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RESEARCH PAPER

Knowledge of sugarcane production technologies of UAS Dharwad by the farmers of North Karnataka

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Abstract : The present study on knowledge of sugarcane production technologies of UAS Dharwad by the farmers of North Karnataka was undertaken during 2021-22. The *ex-post facto* research design was employed for the study. Among sample of 160 sugarcane growers, 20 sugarcane growers were randomly selected from each village of selected two villages from talukas *viz.,* Athani and Gokak from Belagavi district and Jamakhandi and Mudhol from Bagalkot district. Data was collected by personal interview method using structured schedule. The study revealed that, 40.64 per cent of sugarcane growers belonged to medium category of knowledge followed by high (32.50 %) and low (26.86 %) category. With respect knowledge of individual production technologies cent per cent of growers had knowledge of suitable soil type, varieties, planting time (June-September, January-February), spacing of 120cm, methods of irrigation (drip and flood), quantity of FYM, intercropping of maize, after cultivation practices (earthingup, de trashing and propping), spraying of post emergent herbicides, hand weeding (after 45-60 days and after 90 days of planting) and knowledge of harvesting measures.

Key Words : Knowledge, Sugarcane, Production technologies

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INTRODUCTION

Sugarcane (*Saccharum officinarum*) belongs to family Gramineae (Poaceae) is widely grown crop in India. *Saccharum* genus mainly comprises five species in which three are cultivated *Saccharum officinarum, Saccharum barberi, Saccharum sinense* and two are wild species *Saccharum spontaneum* and *Saccharum robustum.* Origin of the sugarcane is New Guinea. India is second largest sugarcane growing country after Brazil.The expansion of the sugarcane industry in India would greatly benefit the economy through foreign exchange savings, job and income generation, rural growth and living standard of rural people. In the year 2019-20 area under sugarcane is 4.60 million hectare and production was 370.50 million metric tonnes with the productivity of 80.4 tonnes/hectare (Anonymous, 2021). Karnataka is third largest producer of sugarcane after Uttar Pradesh and Maharashtra. In Karnataka sugarcane grown in area of 4.29 lakh hectares and the production is 381.81 lakh metric tonnes with the

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productivity of 89 tonnes/hectare (Department of Economics and Statistics, 2020).

University of Agricultural Sciences Dharwad, released the package of practice for sugarcane, which includes soil requirement, time of planting, sett treatment, intercultivation, intercropping, weed management, plant protection, nutrient management, time of harvesting for increasing crop productivity. To know the significant impact of these technologies there is need to study the knowledge these recommended production technologies. Hence, present study was undertaken to measure the knowledge of recommended sugarcane production technologies of UAS Dharwad.

MATERIAL AND METHODS

The study was conducted during 2021-2022 to investigate the knowledge of sugarcane production technologies of UAS Dharwad by the farmers of North Karnataka.The *ex-post facto* research design was used for conducting this study. The study was conducted in Belagavi and Bagalkot districts of Karnataka during 2021-2022. These districts were purposively selected keeping in view that these districts cover maximum area under sugarcane cultivation in North Karnataka.Two talukas from each district *viz.,* Athani (45,351 ha) and Gokak (44,514 ha) taluks from Belagavi district and Jamakhandi (41,816 ha) and Mudhol (29,414 ha) (Department of Economics and Statistics, 2020). From Bagalkot district were selected. Further, from each selected taluka, two villages were selected. Finally, eight villages were selected for the study. Further, from each selected villages of respective taluka 20 sugarcane growers were randomly selected to constitute a total sample of 160 sugarcane growers. Keeping in view the objectives and variables of the study, a structured interview schedule was developed by consulting experts and referring to the relevant literature.The primary data was collected from the sugarcane growers through personal interview method in an informal atmosphere. Mean and standard deviation were used for classification of the members into various categories.

A "Teacher made test" suggested by Anastasi (1961) was employed to measure the knowledge of the respondents about recommended sugarcane production technologies. Forty seven knowledge items were framed by referring to package of practices and also, in consultation with Experts of Department of Agronomy. By following relevancy weightage procedure finally 44 knowledge questions were selected and administered to respondents. The answers to the question were quantified by giving "1" score to correct answer and "0" score to incorrect answer.

Based on the response obtained, the respondents were classified into low, medium and high categories using mean and standard deviation as a measure of check.

Further frequency and percentage were calculated to present the data. The above procedure was also followed by Sushma (2016).

RESULTS AND DISCUSSION

The experimental findings obtained from the present study have been discussed in following heads :

Knowledge level of sugarcane growers about agronomic practices :

The detailed analysis on knowledge of agronomic practices (Table 1) shows that, cent per cent of sugarcane growers had knowledge of suitable soil type, recommended sugarcane varieties, planting times (June-Sept, Jan- Feb), spacing of 120 cm and drip and flood method of irrigation followed by quality of setts and paired row method of planting (90.00 % each), quantity of setts (81.88 %), 150 cm row spacing (70.00 %) and frequency of irrigation (48.25 %). Whereas only 25.00 per cent had knowledge of pit/trench method of planting. Sugarcane is one of the important cash crop in this area so every grower tries to acquire more knowledge about recommended variety, planting time, spacing and irrigation methods to get high yield.

