

A Study on Management Practices followed by the Sugarcane Growers for Preventing Flood Losses

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ABSTRACT: The Sugarcane is main cash crop in the Kolhapur district. Due to surety of water in this region, rich soil and a supporting cooperative ensured a prosperous rural economy for decades. In 2019 sugarcane was planted over 1.52 lakh ha in district Kolhapur of Maharashtra (SANDRP 2019). But due to occurrence of flood in 2019 it was witnessed that the fields were submerged for 20 days. This led to wilted and stunted leaves, with a quickly spreading fungus that ate into the sugarcane leaf. Farmers who are completely dependent on sugarcane crop have undergone heavy losses. Thus, it is essential to utilize the management practices that will help the crop to survive under flood condition.

The study was conducted during the year 2019-20 in the Kolhapur district of Maharashtra state. The present investigation “A study on management practices followed by the sugarcane growers for preventing flood losses” was conducted in Karveer and Shirol tahsil of Kolhapur district. Seven villages from each tahsil and 10 respondents from each village were selected. Data were collected by personally interviewing 140 Sugarcane growers with the help of specially designed interview schedule. Collected data were analyzed with the help of suitable statistical methods. The analysis of the result showed that majority (60.00 %), Sugarcane growers had medium adoption, while, (27.86 %) and (12.14 %) of Sugarcane growers had low and high of adoption, respectively.

Keywords: Adoption, flood management, Sugarcane.

INTRODUCTION

The Sugarcane is a major cash crop of Maharashtra. Sugarcane occupies a place of pride in the agricultural economy of Maharashtra. In Maharashtra, Sugarcane is cultivated over an area of 1.16 m ha with production of about 92.44 m tones during 2018-19 (Anonymous 2018). Sugarcane changed the face of rural area in Maharashtra. The contribution of sugarcane crop is more in the social, economic and educational development of Maharashtra. Kolhapur district is famous for sugarcane cultivation. Weather and climatic conditions of Kolhapur district are very much favorable for cane production and also sugar recovery. In Kolhapur Sugarcane is cultivated over an area of 149280 ha with production of about 12491750 tones and average yield is 83.68 t ha⁻¹ during 2018-19 (Anonymous 2019). Thus, there is ample scope for improvement of cane and sugar productivity in this state. Although many reasons are there for low productivity, one of the important factors that affect productivity is decreased due to flood.

Flood is a natural phenomenon, which occurs due to prolonged high intensity of rain. This situation becomes hazardous when it causes colossal loss to human lives and property (Singh *et al.*, 1995). Floods are usual phenomena in north and eastern India, but during the years 2005 and 2006 in July and August, the flood situation has been experienced in upper Krishna Basin of Kolhapur region. Flood situation has become disastrous during the years 2005 and 2006 in later part of July and early August in upper Krishna basin. about 27.72 per cent of the geographical area of the upper Krishna basin of southern Maharashtra is affected by floods of which about 02.12 per cent of total population of upper Krishna basin has suffered in 2006. About 10.00 per cent loss of sugarcane crop is recorded due to the heavy rainfall and flood conditions secured in the monsoon months of July/August in Maharashtra during last seven to eight years (2005 to 2012). According to the officials, 40.00 per cent of the total estimated area of Sugarcane comes under flood-affected areas of Kolhapur and Sangli. “The total estimated area of sugarcane for the year 2019-2020 was around 8.43 lakh hectares,” said DI Gaikwad, Joint Director

(Development), Sugar Commissionerate. As per the State Sugar Commissioner office, the estimated sugarcane for the year 2019-20 for production of sugar was 632.25 lakh tones, while last year it was 952 lakh tones, which was 319.25 lakh tones less than the previous year. However, for the year 2018-2019, Maharashtra recorded highest production of 107.21 lakh tones while the estimated production for 2019-2020 was around 64 lakh tones. For year 2018-19, around 195 mills were involved in sugar production while it is estimated that for the year 2019-20, around 150 mills will be operating. "Last year due to drought, in places like Marathawada, the production of sugarcane reduced and now with the flood in areas like Kolhapur and Sangli, the production might reduce further," added Gaikwad. West India Sugar Mills Association (WISMA) Executive Director Ajit Chougule said, "Due to drought last year, there was 40.00 per cent reduction in sugarcane and with recent floods in Kolhapur, Sangli and Satara, there are chances of further downfall in production which will be a problem for sugar mills as they have lot of expenses like storage, FRP, working capital etc."

