J. Cotton Res. Dev. **38**(2), 252-261 (July, 2024) **ISSN No. 0972-8619**

Farm Women's Knowledge and Attitude towards Cotton Production in Bhiwani District

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Abstract : Cotton is a primary crop cultivated in India, holding a dominant position in both the agricultural and industrial sectors. Cotton is one of the most crucial cash crops, as it effectively provides 75 per cent of the raw material to the textile industry. Cotton production provides a source of income to approximately 60 million people. India stands as one of the leading global producers of cotton, ranks as the world's second largest consumer of cotton and have the largest acreage. The study was an attempt to get the response regarding knowledge and attitude of respondents towards cotton production in Mandhana village of Bhiwani district, Haryana. A total of 30 respondents were selected by using random sampling technique. Majority of respondents were aged between 20 to 39 years. Education of respondents indicated that 33.3 per cent respondents were primary educated followed by 30.0 per cent were secondary educated. The usage of cotton-picking bags was limited among respondents. The study revealed that 66.7 per cent respondents had medium knowledge regarding cotton production.

Key words: Attitude, cotton, cotton picking, knowledge, production.

Cotton (*Gossypium hirsutum* L.) is cultivated in 100 nations and meets one-third of the worldwide need for natural fiber (Mollaee *et al.*, 2019). Cotton is cultivated primarily in tropical and subtropical regions across the globe. In nations like China, India and Pakistan where cotton plays a significant role in rural livelihoods, millions of households are involved in its production and produce over two-thirds of the world's cotton in developing countries. Cotton holds a prominent position in India's agricultural economy as a crucial cash crop and fiber. It often referred to as "White Gold," it stands as the top-ranking cash crop within the country. Cotton serves as a primary source of income for 6 million farmers in India, while the cotton trade and processing sector provide employment to 40-50 million people. It fulfills 65 per cent of the essential raw material requirement for cotton fiber in India's cotton textile sector. As a major cotton exporter, India is estimated to have exported 30 lakh bales (0.51 million metric tonnes), representing approximately 6 per cent of the world's total export of 528 lakh bales (8.98 million metric tonnes) in the 2022-2023 period (Ministry of Textile, 2023). According to the first advance estimates 2023-2024, Government of India, the cotton crop is projected to be approximately 316.57 lakh bales compared to 336.60 lakh bales in the previous year 2022-2023.

India stands out among the primary cotton-producing nations due to its diverse range of agro-climatic and soil conditions, enabling the cultivation of various cotton varieties and staple lengths. In the northern zone, short and medium staple varieties of cotton are predominantly cultivated, while the southern zone focuses mainly on long and extra-long staple varieties. On the other hand, the central zone cultivates a mix of medium and long staple varieties. Gujarat emerges as the top contributor to cotton production among the states, with an estimated 89.44 lakh bales, followed by Maharashtra with 75.75 lakh bales, Telangana with 47.99 lakh bales, Rajasthan with 28.10 lakh bales and Karnataka with 19.29 lakh bales. (Cotton Outlook – November 2023). In Haryana, cotton cultivation primarily occurs during the *kharif*

season. As estimated by Committee on Cotton Production and Consumption (COCPC), the area under cotton cultivation is 6.36 lakh ha, production is 13.16 lakes bales with a yield of 351.76 kg/ha in Haryana. The major cotton producing districts in Haryana are Sirsa, Fatehabad, Hisar, Bhiwani and Palwal.

