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Knowledge and adoption of sugarcane production technology

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Abstract
The present study was conducted with specific objectives to study Knowledge and adoption of sugarcane production technology. For this study, from Latur district two talukas *viz.* Chakur and Udgir were selected. From these two talukas twelve villages were selected randomly and ten respondents from each villages were selected, i.e. 120 respondents from 12 villages constituted the sample for the study. Ex-Post Facto research design was used for the research study.

From present findings it is observed that majority of respondents were educated up to secondary school level followed by higher secondary school level, semi-medium size of land holding, medium annual income, medium farming experience, medium social participation, medium extension contact, medium sources of information, medium economic motivation and medium risk orientation.

Majority of respondents had medium level of knowledge about sugarcane production technologies i.e. recommended planting time of sugarcane, proper selection of soil, recommended method of irrigation, recommended quantity of FYM application etc.

Majority of the respondents had completely adopted some practices such as, recommended planting time of sugarcane, proper selection of soil and use of recommended variety, While some of them had not adopted the sugarcane production technologies like seed treatment with bio-fertilizer, seed treatment with roger + carbendazim, brix reading of refractometer and application of MOP + urea in dry spell. While some of them had partially adopted the sugarcane production technologies like NPK nutrients application, hand weeding after 8 days of herbicide application and sugarcane setts/ha.

Keywords: Knowledge, adoption, sugarcane crop, sugarcane production technology, sugarcane growers

1. Introduction
The world demand for sugar is the primary driver of sugarcane agriculture. Cane accounts for 80 percent of sugar produced. Sugarcane is a renewable, natural agricultural resource because it provides sugar, biofuel, fiber, fertilizer. Sugarcane juice is used for making white sugar, brown sugar (Khandsari), Jaggery (Gur) and ethanol.

India is the 2nd largest producer of sugar after Brazil. The yield of sugarcane per hectare in India is 69.84 tonnes. Sugar industry is the second largest industry in the country after cotton textiles and contributes around 6 percent of the agricultural GDP. Indian sugar industry contributes substantially to the rural economy as the sugar mills are located in rural areas and employ rural folk to a large extent. Sugar plays important role in daily diet and it has nutritional importance. To supply the sugar to increasing population of India, need to increase the production per unit area of sugarcane.

The area under this crop is low with low productivity. This might be the wide gap in between the knowledge already possessed by the respondents and their application in the field. It creates the wide scope for increasing sugarcane production per unit area. However, a majority of sugarcane grower doesn't have the knowledge and adopt the recommended production technology to the fullest extent. Keeping this in view present study was undertaken to study Knowledge and adoption of sugarcane production technology.

2. Methodology
The present study was conducted in two tahsils of Latur district *viz.* Chakur and Udgir. Six villages from each randomly selected tahsils. The data were collected from 10 respondents from each of randomly selected these twelve villages. 120 respondents from 12 villages constituted the sample for the study.

The respondents were personally interviewed with interview schedule. The data were tabulated and analyzed by using statistical tools like frequency, percentage and correlation coefficient.

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3. Results

The findings of the present study as well as relevant discussion have been presented under following heads.

It was observed from table 1 that majority of the respondents (53.33%) were educated up to secondary school followed by 19.17 percent of respondents were educated up to higher secondary school. It was also observed that majority of the respondents (35.00%) had semi-medium size of land holding followed by 26.67 percent of the respondents had small and medium size of land holding and most of the respondent (74.17%) had medium annual income. Whereas 60.83 percent of the respondents had medium farming experience. Similar findings were noticed by Jamadar (2012) [4], Lad (2013) [5], Ambavane (2014) [1] and Shete (2014) [7].

