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A study on the knowledge, adoption and constraints of the farmers about recommended technologies of sugarcane cultivation

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ABSTRACT

The study was conducted in Madhanur and Gudiyathem blocks of Vellore district in Tamil Nadu to find out the knowledge, adoption of advanced cultivation technologies and constraints faced by the sugarcane growers. The data were collected from 150 respondents through an interview schedule. Nearly half of the respondents (48.00%) possessed medium level of knowledge on sugarcane cultivation technologies; majority of the farmers had adopted the recommended varieties and weedicide use (92.00% each) followed by planting time (88.00%), earthing up operation (83.33%), method of planting (81.33%), fertilizer application (NPK) (81.33%), seed rate/plant population (76.62%) and spacing (62.67%). No farmer adopted intercropping and internode borer management using *Trichogramma* whereas majority (69.33%) did not adopt woolly aphid management. Most of the respondents were not aware of the SSI method of sugarcane cultivation. All of them expressed the non-availability of labour as the major constraint followed by high cost of labour (90.00%) and fertilizers (82.00%).

Keywords: Sugarcane; cultivation; awareness; knowledge; adoption; constraints

INTRODUCTION

Sugarcane cultivation and sugar industry in India play a vital role towards socio-economic development of the rural areas by mobilizing rural resources and generating higher income and employment opportunities. It contributes significantly to the socio-economic development of the nation. Indian sugar industry is also a major sector to generate employment to rural population. Probably 0.5 million people dependent on sugar factories and also 50 million sugarcane farmers and 7.5 per cent of the rural population are involved in cultivation of sugarcane, harvesting and ancillary activities in India (Venkatesh and Venkateswarlu 2017).

Sugarcane is an important commercial crop of India. It has great potential for production and export of sugar and sugar products. Based on the satellite images procured in the latter part of June 2019, the total acreage under sugarcane in the country is estimated to be around 49.31 lakh hectare in 2019-20 SS which is over 10 per cent lower than 2018-19 sugar season's cane area of around 55.02 lakh hectare. Sugarcane area in Tamil Nadu for 2019-20 SS has decreased to about 2.30 lakh hectare as against 2.60 lakh hectare in 2018-19 SS mainly due to deficient rainfall in major cane growing districts during NE monsoon 2018 (Bhosale 2019).

Though there is increase in the area and production of sugarcane the productivity has shown decreasing trend during the last two decades. The factors like increase in relative prices of sugarcane, sugar and jaggery, spread of new technology of sugarcane cultivation, establishment of large number of sugar manufacturing units in cooperative sector, increased availability of production inputs and progressive policy measures of the state government have desirable effect on increasing the area and production of sugarcane in the state. The increased use of pesticides and fertilizers has also deteriorated the quality of soil and thereby declined the yield of sugarcane and resulted into less sugar production.

The present study was thus conducted to find out the knowledge and adoption of recommended cultivation technologies in sugarcane by the farmers and to identify the constraints encountered by them in the adoption of these technologies.

METHODOLOGY

The study was conducted in Vellore district of Tamil Nadu. Out of 20 blocks in Vellore district, two blocks viz Madhanur and Gudiyatham were selected considering the coverage of sugarcane area. Total 150 farmers were selected taking from each block by employing proportionate random sampling method. An ex-post facto research design was used and structured questionnaire was prepared and administered to collect data through face to face interaction. Data were coded and tabulated. The knowledge and adoption of advanced sugarcane technologies and also constraints faced by the farmers were assessed. The statistical software SPSS was used to analyze the data.

RESULTS and DISCUSSION

Knowledge level of the farmers about recommended technologies of sugarcane cultivation

Data given in Table 1 indicate that nearly half of the respondents (48.00%) possessed medium level of knowledge on sugarcane cultivation technologies followed by high (28.67%) and low (23.33%) level. This trend could be due to the efforts made by the extension system by way of undertaking periodical visits to the farmers and educating them on the latest sugarcane cultivation technologies.

