



A Study on the Knowledge about Improved Sugarcane Production Technology in Basti District of Uttar Pradesh, India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study was undertaken to assess the knowledge of farmers towards improved Sugarcane production technology in Basti district of Uttar Pradesh, India. The data were collected through pre-tested interview schedule form for 120 respondents who were selected randomly. Statistical analysis was conducted after preliminary data cleaning. The study revealed that a) most respondents were middle aged with 56.66 percent, b) 38.38 percent respondents had marginal land holding, c) The maximum number of respondents having medium level scientific orientation, mass media exposure, extension contact and d) 45.00 percent of the respondents had medium level of knowledge about sugarcane production technology. Respondents had knowledge about field preparation, varieties, time of sowing and harvesting. However, they had less knowledge about seed treatment, yield of sugarcane per ha etc. Other attributes such as age, education,

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caste, annual income, source of information, scientific orientation, mass media exposure, risk bearing capacity and extension contact were positively and significantly correlated with knowledge of sugarcane production technology.

Keywords: Knowledge; improved sugarcane production technology.

1. INTRODUCTION

Agriculture is one of the most significant sectors of the Indian economy and contributes significantly to India's GDP. The agricultural sector of India has accounts for 43% of India's geographical area and contributes 16.1% of GDP. These include different food crops, commercial crops, oil seeds among other crop types. Sugarcane is one of the most important commercial crops grown in India Policepatil [1] and as noted by Godara et al. [2], India is considered as homeland of sugarcane.

Sugarcane (*Saccharum officinarum*) belongs to the grass family, Gramineae (Poaceae) and is a widely grown crop in India. It is thought to have originated in Southeast Asia and was first cultivated in India around 400 BC.

During 2015-16, an area of about 1200 ha was targeted to be developed with an expected production of 48000 MT. This was stated in the Annual Administrative Report 2015-16 of the Department of Agriculture. The total production of cane in India is 341.20 million tonnes while the sugar recovery is around 10.0 percent.

Sugarcane is becoming an important cash crop for farmers because there is a great potential for sugar production and by-products such as in domestic market. Therefore, the expansion of the sugarcane industry in India would greatly benefit the economy by foreign exchange saving, generation of employment and income, development of rural areas and improving the living standards of rural people.

Worldwide average yield of sugarcane crop in 2016 was 70.6 tonnes per hectare, led by Peru with 112 tonnes per hectare and Zambia with 103 [3]. Sugarcane is cultivated in an area of 4.95 million hectares in India producing 352.163 million tonnes with a productivity of 71.09 tonnes per hectare and in Tamil Nadu, it occupies 0.257 million hectares producing 26.497 million tonnes with a productivity of 102.998 tonnes per hectare [4].

Uttar Pradesh (UP) is the largest sugarcane producing state in India, accounting for over 50%

of the total sugarcane cultivated area in the country. The state has three sugarcane agro-climatic zones, including the North-West Zone, the North-Central Zone, and the North-East Zone.

Sugarcane production is one of the major agricultural activities in Basti district of UP, India. Sugarcane farming is an important agricultural activity in the district and contributes significantly to the local economy. The farmers in Basti district cultivate sugarcane on large tracts of land using traditional farming methods. The crop is sown in February-March and harvested between November-December. The production of sugarcane in Basti district has a significant impact on the lives of the farmers in the region. It is a major source of income for many farmers, and the revenue generated from the crop helps support their families and communities. The income from sugarcane cultivation enables the farmers to invest in better farming practices, improved irrigation facilities, and the education of their children.

2. MATERIALS METHODS

This study was conducted in Basti district of UP. Basti district was purposively selected for the study. In Harraiya block which was selected purposively and 10 villages were selected randomly for study. A total of 120 Sugarcane growers constituted sample for the study. Based on the objectives of the study, an interview schedule was prepared. The information was elucidated from respondents with the help of pre-structured interview schedule. The interviews were conducted in person (or face to face) and (e.g. LOGIT statistical model) was used for analysis.