3.1 The profile of respondents

Table 1: The profile of respondents (N = 120)

Category	Frequency	Percentage
Education		
Illiterate Illiterate	06	05.00
Primary (up to 4th std.)	06	05.00
Secondary (5th to 10th std.)	64	53.33
Higher secondary (11th and 12th std.)	23	19.17
College level	21	17.50
Land holding		
Marginal farmers (Up to 1.00 ha)	09	07.50
Small farmers (1.01 to 2.00 ha)	32	26.67
Semi-medium (2.01 to 4.00)	42	35.00
Medium farmers (4.01 to 10.00 ha)	32	26.67
Big farmers (10.01 ha &Above)	05	04.16
Annual income		
Low income (Up to Rs.130156)	11	09.17
Medium income (Rs.130157 to Rs.705175)	89	74.17
High income (Rs. 705176 &Above)	20	16.66
Farming experience		
Low (Up to 11 years)	23	19.17
Medium (12 to 32 years)	73	60.83
High (33 years and above)	24	20.00
Social participation		
Low (Up to 7)	25	20.84
Medium (8 to 17)	73	60.83
High (18 and above)	22	18.33
Extension contact		
Low (Up to 4)	30	25.00
Medium (5 to 7)	60	50.00
High (8 and above)	30	25.00
Sources of information		
Low (Up to 22)	25	20.83
Medium (23 to 28)	68	56.67
High (29 and above)	27	22.50
Economic motivation		
Low (Up to 21)	24	20.00
Medium (22 to 25)	79	65.83
High (26 and above)	17	14.17
Risk orientation		
Low (Up to 18)	28	23.33
Medium (19 to 23)	84	70.00
High (24 and above)	08	06.67

After analysis of data it was also find that maximum number (60.83%) were form medium social participation category andhalf of the respondents (50.00%) belonged to medium extension contact.It was also observed that majority of the respondents (56.67%) had medium sources of information and majority of the respondents (65.83%) had medium economic motivation. Whereas 70.00 percent of the respondents had medium risk orientation. This type of findings was also found by Bedre (2009) [2], Mane (2012) [6], Jadhav (2013) [3], Ambavane (2014) [1] and Shinde (2014) [8].

3.2 Knowledge amongst the respondents about sugarcane production technologies
3.2.1 Practice wise knowledge of the respondents about sugarcane production technologies

Practice wise knowledge of sugarcane production technologies by respondents is given in Table 2 revealed that the sugarcane production technologies known to the most of the sugarcane growers were those i.e. recommended planting time of suru / seasonal sugarcane (95.00%), recommended planting time of adsali sugarcane (92.50%), recommended

planting time of pre-seasonal sugarcane (85.00%), proper selection of soil (78.33%), recommended method of irrigation (77.50%), recommended quantity of FYM application and age of sugarcane setts at the time of planting (73.33%), variety tolerate to water stress and selection of intercrop (71.66%), immediate transport of harvested sugarcane (65.83%), stop irrigation before 15 days of harvesting (63.33%), recommended planting method of sugarcane (60.00%).

Table 2: Practice wise knowledge of the respondents about sugarcane production technologies (N=120)

