 40 ppm after receipt of rainfall and foliar spray of DAP 2% seven days after NAA application after ascertaining the soil moisture. Severe infestation of *Heliothis (Helicoverpa armigera)* bollworm was observed. Foliar application of DAP and plant protection chemicals was delayed because of dry spell.

Two Front Line Demonstrations for popularizing SVPR.3 in rice fallow delta were laid out. Since SVPR.3 is a short duration variety, it was able to cope up with the terminal stress for moisture. Breeder seeds of SVPR.3 were supplied with the idea of farmer becoming a seed grower, so that quality seeds can be ensured to farmers of that area. Since SVPR.3 is a short duration variety, it was able to cope up with the terminal stress for moisture. The farmers were given training on identification of the genotype using flower, pollen colour, boll size and shape and canopy architecture. Rouging was done to maintain the purity of the crop thus ensuring quality seeds. Foliar nutrition with DAP twice resulted in higher seed cotton yield. The yield 2,100 kg/ha obtained from FLD farmers was phenomenally higher than the non FLD farmers.

Eighteen Front Line Demonstrations were laid out under summer irrigated conditions with the aim to make the farmers to produce quality seed by themselves, Integrated Nutrient Management and Integrated Pest Management.

Among the eighteen Front Line Demonstrations five FLDs were conducted on a new technology viz., skipping of basal fertilizers and applying the recommended dose of fertilizers (60:30:30 NPK/ha) in two equal splits on 45 and 60 DAS. Spraying of NAA at 40 ppm was also imposed at 60 and 75 DAS in cotton. The seed cotton yield was higher in all the demonstrations. The highest Cost Benefit ratio of 1:2.75 was obtained in the FLD plot over farmers' practice where it was only 1:2.54.

The IPM components viz., growing border/trap/catch/eco-feast crops of castor, maize, cowpea and bhendi, monitoring bollworms with pheromone traps in cotton @ 12/ha and monitoring whitefly with yellow sticky traps @ 12/ha were imposed. The farmers obtained a highest yield of 2,200 kg/ha by following IPM measures whereas it was only 2,000 kg/ha in the Non IPM farmers' fields. Also the Cost Benefit Ratio was 1:2.80 for the IPM farmers when compared to Non IPM farmers where it was only 1: 2.60.

### Expenditure details on FLD Demonstrations conducted during 2003-04

Allocation Rs.	Funds Received from the Council Rs.	Expenditure (Rs.)	
		Centres	
F.No.18-2/2003-CAV dt 4 <sup>th</sup> July, 2003 Rs. 20,00,000	F.No.18-2/2003-CAV dt 4 <sup>th</sup> Dec, 2003 Rs.16,00,000	PAU, Faridcot	85,000
		CCSHAU, Hisar	1,30,000
		RAU, Sriganaganagar	85,000
		MPUAT, Banswara	45,000
		CSAUAT, Kanpur*	25,000
		CICR, Sirsa	85,000
	F.No.18-2/2003-CAV dt 19.2.2004 Rs.56,000	GAU, Surat	1,70,000
		JNKVV, Khandwa	1,05,000
		Dr.PDKV, Ako1a	1,05,000
		MAU, Nanded	1,05,000
		MPKV, Rahuri *	1,25,000
		OUAT, Bhawanipatna	65,000
		CICR, Nagpur	1,86,000
		ANGRAU, Guntur	1,30,000
		UAS,Dharwad	1,30,000
		TNAU, Coimbatore	1,30,000
		PC's Cell	1,00,000
		<b>Total</b>	<b>16,56,000</b>

\* Amount of Rs.1, 50,000/- not disbursed since FLDs were not conducted.

#### Abstract

Details	Amount in Rs.
Amount Sanctioned	20,00,000
Amount Received	16,56,000
Amount Disbursed	16,56,000
<b>Unspent Balance Amount</b>	<b>3,44,000</b>