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Knowledge level of cotton growers about cotton production technology in Khandwa District of Madhya Pradesh

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Abstract

Cotton (*Gossypium* spp.) is one of the most important fibre and cash crop of India and plays a leading role in the industrial and agricultural economy of the country. It provides the basic raw material (cotton fibre) to cotton textile industry. The study was conducted in two blocks namely Khandwa and Pandhana block of Khandwa district of Madhya Pradesh. The data were collected from randomly selected 200 cotton growers. In the light of objectives set for the study, the variables studied were knowledge level of cotton growers, socio- economic & personal, communication and psychological attributes like age, education, caste, family size, type of family, annual income, land holding, farm mechanization, extension participation, information seeking behaviour, cosmopoliteness, economic motivation, scientific orientation and risk orientation. The primary data were collected by interviewing the selected respondents with the help of semi structured interview schedule. The study also revealed that the knowledge level of cotton growers was significantly associated with their age, education, family size, family type, land holding, farm mechanization, extension participation, information seeking behaviour, economic motivation, scientific orientation & risk orientation.

Introduction

Cotton (*Gossypium* spp.) is one of the most important fibre and cash crop of India and plays a leading role in the industrial and agricultural economy of the country. It provides the basic raw material (cotton fibre) to cotton textile industry. In India Cotton occupies a predominant place among cash crops touching the country's economy at several points by generating direct and indirect employment in the agricultural and industrial sectors. Cotton is cultivated in three different agro-ecological regions (north, central and south) of the country. The northern zone is almost irrigated, though the percentage of irrigated area is much lower in the central and southern zones. In Madhya Pradesh, cotton occupies an area of about 0.6 million hectare with a production of 19 lakh bales and with a productivity of 527 kg/ha (2020-2021). The productivity of cotton is very poor and this crop is attacked by a number of insects, pests, diseases, nematodes and weeds. So, the aims of the study were to determine the knowledge of cotton growers about cotton production technology and find association between selected socio –economic & personal, communication and psychological characteristics of cotton growers and their knowledge of cotton production technology (Kumar *et al.* 2016).

Materials and Methods

The research study on knowledge level of cotton growers about cotton production practices was conducted during the year 2021-2022 in Pandhana and Khandwa block of Khandwa district (Madhya Pradesh). In the present investigation, descriptive type of ex-post-facto research design was employed. This design was appropriate because the phenomenon had previously happened. Ex-post-facto research is the most logical empirical enquiry in which the researcher does not have any control over independent variables as their appearance has already occurred or as they are inherent and not manipulatable thus, inferences about relations among variables were made without direct intervention from concomitant variation of independent and dependent variables. Khandawa district comprises of 7 blocks namely Khandwa, Punasa, Pandhana, Harsud, Chhaigaon, Baldi and Khalwa. Out of these two blocks namely;Pandhana and Khandwa block were purposively selected, because of highest area under cotton crop. The Pandhana block comprise of 124 villages and Khandwa block comprise of 97 villages. Out of which ten villages were selected on the basis of larger area under cotton crop. From the ten selected villages, 200 cotton growers were selected from each selected village by using proportionate

random sampling method to make the total sample size for the present study.

The knowledge level of cotton growers with respect to improved cultivation practices of cotton was studied by computing knowledge score. Regarding knowledge, the responses were rated on three-point continuum namely complete knowledge, partial knowledge and no knowledge. A numerical score of 2 was assigned for complete knowledge, a score 1 was assigned for partial knowledge and a zero was assigned for no knowledge. The score of all identified practices was then summed up. This sum total indicates the knowledge score of that particular individual respondent. The scores of all the practices earned by each individual were added together to work out the knowledge score of an individual. The raw score then was converted into knowledge index as mentioned below.

$$\text{Knowledge Index} = \frac{\text{Total knowledge score obtained}}{\text{Maximum obtainable knowledge score}} \times 100$$

On the basis of knowledge index, the respondents were categorized in to low, medium and high groups based on mean ± sd

The primary data were collected personally by the researcher by interviewing the selected respondents with the help of semi structured interview schedule.

Results and Discussion
Socio economic personal, communication and psychological characteristics of cotton growers: The data presented in (Table 1) revealed that majority of the cotton growers belonged to young and middle age group (87.5%), possessed medium level of education (72%), belonged to other backward caste & general caste (66%), had medium to large size family (80%) and belonged to joint family (63.5%). The data further revealed that, majority of the cotton growers belong to medium to high annual income group (86%), possessed small to medium land holdings (78.5%), medium level of farm mechanization (67%), and extension participation (61%). Furthermore, the data indicated that the majority of the respondents had medium level of information seeking behaviour (74%), economic motivation (75%), scientific orientation ((74%) and risk orientation (68%).The finding is in line with the findings of Jadav *et al*. (2018) [7] and Singh *et al*. (2021) [12].