The flood events are a part of nature and it occurs frequently in Kolhapur and Sangali district of southern Maharashtra. They have existed and will continue to exist. Thus, one cannot escape from natural phenomenon like this. All that we can do is to adopt such management practices that will reduce the losses that occurs due flood. So, that Farmers will gain an assured income even in flooded situation. Flood management practices will help the farmers to sustain productivity of sugarcane crop. Hence, it is decided to study the management practices followed the sugarcane growers in flood affected areas (Lavanya Raj *et al.*, 2019).

Limitations of the study. All possible efforts were made to make the research more meaningful and precise but due to paucity of time at disposal of investigator, certain limitations do remain in the study which are as follow:

1. The study was confined only on management practices followed by the sugarcane growers in flood affected area and hence, its findings may not be applicable to other major crops grown in the district and the state at large.
2. The study does not claim to generalize the findings in large scale as it was confined to only for Kolhapur district of Maharashtra.

3. The study was restricted to limited number of variables due to restricted time and resources.

4. The analysis is based on the data made available by the farmer, therefore, the validity and reliability depend on how honestly they provided the information.

Scope of the study. The flood events are a part of nature and it occurs frequently in Kolhapur and Sangali district of southern Maharashtra. They have existed and will continue to exist. Thus, one cannot escape from natural phenomenon like this. All that we can do is to adopt such management practices that will reduce the losses that occurs due flood. So, that Farmers will gain an assured income even in flooded situation. Flood management practices will help the farmers to sustain productivity of sugarcane crop. Hence, it is decided to study the management practices followed the sugarcane growers in flood affected areas.

MATERIAL AND METHOD

The present study was undertaken in Kolhapur district of Maharashtra state on the basis of most flood affected area under Sugarcane crop on the bank of panchganga and krishna river. The two tahsils namely karveer and Shirol having maximum flood affected area of Sugarcane. From each tahsil 7 villages were selected, from each village 10 respondents were selected. Data were collected by personally interviewing 140 Sugarcane growers with the help of specially designed interview schedule. The same was analyzed and presented in the following tables.

RESULT AND DISCUSSION

A. Adoption of flood management practices

Adoption refers to the complete or partial use of flood management practices in flood affected area by the Sugarcane growers. The classification of Sugarcane growers as per their overall adoption of flood management practices in Sugarcane is given in Table 1. The above Table 1 revealed that majority (60.00 %) Sugarcane growers had medium adoption, while, (27.86 %) and (12.14 %) of Sugarcane growers had low and high of adoption, respectively. These observations were similar with the findings of Ganesh Prasad (2010); Gurav and More (2013); Vijay Kumar, (1997) and Sumathi, (2020).

Table 1: Classification of the respondents according to their overall adoption of Practices.

| Sr. No. | Category | Respondents (N=140) | |
|---------|---------------------|---------------------|---------------|
| | | Number | Percentage |
| 1 | Low (Up to 63) | 39 | 27.86 |
| 2 | Medium (64 to 72) | 84 | 60.00 |
| 3 | High (73 and above) | 17 | 12.14 |
| | Total | 140 | 100.00 |

Table 2: Classification of respondents according to their practice wise adoption of recommended flood management in Sugarcane.

