



Integrated nutrient management in rice-wheat cropping system

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Abstract : A study was carried out to find out the integrated dose of nutrient for rice and wheat under rice-wheat cropping system at Mainpuri and Saini, Kaushambi. The summarized results of these two interrupted sites indicate that the rice responded to the application of 25 kg ha⁻¹ of zinc sulphate, which registered an additional yield of 4.90 q/ha while in wheat response of zinc sulphate was 1.75 q ha⁻¹. The use of 30 kg P₂O₅ and 60 kg P₂O₅ ha⁻¹ did not influence the yield of rice and wheat in the system, during two experimental years at both sites. Application of 120 kg N + 30 kg P₂O₅ + 40 kg K₂O + 25 kg ZnSO₄ ha⁻¹ to rice and 120 kg N + 30 kg P₂O₅ + 40 kg K₂O + 25 kg ZnSO₄ ha⁻¹ to wheat gave higher total yield of 84.35 q ha⁻¹ and saved 60 kg P₂O₅ ha⁻¹ from rice and wheat doses of P₂O₅. The total production in rice and wheat obtained from the best combination of nutrients by 84.35q ha⁻¹ was higher than the average productivity of India (46.56 q ha⁻¹) and U.P. (42.90 q ha⁻¹) recorded, during 2004-05. Therefore, with the integration of different nutrients in rice-wheat cropping system, the production can be sustained.

Key Words : Integrated nutrient management, Rice-wheat system, System production, Interrupted site, Synergistic effect

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INTRODUCTION

Rice and wheat are the major cereal crops as a good source of human food. Rice-wheat system is a highly adaptable grown under a wide range of various soil and climatic conditions. At present rice-wheat is main cropping pattern of the state of U.P. In the state, out of 90.00 lakh hectare area of wheat crop 47.00 per cent of wheat is sown after paddy crop that means 42.30 lakh hectare of wheat area covered after taking paddy crop. In this way, wheat and rice crops system covers an area of 132.30 lakh hectare, which is about 52.00 per cent of the gross cropped area of the state. Rice-wheat system provide high and assured returns and has made significant impact on the socio-economic status of the U.P. farmers but its continuously adoption, this system has also created numerous soil, water and imbalances in nutrients. With these problems, rice-wheat rotation has interrupted and farmers adopted new rotations. For sustainability in production, through rice-wheat, the present study was undertaken in

interrupted areas.

MATERIALS AND METHODS

A Field trial was conducted for two consecutive years, during the rainy and winter seasons at Zonal Agricultural Research Stations, Mainpuri and Saini, Kaushambi, situated in South-West-Semi-Arid Zone and Central Plain Zone of U.P, respectively. The soil of Mainpuri was sandy loam having pH 8.6, organic carbon 0.45 per cent, total nitrogen 0.04 per cent available P 10 kg ha⁻¹ and available K 269 kg ha⁻¹ while soil of Saini was loam having pH 7.7, organic carbon 0.37 per cent, total nitrogen 0.03 per cent, available P 9.9 kg ha⁻¹ and available K 90 kg ha⁻¹, therefore, the fertility status of both experimental sites was low. Rice and wheat crops were grown with six integrated doses of nutrients (N₁₂₀+P₆₀+K₄₀, N₁₂₀+P₆₀+K₄₀+ZnSO₄ 12.5, N₁₂₀+P₆₀+K₄₀+ZnSO₄ 25, N₁₂₀+P₃₀+K₄₀, N₁₂₀+P₃₀+K₄₀+ZnSO₄ 12.5 and N₁₂₀+P₃₀+K₄₀+ZnSO₄ 25 kg ha⁻¹) replicated thrice in split plot design. Half dose of N and full

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