3. RESULTS AND DISCUSSION

The analysis of Table 1 reveals several key findings about the sample population. The majority of respondents fall into the middle age group, accounting for 56.66% of the total. In terms of education, 25% of respondents had completed primary level education. Furthermore, 60% of the respondents identified themselves as belonging to the OBC caste. Regarding annual

income, 45.83% of the respondents reported a medium level of income. Within this group, 38.34% had land holdings ranging from 2 hectares to 4 hectares. Notably, a significant portion of the respondents, accounting for 77.50%, were involved in farming. In terms of family structure, 46.66%, of the respondents, at resided in joint families. The average family size (5-8), was medium, with 39.16% falling within this category. Additionally, the data suggests that

53.33% of the respondents possessed a medium level of Scientific orientation. Economic motivation was found to be at a medium level for 44.16% of the respondents. Similarly, 54.16% demonstrated a medium level of Risk bearing capacity, while 51.66% had a medium level of Mass media exposure. Lastly, 45% of the respondents reported a medium level of extension contacts.

Table 1. Socio-economic profile of the respondents

Sl. No.	Independent variables	Category	Frequency	Percentage
1.	Age	Young age (Up to 35 years)	21	17.50
		Middle age (36-55 years)	68	56.66
		Old age (above 55 years)	31	25.84
2.	Educational Qualification	Illiterate	39	32.50
		Primary school	30	25.00
		High school	26	21.66
		Intermediate	16	13.33
		Graduate and above	9	7.50
3.	Caste	General	23	19.16
		OBC	72	60.00
		SC & ST	25	20.83
4.	Land Holding	Marginal (Up to 1 ha.)	19	15.83
		Small (1.01 to 2 ha.)	34	28.33
		Medium (2 to 4 ha.)	46	38.34
		Large (Above 4 ha.)	21	17.50
5.	Occupation	Only farming	93	77.50
		Farming + Business	13	10.83
		Farming + Service	9	7.50
		Farming + Others	5	4.17
6.	Annual Income	Low (below 50,000)	18	15.00
		Medium (50,000-1 lakh)	55	45.83
		High (Above 1 lakh)	47	39.16
7.	Type of house	Hut (Kuchha)	23	19.17
		Semi-cemented	61	50.83
		Cemented	36	30.00
8.	Type of Family	Nuclear family	64	53.33
		Joint family	56	46.66
9.	Size of Family	Small (1-4)	34	28.33
		Medium (5-8)	47	39.16
		Large (9 above)	39	32.50
10.	Scientific orientation	Low	29	24.16
		Medium	64	53.33
		High	27	22.50
11.	Economic motivation	Low	35	29.16
		Medium	53	44.16
		High	32	26.66
12.	Risk bearing capacity	Low	34	28.33
		Medium	65	54.16
		High	21	17.50
13.	Mass media exposure	Low	33	27.50
		Medium	62	51.66
		High	25	20.84
14.	Extension contact	Low	42	35.00
		Medium	54	45.00
		High	24	20.00

Table 2. Knowledge level of farmers about sugarcane cultivation practices

S.No.	Statements	Knowledge		
		Fully correct F (%)	Partially correct F (%)	Not correct F (%)
1.	Varieties	59	42	19
	a. CO 238	(49.17%)	(35.00%)	(15.83%)
	b. CO 214			
	c. Colk 1209			
2.	field preparation	86	25	9
	a. Deep ploughing	(71.67%)	(20.83%)	(7.50%)
	b. Leveling			
	c. FYM			
3.	Seed treatment	42	55	23
		(35.00%)	(45.83%)	(19.17%)
4.	Time of sowing	79	41	0
	a. Sept-Oct	(65.83%)	(35.17%)	(0%)
	b. Feb-Mar			
	c. Jun-Aug			
5.	recommended method	82	31	7
	a. Flat planting	(68.34%)	(25.84%)	(5.82%)
	b. Deep furrow planting			
6.	Fertilizer application	43	58	19
	a. Urea 325-350 kg/ha	(35.83%)	(48.34%)	(15.83%)
	b. D.A.P. 125-130 kg/ha			
	c. M.O.P. 50-60 kg/ha			
7.	Irrigation management	39	58	23
	a. 30-35 day after sowing	(32.50%)	(48.33%)	(19.17%)
	b. At the time of formative stage			
	c. At time of making sucrose			
	d. At the time of ripening			
8.	Time of weed management	43	56	21
	a. 20-25 days after sowing	(35.83%)	(46.67%)	(17.50%)
	b. 75-90 days after sowing			
	c. 150 days after sowing			
9.	Disease	43	63	14
	a. Red rot	(35.83%)	(52.50%)	(11.67%)
	b. Leaf scald disease			
10.	Harvesting	82	31	7
	a. Oct-Dec	(68.33%)	(25.83%)	(5.82%)
	b. Jan-Feb			
11.	Yield of sugarcane par ha.	41	53	26
		(34.17%)	(44.17%)	(21.67%)

