



Crop diversification and intensification of rice based cropping system under irrigated condition of Madhya Pradesh

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Abstract : A field experiment entitled crop diversification and intensification of rice based cropping systems under irrigated condition of Madhya Pradesh was taken at J.N. Krishi Vishwa Vidyalaya farm of Kuthulia College of Agriculture Rewa during 2010-11 and 2011-12. The study reveals that grain yield of rice increased by 17.12 per cent in rice-berseem, 13.97 per cent in rice-musturd, 13.37 per cent in rice-chickpea+linseed and 10.43 per cent in rice-green pea-wheat cropping system as compared to rice-wheat cropping system. The rice equivalent yield of different cropping system was increased by 36.39 per cent in rice-berseem, 41.02 per cent in rice-potato-wheat, 87.43 per cent in rice-garlic, 88.08 per cent rice-toria-onion and 26.79 per cent in rice-greenpea-wheat cropping system as compared to rice-wheat cropping system. The gross and net return was maximum in rice-toria-onion cropping system (Rs- 244896/ha and 152922/ha) followed by rice-garlic (Rs-244039/ha and 114601/ha) and rice-berseem (Rs- 195960/ha and 140830/ha) which were 26.5 per cent to 68.8 per cent higher than rice-wheat cropping system. The benefit : cost ratio was maximum 3.55 in rice-berseem followed by 3.17 in rice-greenpea-wheat and 3.07 in rice-chickpea +linseed inter cropping.

Key Words : Crop diversification, Rice based cropping system

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INTRODUCTION

Rice and wheat are the important crop of rice-wheat zone of Madhya Pradesh which occupy an area of 16.75 lakh and 43.0 lakh hectares, respectively. The average productivity of these crops are 11.94 q/ha and 20 q/ha, respectively which are low. It is due to use of local varieties, erratic and uneven distribution of rains as well as prolonged dry spells observed frequently.

Rice- wheat, rice-gram and rice lentil are the major cropping system in Rewa region of Madhya Pradesh. These cropping systems are widely adopted by the farmers due to stable production and less labour requirement (Kumar *et al.*, 2001). But continuous adoption of these cropping system has led to the problem of specific weeds, reduced soil fertility in specific root zone, development of soil sickness and infestation of similar kind of pest which ultimately resulted in decline the efficiency and productivity of system (Katyal, 2003 and Kumar and Yadav, 2005). Diversification of cropping system is necessary to get higher yield and net profits.

Introduction of pulses and oil seed in the system are more beneficial than cereal-cereal sequence (Umarani *et al.*, 1992). In cropping system inclusion of pulse, oilseed and vegetable are more beneficial than cereals after cereals (Kumpawat, 2001 and Raskar and Bhoi, 2001). Rice is the predominate crop in Rewa region of Madhya Pradesh. It is difficult to replace the rice by any other crop in rainy season due to soil and climatic condition. Hence, only option left is to replace the wheat and gram crop in winter season for diversification of rice based cropping system. The multiple cropping system has not been adopted in Rewa region of Madhya Pradesh. Keeping above facts in view, present experiment has been taken.

MATERIALS AND METHODS

The present field experiment was taken under All India co-ordinated research project on farming system at Kuthulia farm of J.N. Krishi Vishwa Vidyalaya, Rewa (M.P.) during 2010-11 and 2011-12 in which ten cropping systems (rice-wheat,

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