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Impact of front line demonstration on cotton production technology

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ABSTRACT : Front line demonstration may play a very important role in proper transfer of technologies and changing scientific temperament of the farmers. The main objective of front line demonstration is to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field. One of the major constraints of traditional cotton farming is low productivity due to non adoption of recommended package of practices and improved verities. Women do extremely tedious, time and labour intensive works like weeding and picking of cotton. Cotton picking manually drudgery due to posture, load carrying, abrasion of fingers. An aid to reduce drudgery, efficient collection and field transportation would improve the picking efficiency. Recommended intervention was found helpful in increasing capacity and income by 30.90 per cent. To replace this anomaly, Krishi Vigyan Kendra Fatehabad conducted Front Line Demonstrations on Cotton Production Technology at farmers fields. During the period under study integrated crop management practices on cotton cultivation were disseminated through package of practices. During cotton picking and post harvesting, front line demonstrations on ergonomically tested technologies namely cot bag, capron and protective gloves were provided at farmers field. Recommended intervention was found in increasing crop yield in tune of 25.5 q/ha through FLD as compared to 23.45 q/ha in local check. Recommended intervention improved the income by 30.90 per cent through FLD.

Key words : Cotton production technology, feasibility, Front line demonstration, occupational health hazards, recommended interventions

Natural fibre is obtained from cotton, jute, sheep and silk worm. More than 90 per cent of fibre is obtained from cotton crop alone. This crop is backbone of the textiles industry where 80 per cent of the raw material is obtained from it. Cotton cultivation in India has tremendous scope as its consumption rises by 3 per cent/ annum. Although there is wide gap in its consumption among developing (5 kg/ annum) and developed (15-20 kg/ annum) countries. Thus, the consumption in India will increase because of increase in population and improvement in economic status of people. In last ten years, cotton acreage has been growing at an average annual rate of around 3 per cent. However, the average cotton yield in India is only 0.49 t/ha compared to world average 0.73 t/ha. (Anonymous, 2015). The low yield of cotton in India are attributed to inadequate input usage, rainfed cultivation, untimely operations on field and inefficient crop production technologies. In Haryana state, 5 districts *viz.,* Sirsa, Hisar, Fatehbad, Jind and Bhiwani account 97 per cent of area and 98 per cent production of cotton in the state.

Women do extremely tedious, time and

labour intensive works like weeding and picking of cotton. These are done manually, despite the technological advancement and farm mechanization. Technologies generated by scientists are of no use unless adopted by farmers. Latest recommended package of practices should demonstrate on farmer's field through demonstrations. Frontline demonstration may play a very important role in proper transfer of technologies and changing attitude of farmers by seeing is believing. The main objective of frontline demonstration is to demonstrate newly released crop production and protection technologies and its management practices in the farmer's field, under different farming situations. A need of the day is to reduce the technological gap between the agricultural technologies recommended by the scientists on farmers field. In view of the above factors, front line demonstrations were undertaken in a systematic manner on farmer's field to show the worth of new technology and convince the farmers to adopt improved practices of cotton for enhancing efficiency. Keeping in view the present investigation attempts to enable farm women through cotton made technologies.

