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Studies on residual effect of maize-lucerne intercropping on succeeding Bengalgram

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ABSTRACT

Significantly higher grain and stover yield of succeeding Bengalgram crop were recorded after maize (90 cm × 20 cm) + lucerne (green manuring) at 1:2 row proportion (12.51 and 14.76 q/ha, respectively) compared to rest of the treatments except Lucerne green manuring treatments with which it was at par. Higher amount of available soil nitrogen (249.17 kg/ha) was found after harvest of Bengalgram in preceding treatment of maize + lucerne (green manuring) at 1:2 row proportion over initial status of soil. Whereas, marked depletion with regard to available soil phosphorus and potassium after harvest of Bengalgram were noticed over initial status of soil due to intercropping system. Significantly higher net returns (Rs. 21133/ha) and benefit:cost ratio (4.29) of Bengalgram were realized after maize (90 cm × 20 cm) + lucerne (green manuring) at 1:2 row proportion compared to rest of the treatments except lucerne green manuring treatment.

Key words : Intercropping, Green manure, Row proportion, Bengalgram, Miaze-lucerne

INTRODUCTION

Legumes intercropping are known to improve soil fertility and supply part of nutrient requirement of associated intercrops or sequences crops. Leguminous plants produce large quantity of biomass which after *in situ* incorporation slowly release the nutrients depending on the C:N ratio of incorporated green manure. Hence, crops grown in sequence are going to be benefited due to rice based cropping system but are very meager in other arable or field crops and cropping systems. Hence, present field study was conducted to know the residual effect of maize + lucerne intercropping on succeeding Bengalgram.

MATERIALS AND METHODS

A field experiment was conducted during *Kharif* and *Rabi* seasons of 2006-07 to study the residual effect of maize-lucerne intercropping on succeeding Bengalgram at Main Agricultural Research Station, University of Agricultural Sciences, Dharwad under rainfed condition. The soil of the experimental site was medium deep vertisol having pH of 7.6. Soil before initiation of experiment was found to contain 228, 34.20 and 339.30 kg per ha of available N, P_2O_5 and K_2O, respectively. The rainfall during the year of experimentation (2006-07) was 870.2 mm, which was 14.58 per cent more than the average of the past 56 years.

The *Kharif* treatments included eight treatment combinations consisting two plant geometries of maize (90 cm × 20 cm and 90 cm/30 cm × 30 cm) and two maize-lucerne row proportions (1:1 and 1:2) with lucerne either for green manuring or for forage. In addition, there were three sole maize treatments with different plant geometries. The experiment was laid out in Randomized Complete Block Design with three replications and a plot size of 7.2 m × 3.6 m. In same experimental site after harvest of *Kharif* maize, the Bengalgram variety Annigeri-1 was sown during *Rabi* season without application of any fertilizers to know the residual effect of maize-lucerne intercropping on succeeding Bengalgram.

RESULTS AND DISCUSSION

The experimental data (Table 1) indicate that significantly higher total dry matter (21.96 g/plant), number of pods (53/plant), grain weight (12.50 g/plant) and hundred grain weight (24.23 g) of Bengalgram were recorded after maize (90 cm × 20 cm) + lucerne (green manuring) at 1:2 row proportion compared to rest of the treatments except after maize (90 cm × 20 cm) + lucerne (green manuring) at 1:1 row proportion. This can be attributed due to incorporation of higher biomass of lucerne in 1:2 row proportion over 1:1 row proportion. These results agree with the findings of Dasaraddy (1998) and Tiwari *et al.* (2004).

Significantly higher grain yield (12.51 q/ha), stover yield (14.76 q/ha) and harvest index (45.87%) of succeeding Bengalgram crop were recorded after maize

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