



The Extent of Awareness Level of Sugarcane Farmers on Crop Residue Management Innovations

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

The present study was conducted in the Sathyamanagalam block of Erode district during 2021 with the objective of studying the Extent of Awareness level of Sugarcane Farmers on Crop Residue Management Innovations. 60 respondents were selected from three villages. The results of the study shows that 100 per cent of respondents were aware that crop residue burning could create health risks. Crop residue management inventions such as trash mulching, trash shredders, and Harvest mounted cane trash shredder and collection systems were known by 100 per cent of the respondents. Only 10 per cent of those polled had no idea what bio-decomposers were. The Majority of the respondents (93.33%), regularly used trash mulching of sugarcane leaves to manage crop residue beneficially. Only 6.66 per cent of respondents used trash shredders regularly. Even though the subsidy given by the Government was available, due to timely unavailability of machinery led to the irregular use of trash shredders. Even though many of the respondents are aware of the negative aspects of residue burning and innovations available to

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manage sugarcane trash, they continue to burn due to time and cost constraints. With regard to constraints in adopting crop residue management technologies cent (100.00%) of respondents reported that lack of awareness on subsidies and involves more time and cost as the major constraints. Continuous monitoring of fields by the officials and demonstrations should be conducted to enhance the knowledge of the sugarcane growers on trash management.

Keywords: Awareness; crop residue management innovations; constraints; sugarcane trash.

1. INTRODUCTION

India plays a vital role in the production of food grain, oilseed, sugarcane, and other agricultural products. Agricultural crops produce significant amounts of surplus residues, with increases in food production crop residues also increasing [1]. These leftover residues exhibit not only resource loss but also an unexploited chance to improve a farmer's income. The use of crop residues in various fields are being discovered by researchers across the world in areas such as textile composite non-woven making processes, power generation industry, biogas production, animal feeds, manures and compost, etc. According to the Indian Ministry of New and Renewable Energy (MNRE, 2019), India generates on an average 500 Million tons of crop residue per year followed by Bangladesh (72 Mt), Indonesia (55 Mt) and Myanmar (19 Mt) [2].

Sugarcane produces about 10 to 12 tonnes of dry leaves per hectare per crop. The detrashing is done on 5th and 7th month during its growth period. This trash contains 28.6 per cent organic carbon, 0.35 to 0.42 per cent nitrogen, 0.04 to 0.1per cent phosphorus, 0.50 to 0.42 per cent potassium. Sugarcane trash is a lengthy one [3]. Handling and heaping the trash will be more cumbersome. The old practice of burning the dry leaves in the field produces ash and smoke which causes environmental pollution and more over the good organisms in the soil get destroyed due to fire, which is again a loss to the farm land ecology. It is recommended to shred the waste into small particles [4].

1.1 Status of Sugarcane Trash Management

National policy for management of crop residue (NPMCR) formulated by the Central Government, has suggested policies and regulations to be commenced by the local agencies to control crop burning and initiatives towards sustainable management practices [5]. Central Pollution Control board (CPCB) will monitor crop burning through aerial surveillance

and penalize farmers who burn crops. The Government is taking necessary actions and giving subsidies to the machineries for residue management. Trash mulching, trash shredder, bio-decomposers, in-situ composting, harvest mounted cane trash shredder and collection system, etc. are available for the management of sugarcane trash [6].

Effects of crop residue burning: Over recent years, burning of residues of crop wastes have become a extensively practiced agricultural activity in developing countries due to economic and social factors [7]. Every year Environment Performance Index is calculated for each country to get a idea on environmental quality aspects. In 2020 India got the place of rank 7 and EPI score of 27.6 [8]. The on-site impact of burning, which includes taking away of a large amount of nitrogen, phosphorus, organic matter and also other nutrients and even loss of useful microorganisms which are present in the upper layers of soil [9]. However, a large quantity of crop residue which has the potential to be put to alternative sustainable uses is burned across the Asian region [10].

