



Intensification and diversification of rice (*Oryza sativa*) based cropping systems for productivity, profitability and water expense efficiency in Jharkhand

UDAY SHANKER MALL*, R.P. MANJHI AND R. THAKUR

Department of Agronomy, Birsa Agricultural University, Kanke, RANCHI (JHARKHAND) INDIA
(Email : udayshankermall@gmail.com)

Abstract : A field experiment was conducted at BAU, Kanke, Ranchi under irrigated medium land condition in 2008-09, 2009-10 and 2010-11 to evaluate the production potential, nutrient uptake, water expense efficiency and economics of seven rice based cropping systems. Seven cropping systems viz., rice-wheat, rice-mustard-green gram, rice-rajma-green gram, rice-potato-green gram, rice – wheat + mustard (5:1)-green gram, rice-wheat+ rajma (5:1)-green gram, and rice-potato + wheat (1:1)-green gram were evaluated in this study. Among the cropping systems, rice-potato + wheat (1:1)-green gram recorded highest rice equivalent yield (215.81 q/ha), system productivity (59.13 kg rice/ha/day), water expense efficiency (35.74 kg/ha/mm) and land use efficiency (95.89%) as compared to other cropping systems. Crop sequences with potato as *Rabi* crop resulted in significantly higher N, P and K uptake. The use of resources and their efficiencies were higher *i.e.* economic analysis revealed that the maximum net profit (Rs. 120602), benefit: cost ratio (1.26) and monetary efficiency (305.41 /ha/day) were recorded in rice- potato + wheat (1:1)-green gram crop sequence closely followed by rice – potato –green gram which were significantly superior over other cropping system. Hence, rice- potato + wheat (1:1)-green gram and rice-potato-green gram were found to be the most productive, resource- use efficient and remunerative cropping system under irrigated conditions and can be followed in place of rice-wheat systems for higher profitability.

Key Words : Resource- use efficiency, Rice-equivalent yield, Cropping system, System productivity, Net returns

View Point Article : Mall, Uday Shanker, Manjhi, R.P. and Thakur, R. (2014). Intensification and diversification of rice (*Oryza sativa*) based cropping systems for productivity, profitability and water expense efficiency in Jharkhand. *Internat. J. agric. Sci.*, **10** (1): 124-129.

Article History : Received : 18.03.2013; Revised : 30.09.2013; Accepted : 25.10.2013