

## Performance of *kharif* maize based legumes intercropping systems under different fertilizer doses

G.L. SAWARGAONKAR\*, D. K. SHELKE, S. A. SHINDE AND SHILPA KSHIRSAGAR

Department of Agronomy, Marathawada Agricultural University, PARBHANI (M.S.) INDIA

### ABSTRACT

Field studies were conducted during *kharif* 2004-05 and 2005-06 to find out the best maize based legume intercropping system and its fertilizer requirement. Three legumes *viz.*, soybean, blackgram and greengram were intercropped with maize and three fertilizer doses i.e. 75 %, 100 % and 125 % RDF were tested. The studies revealed that all the maize based intercropping systems found more remunerative than sole maize. Maize + blackgram and maize + greengram were better than maize + soybean combinations for grain yield and competitive parameters. Maximum competitive ratio and aggressivity values were recorded in maize + soybean intercropping system as compared to rest of intercropping systems thereby indicating that the magnitude of competition was more in case of maize with soybean. Data regarding relative crowding coefficients revealed that maize was a dominant species with all intercrop tested whereas all intercrops were dominated by maize. In vertisol, maize + blackgram were more advantageous, as reflected by different monetary advantage, benefit: cost ratio and competitive parameters. Application of 125 % RDF recorded at par maize grain equivalent with 100 % RDF and both the doses had significantly higher maize grain equivalent and net monetary advantage over 75 % RDF. However, application of 100 % RDF recorded highest Benefit: Cost ratio as compared to application of 125 % and 75 % RDF.

**Key words :** Intercropping, Fertilizer management, Monetary advantage, Competitive ratio.

### INTRODUCTION

Maize (*Zea mays* L.) is one of the most important cereal crop of World's Agricultural economy for human consumption and feed for animal. Among the cereal grain crops, maize ranks third in production in world being surpassed only by rice and wheat. Maize, because of its wider adaptability, is grown under temperate to tropical regions of the world. Besides this, it contains about 10 per cent albuminoides, 1.4 per cent ash, vitamin A, vitamin E and riboflavin. Maize is known for its wider adaptability and multipurpose uses as food, feed, fodder and over 35 daily used industrial products. Maize grain is utilized in many ways like making *roti*, *rawa*, *maida*, pop corns and some industrial products like protein foods, glucose powder, starch, alcohol, etc. The green cobs are roasted and eaten by people being delicious in test. It is also a good feed for piggery, poultry and other animals. Besides the grain, stalk serve as a good fodder for cattle and as such called proudly as 'Queen of Cereals' and 'King of Fodder'.

Intercropping has been proved to be more stable and remunerative over sole cropping under weather aberrations (Willey, 1979). The advantage was 50 – 80 per cent from intercropping of crops having long duration such as pigeonpea with cereals (Sexena and Yadav, 1975)

and 25 – 40 per cent in combination of maize or sorghum with low canopy legumes (Willey and Osiru, 1972). Maize being C<sub>4</sub> plant, is an exhaustive crop which removes large quantity of nutrients from soil. It is being recognized that High Technology Agriculture may not be feasible for all countries and situations because of its high resource intensity, but intercropping gave best results at low fertilizer application levels (Reddy *et al.*, 1982). Hence, it was thought to find out the fertilizer requirement of maize intercropped with grain legumes *viz.*, soybean, black gram and green gram.

### MATERIALS AND METHODS

Field experiments were conducted on the medium deep vertisol at Instructional Farm, Department of Agronomy, Marathawada Agricultural University, Parbhani during *kharif* seasons of 2004-05 and 2005-06. The experiment was laid out in split plot design replicated four times. Intercropping treatments *viz.*, maize + soybean, maize + blackgram and maize + greengram were allotted to main plots whereas in sub plots, three doses of fertilizers *viz.*, 125 per cent, 100 per cent and 75 per cent RDF were tried. The 100per cent RDF, for maize, soybean, blackgram and greengram were 100:75:75, 30:60:30,

---

\* Author for correspondence.