

Paddy Straw Management Strategies

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SUMMARY

Carbon credits, also known as carbon offsets, are permits that allow the owner to emit a certain amount of carbon dioxide or other greenhouse gases. One credit permits the emission of one ton of carbon dioxide or the equivalent in other greenhouse gases. Greenhouse gas (GHG) emissions responsible for causing global warming and climatic change. Rice straw is one of the organic material and natural residue obtained from the rice crop. It's the third largest residue obtained from the agriculture after sugarcane bagasse and maize straw (McLaughlin *et al.* 2016) Storage of the surplus rice straw, removal of entire straw from the field and very little time between the cultivation of the next crop are the major issues associated with the rice straw. Thus, stubble burning is a quick, cheapest and easiest way to prepare the field for the next crop. The burning of the paddy straw results in the extensive impact on both on and off farm, eg. Killing of useful micro flora of soil, losses of soil organic matter, contribution to harmful greenhouse gases and their harmful effects on human and animal health. Therefore, rice straw burning is the major issue of environmental pollution also. Hence, the need of the hour is to provide the environment friendly alternatives to rice straw instead of the open field burning. The paddy straw can be used as a source of energy, mulching material, biofuel, industrial raw material and feed for animals etcge.

INTRODUCTION

Rice (*Oryza sativa*), the staple food of more than half of the population of the world, provide food security and livelihoods for millions of people. With 45.07 mha area, rice is the main crop of India and it produces 122.27 million tonnes of rice per year. When cereal crops are harvested, it is estimated that half of the process ends with agricultural waste or crop residue as straw. Thus, the increase in the productivity and area under cultivation of rice has leads to immense production of rice straw. It is a non-edible product, often left in the field after harvesting. In ancient time animals were used for various agricultural activities and the feed requirement of the animals was fulfilled by paddy straw but now due to mechanization dependency on the animals have decreased. So burning of the biomass in the paddy field is the easiest way of disposing of the residue. Taking farmers view into account, burning is not only a cost-effective method but it acts as an effective pest control procedure.

Effect on Environment:

The burning of rice crop residue causes air, water and land pollution thus effecting the environment. The farmers of our country follows mechanized agriculture and they want to prepare their field quickly for the next crop and thus adopts open field burning. It contributes to atmospheric pollution by emitting trace gases, which forms 'Black Cloud' and adversely affects human health as well as environment. Punjab Agriculture University, Ludhiana (PAU) estimated that crop residue contains carbon of about 6 million tonnes which upon open field burning, produces 22 million tonnes of carbon dioxide within a time period of 15-20 days (Kumar et al. 2015). Also, several nutrients are removed by paddy straw.

Rice Straw Management Alternatives:

Rice Straw can be used for energy production, mulching, manufacturing and feed for animals. In agriculture rice straw can be used for bedding material, cultivation of mushroom and for compost. Chakraborty et al (2010) reported that rice straw mulch increased wheat grain yield, reduced crop water use by 3-11% and improved Water Use Efficiency by 25% compared with no mulch. Mulch produced 40% higher root length densities compared to no mulch due to retention of soil moisture in deeper layers (Singh and Sidhu, 2014). The suppression of weeds with straw mulch might help to reduce herbicide requirements. Rice Straw can be used as a fuel that will reduce the amount of greenhouse gases. In this manner, we can protect the environment from being polluted. Also, as the population is increasing day by day, the demand of petroleum, diesel, coal etc. is also increasing but the availability of these non-renewable sources is decreasing gradually. Thus, the production of

ethanol from the cellulosic material of rice straw solves the problems related to environment, energy and economic. Nowadays bioethanol fuel is recommended for transportation purposes. Rice straw is used as a feed for animals. The nutritive value of the straw can be increased by physical, chemical and biological treatments.

CONCLUSION

As lot of work has been done by the scientists to consider the paddy straw as a useful product but the proper utilization of the rice straw is not done yet. So it is not only the responsibility of the farmers but the government should also take steps to check stubble burning. Farmers should be given proper training for the management of paddy straw. The government should provide subsidies to promote the consumption of paddy straw. In this manner we can protect our environment from the future critical situation of pollution.

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