Women in India play a crucial role in society and are vital human resources in the economy. Women actively involved in a wide range of agricultural activities. Women contribute significantly to cotton farming, serving as both farmers and hired laborers. Especially in developing nations, where seed cotton production is predominantly led by small-scale farmers, women play a central role in driving the production process. Women are often involved in manual tasks such as picking, sowing, weeding, fertilization, and stalk destruction in cotton fields. Meanwhile, men primarily handle activities such as soil preparation, irrigation, pesticide application, procurement of raw materials and farming equipment, transportation and marketing. Cotton is predominantly hand-picked, a task traditionally undertaken by women, with approximately 89 per cent of women engaged in this activity (Zarimedia, 2013). Dash (2000) stated that the Indian women, particularly those in poverty, dedicate over five hours more per day to work compared to Indian men. Moreover, women have dual responsibility of balancing their farm work and taking care of household chores and children. One of the primary concerns expressed by stakeholders was that women undertake a substantial portion of the work in cotton farming. Despite their significant contributions, women's involvement in cotton production is often overlooked and underestimated, resulting in disparities in access to resources, decision making authority, wages and technical knowledge. Women farmers face restricted access to training and capacity-building initiatives that could enhance their productivity in the fields. Women in cotton cultivation predominantly undertake tasks that involve drudgery. The drudgery load for farm women in the cotton production system is particularly high during cotton picking, characterized by repetitive strain and significant physical and physiological exertion. Keeping all this in view the study was conducted to explore Knowledge, attitude and decision making by respondents regarding cotton production.

The study was conducted in Mandhana village of Bhiwani district. Thirty rural women respondents were selected randomly. Primary data were collected through interviews and questionnaires, and secondary data from published literature. This study has been intended to investigate majorly knowledge, attitude and specific aspects of cotton production, such as the cropping pattern, natural calamities and sources of irrigation or pest management strategies.

Table 1 described the personal profile of the respondents including age, caste, family type and family size.

It was revealed from the data that majority of the respondents 66.7 per cent belonged to the age group of 20-39 years of age followed by 30.0 per cent belonged to the age group of 40-59 years whereas only 3.3 per cent belongs to age group of above 60 years.

Caste: Majority of the respondents 53.4 per cent belonged to backward class/other backward class followed by 30.0 per cent of respondents belonged to general and only 16.6 per cent belonged to scheduled caste respectively. Similar study was reported by Rani (2016), Geeta (2010) and Yadav (2013) who disclosed that most of the respondents belonged to younger age group and OBC.

Family type: Data indicated that majority 40.0 per cent of the respondent's belonged to joint families while 60.0 per cent of the respondents belonged to nuclear family. Sharma *et al.*, (2023) and Deswal *et al.*, (2021)

Table 1: Personal profile of the respondents

Sr. No.	Variables and categories	Frequency	Percentage
1.	**Age (Years)**	N=30	
	20 – 39	20	66.7
	40 – 59 years	09	30.0
	Above 60	01	3.3
2.	**Family type**		
	Nuclear	18	60.0
	Joint	12	40.0
3.	**Caste**		
	Scheduled Caste / Scheduled Tribe	05	16.6
	BC/OBC	16	53.4
	General	09	30.0

disclosed that majority of the respondents belonged to nuclear family.

The data in Table 2. described the socio economic profile of the respondents.

It was corroborated from the data that 33.3 per cent respondents were educated up to primary followed by 30.0 per cent were educated up to secondary, 20.0 per cent were illiterate whereas 16.7 per cent were educated upto tertiary education.

As far as occupation was concern 83.3 per cent of the respondents had farming as their main occupation whereas 16.7 per cent were wage labourers.

Land holding: Majority of the respondents 33.3 per cent had land holding between 1.00-2.00 hectares, 30.0 per cent had land holding below 1 hectare, 20.0 per cent had land holding between 2.00-4.00 hectare and 16.67 per cent had no land holding. Purbia and Gahlot (2023) found that large number of respondents belongs to small farmer category (65.84 %) followed by marginal farmer category (20.83%) and large farmer category (13.33%).

Regarding cropping pattern, it was observed that majority of the respondents 56.7 per cent had crop rotation pattern whereas 43.3 per cent of respondents follow monoculture.

Natural Calamities faced during last three years: Majority of the respondents (50.0%) faced pink bollworm attack during last three years followed by 30.0 per cent of the respondents faced extreme temperature and 20.0 per cent of the respondents faced un-timely rainfall.