Particulars	Knowledge level	
	Frequency	Percent
Recommended planting time of pre-seasonal sugarcane	102	85.00
Recommended planting time of suru sugarcane	114	95.00
Recommended planting time of adsali sugarcane	111	92.50
Proper selection of soil	94	78.33
Recommended quantity of FYM application	88	73.33
Variety rich in sugar content	28	23.33
Variety suitable for all three season and resistance to wilt & red rot disease	24	20.00
Variety tolerate to water stress	86	71.66
Age of sugarcane setts at the time of planting	88	73.33
Recommended plant population / ha.	54	45.00
Seed treatment with roger + carbendanzine	28	23.33
Seed treatment with bio-fertilizer (azatobacter)	22	18.33
Recommended planting method of sugarcane	72	60.00
Recommended spacing between two rows	63	52.50
Recommended quantity of NPK nutrients for suru sugarcane	63	52.50
Recommended quantity of NPK nutrients for pre-seasonal sugarcane	56	46.66
Recommended method of fertilizer application	66	55.00
Use of soluble fertilizers increases yield	35	29.17
Recommended method of irrigation	93	77.50
Water saving by use of drip irrigation	60	50.00
Fertilizer saving by use of drip irrigation	32	26.67
Application of MOP + urea in dry spell	25	20.83
Selection of intercrop	86	71.66
Use of atrazine for weed control	66	55.00
Hand weeding after 8 days of herbicide application	64	53.33
No weed control at proper time leads to 50 to 60 percent yield losses	63	52.50
Major disease of sugarcane	68	56.67
Major pest of sugarcane	61	50.83
Use of chloropyriphos for control of white grub	41	34.17
Use of refractometer for maturity measurement	40	33.33
Brix reading of refractometer	32	26.67
Stop irrigation before 15days of harvesting	76	63.33
Immediate transport of harvested sugarcane	79	65.83
Recommended time of ratooning	65	54.17
Recommended variety for ratoon sugarcane	61	50.83
Quantity of NPK nutrients for ratoon sugarcane	56	46.66
Recommended time of harvesting of ratoon	62	51.67

Knowledge regarding major disease of sugarcane (56.67%), recommended method of fertilizer application and use of atrazine for weed control (55.00%), recommended time of ratooning (54.17%), hand weeding after 8 days of herbicide application (53.33%), recommended spacing between two rows, recommended quantity of NPK nutrients for suru sugarcane and no weed control at proper time leads to 50 to 60 percent yield losses (52.50%), recommended time of harvesting of ratoon (51.67%), major pest of sugarcane and recommended variety for ratoon sugarcane (50.83%), water saving by use of drip irrigation (50.00%) had to the respondents.

Knowledge of recommended quantity of NPK nutrients for pre-seasonal sugarcane and quantity of NPK nutrients for ratoon sugarcane (46.66%) of respondents. Knowledge about recommended plant population / ha. (45.00%), use of chloropyriphos for control of white grub (34.17%), use of refractometer for maturity measurement (33.33%).

Knowledge regarding use of soluble fertilizers increases yield (29.17%), fertilizer saving by use of drip irrigation and brix reading of refractometer (26.67%), variety rich in sugar content and seed treatment with roger + carbendanzine (23.33%) application of MOP + urea in dry spell (20.83%), variety suitable for all three season and resistance to wilt & red rot disease (20.00%), seed treatment with bio-fertilizer (18.33%) had to the respondents.

3.2.2 Overall knowledge level

Table 3: Distribution of the respondents according to their level of knowledge level

(N=120)

Knowledge Level	Frequency	Percentage
Low (Up to 23)	30	25
Medium (24 to 28)	61	50.83
High (29 and above)	29	24.17
Total	120	100.00

The data presented in Table 3 revealed that more than fifty percent (50.83%) of the respondents had medium level of knowledge about sugarcane production technologies, followed by 25.00 percent and 24.17 percent of the respondents having low and high level of knowledge,

respectively. Similar result was reported by Bedre (2009) [2], Mane (2012) [6], Jadhav (2013) [3], Lad (2013) [5], Ambavane (2014) [1].

3.2.3 Knowledge index

Table 4: Distribution of the respondents according to their knowledge index sugarcane production technologies.

(N=120)

Knowledge index	Frequency	Percentage
Low	17	14.16
Medium	74	61.67
High	29	24.17
Total	120	100.00

It is reported from Table 4 that majority (61.67%) of the respondents had medium knowledge index while, 24.17 percent of the cotton growers had high and only 14.16 percent of them had low knowledge index. Similar result was reported by Bedre (2009) [2], Mane (2012) [6], Jadhav (2013) [3] and Lad (2013) [5].

3.3 Adoption of recommended sugarcane production technologies by the respondents
3.3.1 Practice wise adoption of recommended sugarcane production technologies by the respondents

Table 4: Practice wise adoption of the recommended sugarcane production technologies by the respondents.

