

Research Article

# Analysis of farmers knowledge and adoption of improved cotton cultivation practices

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**SUMMARY :** The present study was conducted in Raichur, Lingasugur and Manvi taluks of Raichur district during 2012-13 with 120 respondents. Ex post facto research was employed in the study. The data were collected using structured and pre tested interview schedule. The results of the study indicated that, majority of the respondents possessed full knowledge with respect to practices like recommended variety, spacing, seed rate, hand weeding and intercultivation, management of thrips and time of harvesting. Majority of them fully adopted the practices like recommended variety, time of harvesting and chemical fertilizers. Majority of the respondents were having full knowledge regarding simple practices and have adopted the same. Some of the practices like seed rate, spacing, chemical fertilizers application, hand weeding and intercultivation and management of pests and diseases were also partially adopted by majority of the respondents.

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## **BACKGROUND AND OBJECTIVES**

Cotton (*Gossypium hirsutum* L.) is one of the most important fibre and commercial crop playing an important role in India's as well as world's economic, political and social affairs. It provides direct and indirect employment to many farm households, ginners and raw materials for textile industries. Maharashtra occupies the first place with respect to area (4.13 million hectares), Gujarat stands first in production (12 million bales) and in productivity Haryana stands first (703 kg/hectare). Important states growing cotton are Maharashtra, Gujarat, Andhra Pradesh, Haryana, Punjab, Madhya Pradesh, Rajasthan and Karnataka (Anonymous, 2012). Karnataka contributes 5.13 per cent of the total area and 4.21 per cent of the total production of cotton in the country. Most of the production comes from the north Karnataka plateau including the districts of Raichur, Dharwad, Bellary, Gulbarga, Belgaum, Hassan. Bijapur, Mysore, Shimoga, Chitradurga

and Chikmagalur.

Raichur, Lingasugur and Manvi taluks occupies first three places with respect to area under cotton. The production and productivity is low in Karnataka compared to other states and average productivity of the country. The major hindrance to achieve higher production and productivity is poor knowledge level of the recommended cotton cultivation practices as well as its non-adoption by the cotton growing farmers. With this background the present study was conducted in Raichur district of Karnataka to assess the knowledge and adoption level of improved cotton cultivation practices by the farmers.

## **RESOURCES AND METHODS**

The research study was conducted in Raichur district which was purposively selected during 2012-13. Three taluks namely Raichur, Lingasugur and Manvi were selected purposively

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with the criteria of highest area under cotton cultivation in the district. Further, two villages were identified from each taluk based on highest area under cotton cultivation and from each village twenty respondents were selected randomly. Thus the total sample constituted 120 respondents. Ex post facto research design was employed in the study. The data were collected from the respondents using structured and pre tested interview schedule personally. The collected data were tabulated and analyzed using appropriate statistical tools.

## OBSERVATIONS AND ANALYSIS

The results of the present study as well as relevant discussions have been presented under following sub heads:

### Component wise knowledge of improved cotton cultivation practices by the respondents:

#### Seeds and sowing:

It is clear from the Table 1 that, sixty per cent of the respondents had full knowledge regarding recommended

**Table 1: Component wise knowledge level of respondents about cotton cultivation**

Sr. No.	Particulars	Full knowledge		Partial knowledge		No knowledge	
		F	%	F	%	F	%
1.	<b>Seeds and sowing</b>						
	Recommended variety	72	60	41	34.17	7	5.83
	Seed rate	63	52.5	48	40	9	7.5
	Seed treatment	44	36.67	29	24.17	47	39.17
	Spacing	88	73.33	16	13.33	16	13.33
2.	<b>Manures and fertilizers</b>						
	Organic manure / FYM	48	40	69	57.5	3	2.5
	Chemical fertilizers	52	43.33	60	50	8	6.67
3.	<b>Weed management</b>						
	Hand weeding and intercultivation	100	83.33	18	15	2	1.67
	Chemical weed management	35	29.17	43	35.83	42	35
4.	<b>Irrigation management</b>						
	Furrow method	68	56.67	46	38.33	6	5.00
	Method of irrigation						
	Flooding	120	100	0	0.00	0	0.00
	Interval						
5.	<b>Pest management</b>						
	Boll worm	49	40.83	69	57.5	2	1.67
	Stem borer	14	11.67	48	40	58	48.33
	Thrips	62	51.67	54	49.17	4	3.33
6.	<b>Disease management</b>						
	Damping off	8	6.67	39	32.5	73	60.83
	Powdery mildew	5	4.17	62	51.67	53	44.17
	Brown Leaf spot	14	11.67	71	59.17	35	29.17
	Reddanning in cotton	12	10.00	34	28.33	74	61.67
7.	<b>Harvesting</b>						
	Time of harvesting	100	83.33	20	16.67	0	0
8.	<b>Marketing</b>						
	Grading	18	15.00	61	50.83	41	34.17
	Co-operative societies	74	61.67	37	30.83	9	7.50
	Marketing method						
	Closed tender	82	68.33	34	28.33	4	3.33
	Open tender	14	11.67	28	23.33	78	65.00

