INTERCROPPING LEGUMES WITH SUNFLOWER AND FODDER MAIZE

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Extended Summary

In Bangladesh, due to the ever increasing population, pressure of cereal food production on lands leads to nutrient mining and make the land low productive. This problem can be solved by incorporating legumes into the existing cereal based cropping system. Two experiments were carried out at SAU farm with the objectives of i) to study the productivity of intercropping chickpea with sunflower and ii) to study the productivity of intercropping summer mungbean with fodder-maize (grown for fodder). Both the experiments were carried out in randomized complete block design with three replications. Data were taken on different parameters of all the crops used in the study.

Experiment I "Effect of intercropping chickpea with sunflower under different row and spacing arrangements" was sown in November 2008 where seeds of sunflower var. Kironi (main crop) and BARI chola-5 (intercrop) were used. The experiment consisted of nine intercropping treatments plus the sole crops as control. Different row arrangement combinations of sunflower (recommended, paired rows 30 cm spacing) and varying number of row of chickpea (1-4) were tested. The chickpea row(s) were accommodated between two adjacent sunflower paired rows. Results showed that intercropping under different row arrangements did not show any significant effect on plant height, but had significant effect on leaf area, number of grains/head, head dry matter weight and grain yield of sunflower. Sole sunflower always showed the highest value of all the parameters studied. Among the intercropping treatments, the sunflowers having 'paired-rows' had significantly higher leaf area, number of grains/head, head dry matter weight and grain yield. Sunflowers having 'paired-rows followed by 70 cm space for incorporating 2-3 rows of chickpea' showed significantly higher grain yields of sunflower (1900-2039 kg/ha) than other intercropping treatments. The highest grain yield in sole sunflower was 2207 kg/ha. Like in sunflower, most of the chickpea parameters were remarkably suppressed due to intercropping except plant height. The sole chickpea showed significantly the highest grain yield (1015 kg/ha). Among the intercropping treatments, 'three rows of chickpea accommodated in the space of 70 cm between two adjacent paired row sunflower' showed significantly the highest mungbean grain yield (1015 kg/ha), combined grain yield of sunflower and chickpea (3036 kg/ha), sunflower equivalent yield (3645 kg/h), relative yields (0.92 and 0.70 respectively) and land equivalent ratio

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(1.62). So, this row arrangement could be followed to grow chickpea as an intercrop with the sunflower.

Experiment II "Effect of intercropping mungbean with fodder maize under different planting geometry" was sown in Feb, 2009 where maize var. Mohor (main crop) and Barimung-5 (intercrop) were used. Sole maize and mungbean were grown using spacing 75 × 25 and 30 × 10 cm respectively. The intercropping treatments comprised 11 treatment combinations of three intra-paired row of maize (37.5, 30, 30 and 25 cm), three inter-paired-rows space (112.5, 100 and 85 cm), mungbean rows (1-4) and mungbean row to row distance (25 and 30 cm). In the inter-paired-rows space of maize, mungbean rows were accommodated. Results showed that both the sole maize and mungbean showed the highest per plant values in most of the plant parameters studied. The treatments did not show appreciable difference in plant height, number of leaves/plant and leaf area of maize. Maize fresh weight/ha and mungbean seed yield/ha decreased drastically by 33-56% and 50-81%, respectively due to intercropping. Among the intercropping treatments '1 row-mungbean accommodated at the space of 85 cm left between maize paired-rows' showed higher values in both per plant, per hectare fresh weight of maize and most of the per plant parameters of mungbean. But this planting geometry resulted in the lower value of maize equivalent yield. '4 row-mungbean accommodated at the space of 100 cm space between maize paired-rows' showed the highest per hectare fresh weight and seed yield of mungbean, combined fresh weight of maize and mungbean and land equivalent ratio. The increase in per hectare seed yield of mungbean was attributed to the higher plant population of mungbean in such planting geometry. It may be concluded that 4 rows-mungbean grown at the space of 100 cm left between 25 cm apart-paired rows of maize could be followed to intercrop mungbean with fodder maize. However, in this study the spacing of maize was 75 × 25 cm. So, it is essential to examine lesser spacings in the future studies.