Table 1: Distribution of the cotton growers according to their socio-economic &personal, communication and psychological characteristics (N = 200)

S. No.	Characteristic	Categories	F	%	Mean	SD
1	Age	Young (Up to 35 years)	84	42.00	40	11
		Middle (36 to 50 years)	87	43.50		
		Old (Above 50 years)	29	14.50		
2	Education	Low (Up to 1 Score)	37	18.50	2	1.02
		Medium (1.00 to 3 Score)	144	72.00		
		High (Above 3 Score)	19	09.50		
3	Caste	Scheduled Caste	16	08.00	2.94	0.97
		Scheduled Tribes	52	26.00		
		Other Backward Caste	60	30.00		
		General	72	36.00		
4	Family size	Small (<4 Members)	38	19.00	2.07	0.67
		Medium (5 to 8 Members)	111	55.50		
		Large (Above 8 Members)	51	25.50		
5	Family type	Nuclear	73	36.50	1.66	0.53
		Joint	127	63.50		
6	Annual Income	Low income (Up to Rs.1.50 Lakh)	27	13.50	2.23	0.67
		Medium income (Rs1.50 to 3.00 Lakh.)	101	50.50		
		High income (Above Rs.3.00 Lakh)	72	36.00		
7	Land holding	Marginal farmers (Up to 1ha.)	10	05.00	2.88	0.74
		Small farmers (1.01 to 2 ha.)	38	19.00		
		Medium farmers (2.01 to 4 ha.)	119	59.50		
		Large farmers (Above 4 ha.)	33	16.50		
8	Farm mechanization	Low (Up to 48 Score)	39	19.50	139.17	90.96
		Medium (49 to 230 Score)	134	67.00		
		High (Above 230 Score)	27	13.50		
9	Extension participation	Low (Up to 1 Score)	55	27.50	2.70	1.17
		Medium (2 to 4 Score)	123	61.50		
		High (Above 4 Score)	22	11.00		
10	Information seeking behaviour	Low (Up to 5 Score)	28	14.00	7.82	2.52
		Medium (6 to 10 Score)	148	74.00		
		High (Above 10 Score)	24	12.00		
11	Cosmopoliteness	Low (Up to 4 Score)	75	37.50	5.27	1.66
		Medium (5 to 7 Score)	104	52.00		
		High (Above 7 Score)	21	10.50		
12	Economic Motivation	Low (Up to 24 Score)	27	13.50	28.12	4.41
		Medium (25 to 33 Score)	151	75.50		
		High (Above 33 Score)	22	11.00		

13	Scientific Orientation	Low (Up to 20 Score)	24	12.00	24.67	4.37
		Medium (21 to 29 Score)	149	74.50		
		High (Above 29 Score)	27	13.50		
14	Risk Orientation	Low (Up to 18 Score)	28	14.00	22.83	4.46
		Medium (19 to 27 Score)	136	68.00		
		High (Above 27 Score)	36	18.00		

Knowledge level of the cotton growers about recommended cotton production technology: Knowledge level of the cotton growers regarding different practices of cotton cultivation is presented in (Table 2). The perusal of data clearly indicated that the majority of the cotton growers possessed complete and partial knowledge about recommended time of application of FYM (90%), suitable inter crop (96%), suitable soil type for cotton crop (97%), intercultural operation (88%), recommended time of sowing of cotton (98%), benefit of summer ploughing (96%), improved varieties (91%) and duration irrigation methods (76%) and spacing and method of sowing (75%). Whereas, about fifty per cent of them did not possessed knowledge about seed treatment, and use of bio-fertilizer, nearly 70 per cent did not possessed knowledge about suitable trap crop, flower drop and boll drop control. Nearly, three fourth of them did not possessed knowledge about recommended application weedicide and insect management. The data also indicated that huge majority of the respondents did not possessed any knowledge about pheromone trap and light trap (91%), recommended doses of fertilizer (79%) and disease management (78%). The feasible reason of poor knowledge may be lack of education, poor mass media exposure and information seeking behaviour of the cotton growers.The finding is in line with the findings of Bharamagoudar *et al*. (2013) [1] and Jadav *et al*. (2020) [6].

Table 2: Practice wise Knowledge level of the cotton growers about recommended cotton production technology
N = 200)

