

FACTORS AFFECTING THE KNOWLEDGE AND ATTITUDE OF COTTON GROWERS TO ADOPT INTEGRATED PEST MANAGEMENT

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ABSTRACT

The study, conducted in Gujarat's Surendranagar district, examined constraints faced by cotton growers in adopting integrated pest management (IPM) and sought their suggestions. The research involved 120 respondents and used an ex-post facto research design. Findings revealed that 51.67 per cent of the farmers were in the middle age group, with 28.34 per cent having a middle school education. In terms of farm experience, 61.66 per cent had medium-level experience, and 45.83 per cent had received training. Additionally, 34.18 per cent had families of five to six members, and 46.66 per cent had an annual income ranging from Rs. 1,00,001 to Rs. 1,50,000. Landholding size was medium for 56.66 per cent of farmers, while 63.34 per cent had a medium level of social participation. Furthermore, 67.50 per cent had medium-level mass media exposure, and 45.00 per cent had medium-level scientific orientation. Risk orientation showed 62.50 per cent of farmers in the medium-risk group, and 54.84 per cent had a medium level of innovativeness. This study highlights the multifaceted factors influencing cotton growers' knowledge and attitude towards IPM. Education, farm experience, training, income, social participation, mass media exposure, scientific orientation, risk orientation, and innovativeness significantly contribute to the adoption of IPM strategies. The study identified non-availability of tricho-cards, Trichoderma, pheromone traps, and light traps in local markets as major constraints. Cotton growers suggested making these items available at the local market to facilitate their adoption of IPM.

Keywords: cotton, farmers, integrated pest management

INTRODUCTION

Cotton is a significant commercial fiber crop in India, and it holds a dominant position in the textile industry. It has a significant impact on the economy, politics, and social fabric of the world, and its importance is reflected in its moniker "white gold." Cotton cultivation provides livelihood support to farmers and those involved in various stages of production, including processing and textile manufacturing. Besides its value as a fiber, cotton has multiple uses, including producing edible oil from its seeds, cotton cake as cattle feed, and hull meal, particle board, and corrugated boxes. As one of the major kharif crops, cotton is grown extensively in India under both irrigated and rainfed conditions, fulfilling the essential clothing needs and contributing to food and housing requirements. Surendranagar district stands out as a remarkable cotton-growing district in the state, with farmers playing a pioneering role in cotton cultivation.

OBJECTIVES

- (1) To study the personal, socio-economical, communicational and psychological characteristics of cotton growers.
- (2) To study the knowledge and attitude of cotton growers towards Integrated Pest Management.
- (3) To identify the constraints perceived by cotton growers in adopting integrated pest management (IPM) and to seek their suggestions on overcoming these constraints.

METHODOLOGY

The present study was carried out in Surendranagar district of Gujarat State. Three talukas from Surendranagar district were selected for the study of the respondents. From each selected taluka 4 villages were selected randomly and from each selected village, 10 farmers were considered as respondents, thus total 120 farmers, who grow the cotton crop, were considered as respondents for the present study. An interview schedule based on objective of the study was

developed and respondent were personally interviewed for collection of information. The respondents were also given the opportunity to express their suggestions on how to eliminate the constraints encountered in adopting integrated pest management. Ex-post facto research design was used for the research study (Kerlinger, F. N., 1976). All the responses

were recorded and transferred to master excel sheet. The data were compiled, scored, tabulated and analyzed to give statistical treatment in such a way that they might give proper answers to the specific objectives of the study. Frequency, percentage and Karl Pearson's coefficient of correlation were used for interpreting the data.

