

EFFECT OF *Kharif* LEGUMES ON GRAIN AND FODDER YIELD OF *Rabi* SORGHUM

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ABSTRACT

The results of the present investigation showed that among the different preceding *kharif* legumes soybean JS-335 produced the highest grain yield followed by soybean MAUS-47. *Rabi* sorghum registered significantly higher yield when it was preceded by green gram compared to the remaining *kharif* legumes. The fodder yield of *rabi*-sorghum was significantly higher when it was preceded by green gram and black gram. Green gram – *rabi* sorghum sequence recorded the highest grain equivalent yield. The net monetary returns were higher due to green gram – *rabi* sorghum and soybean JS-335 – *rabi* sorghum sequences. Similar trend was noted in case of B : C ratio, increasing fertilizer levels increased the grain and fodder yield, sorghum grain equivalent yield, net monetary return as well as B : C ratio.

Key words : Cropping sequence, Yield, Grain equivalent yield, Net monetary return.

It is well known fact that *kharif* legumes like green gram, black gram, soybean etc. fix the atmospheric nitrogen in soil. Similarly, their inclusion in the crop rotation helps in improving physicochemical and biological properties of soil (Sharma *et al.*, 1986). The research work conducted at various places proved that if recommended dose of phosphorus is applied to *kharif* legumes especially to green gram and black gram, there is saving of 50 per cent of phosphorus in succeeding *rabi* sorghum. Considering such economy of chemical fertilizer management of *kharif* legumes followed by *rabi* sorghum was initiated with the views to study the residual effect of *kharif* legumes on grain and fodder yield of *rabi* sorghum in vertisol.

MATERIALS AND METHODS

The experiment was carried out at Sorghum Research Station, Marathwada Agricultural University, Parbhani during *kharif* and *rabi* seasons of 2004-2005. The soil of the experiment field was of Typic Haplusters (Vertisol) of Parbhani series. The textural class was clayey with 260.6, 18.7 and 686.0 kg ha⁻¹ available nitrogen, phosphorus and potassium, respectively with pH 7.7. The experiment was laid out in Factorial Randomized Block Design with 36 plots and three replications. The treatments consisted of preceding four legumes (Green gram-BM-4, Black gram-TAU-1, soybean-MAUS-47 and soybean-

JS-335 and three fertilizer levels to *rabi* sorghum SPV-655 (0, 50 and 100 % RDF) with total twelve treatment combinations. The seeds of green gram and black gram were dibbled at 30 × 10 cm, while the soybean was sown at 30 × 10.5 cm. *Rabi* sorghum was sown at 45 × 15 cm. The observations regarding grain and fodder yield of legumes, as well as *rabi* sorghum were recorded after harvest of crops. The data thus obtained were analysed statistically by following standard procedures.

The data on grain and fodder yield of *kharif* legumes and *rabi* sorghum, sorghum grain equivalent yield and monetary returns are presented in Table 1.

RESULTS AND DISCUSSION

Yield of kharif legumes :

Among the preceding *kharif* legumes soybean JS-335 produced the highest grain yield (1442 kg ha⁻¹) followed by soybean MAUS-47 (1031 kg ha⁻¹), green gram (944 kg ha⁻¹) and black gram (734 kg ha⁻¹) (Table 1). In general, the yields were low due to low rainfall in this year.

Effect of kharif legumes on grain and fodder yield of rabi sorghum:

The preceding *kharif* legumes significantly influenced the grain yield of *rabi* sorghum. *Rabi* sorghum grown after green gram produced significantly higher grain yield compared to the remaining *kharif* legumes. Similarly, the grain yield of *rabi* sorghum was significantly more due to preceding crops of black gram