| Sr. No. | Recommended Management Practices | Respondents (N=140) (Percentage) | | | |
|-----------|---|-------------------------------------|---------------|----------------|--------------|
| | | Complete | Partial | No | Total |
| A. | Cultivation practices of Sugarcane | | | | |
| 1. | Planting season | | | | |
| | i) Adsali (15 July-15 Agu) | 28 (20.00) | 22 (15.72) | 90 (64.28) | 140 (100) |
| | ii) Pre-seasonal (15 Oct-15 Nov) | 34 (24.28) | 57 (40.72) | 49 (35.00) | 140 (100) |
| | iii) Suru (15 Dec- 15 Feb) | 123 (87.35) | 16 (11.43) | 01 (0.72) | 140 (100) |
| 2. | System of planting | | | | |
| | i) Ridge and Furrow | 139 (99.28) | 00 (00) | 01 (0.72) | 140 (100) |
| | ii) Flat bed | 00 (00) | 00 (00) | 140 (100) | 140 (100) |
| | iii) Trench method | 00 (00) | 00 (00) | 140 (100) | 140 (100) |
| | iv) Paired row | 01 (0.72) | 13 (09.28) | 126 (90.00) | 140 (100) |
| 3. | Water management | | | | |
| | i) Ridges and Furrows | 135 (96.43) | 04 (02.85) | 01 (0.72) | 140 (100) |
| | ii) Drip | 28 (20.00) | 51 (36.42) | 61 (43.58) | 140 (100) |
| | iii) Sprinkler | 10 (07.14) | 12 (08.57) | 118 (84.28) | 140 (100) |
| 4. | Fertilizer management | | | | |
| | a) Organic fertilizer | | | | |
| | i) FYM | 131 (93.57) | 06 (04.28) | 03 (2.15) | 140 (100) |
| | ii) Compost | 15 (10.71) | 38 (27.14) | 87 (62.14) | 140 (100) |
| | iii) Pressmud | 03 (02.14) | 46 (32.86) | 91 (65.00) | 140 (100) |
| | b) Inorganic fertilizer | | | | |
| | i) Adsali N:P:K(kg/ha) Total-400:170:170 kg/ha | 31 (22.14) | 21 (15.00) | 88 (62.88) | 140 (100) |
| | ii) Pre-seasonal N:P:K (kg/ha) Total-340:170:170 kg/ha | 34 (24.28) | 58 (41.44) | 48 (34.28) | 140 (100) |
| | iii) Suru N:P:K (kg/ha) Total-250:115:115 kg/ha | 112 (80.00) | 22 (15.72) | 06 (04.28) | 140 (100) |
| | c) Use of green manure | | | | |
| | i) Sunhemp | 41 (29.28) | 37 (26.42) | 62 (44.28) | 140 (100) |
| | ii) Dhaincha | 04 (02.86) | 21 (15.00) | 115 (82.14) | 140 (100) |
| 5. | Production (t/ha) | | | | |
| | i) Adsali (156-200) | 28 (20.00) | 22 (15.71) | 90 (64.28) | 140 (100) |
| | ii) Pre-seasonal (122-139) | 34 (24.28) | 57 (40.72) | 49 (35.00) | 140 (100) |
| | iii) Suru (98-115) | 123 (87.86) | 16 (11.42) | 01 (0.72) | 140 (100) |
| B. | Management practices to be followed for preventing flood losses in Sugarcane | | | | |
| 1. | Removal of water from the flood affected area after the disaster through channel | 116 (82.86) | 18 (12.86) | 06 (04.28) | 140 (100) |
| 2. | Removal of dried and decayed lower leaves to facilitate the aeration | 32 (22.86) | 73 (52.14) | 35 (25.00) | 140 (100) |
| 3. | Binding of lodged canes after flood to prevent rooting at internodes and sprouting of buds | 10 (07.14) | 25 (17.85) | 105 (75.00) | 140 (100) |
| 4. | Harvesting of crop at ground level in case of complete loss of crop due to submerged condition and cultivation of chickpea, sunflower and seasonal vegetables | 21 (15.00) | 45 (32.14) | 74 (52.85) | 140 (100) |

