

Paddy straw management burning impacts and management techniques

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ARTICLE ID: 032

Introduction

In rice-wheat cropping system farmers are left with limited time to manage the rice residue and prepare the field for sowing of subsequent wheat crop. None the less, a large part of the crop residues remains unutilized and been left at the farms. The dumping of this massive bulk of crop residues becomes a foremost challenge for the farmers. So to vacate the field quickly with little expense and allow tillage practices to proceed unimpeded, the farmers opt for burning of crop residue *in-situ* as it is cheap and simple way to tackle the crop residues without affecting the field preparations for next crop. In Punjab, about 16-17 MT rice residue is produced and most of it is burnt in the field search year prior to wheat sowing.

Problems due to burning: Burning of agricultural biomass results in pollution of land, air and water on local, regional and global scale. Heat produced by burning of straw go into the soil, which leads to the loss of moisture, death of useful microbes thus badly affecting the soil micro flora. The burning also leads to the loss of macro and to some extent of micro nutrients. It doesn't just affects the fertility of the soil but also produces an uncontrollable amount of harmful smoke that causes air pollution. Agricultural residue burning may emit a notable quantity of air pollutants like CO₂, N₂O, CH₄. Burning of agricultural biomass residue is also a major health hazard. The harmful gases produced creates a persisting danger that has the ability to move thousands of kms, completely worsening the air quality index and causes numerous health issues. Burning also contributes in bio-diversity loss, causes accidents due to low visibility, need of higher application of fertilizers and irrigation, increase in

medical and health-related expenditure, loss of workdays, productivity loss due to illness and monetary value of discomfort.

Available technologies to manage paddy straw: By seeing urgent need to curb the burning of paddy straw many innovative techniques have been formulated which are as follows:

1. In-situ management/ management at farmer's level
 - Use of machinery
 - Mulch for livestock
 - Composting
 - Mushroom cultivation
2. Fodder for livestock in fodder deficit region
3. Utilization for power generation
 - Bio mass based power plant
 - Bio fuel /gasification
4. Utilization in industries as raw material
 - Paper and pulp board production
 - Use in brick kiln

Loopholes in adoption: After such a large efforts by the Central and State institutes to curb this problem non- adoption and discontinuance of alternate paddy straw management techniques can be seen. The major loop holes founded by the “Committee of Ministry of Agriculture and Farmers welfare” was

- i) No specific rental rate of machineries.
- ii) Wide perception gap among the farmers on the pricing of mechanical methods for paddy straw management.
- iii) Fragmented market for paddy residue management custom rates.
- iv) Timely availability of paddy straw management techniques for custom hiring centers.

Conclusion: Lack of residue collection mechanism and training to understand the agro-economic benefits of alternative provided to them. The real reasons behind the paddy residue burning have more socioeconomic roots rather than agricultural or waste management ones. Any solutions involving long-haul transportation, expensive



technology, or high capital investment are less likely to succeed. In this context, sustainable solutions that involve methods to feed the nutrients in the crop residue back into the same crop land have better promise to be successful.

