

## Stubble Burning: Effects And Management

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ARTICLE ID: 41

### Introduction:

India is a nation of large population and the food grains are a necessity for their survival. Food grains are a major source of energy and thus vital for food and nutrient security.

The growing of food grains is very popular now days and we are self-sufficient for food security but it generates large volume of crop residue, which is as not much economical for the farmers, are a major issue for them both on and off farming. According to Ministry of New and Renewable Energy about 500 Mt of crop residues are generated annually out of which 92 Mt is burned each year and generate different pollutant gases like {CO<sub>2</sub>, CO, NH<sub>3</sub>, ... etc}.

In recent years 'on farm burning or stubble burning is becoming a major source of air pollution in northern India like {Delhi, Punjab, Haryana, West U.P} reason behind is shortage of human labour, high cost of removing the crop residue from the field and mechanized harvesting of crops.

Stubble burning – It is a process of setting on fire the straw stubble, left after the harvesting of grains like Paddy, Wheat. Etc.

In India, it is generally practices to remove paddy crop residues from field to sow wheat, which occurs around the end of September and beginning of November. Specially in Punjab, Haryana and Uttar Pradesh.

### Effects of Stubble Burning: -

- 1. Damaging the Environment:** Stubble burning emits various toxic gases such Carbon Monoxide (CO), Methane (CH<sub>4</sub>), Polycyclic Aromatic Hydrocarbons (PAH) and Volatile Organic Compounds (VOC).
- 2. Impact on Soil Properties:** The burning elevates soil temperature causing death of beneficial soil organisms and leads to complete loss of microbial pollution and also reduce levels of Nitrogen and Carbon in the soil, which is very essential for crop root development.

- 3. Impact on Human Health:** This can raise several health effects like air pollution, ranging from skin irritation to severe neurological, cardiovascular, and respiratory problems. According to researchers it also has bad influence on mortality rates – The life expectancy of Delhi residents has decreased by about 6.4 years as a result of high pollution levels.
- 4. Insufficient Stubble Management Infrastructure:** The Farmers of majorly Haryana and Punjab burned almost 15.4 MMT (out of 19.7 MMT) in open fields due to the lack of stubble management infrastructure (Punjab government 2017).
- 5.** It is also preferred by farmers because it is cheaper and faster, helping them to clear the land in time for sowing the next crop.

#### Alternatives / Management to Stubble Burning:

- 1. Bio Enzyme-PUSA:** A bio-enzyme called PUSA has been developed by IARI New Delhi as a solution to stubble burning.
- 2.** As being it sprayed on the crop residue, this enzyme starts decomposing the stubble in 20-25 days, turning it into manure, which help in soil fertility. It also Increase organic carbon and soil health so; it reduces the fertilizer cost for the next cropping cycle.
- 3. Palletization:** The crop residue can be dried and converted into pellets can be mixed along with coal which can be used in thermal power plants and Industries as fuel. This can save the coal as well as reduce carbon emission.
- 4. Happy Seeder:** Instead of burning the stubble, a tractor mounted machine called the HAPPY SEEDER can be used as cut and lift rice straw and sows wheat into the bare soil, deposit the straw over the sown area as mulch.
- 5. Chhattisgarh Innovative Model:** In this model used to setting up of gautans, which are 5 acres plot owned by each village where unused stubble or parali is collected through parali dhan (people's donation) and turned into organic fertilizer by mixing cow dung.
- 6. Additional Alternative Uses:** Stubbles can be used in various ways; Cattle feed, compost manure, roofing in the rural areas, for packing materials, for prepration of paper and preparation of bio-ethanol as well.

#### Conclusion:

Stubble burning is most common concern in present time. The farmers continuously burn the residue on field for sowing the next crop, lack management practices. That results



Damaging the Environment, Impact on Soil Properties, Impact on Human Health. The state government should make policies to control it and make the farmers aware of it. The alternatives of stubble burning like happy seeder, biofuel, composting, mulching, used in industries etc. can help to balance the ecology, fertility of soil and health issues. The most of the farmers in North India, due to the lack of knowledge their best choice is to burn it.

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