In case of air quality, burning of agricultural wastes/crop biomass releases large quantities of gaseous and particulate pollutants into the atmosphere, including CO₂, CO, VOCs, PM₁₀, PM_{2.5}, BC, OC, EC, and other compounds which drastically reduces the quality of the air [11]. The air quality in Pakistan, India and Bangladesh ranked 176/180, 178/180 and 179/180, respectively [4].

Keeping the above points in mind, this study was taken up to assess the extent of awareness level of sugarcane farmers on crop residue management innovations and the constraints in adopting the technologies.

2. MATERIALS AND METHODS

Sathyamangalam block of Erode district was purposefully selected for the study as the area is having more sugarcane cultivation. Three

villages viz., Kotuveerampalayam, Sikkarasampalayam, Udhaya marathu medu were randomly selected. From each village, 20 respondents were selected randomly and the survey was employed. Percentage analysis was carried out to analyze the objective [12].

3. RESULTS AND DISCUSSION

3.1 Awareness Level of the Respondents on Crop Residue Burning

From the Table 1, it can be found that 100.00 per cent of the respondents were aware that crop residue burning would cause health problems followed by an equal amount of the respondents (90.00 per cent) who were benefited due to crop residue burning by which they could easily clear the field with no labour charges and aware of residue burning decreases soil fertility. An equal percentage of the respondents (85.00 per cent) were aware crop residue burning create air pollution and decreases soil organic matter or microbial biomass. This was followed by 75.00 percent of the them who were aware that residue burning increases the emission of greenhouse gases. Crop residue burning was practiced by 70.00 per cent of the respondents and 60.00 percent of them knew that this practice was banned in other states like Haryana, Punjab and Uttar Pradesh. Even though the respondents were aware of the ill effects of crop residue burning, they still used to burn the residue due to availability of less time and high laboriousness.

3.2 Awareness Level of Respondents on Crop Residue Management Innovations in Sugarcane

It is evident from Fig. 1 that 100.00 per cent of the respondents were aware of crop residue management innovations like trash mulching, trash shredders, and Harvest mounted cane trash shredder and collection system. Only 10.00 per cent of respondents were unaware of bio-decomposers. Around 83.33 per cent of respondents were unaware of In-situ composting method of sugarcane trash. From these results, it can be said that majority of the respondents were aware of CRM innovations available for sugarcane.

3.3 Usage of CRM Innovations by the Respondents

Fig. 2 revealed that majority of the respondents (93.33%) were regularly using trash mulching of sugarcane leaves to manage crop residue beneficially. Only 6.66 per cent of respondents used trash shredders on a regular basis. Even though the subsidy given by the Government was available, due to timely unavailability of machineries led to the irregular use of trash shredders. 100.00 per cent of the respondents were never used in-situ composting, bio-decomposers and Harvest mounted cane trash shredder and collection system. This may be due the less awareness about the technologies among the respondents.

Table 1. Distribution of respondents according to their awareness level on crop residue burning

Sl. No.	Statements	Response (%)	
		Yes	No
1	Did you practice agricultural crop residues burning (CRB)?	14 (70.00%)	6 (30.00%)
2	Do CRB create air pollution?	17 (85.00%)	3 (15.00%)
3	Do CRB can cause health problems?	20 (100.00%)	0 (0.00%)
4	Do you think CRB can decrease soil organic matter / microbial biomass?	17 (85.00%)	3 (15.00%)
5	Do you know CRB can increase greenhouse gases emission?	15 (75.00)	5 (25.00%)
6	Did you have any benefits after CRB?	18 (90.00%)	2 (10.00%)
7	Do you know soil fertility decreased by CRB?	18 (90.00%)	2 (10.00%)
8	Do you know CRB practice is ban issue in Haryana, Punjab and UP?	12 (60.00%)	6 (40.00%)

