

International Journal of Agriculture Extension and Social Development

Volume 9; Issue 9; September 2026; Page No. 48-51

Received: 26-06-2026
Accepted: 30-07-2026

Indexed Journal
Peer Reviewed Journal

Correlates of Adoption of Recommended Plant Protection Measures among Cotton Growers in Akola District, Maharashtra

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DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i9a.4169>

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Abstract

The present study was conducted in Akola district of Maharashtra. An exploratory research design was followed, with 150 cotton growers selected from Telhara and Balapur tehsils. Primary data were collected through personal interviews using a pre-tested structured interview schedule and analysed using frequency, percentage, mean and coefficient of correlation. The findings revealed that most respondents were middle-aged (49.33%), had higher secondary education (32.00%), possessed 16-30 years of cotton cultivation experience (49.33%) and had small landholdings (33.33%). About 40.00 per cent cultivated cotton on 1.01-2.00 ha, while 60.67 per cent had annual income up to Rs.2,82,000 and 51.33 per cent earned up to Rs.1,58,000 from cotton cultivation. Credit was available to 79.33 per cent of respondents, while 52.67 per cent had a medium level of source of information. Training exposure was limited, with 96.67 per cent reporting no training, and 62.67 per cent experienced labour unavailability. Further, 58.67 per cent had medium spraying frequency, 51.33 per cent had a moderately favourable attitude and 68.00 per cent possessed medium knowledge of plant protection. Correlation analysis revealed that age had a significant negative relationship with adoption, while education, land holding, annual income, income from cotton cultivation, attitude and knowledge showed positive and highly significant relationships. Area under cotton cultivation, access to credit, source of information and training received showed positive and significant relationships, whereas experience, labour availability and number of sprayings were non-significant.

Keywords: Cotton growers, profile, adoption, plant protection measures, correlation, knowledge

1. Introduction

Cotton is one of the major commercial crops of India and holds considerable importance in the agricultural economy of Maharashtra, particularly in the Vidarbha region, where it serves as an important source of livelihood for farming households. In 2024, India ranked as the world's second-largest cotton producer, with cotton cultivated on 11.45 million hectares and production of 15.00 million MT ^[7]. During 2024-25, cotton was cultivated on 3.96 million hectares in Maharashtra, producing 1.71 million MT with an average productivity of 432.42 kg ha⁻¹ ^[4]. In Vidarbha, cotton occupied about 1.70 million hectares, with a production of 672,790 tonnes and an average productivity of 396.00 kg ha⁻¹. Akola district is one of the important cotton-growing districts of the region and contributes substantially to cotton cultivation in Vidarbha. Despite its economic importance, cotton cultivation is

exposed to several production constraints, particularly insect pests and diseases, which can adversely affect crop growth, yield and farm returns. Effective management of these problems requires appropriate and timely plant protection measures, including correct identification of pests and diseases, knowledge of their symptoms and use of suitable control practices. The effective use of such measures depends not only on the availability of plant protection inputs but also on the characteristics and circumstances of the farmers, such as their socio-economic status, access to agricultural information, exposure to training, labour availability, attitude and technical knowledge. In this context, understanding the profile of cotton growers becomes important for gaining insight into the socio-economic and behavioural conditions associated with plant protection practices. Therefore, the present study was undertaken to examine selected characteristics of cotton growers in Akola district of

Maharashtra with respect to plant protection practices.

The present study was framed with objective

1. To study the profile of cotton growers
2. To study the relationship between the selected characteristics of cotton growers and their adoption of recommended plant protection measures

2. Methodology

The present investigation was conducted in Akola district of Maharashtra using an exploratory research design. Telhara and Balapur tehsils were purposively selected on the basis of highest and lowest cotton productivity, respectively. Five villages from each selected tehsil were selected randomly. From each selected village, 15 cotton growers were selected randomly, resulting in a total sample of 150 respondents. Primary data were collected through personal interviews with the help of a pre-tested structured interview schedule. The collected data were subsequently tabulated and analysed using suitable statistical tools such as frequency, percentage, mean and coefficient of correlation to interpret the findings of the study.

3. Results and Discussion

3.1 Profile of cotton growers

The findings indicated in table 1 shows that 49.33 per cent of the respondents belonged to the middle-age group ^[1, 2, 11, 16], while 32.00 per cent had completed higher secondary education ^[2, 11, 16]. Nearly half (49.33%) possessed 16-30 years of experience in cotton cultivation ^[2]. The largest proportion (33.33%) belonged to the small landholding category ^[1, 11], while 40.00 per cent cultivated cotton on 1.01-2.00 ha ^[6]. About three-fifths (60.67%) had annual income up to Rs.2,82,000 and slightly more than half (51.33%) earned up to Rs.1,58,000 from cotton cultivation ^[5]. Credit was available to 79.33 per cent of respondents ^[12, 15]. More than half (52.67%) had a medium level of source of information ^[2, 8]. Training related to cotton cultivation and plant protection was not received by 96.67 per cent of respondents ^[13], while labour was unavailable to 62.67 per cent ^[10, 12]. More than half (58.67%) belonged to the medium category of number of sprayings ^[3]. A moderately favourable attitude towards plant protection was observed among 51.33 per cent of respondents ^[9], while 68.00 per cent possessed medium knowledge ^[14]. Overall, the findings indicate that the respondents were predominantly middle-aged, moderately educated and experienced, with small landholdings, medium access to information, limited training exposure, moderately favourable attitudes and medium knowledge regarding plant protection.

