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Problems faced by farmers in knowledge adoption Behavior of sugarcane in eastern UP

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Abstract

Sugarcane is the world's largest sugar source (80%) and has a high position as a cash crop. For the processing of white sugar, brown sugar (khandsari) and gur or jaggery, sugar juice is used. The highest area under sugarcane cultivation is in Uttar Pradesh. However in Maharashtra, the highest sugar recovery can be obtained. The study was conducted to analyze the problems of adoption of knowledge of sugarcane growing practices. The results revealed that the highest percentage (77.50) of the respondents faced problem about lack of training facilities about package practices followed by 62.50 percent had problem of non availability and high cost of sugarcane sets for seed.

Keywords: sugarcane, problem, suggestion, frequency

Introduction

Sugarcane (*Saccharum officinarum*) 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*, *Saccharum robustum*. Origin of the sugarcane is New Guinea. Sugarcane is one of the world's oldest commercial and viable crops in the tropics and sub-tropics. Sugarcane is becoming an important cash crop for farmers because the domestic market has great potential for sugar production and sugarcane products. The expansion of the sugarcane industry in India would therefore greatly benefit the economy through foreign exchange savings, job and income generation, rural growth and living standard of rural people. Sugarcane is the world's largest sugar source (80%) and has a high position as a cash crop. For the processing of white sugar, brown sugar (khandsari) and gur or jaggery, sugar juice is used. Bagasse and molasses are the sugarcane industry's primary by-products. Bagasse is used primarily as a fuel. It is also used to make compressed cardboard, plastic, etc. Molasses are used to manufacture ethyl alcohol, butyl alcohol, citric acid, etc. in distilleries. Rum is the finest drinkable molasses-based liqueur. For animals, molasses is often used as a feed additive. In acidic and alkaline soils, pressed mud can be used as a soil improver. A good source of forage for livestock is green barrel spikes.

Sugarcane is grown worldwide between the latitude of 36.7 °N and 31.0 ° S of the equator, ranging from the tropical to subtropical areas. There is no country in which sugar is not used and only sugar cane or sugar beet crops are grown. About 80% of sugar is extracted from sugarcane and the remaining 20 percent from sugar beet. Every year, an average person consumes around 24 kg of sugar.

The global production of sugarcane in top three countries in world is shown in the Table 1. below, Brazil producing 51% of the world total with 743.10 million of tones and India producing 17% of the total with 376.90 million tones, and China and Thailand producing about 6% each.

Table 1: Top three sugarcane growing countries in world

Country	Sugarcane area (Million hectare)	Sugarcane production (Million tonnes)	Productivity (Tonne per hectare)
Brazil	10.04	743.10	80.64
India	5.06	341.20	79.65
China	1.76	126.15	81.33

Source: FAO statistics, 2018

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In India, area and production of sugarcane has been fluctuating from year to year depending upon pricing policy and climate conditions. It occupies about 5.06 million hectares. The total production of cane is 341.20 million tonne (Directorate of Economic & Statistics, DAC&FW). In tropical states the productivity of sugarcane is higher (80 t/ha) than that of subtropical countries (60 t/ha). In the tropical zone, sugarcane has more or less ideal climatic conditions for its year-round growth and production. Cool nights with clear sky and the latitudinal location of the area favourable for sugar accumulation due to long sunshine hours in Maharashtra and the adjoining areas of Karnataka, Gujarat and Andhra Pradesh report greater sugar, recovery. While sugarcane crops often face abiotic and biotic stresses during tillering and broad growth phases, they are critical for sugarcane crops and adversely affect growth and yield.

There are three sugarcane agro-climatic zones in the subtropical region, such as the North-West Zone, the North-Central Zone and the North-East Zone. Uttar Pradesh (U.P), Bihar, Haryana and Punjab states face climate extremes in the North Central Region, such as high and low temperatures, relative humidity, sunshine hours and wind velocity, etc. are key distinctive features. The production and productivity of sugarcane in this area is very much affected by climate conditions throughout the region. The highest area under sugarcane cultivation is in Uttar Pradesh. However in Maharashtra, the highest sugar recovery can be obtained. Depending on the seasons, climatic conditions are usually variable and often even throughout the season. In a year the sugarcane crop faces all the seasons. The weather is very hot and dry during April through June. The rainy season from July to October accounts for much of the precipitation from south-west monsoon rains. The months of December and January are very cold and temperatures in many areas hit subzero levels. The months of November to March are cool with a clear sky. The Haryana, Punjab, Western Rajasthan and Western Uttar Pradesh regions of the North West Region and its temperature in December-January is very low, which also induces frost. The temperatures during May and June are extremely high. Active sugarcane development is limited to just 4-5 months due to harsh weather conditions.