RESULTS AND DISCUSSION

Profile of the farmers

Table 1: Distribution of cotton growers according to their personal, socio-economical, communicational and psychological characteristics (n = 120)

Sr. No.	Category	Frequency	Percentage
(I) Personal characteristics			
1	Age		
	Young age (Up to 35 years)	25	20.83
	Middle age (36 to 50 years)	62	51.67
	Old age (Above 50 years)	33	27.50
2	Education		
	College/post-graduation	18	15.00
	Higher school	28	23.33
	Middle school	34	28.34
	Primary school	22	18.33
	Functionally literate	15	12.50
3	Farm experience		
	Low farm experience (Up to 5 years)	15	12.50
	Medium farm experience (6 to 10 years)	74	61.66
4	Training received		
	No training	18	15.00
	One training	55	45.83
	Two training	37	30.83
	Three training	06	05.00
5	Size of family		
	1 to 2 members	03	02.50
	3 to 4 members	36	30.00
	5 to 6 members	41	34.18
	7 to 8 members	29	24.16
	Above 8 members	11	09.16
6	Annual income		
	Above ₹ 2,00,000	09.00	07.50
	₹ 1,50,001 to 2,00,000	24.00	20.00
	₹ 1,00,001 to 1,50,000	56.00	46.66
	₹ 50,001 to 1,00,000	24.00	20.00
Up to ₹ 50,000	07.00	05.84	
(II) Socio-economical characteristics			

Sr. No.	Category	Frequency	percentage
7	Landholding		
	Big (Above 10 ha)	08	06.66
	Medium (4.01 to 10 ha)	68	56.66
	Semi medium (2.01 to 4 ha)	14	11.66
	Small (1.01 to 2 ha)	23	19.16
	Marginal (0.01 to 1 ha)	07	05.86
8	Social participation		
	Low social participation (Below 1.36)	26	21.66
	Medium social participation (1.36 to 3.32)	76	63.34
	High social participation (Above 3.32)	18	15.00
(III) Communicational characteristic			
9	Mass media exposure		
	Low mass media exposure (Below 8.73)	12	10.00
	Medium mass media exposure (8.73 to 13.73)	81	67.50
	High mass media exposure (Above 13.73)	27	22.50
(IV) Psychological characteristics			
10	Scientific orientation		
	Very low (Up to 25.20 score)	03	02.50
	Low (25.21 to 36.40 score)	09	07.50
	Medium (36.41 to 47.60 score)	54	45.00
	High (47.61 to 58.80 score)	41	34.16
	Very high (Above 58.80 score)	13	10.84
11	Risk orientation		
	Low risk orientation (Below 10.81)	21	17.50
	Medium risk orientation (10.81 to 16.49)	75	62.50
	High risk orientation (Above 16.49)	24	20.00
12	Innovativeness		
	Low innovativeness (Below 2.28)	28	23.33
	Medium innovativeness (2.28 to 4.66)	67	54.84
	High innovativeness (Above 4.66)	25	20.83

The result demonstrated in Table 1 indicates revealed that 51.67 per cent of farmers belonged to middle age group, 28.34 per cent of farmers belonged to middle school level of education, 61.66 per cent of the farmers had medium farm experience and 45.83 per cent farmers had received one training, 34.18 per cent farmers had five to six members in family, 46.66 per cent farmers had Rs. 1,00,001

to Rs. 1,50,000 annual income, 56.66 per cent farmers had medium landholding, 63.34 per cent farmers had medium level of social participation, 67.50 per cent of the farmers had medium level of mass media exposure, 45.00 per cent of the farmers had medium scientific orientation, 62.50 per cent of farmers belonged to medium risk orientation group and 54.84 per cent farmers had medium level of innovativeness.

Knowledge of the cotton growers about integrated pest management

Table 2: Distribution of the cotton growers according to their knowledge about integrated pest management

(n=120)

Sr. No.	Category	Frequency	Per cent
1	Low level of knowledge (Below 50.77 score)	19	15.84
2	Medium level of knowledge (50.77 to 77.39 score)	89	74.16
3	High level of knowledge (Above 77.39 score)	12	10.00

The data presented in Table 2 indicates that 74.16 per cent of the cotton growers possess medium-level knowledge regarding Integrated Pest Management. 15.84 per cent of respondents were classified as having low knowledge and

10.00 per cent as having high knowledge. This outcome may be attributed to the fact that the respondents have a medium level of farming experience, social participation, and mass media exposure. These factors are likely to have contributed

to the cotton growers' acquisition of more knowledge on Integrated Pest Management. These results are consistent with those obtained by Dodiya *et al.* (2016).