S. No.	Practices	Knowledge Level			Mean	Rank
		Complete Knowledge	Partial Knowledge	No Knowledge		
1	Suitable soil type for cotton crop	108 (54.00)	86 (43.00)	06 (3.00)	151	III
2	Benefit of summer ploughing	28 (14.00)	164 (82.00)	08 (4.00)	110	VI
3	Recommend dose of FYM	48 (24.00)	124 (62.00)	28 (14.00)	110	VI
4	Application time of FYM	154 (77.00)	26 (13.00)	20 (10.00)	167	I
5	Improved varieties and duration of cotton crop	30 (15.00)	152 (76.00)	18 (9.00)	106	VII
6	Time for sowing of cotton crop	76 (38.00)	122 (61.00)	02 (1.00)	137	V
7	Seed rate of cotton crop	28 (14.00)	102 (51.00)	70 (35.00)	79	X
8	Spacing & method of sowing	34 (17.00)	116 (58.00)	50 (25.00)	92	IX
9	Knowledge about bio-fertilizer	20 (10.00)	81 (40.50)	99 (49.50)	60.5	XIII
10	Knowledge about seed treatment	21 (10.50)	80 (40.00)	99 (49.50)	61	XI
11	Knowledge about suitable trap crop	22 (11.00)	36 (18.00)	142 (71.00)	40	XIII
12	Knowledge about suitable crops for intercropping	124 (62.00)	68 (34.00)	08 (4.00)	158	II
13	Knowledge about recommended doses of fertilizer	08 (4.00)	34 (17.00)	158 (79.00)	25	XVII
14	Knowledge about intercultural operations	90 (45.00)	98 (49.00)	12 (6.00)	139	IV
15	Knowledge about recommended weedicide	20 (10.00)	30 (15.00)	150 (75.00)	35	XIV
16	Knowledge about irrigation	54 (27.00)	97 (48.50)	49 (24.50)	102.5	VIII
17	Insect management	06 (3.00)	44 (22.00)	150 (75.00)	28	XVI
18	Disease management	12 (6.00)	32 (16.00)	156 (78.00)	28	XVI
19	Flower drops and boll drop control	08 (4.00)	48 (24.00)	144 (72.00)	32	XV
20	Pheromone trap and light trap	08(4.00)	10(5.00)	182(91.00)	13	XVIII

Figures in parenthesis indicate percentage

Overall knowledge level of cotton growers regarding cotton production practices: It can be inferred from the (Table 3) that, the majority of the cotton growers (67.00%) had a medium level of knowledge regarding recommended cotton production practices, followed by low (17.50%) and high (15.50%) level of knowledge regarding recommended cotton production practices respectively. Thus, it may be seen from the data that the majority of cotton growers had medium knowledge regarding recommended improved practices of cotton cultivation. The probable reason behind their knowledge level was the medium level economic motivation, extension participation, information seeking behaviour and annual income. The finding is in line with the findings of Bishnoi *et al*. (2016) [2] and Gohil *et al*. (2016) [4].

Table 3: Distribution of cotton growers according to their overall knowledge score on various cotton production practices

S. No.	Categories	Frequency	Percentage
1.	Low (Up to 29 Score)	35	17.50
2.	Medium (30 to 63 Score)	134	67.00
3.	High (Above 63 Score)	31	15.50
	Total	200	100.00

(Mean =45.72, S.D= 16.91)

Association between Socio economic personal, communication and psychological characteristics of cotton growers and their knowledge level: It is apparent from the (Table 4) that out of fourteen independent variables eight variables namely age, education, family size, type of family, farm mechanization, extension participation, economic motivation, and scientific orientation had significant association at 0.01 level of probability with knowledge level of the cotton growers, while, three variables namely land holding, information seeking behaviour and risk orientation had significant association at 0.5 level of probability with knowledge level of the cotton growers. Therefore the null hypotheses were rejected and original propositions that there would be association between age, education, family size, type of family, farm mechanization, extension participation, economic motivation, and scientific orientation land holding, information seeking behaviour and risk orientation of cotton growers and their level of knowledge was accepted. The remaining three variables viz; caste, annual income and cosmopoliteness had no significant association with knowledge level of the cotton growers. Hence, the null hypotheses were accepted and original propositions that there would be association between caste, annual income & cosmopoliteness of cotton growers and their knowledge level were rejected. The finding is in line with the findings of Bishnoi *et al*. (2016) [2] and Shahet *et al.* (2024).

Table 4: Association between Socio economic personal, communication and psychological characteristics of cotton growers and their knowledge level

S. No.	Independent variables	Chi square value (χ^2)
1.	Age	39.63**
2.	Education	63.22**
3.	Caste	7.30^{NS}
4.	Family size	22.55**
5.	Type of family	66.07**
6.	Annual income	8.64^{NS}
7.	Land holding	10.68*
8.	Farm mechanization	64.21**
9.	Extension participation	44.90**
10.	Information seeking behaviour	29.02*
11.	Cosmopoliteness	7.44^{NS}
12.	Economic Motivation	39.34**
13.	Scientific Orientation	68.07**
14.	Risk orientation	9.79*

*Significant at 0.05 level of probability
** Significant at 0.01 level of probability
NS = Non-Significant

Conclusion
The study revealed that huge majority of the respondents did not possessed any knowledge about pheromone trap and light trap, recommended doses of fertilizer and disease management. Furthermore the study indicated that the majority of cotton growers had medium level of knowledge regarding cotton production technology. Significant association was observed between knowledge level of cotton growers and their age, education, family size, family type, land holding, farm mechanization, extension participation, information seeking behaviour, economic motivation, scientific orientation and risk orientation. Hence, to improve the knowledge level of cotton growers, the various training programmes and method & result demonstrations should be organised on farmers' field and extension agencies may also be used information communication technologies for dissemination of cotton production technologies among cotton growers.

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