The following highlights can be deduced from Table 2:

Varieties: The most popular or preferred variety is CO 238, followed by CO 214 and Colk 1209. CO 238 has the highest percentage of fully correct statements (49.17%). **Field Preparation:** The most fully correct method of field preparation is FYM (Farm Yard Manure), followed by leveling and deep plowing.

Seed Treatment: The statements about seed treatment are partially correct, with 45.83% being partially correct and 35.00% being fully correct.

Time of Sowing: The recommended time of sowing is Sept-Oct, followed by Feb-Mar. The statements about Jun-Aug as the time of sowing are fully correct (100%).

Recommended Method: Flat planting is the most recommended method, with 68.34% fully correct statements.

Fertilizer Application: The recommended quantities for fertilizer application are partially correct, with urea at 325-350 kg/ha being the most fully correct statement.

Irrigation Management: The statements about irrigation management are partially correct, with the highest fully correct statement being at the time of ripening.

Time of Weed Management: The most fully correct time for weed management is 75-90 days after sowing.

Disease: The statements about diseases are partially correct, with the highest fully correct statement being about red rot.

Harvesting: The most fully correct time for harvesting is Oct-Dec.

Yield of Sugarcane per Hectare: The statements about the yield of sugarcane per hectare are partially correct, with the highest fully correct statement being 44.17%. Overall, the table provides information on different aspects of sugarcane cultivation, highlighting the correctness percentage of various statements related to each aspect. Similar findings were also reported by Lanjewar et al. [5] and Vaidya and Koshti [6].

Table 3 revealed that 45.00% of respondents had medium level of knowledge about sugarcane

cultivation practices. Considerable percentage of sugarcane farmers were found having high 32.50% and low level of knowledge 22.50%, respectively. Similar findings were also reported by Reichardt et al. [7].

Table 4 indicates that the independent variables i.e. age (0.967362) education (0.59998) caste (0.911669) annual income (0.928397) type of house (0.993247) size of family (0.997662) scientific orientation (0.873908) economic motivation (0.829831) risk bearing capacity (0.730872) mass media exposure (0.786005) were positively and significantly correlated with level of knowledge toward improved sugarcane cultivation practices measures at 0.01 percent of probability. Consequently, the null hypothesis was rejected for these variables. Extension contact (0.455292) exposure were positively and significantly correlated with level of knowledge toward improved sugarcane cultivation practices measures at 0.05 percent of probability, hence, the null hypothesis was rejected for these variables. Further, land holding (-0.29873) occupation (-0.77417) were negatively and significantly correlated, while type of family (-0.05088) was not-significant in relation to knowledge of sugarcane growers about improved sugarcane cultivation [8,9].