Table 1: Distribution of respondents according to their selected characteristics

Sr. No.	Profile of cotton growers	Respondent (n=150)	
		Frequency	Percentage
1	Age		
	Young age (upto 35 years)	30	20.00
	Middle age (36 to 50 years)	74	49.33
	Old age (Above 50)	46	30.67
2	Education		
	Illiterate	00	00.00
	Primary School	17	11.33
	Middle School	13	08.67
	Secondary School	33	22.00
	Higher Secondary School	48	32.00
	Graduation	39	26.00
3	Experience in cotton cultivation		
	Up to 15 years	36	24.00
	16 to 30 years	74	49.33
	Above 30 years	40	26.67
4	Land holding (ha)		
	Marginal (Upto 1.00 ha)	22	14.67
	Small (1.01 to 2.00 ha)	50	33.33
	Semi-Medium (2.01 to 4.00 ha)	39	26.00
	Medium (4.01 to 10.00 ha)	34	22.67
	Large (more than 10.00 ha)	05	03.33
5	Area under cotton cultivation (ha)		
	Marginal (Upto 1.00 ha)	38	25.33
	Small (1.01 to 2.00 ha)	60	40.00
	Semi-Medium (2.01 to 4.00 ha)	41	27.33
	Medium (4.01 to 10.00 ha)	10	06.67
	Large (more than 10.00 ha)	01	00.67
6	Annual income (Rs.)		
	Upto Rs. 282000	91	60.67
	Rs. 282001 to Rs. 564000	32	21.33
	Above Rs. 564000	27	18.00
7	Income from cotton cultivation (Rs.)		
	Upto Rs.158000	77	51.33
	Rs. 158001 to Rs. 316000	44	29.33
	Above Rs. 316000	29	19.33

8	Access to credit		
	Credit availability	119	79.33
	Non availability	31	20.67
9	Source of information		
	Low	56	37.33
	Medium	79	52.67
	High	15	10.00
10	Training received		
	Not received	145	96.67
	Received	05	03.33
11	Labour availability		
	Available	56	37.33
	Unavailable	94	62.67
12	No. of spraying		
	Low (Upto 3)	26	17.33
	Medium (4 to 5)	88	58.67
	High (above 5)	36	24.00
13	Attitude		
	Unfavourable (Up to 33.33)	10	06.67
	Moderately favourable (33.34 to 66.66)	77	51.33
	Highly favourable (Above 66.66)	63	42.00
14	Knowledge		
	Low (Up to 33.33)	10	06.67
	Medium (33.34 to 66.66)	102	68.00
	High (Above 66.66)	38	25.33

3.2 The relationship between the selected characteristics of cotton growers with their adoption of recommended plant protection measures

The findings presented in Table 2 revealed that age showed a negative and significant correlation with adoption at the 0.01 level of probability. Education, land holding, annual income, income from cotton cultivation, attitude towards plant protection and knowledge of plant protection showed a positive and highly significant correlation with adoption.

Area under cotton cultivation, access to credit, source of information and training received showed a positive and significant correlation with adoption at the 0.05 level of probability.

Experience in cotton cultivation, labour availability and number of sprayings showed a non-significant relationship with adoption, indicating that these characteristics were not

significantly associated with the adoption of recommended plant protection measures among cotton growers.

Overall, the findings indicated that knowledge, attitude and socio-economic characteristics of cotton growers played an important role in adoption of recommended plant protection measures. Knowledge of plant protection recorded the highest positive correlation with adoption ($r = 0.7556$). Since several variables showed significant correlation with adoption, extension efforts need to be specifically focused on strengthening these areas. Intensifying training programmes, improving access to credit, enhancing information dissemination and building positive attitude and knowledge among cotton growers through targeted extension activities would help in further improving the adoption of recommended plant protection measures.

Table 2: Coefficient of Correlation of selected characteristics of cotton growers with their adoption of recommended plant protection measures

Sr. No.	Variables	'r values'
1	Age	-0.2716**
2	Education	0.2335**
3	Experience in Cotton cultivation	0.0128 ^{NS}
4	Land holding	0.3566**
5	Area under cotton cultivation	0.2105*
6	Annual Income	0.3531**
7	Income from cotton cultivation	0.2623**
8	Access to credit	0.1677*
9	Source- of Information	0.1590*
10	Training Received	0.1649*
11	Labour Availability	0.0363 ^{NS}
12	Number of Sprayings	0.1527 ^{NS}
13	Attitude towards plant protection	0.4156**
14	Knowledge of plant protection	0.7556**

**: Significance at 0.01 level of probability

*: Significance at 0.05 level of probability

NS: Non-significant

4. Conclusion

The study revealed that majority of the cotton growers in Akola district were middle-aged, moderately educated, with small landholdings and medium level of income, information access and knowledge of plant protection. Training exposure was extremely limited, and labour unavailability was a major constraint faced by most respondents.

Correlation analysis showed that age was negatively and significantly related to adoption, while education, land holding, annual income, income from cotton cultivation, attitude and knowledge of plant protection showed a positive and highly significant relationship with adoption. Area under cotton cultivation, access to credit, source of information and training received were positively and significantly related to adoption, whereas experience, labour availability and number of sprayings showed no significant association.

These findings indicate that knowledge, attitude and key socio-economic characteristics play a decisive role in adoption of recommended plant protection measures. Since these variables were significantly correlated with adoption, extension efforts need to be specifically focused on strengthening these areas. Intensifying training programmes, improving access to credit, enhancing information dissemination and building positive attitude and knowledge among cotton growers through targeted extension activities would help further improve adoption of recommended plant protection measures in the study area.

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