

Constraints in adoption of improved sugarcane cultivation technology by sugarcane growers in East Champaran District of Bihar State

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ABSTRACT

The present investigation was carried out during the year of 20016-2017 in four selected villages at Kotwa block in East Champaran district of Bihar state. 30 respondents were selected from each village by using simple random sampling procedure, thus the total 120 respondents were considered for the study. Information relating to various problems faced by the sugarcane growers was enlisted in pre-tested interview schedule. Oral interview was schedule was used to collect data from one hundred twenty (120) respondents who were randomly selected. The data were analyzed statistical percent and mean score analysis. The results of study revealed that in economical constraints majority of respondents had strongly agree (81.67 per cent) face in high cost of input in cultivation of sugarcane followed by strongly agree In socio cultural constraints most of respondents (74.16 per cent) face in continuous adoption of traditional packages It is observed that, strongly agree the technical constraints majority of respondents (85.00 per cent) face lack of knowledge about insect pest. In Technical constraints, Majority of respondents(90.84%) had faced the lack of knowledge about Improved implements and spraying instruments are not available in rural area and also observed that majority of respondents(88.33%) faced constraints in post harvest was Non availability of juice extractor at village. *Keyword: Constraints, Production technology, Sugarcane growers.*

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INTRODUCTION

Sugarcane (*Saccharum officinarum* L.) is one of the important commercial crops in the world and holds a prominent position as a cash crop. Sugarcane is grown in subtropical and tropical regions of the world in a range of different climates from hot dry environment to cool and moist environment at higher elevations. Sugarcane is a renewable, agricultural resource because it provides sugar, besides biofuel, fiber, fertilizer and myriad of byproducts with ecological sustainability. Sugarcane is used for making many things such as white sugar, brown sugar (khandsari) and jiggery (gur). Sugarcane is a major source of nutrient value like that carbohydrate (111.13 kj), protein (27.51 gram) calcium (0.37mg), iron (0.27 gram) and potassium (11.23 mg). Juice of Sugarcane with the mix of lemon and ice to form a popular drink, now largely supplemented in USA by high fructose corn syrup which is less expensive because of corn subsidies and sugar tariff, the most popular distilled alcoholic beverage in Brazil. It is one of the main crop of earning foreign exchange. The main derivatives of the sugarcane industry are bagasse and molasses. Bagasse is mainly used as a fuel. It is also used for the production of compressed fiber board, paper, plastics and furfural. Molasses is used in distilleries for the manufacture of ethyl alcohol,

butyl alcohol, citric acid etc. Sugar industry in India is next in importance only to the textile industry and provides gainful employment to a large number of people. Sugarcane is restrain to play a greater role in the Indian economy to come by offering a stable income to the farmers by way of cane price, by providing employment to rural masses, by realizing excise duty, purchase tax and foreign exchange earning to the years. The country of the world lying between the latitude 36.70 north and 31.00 south of the equator extending from tropical to sub-tropical zones which are growing sugarcane. In India sugarcane is cultivated from a latitude 80 N to 330 N, except cold hilly areas like Kashmir valley, Himachal Pradesh and Arunachal Pradesh. Sugarcane is the world's largest crop. Sugarcane is grown in over 127 countries. In 2016-2017, an estimated with acreage of about 2.51 lakhs hectares, production to the tune of 1899.99 million ton and average yield of sugarcane worldwide 69.90 ton/ha (FAO, 2016). Sugarcane is an important commercial and cash crop in India with acreage of about 49.53 lakhs hectare, production to the tune of 352.16 million tons and yield of sugarcane is 71095kg/ha. Sugarcane occupies prominent position about 3.0% of the total cultivated area and it is one of the most significant cash crops, tributary about 7.5 per cent of the gross value of agricultural production in the country. Almost 50 million farmers reckon on sugarcane cultivation for their sustenance and equal number of agricultural laborers earn their living by working in sugarcane farms. India ranks second in cane area and sugar production after Brazil. The states of Uttar Pradesh growing sugarcane in areas (21.93lakhs.ha), production(135.75million ton) and yield (61.90t/ha). Maharashtra in area (6.33lakhs ha), production (49.66mt)and yield (78.46t/ha) Karnataka in area (4.40lakhs ha), production (33.44mt) and yield (76t/ha), Tamil Naidu in area(2.57lakhs ha),production (17.69mt) and yield(106t/ha) and Bihar in area (2.51laks ha), production (14.22mt) and yield (53.63t/ha) together produce nearly 90 per cent of the cane and sugar in the country [1].