(N=120)

Particulars	Full		Partial		Non	
	Freq.	percent	Freq.	percent	Freq.	percent
Recommended planting time	92	76.67	28	23.33	0.00	0.00
Proper selection of soil	78	65.00	22	18.33	20	16.67
Quantity of FYM (20-25 tone / ha.)	41	34.17	51	42.50	28	23.33
Use of recommended variety	72	60.00	00	0.00	38	31.67
Age of sugarcane setts	65	54.17	26	21.67	29	24.17
Sugarcane setts / ha	38	31.67	62	51.67	20	16.67
Seed treatment with roger + carbendanzine	20	16.67	00	0.00	100	83.33
Seed treatment with bio-fertilizer (azatobacter)	18	15.00	00	0.00	102	85.00
Recommended planting method of sugarcane	30	25.00	56	46.67	34	28.33
Recommended spacing between two rows	32	26.67	58	48.33	30	25.00
Recommended quantity of NPK nutrients application	28	23.33	70	58.33	22	18.34
Recommended method of fertilizer application	20	16.67	30	25.00	70	58.33
Use of soluble fertilizers increases yield (60 to 80%)	20	16.67	22	18.33	78	65.00
Recommended method of irrigation	30	25.00	00	0.00	90	75.00
Application of MOP + urea in dry spell	26	21.67	00	0.00	94	26
Selection of intercrop	64	53.33	00	0.00	56	46.67
Use of atrazine for weed control	40	33.33	00	0.00	80	66.67
Hand weeding after 8 days of herbicide application	32	26.67	64	53.33	24	20.00
Use of chloropyriphos for control of white grub	34	28.33	00	0.00	86	71.67
Use of refractometer for maturity measurement	28	23.33	00	0.00	92	76.67
Brix reading of refractometer	26	21.67	00	0.00	94	78.33
Stop irrigation before 15days of harvesting	49	40.83	48	40	23	19.17
Immediate transport of harvested sugarcane	32	26.67	58	48.33	30	25.00
Recommended time of ratooning	35	29.17	50	41.67	35	29.16
Recommended variety for ratoon sugarcane	65	54.17	00	0.00	55	45.83
Quantity of NPK nutrients for ratoon sugarcane	30	25.00	49	40.83	41	34.17
Recommended time of harvesting of ratoon	38	31.67	40	33.33	42	35.00

With a view to know the extent of adoption of various sugarcane production technologies data have been tabulated in Table 4, the critical look to data revealed that more than twenty five percent of the respondents have adopted some practices such as, recommended planting time (76.67%), proper selection of soil (65.00%), use of recommended variety (60.00%), age of sugarcane setts at planting and recommended variety for ratoon sugarcane (54.17%), selection of intercrop (53.33%), stop irrigation before 15 days of harvesting (40.83%), quantity of FYM (34.17%), use of

atrazine for weed control (33.33%), sugarcane setts / ha and recommended time of harvesting of ratoon (31.67%), recommended time of ratooning (29.17%), use of chloropyriphos for control of white grub (28.33%), recommended spacing between two rows, hand weeding after 8 days of herbicide application and immediate transport of harvested sugarcane (26.67%), recommended planting method of sugarcane, recommended method of irrigation and quantity of NPK nutrients for ratoon sugarcane (25.00%).
It was also evident from Table 4 that the most of the

respondents had not adopted the sugarcane production technologies like seed treatment with bio-fertilizer (85.00%), seed treatment with roger + carbendazim (83.33%), brix reading of refractometer and application of MOP + urea in dry spell (78.33%), use of refractometer for maturity measurement (76.67%), recommended method of irrigation (75.00%), use of chloropyriphos for control of white grub (71.67%), use of atrazine for weed control (66.67%), use of soluble fertilizers increases yield (65.00%), recommended method of fertilizer application (58.33%), selection of intercrop (46.67%), recommended variety for ratoon sugarcane (45.83%), recommended time of harvesting of ratoon (35.00%), quantity of NPK nutrients for ratoon sugarcane (34.17%), use of recommended variety (31.67%), recommended time of ratooning (29.16%), recommended planting method of sugarcane (28.33%), recommended spacing between two rows and immediate transport of harvested sugarcane (25.00%).