Sugarcane suffers from floods and water logging during the monsoon months in the North East District, Eastern U.P, Bihar, and West Bengal. In achieving greater sugar cane yield, the high incidence of pests and diseases is a major bottleneck. In the subtropics, cane yields are lower due to short growing season, moisture stress, more problems with pests and diseases, floods and water logging, and very poor ratoons. The average yield of this area is about 60 tonnes per hectare.

In Uttar Pradesh the agriculture sector contributes 38.00 percent to the state's net domestic production. The net cultivated area of the Uttar Pradesh state is 4.683 Million hectares and the gross sown area is 5.561 Million hectares. Among the different district of Uttar Pradesh, the highest area covered under the sugarcane crop is in Basti.

The Basti or Gaur district of Uttar Pradesh is one of the most important sugarcane-growing district and the increase area under sugarcane crops in Gaur district has brought a change in the social as well as economic condition of the farmers.

Table 2: Area, Production and Productivity of sugarcane in Basti district of Uttar Pradesh

Block	Area (ha)	Production (t)	Productivity (t/ha)
Gaur	8005.700	628447.450	78.50
Basti Sadar	13148.26	1025564.670	78.00

Source: <https://bssukm.com>

The area under sugarcane crop in the district is 27447.005 hectares while the production is 2169685.745 tones and productivity is 79.05 tonnes per hectare in 2017-18. Above Table 2, shows the area, production and productivity of sugarcane in different blocks of Basti district. There is tremendous opportunity for making further progress in relation to increase the sugarcane production by way of adoption of modern technology in sugarcane- cultivation. The low yield data of sugarcane are due to so many factors responsible for non-adoption of modern sugarcane technology. Until and unless the farmers have not adopted complete package of practices of sugarcane cultivation the production may not be raised to achieve the desirable target of sugar production. The adoption of improved technology of sugarcane by the farmers is not uniform due to several reasons.

Hence, Basti is considered as boon for sugarcane and it will be significant to study on knowledge and adoption of recommended sugarcane production technology. The available literature fails to reflect the problems faced by the sugarcane growers during the adoption of recommended sugarcane production and significant suggestions from sugarcane growers to improve the adoption of recommended sugarcane cultivation.

Material and Methods

Sugarcane is one of the most important cash crops in the Basti region of Uttar Pradesh state. There are 24 state controlled cooperative sugar mills in Uttar Pradesh, two of which are in the Basti district. These sugarcane factories are key to improving the socioeconomic status of sugarcane producers and adoption of recommended sugarcane production technology. The area cultivated with sugarcane increases every year and productivity is well below the recommended one. An obvious reason that can be attributed to the low productivity compared to the expected performance may be the gap between the technical knowledge already achieved and its application in the field is even much higher. There are enough feasible and adoptive technologies developed through extensive sugarcane research, but their reach for producers has been found to be low. The recovery of sugar and poor yield of sugarcane are main reason behind this. If sugarcane growers adopt the recommended practices related to sugarcane production technology, Sugarcane and sugar production can be increased. The research was identifying the problem faced by farmers during the adoption of recommended sugarcane production technology and suggestions obtain by them to improve the adoption. The research included only adoption of production technology of the sugarcane growers. Only 120 respondents from 12 villages were selected purposively for the study. The sugarcane grower's verbal expression and responses was the basis of this result.

Result and Discussion

Problems faced by the sugarcane growers during the adoption of recommended sugarcane production technology: Multiple responses were taken to ascertain the

problems faced by the sugarcane growers in adoption of recommended sugarcane production technology. On the basis of responses obtained from the respondents, various problems are presented in Table 3.