The current study focused on the training needs and the constraints faced by the sugarcane grower in adoption ofcultivation technology, socio-cultural in which continuous adoptionof traditional package of practices, seed and supply constraints etc. and a little bit the research provide to consultancy to sugarcane growers. Unless and until the farmers use the new sugarcane production technology, Indian agriculture cannot be boosted. Training of sugarcane production technology affects the behavior of sugarcane growers concerning a use of new technology and hence, in due course contributes to increase of agricultural allocate in Indian economy. The findings of study should useful to agricultural planners, educators and administrators comparable to plan and carry out the huge scale sugarcane training programmes. The pronouncement of the present study would be massive helpful to extension personnel engaged in the task of promoting sugarcane production of sugarcane growers through formulation of appropriate training programmes in the light of professed training needs of sugarcane growers.

MATERIAL AND METHODS

The present study was conducted in East champaran district of Bihar state, where one block were selected for the study In this block there were 43 villages. A list of sugarcane villages was prepared withthe help of Block Agriculture Officers of the block, out of which four villages were selected randomly were as followed,Kotwa, Dipau, Rajapur, and Barkurwa were randomly selected for the study on the basisof large area covered under sugarcane. Hence, total numbers of villages selected were four. The list of sugarcane producers cultivating sugarcane for last one year was obtained from Gram Sewak and using simple random sampling technique, thirty growers from each village were selected randomly. Thus, the sample size was worked out to 120. A pre tested structured schedule was used to collect related data for year 2016-17. The respondents were interviewed at their homes and in some cases at ordinary place in the village. The intention of the study was also explained to the respondents.

RESULT AND DISCUSSION

The results obtained from the current study as well as discussions have been summarized under following heads:

Constraints faced by sugarcane growers

The constraints faced by sugarcane growers were divided in five broad categories namely Economic constraint, Socio-cultural constraint, Seed supply constraint, Post harvest constraints and Technical constraints.

Economic constraint:

The various types of economic constraints faced by the sugarcane growers were evaluated and presented in Table 1. Multiple responses were taken to ascertain the constraints faced by sugarcane farmers in adoption of recommended production technology of sugarcane. Various problems are presented in table one which indicated that majority (38.50 per cent) of respondents faced problems of high cost of inputs, followed by high wage rate of labor during sowing and harvesting time (36.40 per cent), Non availability of financial aid in time (35.40 per cent), High cost of insecticides and pesticides (34.60 per cent), high cost of chemical fertilizers (33.40 per cent), high cost of planting materials (32.60 per cent), and finally faced by lack of money to purchase required requisite (29.66 per cent). Thus after observation concluded that the major constraints faced by farmers are high cost of inputs, so they adopt a low technologies [3].

Socio-cultural constraint:

The result show that in table 2 continuous adoption of traditional package of practices (36.33 per cent) is the most important perceived constraints under this category. The other major constraints where concluded among farmers are farmers tendency of non using the practices until others farmers in his social system to use the same (33.40 per cent), belief that high yield entirely depend upon god will rather than use of sugarcane seed and fertilizers (27.50 per cent), and finally found that in socio cultural constraints is less affected by neighbor is not using the improved practices (24.46 per cent).

Seed supply constraint:

The majority of respondents faced constraints of lack of knowledge about major insect-pest disease and their control (38.00 per cent) and lowest constraints Lack of knowledge about proper time of harvesting (18.66 per cent). The other major constraints where observe that a little difference are found as followed by lack of knowledge about sugarcane varieties , seed rate, spacing and date of sowing (34.87 per cent), lack of knowledge about soil borne insect-pest and control (34.66 per cent), lack of knowledge about weed and their control (34.60 per cent), Non availability of technical device (34.04 per cent). Some constraints are faced by the respondents is very difficult to solve out like as Lack of knowledge about seed treatment (33.40 per cent), lack of knowledge about propping and blind hoeing (25.13 per cent), lack of knowledge about ratooning (29.66 per cent) and Lack of knowledge about bio- fertilizers. All are presented in the table 3.

Post harvest constraint:

Table 4 indicated post harvest related constraints in adoption of sugarcane cultivation technology as perceived by growers and these were non availability of juice extractor at village. (38.29 per cent), followed by non-availability of market at village. (34.66 per cent), lack of storage facilities (34.60 per cent), The unhealthy fluctuating marketing trends with poor supporting price to the farmer produce (32.60 per cent), Malpractices in market like recording lesser than actual weight (24.66 per cent), Recovery based pricing is not followed (20.87 per cent) and Difficulties in getting money immediately after sale (18.66 per cent) [2].