variety. Remaining 34.17 and 5.83 per cent of them had partial knowledge and no knowledge, respectively. More than half (52.50 %) of the respondents had full knowledge regarding recommended seed rate. Forty and 7.5 per cent of them had partial knowledge and no knowledge, respectively. It might be due to better contact of the respondent farmers with the university scientists, input supply agencies and others. Similar results were reported by Yadav *et al.* (2012).

With respect to seed treatment, 39.17 per cent of them had no knowledge, followed by full knowledge (36.67 %) and partial knowledge (24.17 %). With regard to spacing, majority (73.33 %) of the respondents had full knowledge, followed by equal (13.33 %) of them in partial knowledge and no knowledge. Similar results were reported by Yadav *et al.* (2012) and Adeniji *et al.* (2007).

#### *Manures and fertilizers:*

With respect to organic manures, more than half (57.50 %) of the respondents belonged to partial knowledge category followed by full knowledge (40.00 %) and no knowledge (2.50 %) categories. Half of the respondents belonged to partial knowledge category with respect to chemical fertilizers. More than forty (43.33 %) per cent of them were in full knowledge category followed by no knowledge (6.67 %) category. This might be due to higher farming experience, extension contact and mass media participation.

#### *Weed management:*

Majority (83.33 %) of the respondents were having full knowledge regarding manual weeding and intercultivation. Only meagre per cent of them in partial knowledge and no knowledge categories. This might be due to better understanding and awareness of the farmers about manual weeding and intercultivation coupled with the fact that it is a simple practice. Nearly 35 per cent of the respondents were having partial knowledge and no knowledge with regard to chemical weed management in cotton. It might be attributed to the complex nature of the practice coupled with costly chemicals. Results are in line with the results obtained by Adeniji *et al.* (2007).

#### *Irrigation management:*

With respect to method of irrigation, more than half (56.67 %) of the respondents were having full knowledge regarding furrow method of irrigation followed by partial knowledge (38.33 %). Cent per cent of the cotton growers had full knowledge regarding flooding method of irrigation. This might be due to the fact that flooding method of irrigation is the age old practice followed by the farmers for irrigating the field irrespective of any crop.

#### *Pest management:*

More than half (57.50 %) of the respondents were

having partial knowledge with respect to management of bollworm in cotton followed by full knowledge (40.83 %). About half (48.33 %) of them were not having any knowledge with respect to management of stem borer. Slightly more than half (51.67 %) of them were having full knowledge with regard to management of thrips. This might be due to better contact of the respondents with the university scientists, input supply agencies and also other extension organizations.

#### *Disease management:*

Majority (60.83 %) of the respondents were not having any knowledge with respect to management of damping off. Slightly more than half (51.67 %) of the respondents were having partial knowledge with regard to management of powdery mildew. About sixty per cent (59.17 %) of respondents were having partial knowledge regarding brown leaf spot management and 61.67 per cent of them were having no knowledge regarding management of reddening in cotton. Majority of the cotton growers had no or partial knowledge with respect to plant protection measures. The complexity in understanding the various pests and diseases and their unique symptoms might have influenced the above results. In addition to this, medium extension contact, low formal education background, lesser grasping and remembrance of occurrence and spread of various pests and diseases. The results are in conformity with the results obtained by Sharma *et al.* (2010).