MATERIALS AND METHODS

The present study was conducted in Krishi Vigyan Kendra Fatehabad from 2011 to 2015. Participatory rural appraisal (PRA) was conducted in cluster of villages in Bhattoo, Fatehabad and Bhuna blocks. To survey various aspects of cotton production technologies and health hazards in cotton picking, total 6 villages in cluster were surreyed. Bhattoo block (Sirdhan and Kirdhan), Fatehabad block (Bhuthan and Akanwali), Bhuna block (Gorakhpur and Chabara). Total 120 farm families were selected from all six villages *i.e.* 20 from each. Integrated crop production technologies on cultivation of cotton crop was disseminated through package of practices to all selected farm families. All the participating farmers were trained on various aspects of cotton production technologies through recommended agronomic practices and genuine seeds of cotton were used for FLD's. one fifth area was also devoted to grow local standard check. In addition to this, to mitigate drudgery and health problems in cotton picking, recommended protective garments (cotton picking bag, capron and protective gloves) developed by CCS HAU, Hisar were demonstrated in all selected farm families. Picking bag was used for picking and collection of cotton balls. It was made of cotton cloth and designed as per anthropometric measurements of women. Shaped pockets provided in front and below waist line, made it user friendly. Cushioned belts avoid strain on shoulder, hand and neck. Protective capron made of cotton fabric were used for protection from sunrays, dust inhalation and avoid dirt. Protective gloves were made of cotton fabric or PVC material fusion with hosiery fabric or blended cotton avoid abrasions on hand and neck during picking of cotton. Intervention package of protective garments were provided in peak season of cotton picking. Data were collected to study the impact of intervention in form of FLD from all 120 farm families. Yield and economics of cotton crop was recorded under demonstration over local check, respectively.

Perceived feasibility: Perceived adoption feasibility of protective garments was worked out

on five attributes namely relative advantage, physical and cultural compatibility, simplicity-complexity and trial ability. Perceived feasibility index was calculated with the formula given below:

$$\text{Perceived feasibility index:} \frac{E\ (RA+CC+PC+SC+T)}{P\ (RA+CC+PC+SC+T)} X100$$

Where;

RA: Relative advantage
CC: Cultural compatibility
PC: Physical compatibility
SC: Simplicity complexity
T: Trial ability
E: Expected Score
P: Perceived Score

RESULTS AND DISCUSSION

Results in Table 1 depicts the trend of the trials conducted in cluster villages of district Fatehabad during *kharif,* 2011 to 2015 revealed that average seed cotton yield was to the tune of 25.5 q/ha in demonstration as compare to 23.45 q/ha in local check which was 8.7 per cent higher under demonstration over local check. The average return over variable cost was 34.8 per cent higher under demonstration over local check. Benefit cost ratio higher 1.59 and 1.44 under demonstration over local check, respectively. Similar trends in results were reported by Dhaka *et al.,* 2010 and Patel *et al.,* 2013.

Perceived feasibility index was assessed on four attributes of a new innovation. The results in Table 2 depicts that perceived feasibility index for cotton made protective garments was found 84.92 per cent. Highest PFI (92.78%) was observed for physical and cultural compatibility of the technology disseminated through intervention. It is interesting to note that all the respondents (100%) reported that technology is in accordance with norms and values. It was followed by interest and need based 96.0 per cent, socially acceptable 94.0 per cent, according to existing practices 86.67 per cent and can adopt independently 86.11 per cent of the users. Trend in results shows that the technology is compatible at village level.

Relative advantage of the technology was found 91.78 per cent which speaks of high adoption index. It was worked out on five sub attributes, highest index was observed for

Table 1. Yield and economics of *Bt* cotton during 2011-2015 n=120

Year *kharif* season	Yield (q/ha)		Economics of Demonstration		Economics of local check	
	Demonstration	Local check	Net return (Rs)	B:C Ratio	Net return	B:C Ratio
2011	26.90	24.8	47625	1.67	38385	1.54
2012	26.70	24.2	45980	1.64	34980	1.49
2013	24.10	22.3	36450	1.51	28350	1.39
2014	24.30	19.9	37150	1.51	17350	1.24
2015	25.80	24.4	43700	1.60	37400	1.52
Average (2011-2015)	**25.50**	**23.45**	**42181**	**1.59**	**31293**	**1.44**

multiple use potential 97.22 per cent followed by time saving 95.0 per cent, consistency of use 93.61 per cent, monitory benefits 88.0 per cent and low initial cost 83.0 per cent reported by users.

Triability of the technology was found 80.28 per cent on attribute assessment. However, all the users (100%) reported that the technology can be tried out at village level. It was followed by the sub attributes "results are visible (93.89%) and can be demonstrated (83.33%)", respectively.

