Extent of Adoption of Recommended Practices of Cotton Cultivation by the Cotton Farmer

Shivpal Singh [a++*] and M. M. Patel [b#]

[a] *Department of Agricultural Extension, Mansarovar Global University, Billkisganj, Sehore, Madhya Pradesh, 466001, India.*
[b] *Department of Agricultural Extension, RVSKVV, Gwalior, Madhya Pradesh, 474002, India.*

Authors' contributions

This work was carried out in collaboration between both authors. Author SS performed the statistical analysis, collection of data, wrote the protocol and wrote the first draft of the manuscript. Author MMP designed the study. Both authors read and approved the final manuscript.

Article Information

Original Research Article

ABSTRACT

Aims: To know the adoption level of recommended cultivation practices of cotton crop.
Study Design: The research design used for this study was an Ex-post Facto.
Place and Duration of Study: The study was conducted in Khandwa district of Madhya Pradesh and duration 2020-2022.
Methodology: The study was conducted in Khandwa district of Madhya Pradesh a total of 200 farmers selected by following the proportionate random sampling technique. An interview schedule was prepared for collection data relating to the adoption of recommended practices by the respondents.

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[++] *Ph.D. Research Scholar;*
[#] *(Main Advisor) Rett. Professor;*
Corresponding author: E-mail: shivpal.jnkvv@gmail.com;

Results: The study, concludes that, with respect to the adoption, majority of the farmers (69.00%) had a medium level of adoption of recommended improved practices of cotton cultivation while, an equal number (15.50%) of the respondents had low and high level of adoption of the same practices. Among the socio-economic and personal, communication and psychological characteristics of the respondents, age, education, family size, family type, land holding, annual income, farm mechanization, extension participation, information seeking behaviour, cosmopoliteness, economic motivation, scientific orientation and risk orientation indicated significant association with the extent of adoption of the recommended practices of cotton.
Conclusion: The study concluded that majority of the cotton growers were low adopted recommended cotton practices.

1. INTRODUCTION

Cotton (*Gossypium spp.*) is one of India's most significant cash crops and sources of fibre, and it is vital to the nation's industrial and agricultural economics [1]. The total area planted with cotton in the world in 2020–2021 was 31.66 million hectares, and the crop produced 113.11 million bales, or 778 kg/hectare, on that area. In terms of both total area and production, India has overtaken other countries to become the world's top cotton producer. India ranked first among the top exporters of cotton in the world. India occupied with 5.5 million bales, Canada ranks third after the United States (16.25 million bales) and Brazil (10.70 million bales) (USDA, 2020-21). 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 (2020-21) [2]. The productivity of cotton started to decline in the year 2017-18 and continues to decline and is prone to disease and pest infestation. This marks the essentiality of modern agricultural technologies to improve yields and increase climate as well as disease resistance [3]. The Present study aims to determine the adoption of improved cotton producing technologies among the cotton growers and also find association between selected socio-economic & personal, communication and psychological characteristics of cotton growers and their adoption of improved cotton production technology.

2. MATERIALS AND METHODOLOGY

The research study was conducted during 2020-2022 in Pandhana and Khandwa block of Khandwa district in 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 as the researcher does not have any control over independent variables; their appearance has already occurred or they are inherent and cannot be manipulated. Thus, inferences about relations among variables were made without direct intervention from concomitant variation of independent and dependent variables [4]. Khandwa district comprises of 7 blocks namely Khandwa, Punasa, Pandhana, Harsud, Chhaigaon, Baldi and Khalwa. Out of these two blocks namely; Pandhana and Khandwa blocks were purposively selected, because of the highest area under cotton crop. The Pandhana block comprises of 124 villages and Khandwa block comprises 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 all selected villages by using proportionate random sampling method to make the total sample size for the present study. An interview schedule was prepared to collect data relating to adopting scientific cotton production technology.

The adoption level of cotton growers with respect to improved cultivation practices of cotton was studied by computing adoption score [5]. Concerning adoption, the responses were rated on three-point continuum namely complete adoption, partial adoption and no adoption. A numerical score of 2 was assigned for complete adoption, a score 1 was assigned for partial adoption and a zero was assigned for no adoption. The score of all identified practices was then summed up. This sum total indicates the adoption score of that particular individual respondent. The raw score then was converted into adoption index (Sarker 2016) as mentioned below.

Adoption Index = Total adoption score obtained/ Maximum obtainable adoption score x 100

On the basis of adoption index, the respondents were categorized in to low, medium and high groups based on mean ± Standard Deviation.

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

3. RESULTS AND DISCUSSION

3.1 Adoption Level of the Cotton Growers about Recommended Cotton Production Technology

Adoption level of the cotton growers regarding different practices of cotton cultivation is presented in Table 1. The perusal of data clearly indicated that the majority of the cotton growers had adopted recommended land preparation practice (Complete 24.50% and Partially 67.00%), method of sowing (Complete 28.50% and Partially 45.50%), recommended dose of fertilizer (Complete 18.00% and Partially 58.50%), application of FYM/compost (Complete 23.00% and Partially 42.50%), use of improved varieties of cotton (Complete 19.00% and Partially 44.50%), insect management and seed treatment (Complete 20.00 and Partially 40.50%), whereas, nearly more than half of the respondents were fully or partially adopted recommended seed rate (Complete 17.00% and Partially 26.50%), intercropping (Complete 23.50% and Partially 32.00%) and time of irrigation (Complete 19.00% and Partially 29.50%). Furthermore, the data indicated that recommended practices like striking trap (74.50%), topping operation (62.50%), intercultural operations (61.50%), and disease management (54.50%) were not adopted by majority of the respondents. The findings are in line with the findings of Jat et al. [6] and Bondarwad et al. [7].