Sources of irrigation: Majority 55.3 per cent of the respondents used canal as source of irrigation whereas 46.7 per cent of the respondents used tube well as source of irrigation. Shehrawat *et al.*, (2023) also showed that majority of respondents (80.0%) of respondents had canal as a source of irrigation, whereas 70.0 per cent farmers had tubewell as source of irrigation.

As far as quantity of cotton picked was concerned it was found that majority 46.7 per cent of respondents picked upto 30-40 kg of cotton per day whereas 40.0 per cent of respondents picked 40-50 kg and 13.3 per cent of respondents picked 20-30 kg of cotton per day. Mahesh *et al.*, (2022) also observed that while 30-40 kg cotton was harvested per day by women using the conventional method.

Primary picking method: Cent per cent of the respondents conventional method the cotton during harvesting.

Table 3. indicated the major decision making for cotton management. The findings showed that 96.7 per cent of males took decision while only 3.3 per cent of males took decision with some support from women regarding marketing of cotton crop followed by 66.7 per cent of males took decision regarding farm management while 33.3 per cent both equally took decision on farm management.

On the other hand, 53.4 per cent of males

Table 2: Socio-economic profile of the respondents

n=30

Sr. No.	Variables and categories	Frequency	Percentage
1.	**Educational status**		
	No Schooling	6	20.0
	Primary Education	10	33.3
	Secondary Education	9	30.0
	Tertiary Education	5	16.7
2.	**Occupation**		
	Farming	25	83.3
	Wage labourer	5	16.7
3.	**Land Holding**		
	Marginal (Below 1.00 hectare)	09	30.0
	Small (1.00 – 2.00 hectare)	10	33.3
	Semi-Medium (2.00- 4.00 hectare)	6	20.0
	Medium (4.00- 10.00 hectare)	-	-
	No land	5	16.7
4.	**Cropping pattern**		
	Monoculture	13	43.3
	Crop rotation	17	56.7
	Diversification	-	-
5.	**Natural calamities faced during last three year**		
	Extreme Temperature	09	30.0
	Earthquake	-	-
	Drought	-	-
	Un-timely rainfall	06	20.0
	Pink bollworm attack	15	50.0
6.	**Sources of irrigation**		
	Canal	16	53.3
	Tube well	14	46.7
	Rainfed	-	-
7.	**Quantity of cotton picked (kg)**		
	20-30	4	13.3
	30-40	14	46.7
	40-50	12	40.0
	60-70	-	-

had access to resources whereas 43.3 per cent both males and females had access to resources and only 3.33 per cent mostly men with some support from women had access to resources, 50.0 per cent of males, 43.3 per cent both equally whereas only 6.7 per cent of females took community level decisions regarding involvement in village or community meetings, discussions on resource management. As far as the storage of cotton crop was concerned decision was taken majorly by both equally (56.7%) followed by 26.6 per cent of males and 16.7 per cent mostly men with some support from women took decision for storage of cotton crop.

Table 4. revealed about information source utilization and it was found that majority of the respondents 56.7 per cent had medium utilization which was followed by 13.3 per cent had high utilization and only 30.0 per cent had low utilization of mass media.

Data regarding usage of digital technology indicated that 40.0 per cent respondents had high level usage of digital technology followed by 30.0 per cent had low level usage whereas 20.0 per cent had medium level usage of digital technology in the form of Whats

Table 3: Major decision making done by respondents for cotton management n=30

Categories	Male		Female		Both equally		Mostly men with some support from women	
	F	(%)	F	(%)	F	(%)	F	(%)
Farm Management	20	66.7	-	-	10	33.3	-	-
Access to resources	16	53.4			13	43.3	1	3.3
Community level decision (involvement in village or community meetings, discussions on resource management)	15	50	2	6.7	13	43.3	-	-
Marketing	29	96.7	-	-	-	-	1	3.3
Storage	8	26.6	-	-	17	56.7	5	16.7

