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Studies on different planting patterns of sorghum + soybean intercropping system

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ABSTRACT

A rainfed field experiment was conducted during the rainy season of 2002-2003 on sorghum (*Sorghum bicolor L.*) + soybean [*Glycine max* (L.) Merr.] intercropping systems at Sorghum Research Station, Marathwada Agril. University, Parbhani. Sorghum plant height, mean leaf area and dry matter accumulation per plant (g) was highest in 3:6 planting pattern which was at par with 3:3 treatment and both treatments found significantly superior over rest of the treatments. Sorghum grain yield recorded highest 3397 kg ha^{-1} in planting pattern of 2:1 which was at par with 6:3 planting pattern (3364 kg ha^{-1}). In case of growth parameters and yield of soybean 3:6 and 2:4 planting pattern were at par with each other and significantly superior over rest of treatments except sole soybean. Highest sorghum grain equivalent yield (6884 kg ha^{-1}) was given by 6:3 planting pattern which was at par with 2:1 (6720 kg ha^{-1}) planting pattern and sole soybean and these three treatments were significantly superior over rest of the treatments. Highest monetary returns (Rs.15292 ha^{-1}) were obtained from 6:3 planting pattern which was at par with sole soybean (Rs.14706 ha^{-1}) and 2:1 planting pattern (Rs.14565 ha^{-1}).

Key words : Intercropping, Planting pattern, Sorghum, Soybean

INTRODUCTION

Sorghum is an important cereal crop in the world next to wheat, rice and maize. Sorghum has special significance in India as in addition to its importance as one of the major grain crop, it is extensively grown for fodder purpose. Soybean (*Glycine max* (L.) Merr.) was recently introduced to the Marathwada region. Soybean is assuming its importance due to high protein content (40-42%) especially lysine, edible oil (20 %) and other industrial uses. Soybean is supplementing the edible oil needs of the country and therefore, gaining much importance in these days.

Studies on the intercropping systems under the sorghum project involved the development of suitable genotypes, which offer the least competition and result in the development of suitable cropping patterns so as to identify remunerative intercropping systems. Legume as intercrop not only enhance the income but also provide much needed protein to supplement farmer's predominantly cereal diet (Anonymous, 2001) planting alternate rows of sorghum and soybean in 2:2 proportion was the best way of intercropping at both Indore and Sehore (Hedge and Pandey, 1992).

The total productivity and economic returns per unit area were found to be increased by intercropping of soybean + sorghum under additive series in 2:1 row proportion at Akola (Anonymous, 2002).Taking into account above points a trial was conducted on deep Vertisol during kharif 2002-2003 under replacement series at 45 cm row spacing.

MATERIALS AND METHODS

The experiment was conducted in Randomised Block Design with three replications on deep Vertisol during *kharif* 2002-2003 at Sorghum Research Station, Marathwada Agricultural University, Parbhani.The treatment comprising six planting patterns with sorghum + soybean intercropping and one of each sole sorghum and sole soybean. Sorghum var. PVK 801 and soybean var. JS 335 was sown with a 45cm row spacing and 12.5 cm and 5 cm plant to plant distance, respectively on 21st June 2002.

The net plot sizes were 4.05 m x 4.0 m for treatment T_5 (6:3) and T_6 (3:6) and 5.4 m x 4.0 m for T_1 (2:1), T_2 (3:3), T_3 (4:2), T_4 (2:4), T_7 (sole sorghum) and T_8 (sole soybean).

The recommended dose of fertilizer was given at the time of sowing i.e. half dose of N and full dose of P_2O_5 and K_2O as a basal dose and remaining half dose of N was applied 30 days after sowing only to sorghum rows. Plant protection measures were taken for the control of pests and diseases according to the

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