| | | | | | |
|----|--|----------------|---------------|---------------|--------------|
| 5. | Application of 25% of additional dose of N, P and K after flood for <i>suru</i> plantation | 57 (40.72) | 67 (47.85) | 16 (11.42) | 140 (100) |
| 6. | Application of 8-10 kg Zinc sulphate by mixing in organic manures after flood | 27 (19.28) | 46 (32.86) | 67 (47.86) | 140 (100) |
| 7. | Sprayings of insecticides to prevent the attack of aphids, army worm and white fly, after flood | 104 (74.28) | 29 (20.72) | 07 (05.00) | 140 (100) |
| C. | Care to be taken at the time of planting of Sugarcane in flood affected area | | | | |
| 1. | Planting of pre-seasonal Sugarcane (Oct. 15 to Nov. 15) in flood affected area so that the Sugarcane tops will remain above flood water level | 48 (34.28) | 43 (30.72) | 49 (35.00) | 140 (100) |
| 2. | Cultivation of fast growing and tall varieties viz., Co-86032, CoM-0265, Co-7527 and Co-8014 in flood affected area | 126 (90.28) | 12 (08.57) | 02 (01.43) | 140 (100) |
| 3. | Use of Sugarcane seedlings (40-45 days) grown in polythene bags for cultivation of pre-seasonal crop after cultivation of short duration <i>kharif</i> crops | 64 (45.72) | 63 (45.00) | 13 (09.28) | 140 (100) |
| 4. | Use of Integrated Nutrient Management Practice for healthy growth of Sugarcane | 42 (30.00) | 52 (37.14) | 46 (32.86) | 140 (100) |
| 5. | Adoption of wide row, paired row and long row methods of Sugarcane plantation so as to enable to adopt management practices in flood situation | 73 (52.14) | 53 (37.86) | 14 (10.00) | 140 (100) |

(The figures in parenthesis indicates percentage)

With a view to know the extent of adoption of various recommended flood management practices of Sugarcane data have been tabulated in Table 2, the critical look to data revealed that the more than fifty percent of the respondent had complete adopted the flood management practices regarding planting season adsali (20.00%), preseasonal (24.28%) and suru (87.35%), regarding system of planting ridge and furrow (99.28%), flatbed (00%), trench method (00%), paired row (0.72%), regarding water management ridges and furrows (96.43%), drip (20.00%), sprinkler (07.14%), regarding fertilizer management F.Y.M. (93.57%), compost (10.71%), pressmud (02.14%), adsali N:P:K (22.14 %), pre-seasonal N:P:K (24.28%), suru N:P:K (80.00 %), jute (29.28%), dhainchya (02.86%), regarding production of adsali (20.00%), preseasonal (24.28%), suru (87.86%), (Rahman *et al.*, 2011), regarding removal of water from the flood affected area after the disaster through channel (82.86%), removal of dried and decayed lower leaves to facilitate the aeration (22.86%), Binding of lodged canes after flood to prevent rooting at internodes and sprouting of buds (07.14%), harvesting of crop at ground level in case of complete loss of crop due to submerged condition and cultivation of chickpea, sunflower and seasonal vegetables (15.00%), application of 25% of additional dose of N, P and K after flood for suru plantation (40.72%), Application of 8-10 kg Zinc sulphate by mixing in organic manures after flood (19.28%), (Hadole *et al.*, 2003), sprayings of insecticides to prevent the attack of aphids, army worm and white fly, after flood (74.28%), planting of pre-seasonal Sugarcane (October 15 to November 15) in flood affected area so that the Sugarcane tops will remain above flood water level (34.28%), cultivation of fast growing and tall varieties viz., Co- 86032, CoM-0265, Co-7527 and Co-8014 in flood affected area (90.28%), use of Sugarcane seedlings (40-45 days) grown in polythene bags for cultivation of pre-seasonal

crop after cultivation of short duration *kharif* crops (45.72%), use of Integrated Nutrient Management Practice for healthy growth of Sugarcane (30.00%) and adoption of wide row, paired row and long row methods of Sugarcane plantation so as to enable to adopt management practices in flood situation (52.14%) (Gomathi *et al.*, 2014).

It was also evident from Table 2 that the most of the respondents had partially adopted the flood management practices of Sugarcane like planting season- adsali (15.72%), preseasonal (40.72%) and suru (11.43%), regarding system of planting ridge and furrow (00%), flatbed (00%), trench method (00%), paired row (09.28%), regarding water management ridges and furrows (02.85%), drip (36.42%), sprinkler (08.57%), regarding fertilizer management F.Y.M. (04.28%), compost (27.14%), pressmud (32.86%), adsali N:P:K (15.00%), pre-seasonal N:P:K (41.44%), suru N:P:K (15.72 %), jute (26.42 %), dhainchya (15.00%), regarding production of adsali (15.71%), preseasonal (40.72%), suru (11.42%), (More *et al.*, 2009), regarding removal of water from the flood affected area after the disaster through channel (12.86%), removal of dried and decayed lower leaves to facilitate the aeration (52.14%), binding of lodged canes after flood to prevent rooting at internodes and sprouting of buds (17.85%) (Sunil, 2015), harvesting of crop at ground level in case of complete loss of crop due to submerged condition and cultivation of chickpea, sunflower and seasonal vegetables (32.14%), application of 25% of additional dose of N, P and K after flood for suru plantation (47.85%), application of 8-10 kg Zinc sulphate by mixing in organic manures after flood (32.86%), sprayings of insecticides to prevent the attack of aphids, army worm and white fly, after flood (20.72%) (Shaikh *et al.*, 2004), planting of pre-seasonal Sugarcane (October 15 to November 15) in flood affected area so that the Sugarcane tops will remain above flood water level (30.72%), cultivation of fast