Table 4: Communication profile of the respondent

n= 30

	Information Source Utilization	Frequency	Percentage
a)	**Mass media exposure**		
	Low (5-7)	09	30.0
	Medium (8-10)	17	56.7
	High (11-13)	4	13.3
b)	**Usage of Digital Technology**		
	Low (4-6)	10	33.3
	Medium (7-9)	6	20.0
	High (10-12)	12	40.0

app, Face book, YouTube in the form of watching movies, shopping and sharing messages.

i) Risk proneness

Table 5 described the psychological profile of the respondents regarding cotton production. It included risk proneness, achievement motivation, aspiration of farmers, procurement of subsidies/loans for agriculture and availability of infrastructure.

facility for storage. The data revealed that in village Mandhana, 86.7 per cent of the respondents agreed that the market risk is very high in terms of prices availability of market and price fluctuation followed by 73.3 per cent of the respondents agreed that a farmer should prefer to take more of a chance facility for storage. The data revealed that in village Mandhana, 86.7 per cent of the respondents agreed that the market risk is very high in terms of prices availability of market and price fluctuation followed by 73.3 per cent of the respondents agreed that a farmer should prefer to take more of a chance on generating a large profit than to settle for a smaller but riskier profit and 66.7 per cent farmers agreed regarding taking the risk to switch to commercial agriculture was worth it and 50.0 per cent of the respondents accepted that a farmer who is more risk-tolerant than the average farmer typically had better financial results. Choudhary (2021) revealed that majority of the respondents (82.2 %) perceived that the market risk in terms of prices, availability of market and price fluctuation is very high.

On the other hand, data found that equal majority 50.0 per cent of the respondents both agreed and disagreed that a farmer who was more risk-tolerant than the average farmer typically had better financial results followed by 33.3 farmers disagreed regarding taking the risk to switch to commercial agriculture is worth it, 26.7 per cent of the respondents disagreed to take more of a chance on generating a large profit than to settle for a smaller but riskier profit and only 13.3 per cent of the respondents disagreed regarding very high market risk in terms of prices, availability of market and price fluctuation.

Table 5: Psychological profile of the respondents

n=30

i)	Risk proneness	Frequency Agree	Percentage Disagree	Agree (%)	Disagree (%)
1.	A farmer should prefer to take more of a chance on generating a large profit than to settle for a smaller but riskier profit	22	8	73.3	26.7
2.	A farmer who is more risk-tolerant than the average farmer typically has better financial results	15	15	50.0	50.0
3.	Market risk is very high in terms of prices, availability of markets, and price fluctuation	26	4	86.7	13.3
4.	Farmers taking the risk to switch to commercial agriculture is worth it	20	10	66.7	33.3
ii)	Achievement motivation				
1,	A farmer shouldn't be reluctant to adopt novel techniques	27	3	90.0	10.0
2,	A most successful farmer is the one who is persistent	23	7	76.7	23.3
3.	A farmer should be adaptable	18	12	60.0	40.0
4.	A farmer should be self-assured and motivated to succeed	21	9	70.0	30.0
5.	A farmer should feel pride in productivity	28	2	93.3	6.7
iii)	Aspiration of farmers				
1.	Low-cost input	17	13	56.7	43.3
2.	Loan	14	16	53.3	46.7
3.	Subsidies	25	5	83.3	16.7
4.	Incentives for loss	23	7	76.7	23.33
5.	Timely information	18	12	96.7	3.3