Multiple responses : Performance evaluation of intervention in cotton picking was assessed on three parameters namely health related, working efficiency related and economic related benefits. It is evident from the data in Table 3 that physical health hazards were found drastically reduced by using recommended intervention *i.e.* majority of women (70.83 %) reported reduction in strain on shoulder followed by pain in back 47.50 per cent, pain in hand 46.67 per cent respectively. Regarding working efficiency related parameters, performance was

Table 2. Perceived adoption feasibility of protective garments in cotton picking n=120

Attributes	Response category			WMS	M.S.	PFI
relative advantage	Agree(3)	Undecided(2)	Disagree(1)			
Low initial cost	80 (240)	20(40)	20	300	2.50	83.00
Monetary benefits	92 (276)	16(32)	12	320	2.66	88.00
Consistency of use	102 (306)	13 (26)	05	337	2.80	93.61
Time saving	105 (315)	15 (30)	-	345	2.87	95.00
Multiple use potential	110 (330)	10 (20)	-	350	2.91	97.22
Total				**1652**	**2.75**	**91.78**
Cultural compatibility	120 (360)	-	-	360	3.0	100.0
Physical compatibility	108 (324)	12 (24)	-	348	2.90	96.0
Situational compatibility	110 (330)	-	10	340	2.83	94.0
Social compatibility	90 (270)	12 (24)	18	312	2.60	86.67
Relational compatibility	85 (255)	20 (40)	15	310	2.58	86.11
Total				**1670**		**92.78**
Simplicity complexity						
Cognitive simplicity	195 (285)	17(34)	8	327	2.72	90.83
Application simplicity	100 (300)	10 (20)	10	320	2.66	88.89
Resource simplicity	-		60	180	1.50	50.00
Reversibility	10 (30)	60 (120)	90	160	1.33	44.44
Increase in efficiency	120 (360)	20 (40)	-	360	3.0	100.0
Total				**1347**	**2.24**	**74.83**
Communicability	82 (246)	08(16)	10	272	2.26	
Visibility of results	102 (306)	14(28)	04	338	2.80	93.89
Demonstrability	80 (240)	20(40)	20	300	2.50	83.33
Triability	120 (360)	-	-	360	3.00	100.0
Provision for modifications	15 (45)	25(50)	80	175	1.45	48.61
Total				**1445**	**2.40**	**80.28**

Overall PFI = 84.92 per cent

Table 3. Performance evaluation of protective garments on cotton picking n=120

Parameter	Conventional method		Recommended intervention (FLD)		Reduction in problem	
	F	(%)	F	(%)	F	(%)
1. Health related						
· Strain on shoulder	93	77.50	8	6.67	85	70.83
· Pain in back	65	54.17	8	6.67	57	47.50
· Pain in hand	62	71.67	6	5.00	56	46.67
· Pain in neck	02	1.67	2	1.67	-	-
· Pain in wrist	21	17.50	4	3.33	17	14.17
2. Working efficiency related						
Time taken in one load of cotton balls						
· Less than ½ hour	12	10.00	86	71.67	74	61.67
· Half to one hour	55	45.83	29	20.17	26	21.66
· More than one hour	53	44.17	05	4.16	48	40.00
Conventional method load= 6 kg						
Recommended intervention=8 kg						
3. Economic						
Cotton collection/day/person	42 kg		56 kg			
Income	210		280			

Increase in income and efficiency by 30.30 percent

evaluated by assessing time taken in one load of cotton balls. It is interesting to note that only 10.0 per cent women could collect one load in less than half an hour by using conventional method. In contrast 71.67 per cent of the users succeeded in collecting one load in less than half an hour. However, 44.17 per cent reported that they take more than one hour in collecting one load where as this trend was drastically reduced by using recommended intervention. Only 4.16 per cent of the respondents took more than half an hour in collecting cotton. The result clearly indicate that recommended intervention enhanced the efficiency of women in cotton picking and consequently increase their capacity 33.33 per cent and earning 33.33 per cent. The results are in consonance with Dahiya and Yadav, 2014 and Dahiya and Yadav, 2017.

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