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Constraints in Sugarcane Trash Utilization in Tiruchirappalli district of Tamilnadu

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ABSTRACT

Burning of sugarcane trash inside the field in India is a common practice among the farmers due to lack of labour availability and less time available for sowing of the next crop. This is a hazardous practice which has affected soil health, air, human health etc. leading to massive as well as monetary losses. The present study has been based on primary data collected from the sugarcane growers to highlight the constraints pertaining to this issue. Lack of labour availability, high cost for disposing and lack of knowledge on in-situ composting emerged as the major reasons for the ongoing practice. The different measures like creating awareness on in-situ composting and mulching technique were suggested by the farmers to deal with the issue. In-situ composting and trash mulching in sugarcane field can be a good alternate to mitigate these problems. Some of the measures to deal with the problem can be creating awareness among the farmers about eco loss and strict implementation of the law prohibiting the burning of crop residue, custom hiring of expensive machinery for chopping of straw, off farm utilization were suggested by farmers.

Key Words: Constraints, Environment, In-situ composting, Sugarcane trash.

INTRODUCTION

Sugarcane is one of the important cash crops in India and play pivotal role in both agriculture and industrial economy of the country. India is one of the largest producers of sugar and is in close competition with Brazil for the top position. In India, sugarcane is cultivated over an area of 4 m ha and the production is estimated about 325 MT with the productivity of 70 t/ha. In Tamil Nadu, sugarcane is cultivated in an area of 3.22 lakh hectares with an average productivity of 101.8 t/ha. India needs to produce 320 MT of sugarcane to cater the crushing requirement of sugar factories operated in the country. Greater attention is given only in improving the sugarcane yield and not much in awareness on sugarcane trash recycling and more labour cost for disposing the trash (Prasanthrajan and Ponnusamy, 2011). Besides the loss of organic matter and the plant nutrients, burning of crop residue also causes atmospheric pollution due to the emission of toxic gases such as methane, carbon dioxide that poses threat to humans and the ecosystem.

In Tiruchirapalli district of Tamil Nadu, sugarcane is cultivated in an area of 3000 ha with an average productivity of 100 t/ha. Though a ban was imposed on stubble burning by the state government, the practice is still going. The problem has been highlighted by the United States National Aeronautics and Space Administration (NASA) and Supreme Court of India has also taken a serious note of it, but of no avail. Impact is manifold i.e. air as well as soil pollution, health hazards, road safety etc. According to study conducted by Centre for Sustainable Agriculture, Hyderabad, the burning a tonne of straw releases 3 kg particle matter , 60 kg of CO, 1460 kg of CO2 , 199 kg of ash and 2 kg of SO2 in the air. Apart from this, the practice causes massive loss in soil both in term of nutrients and microorganisms. As per the study conducted by the Department of Soils, PAU, Ludhiana in 2010, the nutrient losses by burning of sugarcane trash was estimated and were around 6-7 kg of N, 1-1.7 kg of P, 14-25 kg of K and 1.2-1.5 kg of S. This leads to an additional expenditure of Rs.150 crore per year

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to replenish the soil. Preservation of organic carbon is must as these boost the water holding capacity in the soil. About 38 lakh tonne of organic carbon is lost every year due to burning of soil and 32 kg of urea, 5.5 kg of DAP and 51kg of potash per acre is also lost (Kaur, 2017).

In-situ composting and sugarcane trash mulching can be a good alternate to mitigate the problems. Though mulching and in-situ composting is better option for sugarcane trash management, but the time taken is little high. In recent years integrated system of composting with bio inoculants and subsequent incorporation in field to overcome the problem is receiving worldwide attention of scientist (Sweta *et al,* 2010 and Dahiya *et al,* 2003). Effective microbes (EM) or biomineralizer are variety of microorganism grown as consortium that is capable to make a residue into valuable nutrient sources. Simple biotechnological process, which could provide a 'win-win' solution to tackle the problem of safe disposal of waste as well as the most needed plant nutrients for sustainable productivity is described. Even though there is wide scope for utilization of sugarcane trash, but still the farmers are not adopting those technologies. Keeping in view the above mentioned facts, the present study was undertaken to highlight the quantity of crop residue generated in sugarcane cropping system as well as constrains to its management in Tiruchirappalli district of Tamil Nadu .

MATERIALS AND METHODS

The study was undertaken in sugarcane growing areas of Tiruhchirappalli district in Tamil Nadu. The villages covered under study were Lalgudi, Mannachanallur and Manikandam Taluk in Tiruchirappalli district. The taluk and villages were selected purposively, where random sampling technique was followed to select the respondents. It was decided to draw samples from all categories of farmers i.e. small (upto 2 ha), medium (>2-4 ha) and large (>4 ha). The criteria of section based on the considération that the farmers were growing sugarcane continously and marked them to earn income. In other words, the farmers growig sugarcane for commercial purpose were selected. A random technique was followed to select 25 sugarcane growers from each group in each village. The constraints diffèr from individual to individual depending upon their social status, family, requirement, family obligation, cultural background and economical conditions. These constraints were classified into four categories namely social, organizational, technology transfer and economical. The responses were scored on 4 points scales fitting to the statements as very much (4), much (3) not so much (2) and not at all (1) important.