It was also observed from Table 4 that most of the respondents had partially adopted the sugarcane production technologies like recommended quantity of NPK nutrients application (58.33%), hand weeding after 8 days of herbicide application (53.33%), sugarcane setts / ha (51.67%), recommended spacing between two rows and immediate transport of harvested sugarcane (48.33%), recommended planting method of sugarcane (46.67%), quantity of FYM per hectare (42.50%), recommended time of ratooning (41.67%), quantity of NPK nutrients for ratoon sugarcane (40.83%), stop irrigation before 15 days of harvesting (40.00%), recommended time of harvesting of ratoon (33.33%), recommended method of fertilizer application (25.00%).

3.3.2 Overall adoption level

Table 5: Distribution of the respondents according to their level of overall adoption

(N=120)

Adoption Level	Frequency	Percentage
Low (Up to 26)	19	15.83
Medium (27 to 35)	81	67.50
High (36 and above)	20	16.67
Total	120	100.00

It is elucidated from Table 5 that, 67.50 percent respondents had medium level of adoption of recommended sugarcane production technologies, followed by 16.67 percent respondents had high level of adoption and 15.83 percent had low level of adoption.

3.3.3 Adoption index

Table 6: Distribution of the respondents according to their adoption index

(N=120)

Adoption Index	Frequency	Percentage
Low (Up to 49.9)	19	15.83
Medium (50 to 65.9)	83	69.17
High (66 and above)	18	15.00
Total	120	100.00

It is elucidated from Table 6 that majority of (69.17%) respondents had medium adoption index of recommended sugarcane production technologies, followed by 15.83 percent

respondents had low and 15.00 percent had high adoption index.This finding is similar Lad (2013) [5], Ambavane (2014) [1] and Shete (2014) [7].

4. Conclusions
Most of the respondents were educated up to secondary school level, belonged to semi medium size of land holding with annual income of Rs. 1,30,157 to 7,05,175 per annum, had 12 to 32 years of farming experience and had medium social participation, extension contact, sources of information, economic motivation and risk orientation.

As regards levels of knowledge and adoption of the respondents were under medium category in knowledge and adoption of sugarcane production technologies.

5. References
1. Ambavane DN. Knowledge and adoption of recommended chilli production technology by the growers. M.Sc. (Agri) Thesis, VNMKV, Parbhani (M.S.); c2014.
2. Bedre VS. Knowledge and adoption of recommended package of practices by okra growers. M.Sc. (Agri.) Thesis (Unpub.), MAU, Parbhani (M.S.); c2009.
3. Jadhav SR. knowledge and adoption of recommended package of practices in *rabi* groundnut. M.Sc. (Agri.) Thesis, MKV, Parbhani (M.S.); c2013.
4. Jamadar CR. Training needs of sugarcane growers about recommended production technology. M.Sc. (Agri.) Thesis (Unpub.), MKV, Parbhani (M.S.); c2012.
5. Lad AS. Knowledge and adoption of recommended package of practices of green gram.M.Sc. (Agri.) Thesis (Unpub.), VNMKV, Parbhani (M.S.); c2013.
6. Mane SS. Knowledge and adoption of recommended production technology on green gram. M.Sc. (Agri.) Thesis (Unpub.), MKV, Parbhani (M.S.); c2012.
7. Shete DS. Knowledge and adoption of drip irrigation for sugarcane. M.Sc. (Agri) Thesis, VNMKV, Parbhani (M.S.); c2014.
8. Shinde PB. Knowledge and adoption of recommended seed production technology of soybean by the growers. M.Sc. (Agri) Thesis, VNMKV, Parbhani (M.S.); c2014.