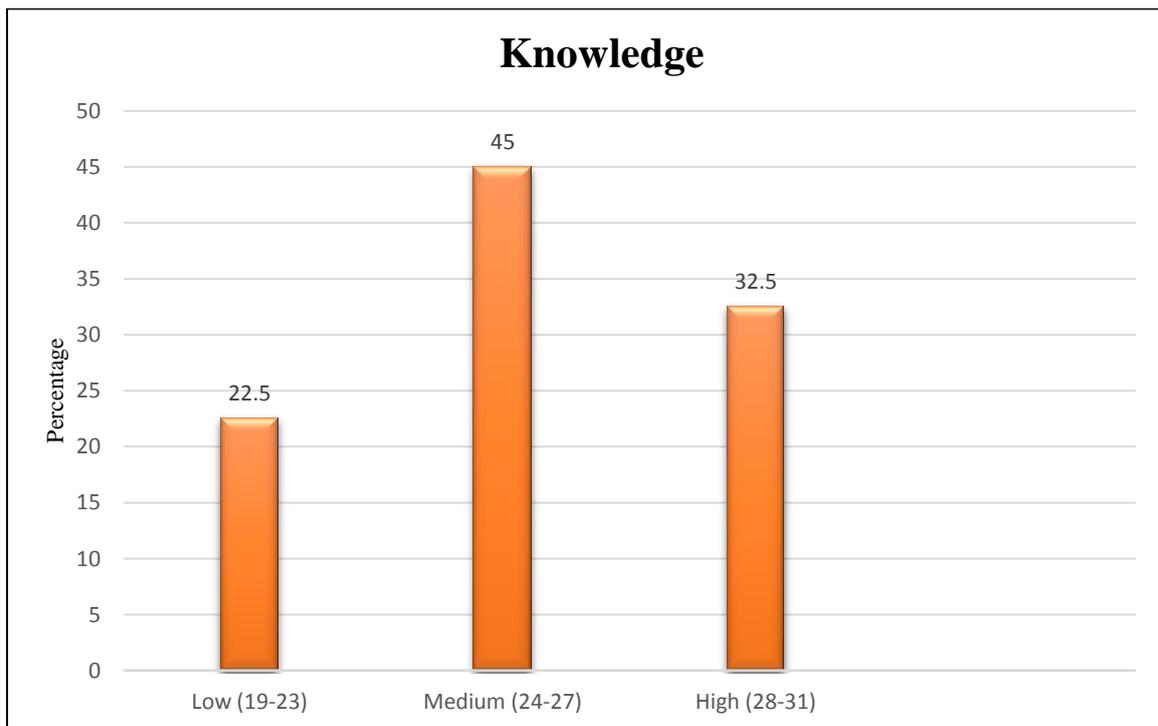


Fig. 1. Distribution of the respondents based on the overall knowledge level of farmers about sugarcane cultivation practices

Table 3. Distribution of the respondents on the basis of overall knowledge level of farmers about sugarcane cultivation practices

Sl. No.	Categories	Frequency	Percentage
1.	Low (19-23)	27	22.50
2.	Medium (24-27)	54	45.00
3.	High (28-31)	39	32.50
Total		120	100.00

Table 4. Correlation coefficient (r) between different independent variables and knowledge about improved sugarcane cultivation practices

Sl. No.	Independent variable	Correlation coefficient
1.	Age	0.967*
2.	Education	0.599*
3.	Caste	0.911*
4.	land holding	-0.298**
5.	Occupation	-0.774*
6.	Annual income	0.928*
7.	Type of house	0.993*
8.	Type of family	0.050NS
9.	Size of family	0.997*
10.	Scientific orientation	0.873*
11.	Economic motivation	0.829*
12.	Risk bearing capacity	0.730*
13.	Mass media exposure	0.786*
14.	Extension contact	0.455**

*= Correlation is significant at the 0.01% level of probability

**= Correlation is significant at the 0.05% level of probability

NS= Not-significant

4. CONCLUSION

It was found that majority of the respondents belonged to middle-aged group, having education up to primary level, having medium level annual income. Further, majority of the respondents belonged to nuclear family composition with land holding of more than 2 to 4 hectares. The majority of respondents had medium levels of mass media exposure, risk bearing capacity, extension contact and scientific orientation. It was observed that Knowledge level of farmers about improved sugarcane cultivation practices were found medium level households?. It was found that age, educational qualification, caste, annual income, type of house, size of family, scientific orientation, economic motivation, risk bearing capacity, mass media exposure and extension contact were positively and significantly correlated with Knowledge about improved sugarcane cultivation practices.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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