With respect to the nutrient management cent per cent had knowledge of application of FYM followed by growing of green manure crops prior to planting (71.25 %) time of chemical fertilizer application (41.88 %) and quantity of chemical fertilizers (41.88 %). With regard to sett treatment 41.25 per cent of respondents had knowledge. Nutrient management is core practice in cash crop to get more yield.

In case of intercropping in sugarcane cent per cent of respondents had knowledge of intercropping with maize followed by vegetables (97.50 %), groundnut (72.50 %). With regard to after cultivation practices cent per cent of respondents had knowledge of earthing up, de trashing and propping.They had knowledge of intercropping to utilizethe space between rows and to get additional income they grow intercrops.

Table 1 : Knowledge level of sugarcane growers about agronomic practices		(n=160)	
Sr. No.	Recommended production technologies of sugarcane	Knowledge	
		f	%
1.	Soil type suitable for sugarcane cultivation Sandy loam soil, Black soil, Red soil, Sandy soil	160	100.00
2.	Recommended sugarcane varieties Co18024, CoM0265, SNK9227, VSI08005, Co-86032, SNK-632	160	100.00
3.	Planting time		
	June- September	160	100.00
	January- February	160	100.00
4.	Spacing		
	120cm row spacing	160	100.00
	150cm row spacing	112	70.00
	Paired row method	144	90.00
	Pit/trench method	40	25.00
5.	Nutrient management		
a.	Application of organic manures FYM 10 tones/acre or vermicompost 1 tone/acre or composted press mud enriched with microbes 5 tones/acre	160	100.00
b.	Application of chemical fertilizers N:P:K=100:30:90 kg/acre	44	27.50
6.	Time of chemical fertilizer application 20% of N and 20% of K, full quantity of P fertilizers applied during planting and after 2 months on interval of 1 month application of 20% each.	67	41.88
7.	Quality of setts/planting material 8-10 months aged, free from disease and pest with 2-3 healthy buds	144	90.00
8.	Quantity of planting material 8000-10000 two budded setts per acre or 1-2 tons/acre	131	81.88
9.	Sett treatment Treatment of setts in 100 lit of water with 200gm Bavistin + 200ml of Chlorpyriphos 20EC + 200gm of Urea for 10 mins	66	41.25
10.	Growing of green manure crops sunhemp, dhaincha, Cowpea, nectar/navadhanya	114	71.25
11.	Method of irrigation		
	Drip irrigation	160	100.00
	Flood irrigation	160	100.00
12.	Frequency of irrigation Once in week during germination and growth stage, once in 10 days during tillering stage and once in 15 days during ripening stage	77	48.25
13.	Intercropping in sugarcane		
	Sugarcane + Onion (1:2)	53	33.13
	Sugarcane + Groundnut (1:2)	89	55.63
	Sugarcane + Green gram (1:1)	30	18.75
	Sugarcane + Chickpea (1:1)	68	42.50
	Sugarcane + Vegetables (1:1)	156	97.50
	Sugarcane + Maize (1:1)	160	100.00

Table 1: Contd……..

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14.	After cultivation practices		
	Earthing up: after 100-110 days of planting	160	100.00
	De trashing: after 150-180 days of planting	160	100.00
	Propping: tying the cane together using dry leaves	160	100.00
15.	Weed management		
a.	Chemical method of weed control		
	Pre-emergent herbicide Pendimethalin 30 EC or 38.7 CS @1kg/acre.	56	35.00
	Post emergent herbicide 2,4 D @2gm/lit + Metribuzin 70%WP @1gm/lit.	160	100.00
b.	Hand weeding Hand weeding 45-60 and 90 days after planting	160	100.00
16.	Striga weed management		
	High application of organic manure, heavy inundation of water/flooding type of irrigation or uprooting of weed before seed set	93	58.13

f- Frequency %- Percentage

In case of weed management cent per cent of sugarcane growers had knowledge of spraying of post emergent herbicides and hand weeding. Whereas, one third (35.00 %) of growers had knowledge of spraying of pre-emergent herbicides and striga weed management (58.13 %).

