

## Economics of intensification and diversification of the existing cropping system in plain zone area of Nasik, India

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### ABSTRACT

A field experiment was conducted on cultivators' field for three years i.e. during *Kharif*, *Rabi* and *Summer seasons* of 2003 to 2006 on medium black soils in the plain zone area of Nasik district of Maharashtra in order to study the intensification and diversification of nutrients uptake in maize-wheat, maize-groundnut, maize-onion and maize-chilli in cropping sequences. The field experiment was laid out on permanent site in Randomized Block Design with six replications and four treatments with application of 100 % RDF in the respective crops with adequate supply of irrigation water. Maize variety cv. 'Super 900M' was sown in the second week of July followed by wheat variety cv. 'NIAW 301' in the third week of November, groundnut variety cv. 'TG-26' in the first week of February, onion variety cv. 'N-2-4-1' in the second week of October and chilli cv. 'Sitara' during each season. Out of four crop sequences, soil fertility status including organic carbon, available nitrogen, phosphorus and potassium has been improved with significant increase in yield. Singh, *et al.* (1998). reported that the productivity and economics of different cropping systems were significantly higher in gross monetary returns, net monetary returns and B: C ratio. The maximum productivity and net returns, improvement in fertility status and chemical properties of soil could be possible from this cropping sequence. Maize-chilli cropping system was found significantly superior as it gave higher net monetary returns and B: C ratio followed by maize-onion, maize-wheat and maize-groundnut cropping system as compared to other cropping systems.

**Key words :** Intensification, Diversification, Cropping sequences

### INTRODUCTION

In plain zone area of Nasik district is a common practice to grow the maize after wheat crop sequence without any modification. The farmers are facing problem of unsustainable yields particularly during summer due to ill distribution of water between head and the tail end. Therefore, it has been recommended to grow light irrigated crops during summer, but there is urgent need to evaluate suitable remunerative crops equivalent to maize. Mahapatra (1985) reported that in southern states, *viz.* Andhra Pradesh, Tamilnadu, Karnataka, Kerala, rice-rice-rice system had indicated highest yield by rice-rice-maize and rice-mung-rice. Whereas in eastern part of India the rice-rice rotation was the best in lowlands and rice wheat rotation was superior under slightly dry hot zone (AICARP, 1986). Hence, the present study was undertaken to find out suitable alternate crops for *rabi* and *summer* crops like maize grown in *kharif* season while wheat, groundnut, onion and chilli on receding moisture along with protective irrigations at critical growth stages.

The present study entitled "Economics of Diversification and intensification of the existing cropping system in plain zone area of Nasik district in Maharashtra" was undertaken to evaluate profitability and productivity

of different cropping systems under various level stages of crops with the following objectives.

1. To identify the existing cropping system in order to achieve maximum crop productivity and economic returns.
2. To work out the economics of different cropping systems.

### MATERIALS AND METHODS

An experiment was conducted during the cool and dry seasons of 2003 to 2006 in semi- arid climatic conditions under irrigated ecosystem in plain zone area in Nasik district of Maharashtra for experiments on cultivators fields scheme. The soil was medium black with pH 8.26; organic carbon 0.62 per cent, available N, P and K in the soil was 195.45, 13.49 and 535.25 kg/ha, respectively. The experimental design was split plot with six replications, four treatments and four cropping systems. Sub-plot treatment (Cropping Systems) were T<sub>1</sub> - Maize-Wheat, T<sub>2</sub> -Maize-Groundnut, T<sub>3</sub> Maize- Onion and T<sub>4</sub> -Maize-Chilli in cropping sequences. The gross and net plot size was 200 m<sup>2</sup> and 100 m<sup>2</sup>, respectively. After the harvest of general crop of maize in *Kharif* four crops, *viz.* chilli, onion, wheat and groundnut were grown. All the treatments were replicated 24 times.

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