Table 6: Pertaining subsidies/loans and infrastructural facility for storage by the respondents

a)	Procurement of subsidies/loans for agriculture				
1.	Inputs	12	18	40.0	60.0
2.	Fertilizers	10	20	3.3	66.7
3.	Irrigation	2	28	6.7	93.3
4.	Seed	8	22	26.7	73.3
5.	Agricultural equipment	17	13	56.7	43.3
6.	Power	6	24	20.0	80.0
b)	Availability of infrastructural facility for storage				
1.	Home	23	7	76.7	23.3
2.	Warehouses	5	25	16.7	83.3
3.	Mandi	21	9	70.0	30.0
4.	Broken sheds	-	30	-	100

ii) Achievement motivation

Data found from achievement motivation, majority 93.3 per cent of the respondents had high achievement motivation in terms of a farmer should feel pride in productivity followed by 90.0 per cent of farmer shouldn't be reluctant to adopt novel techniques followed by a most successful farmer was the one who was persistent (76.7%), self-assured and motivated to succeed (70.0%) and 60.0 per cent respondents had achievement motivation in terms of a farmer should be adaptable. Dahiya *et al.*, 2023 found similar results that 86.7 per cent of the respondent had high high achievement motivation in terms of a farmer should feel pride in productivity.

Furthermore, data also found that majority 40.0 per cent of the respondents disagreed that a farmer should be adaptable followed by 30.0 per cent farmer should be self-assured and motivated to succeed and a most successful farmer was the persistent one (23.3%), shouldn't be reluctant to adopt novel techniques (10.0%) and 6.7 per cent of the respondents condemned that a farmer should feel pride in productivity.

iii) Aspirations of the farmer

Data indicated that majority of the respondent's cent per cent had high aspirations related to subsidies, incentives for loss and timely information followed by low-cost input (80.0%) and loan (26.7%).

Further data elucidated that 73.3 per cent of respondents disapproved with loan and only 20 per cent of the respondents disagreed with low-cost input.

a. Procurement of subsidies/loans for agriculture

Table 6. highlighted that majority of the respondents 56.7 per cent agreed for procuring subsidies/loans for agricultural equipment followed by 40 per cent of the respondents were procuring loans for inputs (Urea, DAP) and 20 per cent of respondents were procuring loans for power.

Further data illuminated that majority 93.3 per cent of the respondents disagreed for not procuring subsidies/loans for irrigation followed by 80 per cent for power not procuring subsidies/loans whereas 73.3 per cent of the respondents were not procuring loans for seeds.

b. Availability of infrastructural facility for storage

Data depicted that majority of the respondents 76.7 per cent stored their produce at home followed by 70 per cent of respondents stored their produce at mandi whereas only 16.7 per cent stored their produce at warehouses.

Furthermore, data expounded that cent per cent of the respondents disagreed for availability of infrastructural facility for storage in form of broken sheds followed by 83.3 per cent of the respondents were not stored their produce at warehouses, 30 per cent were not stored their produce at mandi and 23.3 per cent were not stored their produce at home. Table 7 revealed that cent per cent of the respondents did not attended training/awareness programmes on cotton production.

Table 9. revealed about the overall knowledge of respondents which highlighted that majority of the respondents (66.7%) had medium knowledge on cotton production whereas 23.3 per cent respondents had low knowledge on cotton production whereas only 10.0 per cent respondents had high knowledge on cotton production.

The Table 10 elaborated the attitude of women regarding cotton production. The attitude was taken on three-point continuum

Table 7: Training/Awareness programmes on cotton production

n-30

		Yes	Percentage	No	Percentage
1.	Training on Cotton production	-	-	30	100.0

Table 8: Knowledge of respondents on Ccotton production

n-30

V	Statements	Correct		Incorrect		TWS	INDEX	RANK
		F	(%)	F	(%)			
1.	The best period to sow is after a week in April to the end of May	20	66.7	10	33.3	50	83.3	V
2.	Selection process for seeds (high yielding or disease resistant)	24	80.0	6	20.0	54	90.0	II
3.	Plants should be spaced 45/60 cm apart	23	76.7	7	23.3	53	88.3	III
4.	Line to line spacing should be minimum 67.7/100 cm	19	63.3	11	36.7	49	81.7	VI
5.	The attack of pest in the area i.e. pink ballworm.	26	86.7	4	3.3	56	93.3	I
6.	For pest management, chemical measures like Rogor was used.	22	73.3	8	26.7	52	86.6	IV
7.	Use of bio-pesticides i.e. Neem based products.	24	80.0	6	20.0	54	90.0	II
8.	Time to pick cotton should be between 150 and 170 days	11	36.7	19	63.3	41	68.3	VIII
9.	Picking needs to be done more frequently	12	40.0	18	60.0	42	70.0	VII
10.	Stopped irrigation after the opening of one-third of bolls	7	23.3	23	76.7	37	61.7	IX
11.	Do you know about the cotton-picking bag	-	-	30	100	30	50.0	X

