

Economics of paddy based cropping system under south Gujarat condition

H.M. VIRDIA AND H.D. MEHTA

See end of the article for authors' affiliations

Correspondence to :

H.M. VIRDIA

Regional Rice Research Station, Vyara, Tapi, SURAT(GUJARAT) INDIA

ABSTRACT

A field experiment was conducted at Regional Rice Research Station, Navsari Agricultural University, Vyara dist.Tapi (Surat, Gujarat) during the year 2003-04 to 2005-06 on heavy black soil to find out most economic rice based cropping system under transplanting(T.P.) or drilled condition. Transplanting condition reported higher yield of paddy as well as subsequent *Rabi*/summer crops. Paddy equivalent yield and monetary return were significantly higher with T.P. conditions than drilled condition. Among cropping sequences, paddy-groundnut(s) system recorded significantly higher paddy equivalent grain and straw yield, gross and net realization as well as benefit cost ratio followed by paddy-castor system, while paddy-sorghum and paddy-wheat system reported much lower value.

INTRODUCTION

Intensification of cropping is the need of the day to increase monetary output from the available land. The per capita availability of land is consequently decreasing while food and fodder demand is increasing. Sustainable crop production including appropriate cropping sequences is one of the practices to increase output per annum from limited natural resources. Rice is the major and most common *Kharif* crop of the high rainfall area and mainly grown rainfed either by transplanting or direct seeding by drilling. Rice transplanting on puddled soil is complicated and highly labour intensive. The timely availability of labour for transplanting is a big problem in most area. Moreover, under puddled condition, though the yield of paddy is high it has its own limitations and ill effects on soil health and subsequent sequential field crops on same field. Puddling results in poor soil physical condition for establishment and raising the succeeding crops (Tripathi *et al.*,2003). Due to rising costs of labour and excessive water use in puddled transplanting rice in the irrigated eco-system, direct seeding of rice is gaining popularity in south-east Asia (Balasubramanian and Hill, 2002). Direct seeded rice needs only 34% of the total labour requirement and saves 29% of the total cost of transplanted crops (Ho and Romli, 2000).

To sustain the rice based agriculture, efficient cropping system can contribute to a great extent. An effective crop rotation not only

helps to increase the crop productivity, economics and soil fertility, but also improve the water use efficiency by reducing weeds, providing conducive microclimate for plant growth and development as well as physical properties of the soil (Faroda *et al.*, 2007).

Paddy based cropping system includes various *Rabi*/summer crops, viz., wheat, pulses, sorghum, groundnut, castor etc. however, under limited water availability up to *Rabi* crops it is not possible to go for more remunerative rice-groundnut system which is being popular among farmers but some time they fail to get good crops due to limitation of irrigation water after March or April. To find alternative and more remunerative crop either in transplanting or drilled condition, this experiment was conducted.

METHODOLOGY

A field experiment was conducted during 2003-04, 2004-05 and 2005-06 at Regional Rice Research Station, Vyara dist.Tapi (Surat). The experimental soil was deep black, having normal pH, low in organic carbon and available N and high in available P₂O₅ and K₂O (Table 1).

The experiment was laid out in split plot design with 4 replications. The main plot treatment involved 2 sowing/transplanting (crop establishment) methods of paddy(G.R.-3), viz., transplanting and drilling. After the rice harvested each main plot was divided into 4 sub plots for *Rabi*/summer crops [castor

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