3.2 Overall Adoption Level of the Cotton Growers

It is evident from the data reported in Table 2 that, nearly two third of the respondents (69.00%) had a medium level of adoption of recommended improved practices of cotton cultivation while, an equal percentage (15.50%) of the respondents had low and high level of adoption of recommended cotton cultivation practices. Thus, it may be inferred from the data that the majority of cotton growers had medium level of adoption regarding recommended improved practices of cotton cultivation. The probable reason might be that the majority of the respondents had medium level of knowledge that motivated them to adopt the technologies fully or partially. Besides medium risk orientation, scientific orientation, extension participation and information seeking behaviour of the respondent also influenced adoption of the latest recommended technologies to some extent. The findings are in line with the findings of Rajput and Chinchmalatpure [8], Kumar et al. [9] and Mahendrakar et al. [10].

3.3 Association between Socio-economic Personal, Communication and Psychological Characteristics of Cotton Growers and Their Adoption Level

It is apparent from the Table 3 that out of fourteen independent variables seven variables namely age, education, farm mechanization, economic motivation, family size, scientific orientation and risk orientation had shown significant association at 0.01 level of probability while other six variables namely type of family, annual income, land holding, extension participation cosmopoliteness and information seeking behaviour had significant association at 0.05 level of probability with the dependent variable adoption level of the cotton growers.

Therefore, the null hypotheses were rejected and original propositions that there would be association between age, education, farm mechanization, economic motivation, scientific orientation, risk orientation, family size, type of family, annual income, land holding, extension participation, information seeking behaviour and cosmopoliteness of cotton growers and their adoption level were accepted. The findings are in line with the findings of Singh et al. [11], and Bishnoi et al. [12].

The remaining one variable viz; caste, had no significant association with adoption level of the cotton growers. Hence, the null hypothesis was accepted and original proposition that there would be association between caste, of cotton growers and their adoption level was rejected. The findings are in line with the findings of Verma et al. [13].

Table 1. Practice wise adoption level of the cotton growers about recommended cotton production technology (n = 200)

S. No.	Practices	Adoption level				
		Complete adoption	Partial adoption	No adoption	Mean	Rank
1	Preparation of land	49 (24.50)	134 (67.00)	17 (8.50)	116	I
2	Use of improved varieties of cotton	38 (19.00)	89 (44.50)	73 (36.50)	82.50	V
3	Method of sowing	57 (28.50)	91 (45.50)	52 (26.00)	102.50	II
4	Seed rate	34 (17.00)	53 (26.50)	113 (56.50)	60.50	XI
5	Seed treatment	28 (14.00)	93 (46.50)	79 (39.50)	74.50	VIII
6	Application of FYM/compost	46 (23.00)	85 (42.50)	69 (34.50)	88.50	IV
7	Time of Irrigation	38 (19.00)	59 (29.50)	103 (51.50)	67.50	X
8	Recommended dose of fertilizer	36 (18.00)	117 (58.50)	47 (23.50)	94.50	III
9	Application of weedicide	42 (21.00)	59 (29.50)	89 (49.50)	71.50	IX
10	Intercultural operations	33 (16.50)	44 (22.00)	123 (61.50)	55.00	XIII
11	Insect management	40 (20.00)	81 (40.50)	79 (39.50)	80.50	VI
12	Disease management	22 (11.00)	69 (34.50)	109 (54.50)	56.50	XII
13	Intercropping	47 (23.50)	64 (32.00)	89 (44.50)	79.00	VII
14	Topping operation	24 (12.00)	51 (25.50)	125 (62.50)	49.50	XIV
15	Striking trap	24 (12.00)	27 (13.50)	149 (74.50)	37.50	XV

Figures in parenthesis indicate percentage

Table 2. Distribution of cotton growers according to their adoption level

S. No.	Categories	Frequency	Percentage
1.	Low (Up to 39 Score)	31	15.50
2.	Medium (40 to 64 Score)	138	69.00
3.	High (Above 64 Score)	31	15.50
Total		200	100.00

(Mean = 51.31, S.D=12.20)

Table 3. Association between socio-economic personal, communication and psychological characteristics of cotton growers and their adoption level

S. No.	Independent variables	Chi square value (χ^2)
1.	Age	35.44**
2.	Education	64.29**
3.	Caste	7.33[ns]
4.	Family size	13.79**
5.	Type of family	6.99*
6.	Annual income	19.76*
7.	Land holding	24.61*
8.	Farm mechanization	40.98**
9.	Extension participation	10.19*
10.	Information seekingbehaviour	10.97*
11.	Cosmopoliteness	17.13*
12.	Economic Motivation	44.39**
13.	Scientific Orientation	67.65**
14.	Risk orientation	39.93**

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

4. CONCLUSION

The study concluded that majority of the cotton growers had adopted recommended practices of land preparation, sowing, fertilizer dose, FYM/compost application, use of improved varieties and insect management. A few adopted recommended seed treatment, weedicide application, timely irrigation, seed rate, disease management, intercultural operations, topping operation, striking trap and use of light trap [14]. The study also indicated that the majority of cotton growers had medium level of adoption of the concerned practices. The study also concluded that adoption level of cotton growers was significantly associated with their age, education, farm mechanization, economic motivation, scientific orientation risk orientation, family size, family type, annual income, land holding, extension participation, cosmopoliteness and information seeking behaviour. Hence, to increase the adoption level of cotton growers, various training programmes including method and result demonstrations should be organised on farmers' fields. Extension agencies may also use information communication technologies for motivation of cotton growers towards cotton production technologies and required inputs should make available in time.

CONSENT

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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