Table 3: Distribution of respondents on the basis of problem faced by them

S. No.	Problems	Frequency	Percentage
1.	Lack of training facilities about package of practices	93	77.50
2.	Non availability and high cost of sugarcane setts for seed	75	62.50
3.	High labour intensive nature of various cultivation practices	62	51.67
4.	Delay of payment by sugar factory	61	50.83
5.	High cost of fertilizer, weedicide and pesticide	59	49.17
6.	High labour charges and non-availability of labour	52	43.33
7.	Not getting satisfactory price from the produce	51	42.50
8.	Non availability of transportation facility during selling time	48	40.00
9.	Non availability and high cost of sugarcane setts for seed	47	39.17
10.	Shortage of fertilizer in market during peak period	38	31.67

So far as of the respondents faced problem in adoption of recommended sugarcane production technology are concerned and it was found that majority (77.50%) of the respondents had lack of training facilities about package and practices followed by 62.50 percent of the respondents had problem of non availability and high cost of sugarcane setts for seed, high labour intensive nature of various cultivation practices (51.67%), delay of payment by sugar factory (50.83%), high cost of fertilizer weedicide and pesticide (49.17%), high labour charges and non availability of labour (43.33%), not getting satisfactory price from the produce (42.50%), non availability of transportation facility during selling time (40%), non availability and high cost of sugarcane setts for seed (39.17%) and 31.67 percent of the respondents had problem of shortage of fertilizer in market in educate credit facilities 37.50 percent shortage of fertilizers in market during peak period. Suresh (2014) [7] reported that majority (97.50%) of the respondents had problem of prolonged drought and water scarcity followed by 93.33 percent of the respondents had problem of irregular electricity supply, non-availability of labour and high cost of labour (89%), high cost of in-organic fertilizer (81.6%) and low procuring cost by sugar factory (80.00%) were the major

problems reported by the sugarcane farmers. Shete *et al.* (2015) [6] it was noticed that, the constraints like lack of knowledge about identification of insect and pest was the main constraint in the adoption of sugarcane production technologies which was reported by (93.33%) respondents, another major problem was lack of availability of water and lack of knowledge about scientific plant protection reported by 91.67 percent and 90.00 percent respondents, respectively. Khandre (2015) [2] found that the constraints like lack of knowledge about identification of insect and pest was the main constraint in the adoption of sugarcane production technologies which was reported by 93.33 percent respondents, another major problem was lack of availability of water and lack of knowledge about scientific plant protection reported by 91.67 percent and 90.00 percent respondents, respectively.

Suggestions from respondents to improve the adoption recommended sugarcane production technology

As regards to the suggestions given by the respondents to overcome the problem faced by them during the adoption of recommended sugarcane production technology the findings are presented in the Table 4.

Table 4: Distribution of respondents on the basis of suggestions to improve the adoption recommended sugarcane production technology

S. No.	Suggestions	Frequency	Percentage
1.	Training should be imparted on new technology of sugarcane cultivation	91	78.83
2.	Improved/treated seeds should be made available to sugarcane growers in low price	84	70.00
3.	Knowledge should be provided from respective department regarding plant protection measures	69	57.50
4.	Payment should be made in a short time from sugar factory	56	46.67
5.	Satisfactory price should be provided from sugar factory	45	37.50
6.	Credit should be provided at proper time and as required quantity	37	30.83
7.	Regular visit and guidance should be done by village level workers	25	20.83

The data reveals that the majority 78.83 percent of the respondents were suggested that, training should be imparted on new technology of sugarcane cultivation followed by 70.00 percent of the respondents suggested that improve/treated seed should be made available to sugarcane growers in low price, 57.50 percent of the respondents suggested that knowledge should be provided from respective department regarding the plant protection measures, 46.67 percent of the respondents suggested that payment should be made in a short time from sugar factory, 30.83 percent of the respondents suggested that credit should be provided at proper

time and as required quantity and 20.83 percent of the respondents suggested that regular visit and guidance should be done by village level workers. Mane (2001) [3] concluded that majority of the respondents (70.83%) should be timely provided followed by 66.66% of the respondents emphasize that value of return should be constant for sugarcane cultivation. 61.66 percent of the respondents suggested that proper credit facilities should be provided for sugarcane cultivation 56.66 percent the respondents suggested that agricultural resources should be made available and 55.83 percent of the respondent suggested that equipment should be

available at less cost. Other problems like extension workers should we keep contact with farmers regularly, special training on low cost in input technology should be provided, improved sugarcane technology should be simply available in rural area and improve agriculture technology should be simplified and training should also conducted.

