

Productivity and economics of cropping sequences under different irrigation methods

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ABSTRACT

A field experiment was conducted during 2005-06 and 2006-07 at Water Management Project, Mahatma Phule Krishi Vidyapeeth, Rahuri to compare cropping sequences under different methods of irrigation. Drip irrigation method recorded significantly more sugarcane equivalent yield, system productivity, nutrient use productivity, fertilizer use productivity than other irrigation methods. Brinjal-chilli sequence produced significantly more gross and net monetary returns as well as B:C ratio than sugarcane and cotton-beet root sequences. It would be therefore concluded that brinjal-chilli cropping sequence is better cropping sequence than sugarcane under drip irrigation for achieving higher crop productivity and more monetary benefits.

INTRODUCTION

Sugarcane accounts for 4 per cent of gross cropped irrigated area in Maharashtra but consumes around 60 per cent of total irrigation (Rath and Mitra, 1986). The continuous monocropping decreases the nutrient availability in the top 15-30 cm surface layer (Kapur, 1994). The advance micro-irrigation methods introduced recently such as drip, micro-sprinkler and irrigation through sub-surface porous pipe increase the productivity of crop and also save water. Cotton is another cash crop which was preferred by the farmers of the region. In view of sharply shooting prices, many farmers are adding vegetables to crop rotations as their water requirement is less (50-90 ha-cm). Due to their diversity and relatively short duration, they can easily be incorporated in many cropping systems. Focusing, the attention on increasing the cropping intensity as well as production per unit area, per unit drop and per unit time is now gaining importance. Change in cropping pattern not only brings change in farming system but also influences social and economical activities of the farmers.

Therefore, the present study was undertaken to compare the productivity and economical feasibility of cropping sequences under different irrigation methods.

METHODOLOGY

The field experiment was conducted

during the seasons of 2005-06 and 2006-07 at All India Co-ordinated Research Project on Water Management, Mahatma Phule Krishi Vidyapeeth, Rahuri, Dist. Ahmednagar (M.S.). The soil was well drained, clay in texture, low in available N (188.16 kg ha⁻¹) and medium in available P (16.45 kg P₂O₅ ha⁻¹) and very high in available K (720.8 kg K₂O ha⁻¹). The experiment was carried out in strip plot design with three replications. There were total 12 treatment combinations. Four irrigation methods viz., surface, sub-surface irrigation through porous pipe, drip and micro-sprinkler irrigation methods assigned in one strip at east-west direction and three cropping sequences includes suru sugarcane, cotton-beetroot and brinjal-chilli assigned in another strip at north-south direction. Except beetroot, all crops were planted by paired row planting technique of 90-180 cm. For beetroot four row planting technique (45-90 x 10 cm) with BBF was adopted. Recommended fertilizer dose was applied for all crops involved in cropping sequences. The crops were raised with recommended agronomic package of practices.

The yield of cotton-beetroot and brinjal-chilli sequences was converted into sugarcane equivalent yield. Conversion was done into total monetary value. System productivity was computed by formula as suggested by Gangwar *et al.* (2006). Nutrient use productivity and fertilizer use productivity was

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