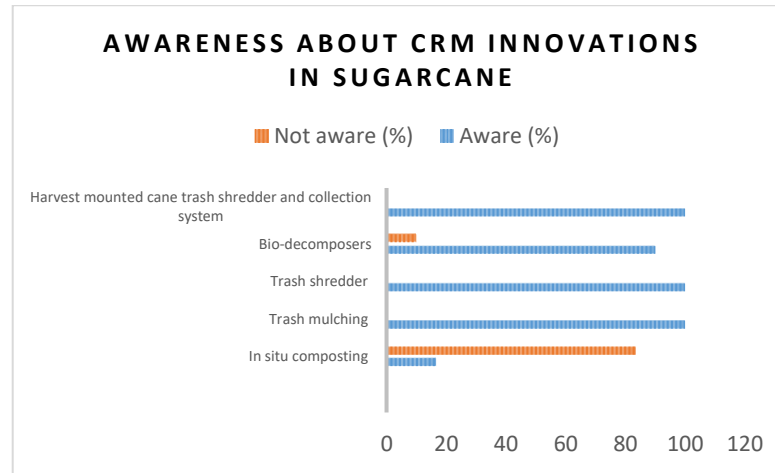


Fig. 1. Distribution of respondents according to awareness about CRM innovations in Sugarcane

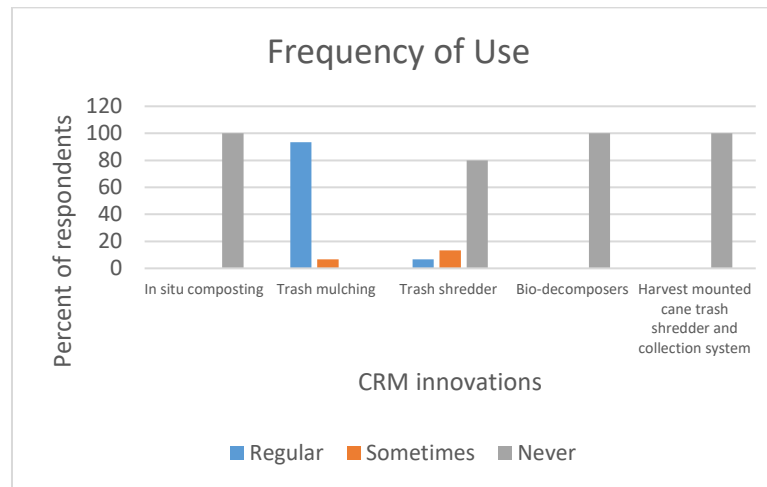


Fig. 2. Distribution of respondents according to usage of CRM innovations

Table 2. Distribution of respondents according to constraints faced by them in adopting the CRM technologies

(n=60)			
S. No.	Constraint	Yes	No
1.	Lack of aware about the subsidies available	60 (100.00%)	0 (0.00%)
2.	Involves more time and cost	60 (100.00%)	0 (0.00%)
3.	Lack of awareness on CRM technologies	57 (95.00%)	3 (5.00%)
	Fear of failure	57 (95.00%)	3 (5.00%)
4.	Shortage of required machineries and inputs during peak time	57 (95.00%)	3 (5.00%)
5.	Lack of skill in using the machineries and inputs	54 (90.00%)	6 (10.00%)
6.	Lack of help from family members	54 (90.00%)	6 (10.00%)

3.4 Constraints in Adopting CRM Technologies by Respondents

Result pertaining to the constraints faced by the respondents in adopting crop residue management practices is presented in Table 2.

It is evident from the Table 2 that, lack of awareness about the availability of subsidies and involvement more cost and time are considered as the major constraint by cent of the respondents (100.00%). This was followed by an equal percentage of respondents (95.00%) who stated that lack of awareness on CRM technologies, fear of failure and shortage of required machineries and inputs during peak time were the constraints faced by them. Further, 90.00 per cent of the respondents expressed that lack of skill in using the machineries and inputs and lack of help from family members as major constraints in adopting the innovations in crop residue management.

4. CONCLUSION

The Health Effect Institute (HEI) (2020) report ranks South Asia as the global highest population-weighted pollution concentration due to numerous combustion sources, including agricultural burning. Crop residue burning causes ill effects on the human being as well as on the environment. Even though many of the respondents were aware of the negative aspects of residue burning and innovations available to manage sugarcane trash, they continue to burn due to lack of awareness on subsidies in purchasing the machineries and time and cost constraints. Continuous monitoring of fields by the officials, creating awareness on subsidies available and demonstrations should be conducted to enhance the knowledge of the sugarcane growers on trash management.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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