Nissar Hussain *et al.* (2004) [4] reported in his study that major difficulties faced by the respondent in adoption of recommendation Sugarcane practices include the high cost of farm machinery, high cost of herbicide, scarcity of irrigation water, lack of credit facilities, lack of finance and lack of awareness

Rangarao (2016) [5] in his study impact of integrated sugarcane trash management reported that majority 80.83 percent of the respondent suggested that knowledge should be provided through demonstration about improved trash management followed by 76.66 percent of the respondents suggested that knowledge should be provided for different chemical and biological fertilizers in management. Balasaheb (2015) [1] reported that majority 93.75 percent of the mechanical harvesting method by sugarcane growers suggested that use of by-product as manure for next year crop or next season of sugarcane. It is more profitable hot double profit as compared to by-produce. MSEB supply the electricity regularly to the farmers at day time to suggested by the 84.37 percent mechanical harvesting method and 75 percent manual harvesting method of sugarcane growers government should nominate the state price fixation committee for all the crops harvested by 78.17 percent and 62.50 percent in mechanical harvesting and manual harvesting method of sugarcane growers respectively. Agriculture department government of Maharashtra and Agriculture University should organise training program was suggested by both the mechanical harvesting method 68.75 percent and manual harvesting method 56.25 percent of the sugar cane growers. Government should provide quality drip irrigation system on subsidy was suggested by both the mechanical harvesting method 53.13 percent and manual harvesting method 43.75 percent of the sugarcane growers. Develop and spread new technology of intercultural operation was suggested by both the mechanical harvesting method 40.63 percent and manual harvesting method 31.25 percent of sugarcane growers.

Conclusion

Basti is considered a boon for sugarcane, and it will be necessary to research the knowledge and adoption of the prescribed technologies for the production of sugar cane. The study was conducted to know the problems faced by the sugarcane growers during the adoption of recommended sugarcane production technology and obtain the suggestions from sugarcane growers to improve the adoption of recommended sugarcane production technology.

Among several problems, the highest percentage (77.50) of the respondents faced problem about lack of training facilities about package practices subsequently 62.50 percent had problem of non availability and high cost of sugarcane setts for seed, high labour intensive nature of various cultivation practices (51.67 percent), delay of payment by sugar factory (50.83 percent), high cost of fertilizer weedicide and pesticide (49.17 percent), high labour charges and non availability of labour (43.33 percent), not getting satisfactory price from the produce (42.50 percent), non availability of transportation

facility during selling time (40 percent), non availability and high cost of sugarcane setts for seed 39.17 percent and 31.67 percent had problem of shortage of fertilizer in market in educate credit facilities 37.50 percent shortage of fertilizers in market during peak period.

Majority of the respondents 78.83 percent were suggest that, training should be imparted on new technology of sugarcane cultivation followed by 70.00 percent suggested that improve/treated seed should be made accessible to sugarcane growers in low price, 57.50 percent suggested that knowledge should be provided from respective department regarding the plant protection measures, 46.67 percent suggested that payment should be made in a short time from sugar factory, 30.83 percent propose that credit should be provided at proper time and as required quantity and 20.83 percent suggested that regular visit and guidance should be done by village level workers.

Conclusion

Among several problems, the highest percentage (77.50) of the respondents faced problem about lack of training facilities about package practices followed by 62.50 percent had problem of non availability and high cost of sugarcane setts for seed, high labour intensive nature of various cultivation practices (51.67 percent), delay of payment by sugar factory (50.83 percent), high cost of fertilizer weedicide and pesticide (49.17 percent), high labour charges and non availability of labour (43.33 percent), not getting satisfactory price from the produce (42.50 percent), non availability of transportation facility during selling time (40 percent), non availability and high cost of sugarcane setts for seed(39.17) and 31.67 percent had problem of shortage of fertilizer in market in educate credit facilities 37.50 percent shortage of fertilizers in market during peak period.

The suggestions obtained from the respondents to overcome the problems faced by them, the data revealed that majorityof the respondents 78.83 percent of the respondents were suggested that, training should be imparted on new technology of sugarcane cultivation followed by 70.00 percent of the respondents suggested that improve/treated seed should be made available to sugarcane growers in low price, 57.50 percent suggested that knowledge should be provided from respective department regarding the plant protection measures, 46.67 percent suggested that payment should be made in a short time from sugar factory, 30.83 percent of respondents suggested that credit should be provided at proper time and as required quantity and 20.83 percent of respondents suggested that regular visit and guidance should be done by village level workers.

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