Table 1. Distribution of respondents according to their knowledge level of recommended technologies of sugarcane cultivation

Category	Respondents (n= 150)	
	Number	Percentage
Low	35	23.33
Medium	72	48.00
High	43	28.67

Kanavi (2000) reported that majority (68.00%) of the respondents of sugarcane growers in Belgaum (Karnataka) possessed medium level of knowledge about recommended sugarcane cultivation practices. Majority had knowledge about correct planting time (98.00%), harvesting period (94.00%) and number of top dressings with nitrogen (86.00%). Maraddi (2006) found that knowledge of sugarcane farmers of Karnataka about cultivation technologies was at moderate level. Cent per cent of the respondents had knowledge about preparing land into ridges and furrows, selecting setts from main crop, use of FYM, use of mulching and chemical tools of IPM. Majority had no knowledge regarding vermicompost and biofertilizers (*Azotobacter/Azospirillum*). Meena et al (2012) assessed the knowledge level of the farmers of Hanumangarh district, Rajasthan about rice production technology and found that 70.00 per cent farmers had medium level of knowledge. The farmers had very good amount of knowledge (above 90%) in practices like irrigation management, high yielding varieties and soil and field preparation while they had poor knowledge regarding seed and soil treatment.

Extent of adoption of recommended sugarcane cultivation technologies by the farmers

Extent of adoption of technologies was studied wrt recommended sugarcane cultivation practices (Table 2). Majority of the farmers had adopted the recommended varieties and weedicide use (92.00% each) followed by planting time (88.00%), earthing up operation (83.33%), method of planting (81.33%), fertilizer application (NPK) (81.33%), seed rate/plant population (76.62%) and spacing (62.67%). No farmer adopted intercropping and internode borer management using *Trichogramma* whereas majority (69.33%) did not adopt woolly aphid management.

Kanavi (2000) reported that majority (79.00%) of the respondents sugarcane growers in Belgaum district (Karnataka) belonged to medium adoption category with respect to recommended sugarcane cultivation practices and most of the respondents adopted practices like top dressing of nitrogen (98.00%), use of the organic fertilizers (92.00%), spacing (81.33%) and planting time (76.00%) as recommended.

Maraddi (2006) reported that among sugarcane growers in Karnataka, majority had adopted inorganic manures, deep tillage to incorporate left over debris, dipping setts in 0.1 carbendazim and planting disease-free setts. Meena et al (2012) found that about 68.50 per cent rice growers had medium extent of adoption followed by low and high. They had very good extent of adoption regarding recommended irrigation

Table 2. Distribution of respondents according to extent of adoption of recommended cultivation technologies

Component	Respondents (n= 150)					
	Adopted		Partially adopted		Not adopted	
	Number	percentage	Number	percentage	Number	percentage
Varieties	138	92.00	12	8.00	-	-
Planting time	132	88.00	18	12.00		
Seed rate/plant population	115	76.62	35	23.33	-	-
Method of planting	122	81.33	28	18.67	-	-
Spacing adopted	94	62.67	56	37.33	-	-
FYM application	46	30.62	34	22.67	70	-
Fertilizer application (NPK)	122	81.33	28	18.67	-	-
Earthing up operation	125	83 33	25	16.67	-	—
Weedicide use	138	92.00	12	8.00	-	-
Intercropping	-	-	-	-	150	100
Internode borer management using *Trichogramma*	-	-	-	-	150	100
Woolly aphid management	46	30.62	-	-	104	69.33

Multiple responses

management practices and useful method of planting. They had very low extent of adoption in recommended storage practices. Nagaraja et al (2008) reported that in Bhadra command area, Karnataka cent per cent of the respondents adopted the use of weedicide and 80 per cent used the recommended seed rate and sowing time. Nearly 50 per of the respondents adopted varieties and use of *Azotobacter* biofertilizer as per recommendation. Sisodia (2006) reported that of the respondent farmers of Chittorgarh district, Rajasthan 48.33 per cent adopted the sugarcane production technology to medium level whereas 22.50 and 29.17 per cent to low and high level respectively. In overall farmers had adequate adoption regarding recommended time of sowing and using phosphatic fertilizer as per recommendation whereas less adoption regarding using proper soil treatment to prevent the soil born diseases and using recommended doses of micronutrients. Deokate et al (2015) in western Maharashtra found that the adoption of the recommendations on sugarcane cultivation was very poor.

