ABSTRACT

Meager attention has been done on selection of compatible crops and genotypes and agronomic factors effecting the efficiency of different species for agro-climatic zone of Eastern plateau of the country. Therefore the studies were carried out on compatibility of fingermillett genotypes with pigeonpea and blackgram in intercropping system for two consecutive years during kharif (rainy) season of 2001 and 2002 on a representative sandy loam rainfed upland (Belonging to the red-yellow-light-gray-catenary soil association group representing major soil group of Jharkhand) of Birsa Agricultural University, Farm, Ranchi, with main objective of selecting a suitable and compatible genotypes of fingermillett with pigeonpea, blackgram intercropping system in place of dominant monocropping in rainfed uplands. The average rainfall of area is about 1438 mm most of which is received between June to mid September.

Under this investigation three genotypes Short (VR-708), medium (HR-374) and long (PR-202) duration of fingermillett was taken as base crop with pigeonpea (BR-65) and blackgram (T-9) as intercrops.

The experiment was conducted in a Randomised Block Design with three replication and seventeen treatments consisting of three genotypes of fingermillett with pigeonpea and blackgram in sole cropping and twelve intercropping under six fingermillett + pigeonpea in 6 : 2 and 3 : 1 row proportions and six under fingermillett + blackgram in 6 : 2 and 3 : 1 row proportion in intercropping system.
Salient features of the results of the experiment are given below.

The close scrutiny of data of individual year indicated that cereal (finger millet) alone or cereal + legume performed better in normal rainfall year (2002) which was adversely affected in low rainfall year (2001).

The advantage of intercropping was enhanced by changing the spatial row arrangement of the component crops in finger millet + pigeonpea intercropping system. The association effect and yield advantage revealed that though the yield attributes and yield per se of component crops in intercropping system were reduced as compared to those of the sole cropping, the combined equivalent yield of component crops in intercropping system exceeded the higher sole crop yield.

In intercropping, finger millet (MD) + pigeonpea 6 : 2 followed by finger millet (SD) + pigeonpea 6 : 2 row proportion performed better in producing higher land equivalent ratio (1.46), finger millet equivalent yield (37.39 q ha⁻¹), net returns (Rs. 10,719.0 ha⁻¹) and monetary advantage of Rs. 3,136.0 ha⁻¹. This showed that short and medium duration finger millet genotypes + pigeonpea in 6 : 2 row proportion perform better as compared to long duration finger millet genotype + blackgram intercropping system. It is clear from the result that short and medium duration finger millet genotypes are more compatible with pigeonpea in intercropping system.

Data on crowding co-efficient (RCC) and competitive ratio (CR) revealed that short and medium duration finger millet genotypes performed well over its component species of pigeonpea due to
accounting higher value of relative crowding co-efficient. Similar, lower value of competitive ratio (CR) obtained with finger millet (MD) + pigeonpea 6 : 2 row proportion showed that finger millet short and medium duration genotypes in combination with pigeonpea in 6 : 2 row proportion is more compatible and advantageous than any other intercropping treatment combinations.

Though, uptake of nutrient (N, P and K) was higher in sole cropping as compared to their uptake as individual component crop in intercropping system, total uptake of individual nutrient by cropping system (both components) was higher than any sole cropping. The maximum uptake (N 108.4 kg ha\(^{-1}\), P 12.5 kg ha\(^{-1}\) and K 109.7 kg ha\(^{-1}\)) was recorded with finger millet (MD) + pigeonpea 6 : 2 row proportion.

Combined mean value of both the years indicated that available nitrogen content of soil was higher under finger millet + pigeonpea intercropping whereas available potassium in soil was higher under finger millet + blackgram crop combinations in intercropping system.