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Effect of plant geometry on economics of soybean+sesamum intercropping system

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SUMMARY

A field experiment was conducted during *kharif* season of 2004 at Experimental farm of Department of Agronomy, Marathwada Agricultural University, Parbhani (M.S.). Eight treatments were laid out in Randomised Block Design with four replications comprised of sole soybean, soybean + sesamum intercropping at various planting geometry of 2:1, 4:2, 3:3, 1:1 (replacement), 1:1 (additive), 2:1 (paired). The soybean yield at soybean + sesamum (2:1) and 1:1 (additive) were at par but significantly superior over 3:3 and 1:1 (replacement) plant geometry. However, soybean equivalent yield (2450 kg/ha), gross monetary returns (Rs. 33800/ha) and vet monetary returns (Rs. 24300/ha) were significantly higher at 1:1 (additive) plant geometry.

Key words : Intercropping, Plant geometry, Soybean, Sesamum.

Soybean becomes the most assured and income generating crop of Marathwada region of Maharashtra. Apart from its high nutritive value, the crop can be grown in multiple cropping system so as to increase cropping intensity and crop production. It serves as a good rotational crop and helps to enrich soil fertility.

The introduction of short durational and high yielding varieties of sesamum has opened up a new array of intercropping possibilities (Narwal and Malik, 1986). Intercropping is one of the approaches to increase productivity of crops per unit area per unit time. The companion crops in intercropping systems can be grown either in different row proportions or additional rows of intercrop can be planted in the rows of base crop. Planting patterns can suitably modified so as to reduce competition between companion crops and with a hope to achieve maximum productivity as compared to sole crop (Umrani 1981). In view of this, an experiment was planned to find out suitable plant geometry for soybean + sesamum intercropping so as to get higher monetary returns.

MATERIALS AND METHODS

An investigation was executed at experimental farm, Department of Agronomy, Marathwada Agricultural University, Parbhani during 2004-05. The treatment comprises, sole soybean, sole sesamum, various row proportion of soybean + sesamum intercropping *i.e.* 2:1, 4:2, 3:3, 1:1 (replacement), 1:1 (additive), 2:1 (paired rows). The varieties of soybean and sesamum crops were MAUS-81 (Shakti) and JLT-7 (Tapi), respectively were sown by dibbling. The recommended dose of fertilizers 30:60:30 and 50:25:0 NPK kg/ha were given to soybean and sesamum, respectively based on population. The population were variable in different row proportions. All other cultural and plant protection measures have taken as per recommendation.

The leaf area was calculated with L x B x K x N formula with a constant factor of 0.691 and 0.681 for soybean and sesamum, respectively.

RESULTS AND DISCUSSION

Among the different plant geometry, row proportion of soybean+sesamum 1:1 (additive) recorded significantly more plant height and higher leaf area than other planting patterns (Table 1). However, higher leaf area of sesamum was recorded by 3:3 row proportion which may be because of more space available to sesamum compared to other pattern (Singh *et al.*, 1991).

The maximum soybean yield was recorded in sole soybean which was significantly superior over rest of treatments which was attributed mainly because of higher plant population. Increased number of pods contributed to higher yield in sole cropping. The soybean yield at soybean + sesamum (2:1) and 1:1 (additive) series were at par but significantly superior over 3:3 and 1:1 (replacement) series. However, soybean equivalent yield was significantly higher at 1:1 (additive) series, which was attributed to normal population of soybean. These findings are in confirmation with Halvankar *et al.* (2000).

The maximum sesamum yield was recorded by sole crop which was significantly superior over rest of the

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