growing and tall varieties viz., Co- 86032, CoM-0265, Co-7527 and Co-8014 in flood affected area (08.57%), use of Sugarcane seedlings (40-45 days) grown in polythene bags for cultivation of pre-seasonal crop after cultivation of short duration *kharif* crops (45.00%), (Jeya *et al.*, 2020), use of Integrated Nutrient Management Practice for healthy growth of Sugarcane (37.14%) and adoption of wide row, paired row and long row methods of Sugarcane plantation so as to enable to adopt management practices in flood situation (37.86%).

The respondents had not adopted the flood management practices of Sugarcane were regarding planting season-adsali (64.28%), preseasonal (35.00%) and suru (0.72%), regarding system of planting ridge and furrow (0.72%), flatbed (100.00%), trench method (100%), paired row (90.00%), regarding water management ridges and furrows (0.72%), drip (43.58%), sprinkler (84.28%), regarding fertilizer management F.Y.M. (02.15%), compost (62.14%), pressmud (65.00%), adsali N:P:K (62.85%), pre-seasonal N:P:K (34.28%), suru N:P:K (04.28%), jute (44.28%), dhainchya (82.14%), regarding production of adsali (64.28%), preseasonal (35.00%), suru (0.72%), regarding removal of water from the flood affected area after the disaster through channel (04.28%), (Bhingardeve *et al.*, 2012) removal of dried and decayed lower leaves to facilitate the aeration (25.00%), binding of lodged canes after flood to prevent rooting at internodes and sprouting of buds (75.00%), harvesting of crop at ground level in case of complete loss of crop due to submerged condition and cultivation of chickpea, sunflower and seasonal vegetables (52.85%), (Patel *et al.*, 2016), application of 25% of additional dose of N, P and K after flood for suru plantation (11.42%), application of 8-10 kg Zinc sulphate by mixing in organic manures after flood (47.86%), sprayings of insecticides to prevent the attack of aphids, army worm and white fly, after flood (05.00%), planting of pre-seasonal Sugarcane (October 15 to November 15) in flood affected area so that the Sugarcane tops will remain above flood water level (35.00%), cultivation of fast growing and tall varieties viz., Co- 86032, CoM-0265, Co-7527 and Co-8014 in flood affected area (01.43%), use of Sugarcane seedlings (40-45 days) grown in polythene bags for cultivation of pre-seasonal crop after cultivation of short duration *kharif* crops (09.28%), use of Integrated Nutrient Management System for healthy growth of Sugarcane (32.86%) and adoption of wide row, paired row and long row methods of Sugarcane plantation so as to enable to adopt management practices in flood situation (10.00%) (Jagatpal *et al.*, 2017).

CONCLUSION

The investigation was carried out in two tahsils (Karveer and Shirol) of Kolhapur district where majority area of Sugarcane is affected by flood. The

present investigation was undertaken with a view to know the level of adoption of recommended flood management practices in Sugarcane. The significant findings concluded that majority of the respondents had medium level of adoption.

Acknowledgement. As majority of younger to middle age group of farmers are engaged in the sugarcane cultivation. This group of society should be given complete and need based training in sugarcane cultivation by the State Department of Agriculture and State Agricultural University. As majority of the Sugarcane growers were not adopting recommended preseasonal Sugarcane planting season in flood affected area, it is suggested to create awareness among the Sugarcane growers about the adoption of preseasonal Sugarcane planting through various extension activities by the State Department of Agriculture and State Agricultural University.

Conflict of Interest. None.

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