Attitude of the farmers towards integrated pest management

Table 3: Distribution of the cotton growers according to their attitude towards integrated pest management

(n=120)

Sr. No.	Category	Frequency	Per cent
1	Less favourable (Below 12.20 score)	25	20.84
2	Favourable (12.20 to 22.60 score)	66	55.00
3	Most favourable (Above 22.60 score)	29	24.16

Table 4: Factors affecting knowledge and attitude of cotton growers to adopt integrated pest management

(n=120)

Sr. No.	Independent variables	Knowledge	Attitude
X ₁	Age	-0.0175 ^{NS}	-0.0051 ^{NS}
X ₂	Education	0.2705 ^{**}	0.1885 [*]
X ₃	Farm experience	0.1920 [*]	0.2249 [*]
X ₄	Training received	0.2193 [*]	0.1761 [*]
X ₅	Size of family	-0.0062 ^{NS}	-0.1256 ^{NS}
X ₆	Annual income	0.2780 ^{**}	0.1754 [*]
X ₇	Land holding	0.1563 ^{NS}	0.1042 ^{NS}
X ₈	Social participation	0.2136 [*]	0.1980 [*]
X ₉	Mass media exposure	0.2743 ^{**}	0.2852 ^{**}
X ₁₀	Scientific orientation	0.3556 ^{**}	0.5094 ^{**}
X ₁₁	Risk orientation	0.3601 ^{**}	0.2388 ^{**}
X ₁₂	Innovativeness	0.3723 ^{**}	0.2244 [*]

* = Significant at 0.05 level of probability

** = Significant at 0.01 level of probability

NS = Non-significant

The data presented in Table 2 reveals that 55.00 per cent of cotton growers had a favourable attitude towards Integrated Pest Management (IPM), while 24.16 per cent and 20.84 per cent had the most favourable and less favourable attitudes towards IPM, respectively. The results suggest that the majority of cotton growers held moderately favourable attitudes towards IPM. It is possible that the respondents' level of education, income, and experience in cotton cultivation (i.e., more than six years) contributed to their favourable attitudes towards IPM. This finding is consistent with the results of prior studies by Kadam (2016).

Based on the data provided in Table 4, it can be revealed that several factors, including education, farm experience, training received, annual income, social participation, mass media exposure, scientific orientation, risk orientation, and innovativeness, have exerted a positive and significant contribution to both the knowledge and attitude of cotton growers regarding Integrated Pest Management (IPM).

Table 5: Constraints perceived by cotton growers to adopt integrated pest management

(n=120)

Sr. No.	Constraints	No.	Per cent	Rank
1	Poor knowledge to judge Economic Threshold Level (ETL)	87	72.50	IV
2	Lack of knowledge about pests life cycle and their infestation	51	42.50	IX
3	Lack of technical advice on IPM	84	70.00	V
4	High cost and non-availability of skilled labour	79	65.83	VI
5	Inadequate demonstration on IPM	98	81.66	II
6	High cost of pesticide and fungicides	76	63.33	VII
7	Non-availability of tricho-cards, trichoderma, pheromone traps, light trap at local market	108	90.00	I
8	Lack of trainings on IPM	91	75.83	III
9	Lack of knowledge about proper dose of insecticide and pesticides	73	60.83	VIII
10	Lack of proper knowledge of IPM	45	37.50	X

The respondents were requested to express the constraints faced by them to adopt integrated pest management. The data presented in Table 5 revealed that among the different constraints faced by cotton growers to adopt integrated pest management non-availability of tricho-cards, trichoderma, pheromone traps, light trap at local

market perceived as the most severe constraint with (90.00 per cent) and Inadequate demonstration on IPM is second most constraint with (81.66 per cent) and third constraint is lack of trainings on IPM with 75.83 per cent. The constraint poor knowledge to judge Economic Threshold Level (ETL) with 72.50 per cent was given fourth rank followed by lack of

technical advice on IPM (70.00 per cent), high cost and non-availability of skilled labour (65.83 per cent), high cost of pesticide and fungicides (63.33 per cent), lack of knowledge about proper dose of insecticide and pesticides (60.83 per cent), lack of knowledge about pests life cycle and their infestation (42.50 per cent) and Lack of proper knowledge of IPM (37.50 per cent), respectively.