RESULTS AND DISCUSSION

Social Constraints

The social problems were location specific and mostly concerned with individuals residing in a specific social condition (Table 1). The score analysis revealed that traditional norms in the village, lack of awareness, low adoption by neighbours and were most important constraints, which do not permit the farmers to accept and adopt new technologies of utilization of sugarcane trash (Arya and Shah, 1984 ; Samantrary *et al,* 2009).

Organizational Constraints

As much as five important constraints were reported in the area under study. Non availability of production inputs timely, lack of timely advice and guidance by extensional personnel, irregular visit of extension workers and lack of effective supervision were identified as constraints in sugarcane trash utilization (Table 1). However, most of them were related to government actions that need to be stream lined to make sugarcane trash utilization.

Technology Transfer

Transfer of technology is another important dimension in our farming activities. It is more so in case of sugarcane cultivation, which are known as cash crop. The data (Table 1) revealed the inadequate

Table 1. Constraints reported by different categories of farmers in utilization of sugarcane trash.

Sr. No.	Constraint	M.F. M.S	S.F. M.S	B.F. M.S	Total MS
A	**Social Constraints**				
	Lack of awareness	3.5	3.2	3.6	3.4
	Traditional norms	3.7	3.5	3.7	3.6
	Low adoption by neighbours	1.4	1.8	1.5	1.6
	Coordination among farmers	1.0	1.3	1.3	1.2
	Groupism in village	1.6	1.4	1.3	1.4
B	**Organizational Constraints**				
	Poor coordination and cooperation among grass root level extension workers	1.9	2.1	1.8	1.9
	Lack of timely advice and guidance by extensional personnel	3.1	2.9	3.2	3.1
	Non availability of production inputs timely	3.4	3.5	3.4	3.4
	Irregular visit of extension workers	2.4	2.4	2.5	2.4
	Lack of effective supervision	2.1	2.5	2.4	2.3
C	**Technological Constraints**				
	Inadequate training of farmers	3.5	3.6	3.6	3.6
	Inadequate demonstration of new technology	3.6	3.7	3.0	3.4
	Inadequate follow up service	2.5	2.7	2.6	2.6
	Lack of location specific recommendation	2.1	2.3	2.7	2.4
	Deficiency in technical know-how	2.9	3.0	3.0	3.0
	Unavailability of mass media sources for information	2.3	2.5	2.5	2.4
D	**Economical Constraints**				
	High cost of technology	3.2	3.3	3.3	3.3
	Poor economical condition of the farmers	2.1	2.4	2.5	2.3
	Labour shortage	3.1	3.1	3.0	3.1
	Lack of machinery	3.6	3.5	3.7	3.6
	Costly machines	3.5	3.1	3.4	3.3

M.F.-Marginal farmers , S.F. -Small farmers, B.F- Big farmers, M.S.-Mean score

demonstration of new technology, inadequate training programme, deficiency in technical know–how and inadequate follow up service were the major constraints. The other constraints were lack of location specific recommendation and non–exposure to mass media.

Economical Constraints

Economic constraints were identified, which stand as barrier in utilization of sugarcane trash. The data (Table 1) revealed that high cost and lack of machinery, shortage of labour and higher wages for disposing it off are quoted as the reason for the burning practice. In general, farmers were favoring its mixing in the soil. So it was found that all the sampled farmers were against burning of sugarcane trash in principle. But majority of them could not find any solution at an individual level and were seeking government assistance to dispose it off.

CONCLUSION

It was evident from the study that the major constraints like traditional norms, lack of awareness on technology, inadequate training and demonstrations, non availability of production input, lack of timely advice and guidance by the extension persons, high cost machinery and high cost of technology were faced by the farmers. The study has confirmed that the lack of proper recommendation, lack of community awareness and lack of effective supervision are the contributing factors to the issue. Thus there is a need to organize training programme, proper demonstration of improved technologies to encourage the farmers for utilization of sugarcane trash so that the farmers become aware of the technology for utilization of sugarcane trash. Moreover, it will improve the fertility status of the soil. Based on these training needs of farmers, public and private organizations may organize various training cum awareness programmes. It was evident that farmers were aware of the hazardous effect of burning of sugarcane trash to the environment, soil and living beings. It is the right time to make them aware of the technologies for utilization of sugarcane trash and produce compost, which not only helps in protecting the environment, but also provide economic gain.

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