

Resource conservation techniques in rice

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Abstract

Resource conservation techniques (RCTs) are the practices which result in saving the energy, cost and also reduce the environmental pollution over conventional practices. The resource conservation technologies primarily focus on saving of resources through minimal tillage, ensuring soil nutrients and moisture conservation through crop residues and cover crops and adoption of spatial and temporal crop sequencing. Rice is a major staple crop in India and requires special focus in minimizing the production cost, effective utilization of resources and doubling the farmer's income to achieve sustainability. Adopting RCTs into the production system enables to fulfill the above objectives. Rice is one of the major contributors of greenhouse gas emission in agriculture. This can be compensated by implementing RCTs in rice production system.

Keywords: RCTs, rice, zero tillage, laser land leveling, urea deep placement

Introduction

In recent years, farmers concerned in sustainable crop production systems have initiated to adopt and adapt improved crop management practices as a step towards resource conservation, which is considered as an ultimate solution for doubling the income. To realize the potential of the production system on a sustained basis, efficient management of resources is very essential. Hence, the role of modern tools and techniques plays a major role to enlarge carrying capacity, enhance the input use efficiency without declining the resource base have become an important mean for sustained growth (Meena, 2013). Soil, water, climate and vegetation are considered to be a basic natural resource for agricultural growth and development. "Resource conservation, which focuses on the complete agricultural system, involves major changes in farm cropping operations from the traditional tillage-based farming practices to irrigation management". Resource conservation techniques (RCTs) are the practices which result in saving the energy, cost and also reduce the environmental pollution over conventional practices. "The resource conservation technologies primarily focus on saving of resources through minimal tillage, ensuring soil nutrients and moisture conservation through crop residues and cover crops and adoption of spatial and temporal crop sequencing". For example, growing new varieties that use nitrogen more efficiently may be considered RCTs. Zero or minimum tillage practices that conserve the fuel may also be considered RCTs. RCTs also help to mitigate the effects of climate change, at least concerning the emission of greenhouse gases. The utilization of fossil fuel for agricultural production is significantly minimized under RCTs and burning of crop residues is eliminated, which also contributes to a reduction in greenhouse gas release.

Rice is a major staple crop in India and requires special focus in minimizing the cost of production, effective utilization of resources and doubling the farmer's income to achieve sustainability. Adopting RCTs into the production system enables to fulfill the above objectives. This paper gives an emphasis on how RCTs will conserve the natural resources in rice crop production system with special reference to soil, nutrient, water, energy and environmental conservation.

1). Soil Conservation

Tillage is one of the factors which are accountable for soil degradation. Intensive tillage practices result in water and wind erosion and destroy the soil structure. So, there is a necessity of decreasing the tillage practices for conserving soil. "Zero tillage is a practice in which the seeds are directly placed into untilled soil which has retained the previous crop