Table 6: Suggestions from cotton growers overcome the constraints to adopt integrated pest management

(n=120)

Sr. No.	Constraints	No.	Per cent	Rank
1	Trichoderma, tricho-cards, pheromone traps, light trap should be available at local market	103	85.83	I
2	More trainings on IPM technologies should be conducted	95	79.16	II
3	More demonstrations on IPM technologies should be conducted	91	75.83	III
4	Technical guidance should be provided	84	70.00	IV
5	Skilled labour should be available at lower cost	76	63.33	V
6	Pesticide and fungicides should be available at lower price	72	60.00	VI
7	Knowledge about proper dose of insecticide and pesticides should be provided	68	56.66	VII
8	Awareness of use of chemical pesticides in recommended quantity	63	52.50	VIII
9	More Effective insect-pest control measures should be developed	54	45.00	VIII
10	Proper knowledge of IPM in cotton should be provided	51	42.50	X

The data given in Table 6 clearly revealed that the major suggestions given by the cotton growers to overcome the constraints associated with adoption of Integrated Pest Management were: Trichoderma, tricho-cards, pheromone traps, light trap should be available at local market (85.83 per cent) followed by, more trainings on IPM technologies should be conducted (79.16 per cent), more demonstration on IPM technologies should be conducted (75.83 per cent), respectively. This finding was in concurrence with the findings of Shinde (2011) and Rajput (2016).

CONCLUSION

The study provides insights into the characteristics of cotton growers. They were predominantly in the middle to old age group with a middle to graduate level of education, medium to high farm experience, and had received one to two trainings. The average family size was 5 to 6 members, with an annual income ranging from 1,00,001 to 1,50,000. Landholding size varied from small to medium. Cotton growers had low to medium social participation but medium to high mass media exposure, indicating access to agricultural information. They also displayed medium to high levels of scientific orientation, risk orientation, and innovativeness, showing openness to new practices and evidence-based approaches. In terms of Integrated Pest Management (IPM), most growers had a medium level of knowledge, but 55.00 per cent showed a favorable attitude towards IPM. This positivity could be attributed to good education, income level, and over six years of cotton cultivation experience. Several factors, including education, farm experience, training,

income, social participation, mass media exposure, scientific orientation, risk orientation, and innovativeness, positively and significantly contribute to the knowledge and attitude of cotton growers towards Integrated Pest Management (IPM). The significant impact of various factors on the knowledge and attitude of cotton growers towards Integrated Pest Management (IPM). The findings reveal that factors such as education, farm experience, training received, annual income, social participation, mass media exposure, scientific orientation, risk orientation, and innovativeness all play crucial roles in shaping the cotton growers' understanding and perspective on IPM. The study identified key constraints to adopting IPM, including the unavailability of tricho-cards, trichoderma, pheromone traps, and light traps in local markets. Inadequate demonstrations and lack of IPM training were also significant constraints. Recommendations include making these resources available locally, conducting more IPM training programs, and increasing demonstrations of IPM practices.

IMPLICATION

This study offers valuable insights into the characteristics of farmers and factors affecting the knowledge and attitude to adopt IPM, which could serve as a guide for planners and extension agencies when developing and executing Integrated Pest Management programs in other regions. The findings could aid in identifying factors that could impact the effectiveness of such initiatives, thereby contributing to more targeted and efficient interventions. Ultimately, this could result in better outcomes for farmers

and other stakeholders in the agricultural value chain.

CONFLICT OF INTEREST

This is to declare that there is “No conflict of interest” among researcher.

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