Technical constraints:

Table 5 that the major constraints for adoption of recommended cultivation technologies of sugarcane were reported as improved implements and spraying instruments are not available in rural area. (39.26 per cent). Non availability of sugarcane sets in time. (38.29 per cent). lack of adequate irrigation facilities (34.60 per cent), fertilizers are not timely available (34.06 per cent), irregular supply of electricity for irrigation (27.86 per cent), and Insecticides /Pesticides/Weedicide are not timely available (20.87 per cent).

**Table1: Economic constraints faced by sugarcane growers during cultivation
n = 120**

Sl.No.	Practices	S.A.	A.	Un	Dis	S.D.	Weighted mean	Rank
1.	Lack of money to purchase required requisite.	48.33% (58)	17.50% (21)	7.50% (9)	10.00% (12)	16.67% (20)	29.66	VII
2.	High cost of inputs.	81.67% (98)	18.33% (22)	0.00% (0)	0.00% (0)	0.00% (0)	38.53	I
3.	Non availability of financial aid in time.	74.16% (89)	7.53% (9)	6.67% (8)	8.33% (10)	5.00% (6)	35.40	III
4.	High cost of insecticides and pesticides.	65.83% (79)	19.17% (23)	5.84% (7)	0.00% (0)	9.16% (11)	34.60	IV
5.	High cost of planting materials.	47.50% (57)	26.67% (32)	17.50% (21)	2.05% (3)	5.833% (7)	32.60	VI
6.	High wage rate of labor during sowing and harvesting time.	85.00% (102)	0.00% (0)	7.50% (9)	0.00% (0)	7.50% (9)	36.40	II
7.	High cost of chemical fertilizers.	52.50% (63)	35.83% (43)	0.00% (0)	0.0% (0)	11.67% (14)	33.40	V

**Table 2 :Socio- cultural constraints
n = 120**

Sl.No.	Practices	S.A.	A.	Un	Dis	S.D.	Weighted mean	Rank
1	Farmers tendency of non using the practices until others farmers in his social system to use the same.	54.16% (65)	30.00% (36)	0.00% (0)	10.83% (13)	5.00% (6)	33.40	II
2	Neighbor is not using the improved practices.	13.33% (16)	23.33% (28)	32.50% (39)	17.50% (21)	13.33% (16)	24.46	IV
3	Belief that high yield entirely depend upon god will rather than use of sugarcane seed and fertilizers.	38.33% (46)	10.00% (12)	26.67% (32)	7.50% (9)	17.50% (21)	27.53	III
4	Continuous adoption of traditional package of practices.	74.16% (89)	19.17% (23)	0.00% (0)	0.00% (0)	6.67% (8)	36.33	I

**Table 3 : Seed and supply constraints:
n = 120**

S.N.	Practices	S.A.	A.	Un	Dis	S.D.	Weighted mean	Rank
1.	Lack of knowledge about sugarcane varieties ,seed rate, spacing and date of sowing.	70.83% (85)	9.16% (11)	10.83% (13)	3.33% (4)	5.85% (7)	34.87	II
2.	Lack of knowledge about soil borne insect-pest and control	68.33% (82)	15.00% (18)	7.50% (9)	0.00% (0)	9.16% (11)	34.66	III
3.	Lack of knowledge about adequate quantity and methods of fertilizers application.	30.00% (36)	24.166% (29)	32.50% (39)	4.16% (5)	9.16% (11)	28.93	VIII
4.	Lack of knowledge about seed treatment.	54.16% (65)	30.00% (36)	0.00% (0)	10.83% (13)	5.00% (6)	33.40	VI
5.	Lack of knowledge about critical stage of irrigation.	13.33% (16)	23.33% (28)	32.50% (39)	17.50% (21)	13.33% (16)	24.46	X
6.	Lack of knowledge about weed and their control.	65.83% (79)	19.17% (23)	5.84% (7)	0.00% (0)	9.16% (11)	34.60	IV
7.	Lack of knowledge about major insect-pest disease and their control.	85.00% (102)	10.83% (13)	0.00% (0)	2.50% (3)	1.67% (2)	38.00	I
8.	Non availability of technical device.	57.50% (69)	21.67% (26)	10.00% (12)	10.83% (13)	0.00% (0)	34.06	V
9.	Lack of knowledge about propping and blind hoeing.	15.83% (19)	25.83% (31)	30.00% (36)	13.34% (16)	15.00% (18)	25.13	IX
10.	Lack of knowledge about bio-fertilizers.	23.33% (28)	43.33% (52)	0.00% (0)	20.84% (25)	12.50% (15)	24.06	XI
11.	Lack of knowledge about proper time of harvesting.	7.50% (9)	14.16% (17)	15.00% (18)	30.84% (37)	32.50% (39)	18.66	XII
12.	Lack of knowledge about ratooning.	48.33% (58)	17.50% (21)	7.50% (9)	10.00% (12)	16.67% (20)	29.66	VII