Knowledge level of sugarcane growers about plant protection measures :

The results on knowledge of plant protection measures as shown in Table 2 highlighted that, cent per cent of sugarcane growers had knowledge of recommended method for management of woolly aphid followed by root grub through drenching of chlorpyriphos (93.75 %), early shoot borer through spraying of Chlorantraniliprole (Coragen) (69.38 %) and control of root grub by drenching of Fipronil+Imidacloprid (lesenta) (31.88 %). Whereas less per cent of the sugarcane growers had knowledge about management of root grub by sett treatment (18.75 %) and early shoot borer by

Table 2: Knowledge level of sugarcane growers about plant protection measures (n=160)

Sr. No.	Recommended production technologies of sugarcane	Knowledge of practices	
		f	%
I	**Insect pest management**		
1.	Woolly aphid		
	Spray malathion 50EC @2ml/lit or chlorpyriphos 50EC @2ml/lit or Acephate 75WP @2ml/lit	160	100.00
2.	Root grub		
	Sett treatment with Chlorpyriphos 50EC	30	18.75
	Drenching of Chlorpyriphos 50EC @2lit in 400 litres of water or heavy inundation of water	150	93.75
	Drenching of Lesenta (Fipronil+Imidacloprid) @150gm/acre.	36	22.50
3	Early shoot borer		
	Spray Chlorantraniliprole (Coragen) 18.5 SC 0.5ml/lit	111	69.38
	Release of *Trichogramma chilonis* 5 cards/acre	12	7.50
II	**Disease management**		
1.	Grassy shoot Rough out infected plants or uproot and burn	160	100.00
2.	Smut Sett treatment with Carbendazim 50WP 1gm/lit or Benomyl 50WP @1gm/ lit.	37	23.12
3.	Pineapple disease Sett treatment with *Trichoderma harzianum* @10gm/lit.	7	4.38

f- Frequency %- Percentage

biocontrol agent *Trichogramma chilonis* (16.88 %).With respect to diseases management, cent per cent of growers had knowledge about recommended method of managing grassy shoot, while 31.25 per cent of growers had knowledge about management of smut (31.25 %).The woolly aphid and root grub are regularly occurring pests in sugarcane so that growers had knowledge of management of these pests.

Knowledge level of sugarcane growers about harvest operation :

The Table 3 shows that, cent per cent of respondents had knowledge about harvesting of cane 10-14 months after planting, harvesting of sugarcane within two months of emergence of arrow, manual harvesting and mechanical harvesting.

The results are similar to the results of Mishra (2006) noticed that, 75.83 per cent of sugarcane farmers had knowledge of market facility followed by fertilizer use (72.50 %), tying operation (70.83 %), time and method of harvesting (70.00 %), time of irrigation (68.83 %), improved varieties (46.67 %) and preparation of land (41.67 %). Rojh *et al.* (2016), Netam *et al.* (2018) and Sujaivelu and Saravanam (2019) were also reported similar findings.

Overall knowledge level of sugarcane growers about production technologies :

It was observed from Table 4 that, two fifth (40.63 %) of sugarcane growers distributed in medium knowledge category followed by high (32.50 %) and low (26.86 %) knowledge category. This might be because of the fact that most of North Karnataka area considered sugarcane as potential cash crop and cultivated since long time. As it is a main cash crop all growers generally try to know more about the crop. This aspect might have made majority growers to strive themselves to acquire more knowledge about production technologies.

The findings are in line with the findings of Khandave *et al.* (2017) revealed that, 82.50 per cent of cotton growers had medium knowledge of cotton production technology followed by high and low (10.00 and 7.50 %), respectively. Findings of Emran *et al.* (2020) were also similar to the present findings.

Conclusion :

It can be concluded from the above findings that more than one third the sugarcane growers belonged to medium knowledge level category. With respect to recommended production technology wise knowledge majority of the respondents are aware about soil type, recommended varieties, planting time, spacing, application of organic manures, methods of irrigation and after cultivation practices. Comparatively low proportion of the growers expressed knowledge about quantity of chemical fertilizers application, sett treatment, intercropping with green gram and pre-emergent herbicides. This trend is due to their medium extension

Table 3 : Knowledge level of sugarcane growers about harvest operation **(n=160)**

Sr. No.	Recommended production technologies of sugarcane	Knowledge of practices	
		f	%
1.	Harvesting of sugarcane 10 to 14 months after planting	160	100.00
2.	Harvesting of sugarcane within two months of emergence of flower	160	100.00
3.	Manual	160	100.00
4.	Mechanical	160	100.00

f- Frequency %- Percentage

Table 4 : Distribution of sugarcane growers based on their overall knowledge on recommended production technologies **(n=160)**

Sr. No	Category	Sugarcane growers	
		f	%
1.	Low (<28.45)	43	26.86
2.	Medium (28.45-31.59)	65	40.64
3.	High (>31.59)	52	32.50
	Total	160	100.00
Mean		30.02	
SD		3.70	

f- Frequency % - Percentage

participation, mass media exposure, economic motivation, innovativeness and lack of training facilities. Hence, the development department has to conduct training programmes on sugarcane cultivation and establish demonstration plots in the farmer's field.

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