Table 9: Overall knowledge of respondents on cotton production

n-30

	Categories	Frequency	(%)
1.	Low (12-14)	7	23.3
2.	Medium (15-17)	20	66.7
3.	High (18-20)	3	10.0

with range as agree, neutral and disagree attitude. It was found that regarding the attitude, respondents had positive attitude (Rank=1, WMS=2.6) for women should take part in deciding how to handle the household's finances followed by (Rank=2, WMS=2.23) for men can clean the house and provide meals whereas (Rank=3, WMS=2.2) for women are capable of handling production costs, (Rank=4 WMS=2.06) for only men should take up sales and marketing for cotton, (Rank=5, WMS=1.96) for women should take part in selecting the seeds to plant and women can harvest cotton, but they cannot carry it to markets, (Rank=6, WMS=1.93) for women can operate the tractor or bullock wagon, if necessary, (Rank=7, WMS=1.83) for women cannot decide the quantity of insecticide to use in cotton, whereas respondents had neutral attitude (Rank=8, WMS=1.8) for women were not able to decide the quantity of fertilizer to use and

Table 10: Attitude of women farmers regarding cotton p roduction

n-30

Sr. No.	Statements	Agree	Neutral	Disagree	TWS	WMS	Rank
1.	Women can harvest cotton, but they cannot carry it to markets	11	7	12	59	1.96	V
2.	Men can clean the house and provide meals	18	1	11	67	2.23	II
3.	Women are capable of handling production costs of cotton	13	10	7	66	2.2	III
4.	Women should take part in selecting the seeds to plant	11	7	12	59	1.96	V
5.	Women are not able to take part in selection of fertilizer to use and when to use in cotton	7	10	13	54	1.8	VIII
6.	Women can operate the tractor or bullock wagon, if necessary	12	4	14	58	1.93	VI
7.	Women cannot decide quantity of insecticide to use in cotton	8	9	13	55	1.83	VII
8.	Women should take part in making decisions about how to handle the household's finances	19	10	1	78	2.6	I
9.	Only men should take up sales and marketing for cotton	11	10	9	62	2.06	IV
10.	Women should participate in deciding how many children to have	6	11	2	42	1.4	IX

when to use in cotton, (Rank=9, WMS=1.4) for women should participate in deciding how many children to have.

CONCLUSION

From study, it can be deduced that most of the respondents belonged to the age group of 20-39 years, female respondents, backward class, nuclear family, educated up to primary level, medium mass-media exposure, small farmers, not member of any organization and with no extension contacts. Majority of the respondents had medium knowledge level. In overall, it was found that first rank was given to the attack of pest in the area *i.e.* pink bollworm followed by second rank is given to selection process for seeds (high yielding or disease resistant) and use of bio-pesticides *i.e.* Neem based products which index value is (93.3 and 90.0). The results also showed that majority of the respondents had neutral attitude regarding cotton production. The usage of cotton-picking bags was limited in the study area. The main reason could be lack of awareness, knowledge, low educational status and training. The government or non-government organization and extension agents must provide cotton picking bags to farm women free of charge or at subsidized rates to encourage their adoption and also provide training to farm women stitching of cotton-picking bags. This will help in increase in awareness and intern promote the adoption of cotton-picking bags among farm women. Leading to their improved efficiency and productivity in cotton harvesting.

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Received for publication : April 6, 2024
Accepted for publication : May 19, 2024