**Table 4 :Post harvest constraints
n = 120**

Sl.No.	Practices	S.A.	A.	Un	Dis	S.D.	Weighted mean	Rank
1	Lack of storage facilities.	65.83% (79)	19.17% (23)	5.84% (7)	0.00% (0)	9.16% (11)	34.60	III
2	Difficulties in getting money immediately after sale.	7.50% (9)	14.16% (17)	15.00% (18)	30.84% (37)	32.50% (39)	18.66	VII
3	Non availability of juice extractor at village.	88.33% (106)	6.67% (8)	0.00% (0)	5.00% (6)	0.00% (0)	38.29	I
4	Non availability of market at village.	68.33% (82)	15.00% (18)	7.50% (9)	0.00% (0)	9.16% (11)	34.66	II
5	The unhealthy fluctuating marketing trends with poor supporting price to the farmer produce.	47.50% (57)	26.67% (32)	17.50% (21)	2.05% (3)	5.833% (7)	32.60	IV
6	Mal practices in market like recording lesser than actual weight.	13.33% (16)	23.33% (28)	32.50% (39)	17.50% (21)	13.33% (16)	24.46	V
7	Recovery based pricing is not followed.	9.16% (11)	22.50% (27)	11.67% (14)	33.33% (40)	23.35% (22)	20.87	VI

Table 5 :Technical constraints n = 120

Sl.No.	Practices	S.A.	A.	Un	Dis	S.D.	Weighted mean	Rank
1.	Non availability of sugarcane sets in time.	88.33% (106)	6.67% (8)	0.00% (0)	5.00% (6)	0.00% (0)	38.29	II
2.	Fertilizers are not timely available.	57.50% (69)	21.67% (26)	10.00% (12)	10.83% (13)	0.00% (0)	34.06	IV
3.	Lack of adequate irrigation facilities.	65.83% (79)	19.17% (23)	5.84% (7)	0.00% (0)	9.16% (11)	34.60	III
4.	Insecticides/Pesticides/Weedicide are not timely available.	9.16% (11)	22.50% (27)	11.67% (14)	33.33% (40)	23.35% (22)	20.87	VI
5.	Improved implements and spraying instruments are not available in rural area.	90.84% (109)	9.16% (11)	0.00% (0)	0.00% (0)	0.00% (0)	39.26	I
6.	Irregular supply of electricity for irrigation.	45.00% (54)	14.16% (17)	0.00% (0)	25.84% (31)	15.00% (18)	27.86	V

Suggestions to overcome the constraints: In order to improve the adoption of sugarcane production technology suggestions were invited from the sugarcane growers. Each individual respondent was posed to make suggestion to overcome the constraints experienced in adoption of sugarcane production technology. The suggestions were as follow:

- 1) Timely availability of required agricultural inputs at low cost.
- 2) Fertilizers, insecticides and weedicide are timely available.
- 3) Availability of adequate water for irrigation of sugarcane field.
- 4) Regularly supply of electricity for irrigation.
- 5) Increase the knowledge about soil borne insect-pest and disease control.
- 6) Continuously improve adoption of modern package of practices.
- 7) Availability of technical device.
- 8) To store the byproduct of sugarcane provide good storage facilities.
- 9) Proper harvesting schedule of sugarcane should be followed.
- 10) Prices of the sugarcane should be increased.

CONCLUSION

It can be concluded from the study that higher percentage of respondents were middle aged, literate up to primary school level, having medium size of land holding with medium annual income, medium, medium material possession, medium farming experiences with

sugarcane cultivation technology, medium mass media exposure, medium knowledge about sugarcane cultivation technology and medium adoption of improved technology. The technological gap was higher in case of disease control, insect control, weed control etc.

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