#### *Harvesting:*

Majority (83.33 %) of the respondents belonged to full knowledge category with respect to time of harvesting in cotton followed by partial knowledge (16.67 %). This might be due to specificity of harvesting indicators in cotton.

#### *Marketing:*

Slightly half of the respondents were having partial knowledge with respect to grading in cotton followed by no knowledge (34.17 %). With regard to method of marketing, majority of them were having full knowledge regarding closed tender (68.33 %) and co-operative societies (61.67 %). Majority (65.00 %) of the respondents were having no knowledge regarding open tender method of marketing.

### **Component wise adoption of improved cotton cultivation practices by the respondents:**

#### *Seeds and sowing:*

It is clear from the Table 2 that, about forty five per cent (45.83 %) of the respondents fully adopted the recommended variety. The per cent of respondents adopting the practice partially was found to be 29.17 per cent and 25 per cent of them had not adopted the practice. It might be due to exposure of the farmers to extension activities and

contact with university scientists and input supply agencies. About sixty per cent (58.33 %) of the respondents partially adopted the recommended seed rate. Remaining 25 and 16.67 per cent of them fully adopted and not adopted the practice, respectively. With regard to seed treatment, about sixty per cent (58.33 %) of the respondents not adopted the practice. Remaining per cent of them belonged to partial (33.33 %) and full adopters (8.33 %) categories. It might be due to lack of awareness towards importance and benefits of the seed treatment. Similar results were reported by Adeniji *et al.* (2007).

Majority (62.50 %) of the respondents partially adopted the recommended spacing followed by full adoption (20.83 %) and non-adoption (16.67 %). This might be due to the fact that farmers have their own way of deciding the spacing

and accordingly follow their own spacing.

#### *Manures and fertilizers:*

With regard to organic manure, half of the respondents partially adopted the application of organic manure followed by full adoption (29.17 %) and non-adoption (20.83 %). This might be due to non-availability of required quantity and high cost of organic manure in the villages and lack of knowledge regarding importance of organic manure coupled with work culture among farmers who are growing more commercial crops and also gradual decrease in livestock population in the rural areas. Majority (58.33 %) of the respondents partially adopted the application of recommended chemical fertilizers followed by full adoption (41.67 %). The

**Table 2: Practice wise adoption of cotton cultivation practices by the respondents**

Sr. No.	Particulars	Full adoption		Partial adoption		Non adoption		
		Freq	Per	Freq	Per	Freq	Per	
1.	<b>Seeds and sowing</b>							
	Recommended variety	55	45.83	35	29.17	30	25.00	
	Seed rate	30	25.00	70	58.33	20	16.67	
	Seed treatment	10	8.33	40	33.33	70	58.33	
	Spacing	25	20.83	75	62.50	20	16.67	
2.	<b>Manures and fertilizers</b>							
	Organic manure / FYM	35	29.17	60	50.00	25	20.83	
	Chemical fertilizers	50	41.67	70	58.33	0	0	
3.	<b>Weed management</b>							
	Hand weeding and intercultivation	35	29.17	80	66.66	5	4.16	
	Chemical weed management	30	25	40	33.33	50	41.67	
4.	<b>Irrigation management</b>							
	Method of irrigation	Furrow method	115	95.83	0	0	15	12.50
		Flooding	15	12.50	0	0	115	95.83
	Interval	20	16.67	24	20	76	63.33	
5.	<b>Pest management</b>							
	Boll worm	45	37.50	75	62.5	0	0	
	Stem borer	10	8.33	55	45.83	55	45.83	
	Thrips	0	0	75	62.50	45	37.50	
6.	<b>Disease management</b>							
	Damping off	5	4.17	55	45.83	60	50.00	
	Powdery mildew	0	0	50	41.67	70	58.33	
	Brown Leaf spot	0	0	60	50.00	60	50.00	
7.	<b>Harvesting</b>							
	Time of harvesting	95	79.17	25	20.83	0	0	
8.	<b>Marketing</b>							
	Grading							
	Marketing method	Co-operative societies	72	60.00	27	22.5	21	17.50
		Closed tender	95	79.17	21	17.5	4	3.33
		Open tender	5	4.17	0	0	115	95.83

application of fertilizers depends on the availability and purchasing capacity of the farmers and also high cost of fertilizers.