Awareness of the farmers about sustainable sugarcane initiative (SSI) method of sugarcane cultivation

Data given in Table 3 show that more than 40.00 per cent of the respondents (43.33%) were aware about the drip irrigation in sugarcane cultivation followed by organic manure application (36.00%), portray seedlings (32.00%), spacing (30.66%) and usage of farm implements/machineries for intercultural operations (30.00%). Thus most of the respondents were not aware of the SSI method of sugarcane cultivation. It may be due to the lack of technical guidance, small size landholdings and poor economic condition of the farmers.

Deokate et al (2015) in a study in western Maharashtra found that the awareness level of the respondents regarding recommended sugarcane production practices was very low.

Constraints faced by the farmers in the adoption of recommended technologies of sugarcane cultivation

All the respondents expressed the non-availability of labour as the major constraint followed by high cost of labour (90.00%) and high cost of fertilizers (82.00%). It may be due to the fact that the farm activities require labour throughout the year and hence these constraints were perceived as the major ones by the respondents. Lack of awareness of advanced technologies (72.00%), lack of technical guidance (68.67%), frequent power cut (62.00%), delay in cutting order from the mill (57.33%) and water scarcity (43.33%) were the other constraints face by the growers (Table 4).

According to Kanavi (2000), more than half of the respondents expressed irregular supply of electricity for irrigation (67.33%), high cost of chemical

Table 3. Distribution of respondents according to their awareness about SSI method of sugarcane cultivation

SSI-technology	Respondents (n=150)	
	Number	Percentage
Protray seedlings	48	32.00
Spacing	46	30.66
Drip irrigation	65	43.33
Organic manure application	54	36.00
Usage of farm implements/machineries for intercultural operations	45	30.00

Multiple responses

Table 4. Constraints faced by the respondents in adoption of management technologies in sugarcane cultivation

Constraint	Respondents (n= 150)	
	Number	Percentage
Non-availability of labour	150	100.00
High cost of labour	135	90.00
Lack of awareness of advanced technologies	105	72.00
Water scarcity	65	43.33
Lack of technical guidance	103	68.67
Delay in cutting order from the mill	86	57.33
High cost of fertilizers	123	82.00
Frequent power cut	93	62.00

Multiple responses

fertilizers (54.66%) and delay in cutting order and payment (53.66%) as major problems in sugarcane cultivation. Thakur and Shirke (2016) studied the constraints faced by the mango growers and found that lack of technical and scientific guidance regarding plant protection measures, lack of knowledge regarding quantity and concentrations of chemicals to be used and lack of knowledge regarding identification of pests, their nature of damage, diseases and their symptoms, unavailability of required insecticides and fungicides at village level, high cost of plant protection chemicals and equipments, unavailability of plant protection equipments on hire basis, lack of facilities for repairing plant protection equipments at village level, lack of finance and sudden rainfall after spraying causing washing off plant protection were the major constraints.

Sisodia (2006) indicated that the most important constraints faced by the sugarcane growers of Chittorgarh district of Rajasthan were non-availability of financial aid in time, continuous adoption of traditional package of practices, lack of awareness about biofertilizers, irregular supply of electricity for irrigation and non-availability of market at village.

CONCLUSION

Majority of the respondents were not aware about latest technologies in sugarcane cultivation. The lack of information on the part of the farmers might be the major cause of non-adoption. Thus there is need to make use of extension methods such as group meetings, trainings and demonstrations by extension workers to educate farmers regarding the SSI technologies. Sugarcane being a long duration crop, the farmers were not aware of biofertilizer application and intercropping in sugarcane. The extension workers need to educate the farmers in this regard. Cultural practices like preparatory tillage, season planting, recommended doses and balanced use of plant nutrients, weeding, intercultural operations, manureing and disease, pest and water management have been very crucial for exploiting untapped farm potential incurring little cost.

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