



## Residue Mulching and Foliar Application of Potassium Enhances Yield and Water Productivity of Wheat Under Restricted Irrigated Conditions in Saline Soil

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### Abstract

Wheat is the second most important crop in India and the world. Among many difficulties faced in the wheat growing regions, salinity and declining water table and water quality are most affecting factors. This study was conducted to test the hypothesis that whether the use of rice residue as mulch with reduced amount of irrigation water and foliar application of K could maintain wheat yield under salinity conditions. *Ex-situ* rice residue mulching @ 4 Mg ha<sup>-1</sup> significantly enhanced the tillers m<sup>-2</sup> (307.1), grain yield (5.10 Mg ha<sup>-1</sup>), net returns (INR 80.3×10<sup>3</sup> ha<sup>-1</sup>) and water productivity (2.04 kg m<sup>-3</sup>) over no residue mulching. Residue mulching significantly enhanced grain yield and net returns at all the irrigation levels. Irrigation at all critical stages (ICS) and residue mulching gave significantly maximum grain yield of 5.69 Mg ha<sup>-1</sup> and net returns of INR 91.1×10<sup>3</sup> ha<sup>-1</sup>. Further, restricting irrigations to CRI+BS+MS stages along with residue retention also resulted in statistically similar wheat grain yield (5.38 Mg ha<sup>-1</sup>) and Net returns (INR 84.1×10<sup>3</sup> ha<sup>-1</sup>) that obtained with ICS without residue retention, showed advantage of residue mulching in saving of irrigation water. Residue mulching significantly improved the water productivity at all irrigation levels. Foliar application of K:N (2% K + Nitrogen 0.5%) significantly improved tillers m<sup>-2</sup>, grains spike<sup>-1</sup> (GPS), grain yield (5.14 Mg ha<sup>-1</sup>), straw yield (11.29 Mg ha<sup>-1</sup>), net returns (INR 82.2×10<sup>3</sup> ha<sup>-1</sup>), benefit cost ratio (2.32) and water productivity of wheat (2.05 kg m<sup>-3</sup>) compared to control.

**Key words:** Residue mulching, Foliar application, Potassium, Productivity, Salinity, Net return