#### *Weed management:*

Hand weeding and inter cultivation was partially adopted by majority (66.66 %) of the cotton growers followed by full adoption (29.17 %) and no adoption (4.16 %). Around forty per cent of them not adopted the chemical weed management and 33.33 per cent of them partially adopted the practice and remaining per cent (25.00 %) of them fully adopted the practice. This could be due to complex nature of the herbicide technology and also less exposure of the farmers to the extension activities relating to herbicide technology. Results are in line with the results obtained by Adeniji *et al.* (2007).

#### *Irrigation management:*

With regard to irrigation management, as high as 95.83 per cent of the respondents fully adopted furrow method of irrigation and similar per cent of them not adopted flooding method of irrigation. Since cotton is grown in wider spacing, furrow method of irrigation is most beneficial and useful. This might be the probable reason for the above results.

#### *Pest management:*

Majority of the cotton growers partially adopted the recommended pest management practices with regard to boll worm (62.50 %), stem borer (45.83 %) and thrips (62.50 %). Remaining per cent of them belonged to non-adoption and full adoption categories.

#### *Disease management:*

Majority of the respondents not adopted the recommended disease management practices for diseases like damping off (50.00 %), powdery mildew (58.33 %) and brown leaf spot (50.00 %). The non-adoption and partial adoption of recommended pest and disease management practices might be due to lack of exposure to extension activities coupled with lack of knowledge and lesser contact with extension agencies and extension functionaries.

#### *Harvesting:*

Majority (79.17 %) of the cotton growers fully adopted the proper time of harvesting followed by partial adoption (20.83 %). The reason might be due to cotton farming experience, simplicity of the practice and easy identification of harvesting symptoms in the plant.

#### *Marketing:*

Majority (63.33 %) of the respondents not adopted the grading of cotton followed by partial adoption (20.00 %). With regard to method of marketing, majority of the cotton growers adopted co-operative societies (60.00 %) and closed tender (79.17 %) method of marketing. This might be due to reliability on the marketing procedure pattern and worthiness.

#### **Constraints perceived by farmers in adoption of improved cotton cultivation practices:**

It is clear from the Table 3 that, non - availability and high cost of labour was the constraints perceived by majority (94.17 %) of the respondents followed by non - availability of quality seeds and other inputs (89.17 %), lack of credit facilities with less interest rate (85.83 %), lack of knowledge regarding plant protection chemicals (75.83 %), high cost of plant protection chemicals and fertilizers (74.17 %) and lack of knowledge regarding seed treatment (65.83 %).

#### **Conclusion:**

It is clear from the results of the study that, majority of the respondents possessed full knowledge with respect to practices like recommended variety, spacing, seed rate, hand weeding and intercultivation, management of thrips and time of harvesting. Majority of them fully adopted the practices like recommended variety, time of harvesting and chemical fertilizers. Majority of the respondents were having full knowledge regarding simple practices and have adopted the same. Therefore, administrators and policy makers of the extension organizations and developmental departments should formulate more intensive extension programmes to improve the knowledge level of the farmers about improved cotton cultivation practices and motivate the farmers to adopt the same to improve the production and productivity of cotton.

**Table 3: Constraints perceived by farmers in adoption of improved cotton cultivation practices**

Sr. No.	Constraints	Frequency	Percentage
1.	Non-availability and high cost of labour	113	94.17
2.	Lack of knowledge regarding plant protection chemicals	91	75.83
3.	Lack of credit facilities with less interest rate	103	85.83
4.	Lack of knowledge regarding seed treatment	79	65.83
5.	High transportation cost	69	57.50
6.	High cost of plant protection chemicals and fertilizers	89	74.17
7.	Non-availability of quality seeds and other inputs	107	89.17

Emphasis should be given to use participatory approaches like farmers field school, participatory rural appraisal, participatory learning and action and participatory technology development while disseminating more complex technologies so that the technologies will be clearly understood by the average farmers. Hobli wise and season wise campaign should be organized on seed treatment, fertilizers application and plant protection measures.

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