

Effect of different land configuration on the yield of soybean (*Glycine max* L.)

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■ **ABSTRACT** : A field experiment was conducted during the *Kharif* season of 2014-15, 2015-16 and 2016-17 at KVK, Indore to study the effect of different land configuration on the yield of soybean. The experiment consisted of three treatments of land configuration, viz., T₁ (FIRBS layout), T₂ (Ridge and furrow layout), T₃ (BBF layout), under RBD design with seven replications. Result showed that significant increase was observed in yield contributing characters viz., number of pods plant⁻¹, 100 seed weight (g), seed yield (q ha⁻¹) and harvest index (%) in FIRBS layout as compared to ridges and furrow and broad bed furrow. The net return is the best index of profitability of soybean crop and higher net return per ha of Rs. 24699 was recorded for soybean crop under the FIRBS whereas lower net return per ha of Rs. 20808 was recorded under BBF land configuration.

■ **KEY WORDS** : Soybean, Land configuration, Yield attributes

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Soybean is a major *Kharif* crop in Indore district of Madhya Pradesh. It faces extremes adverse climate condition during the *Kharif* season which creates either moisture excess or moisture stress condition during the crop growing period. Different land configuration methods are available for moisture conservation. Moisture conservation measures not only help in reducing the soil and runoff losses but also useful for raising rainfed crops successfully in arid and semiarid region. Ridges and furrows, tied ridges are some of the methods for conserving the soil moisture for getting the higher yield. Jain and Dubey (1998) reported that maximum yield of soybean was recorded under ridges and furrow sowing over flat beds. Keeping this in view, an experiment was conducted to find out the effect of different land configurations on growth and yield of soybean [*Glycine max* (L.) Merrill.] under rainfed

conditions for the Malwa region.

■ METHODOLOGY

A field experiment was conducted in soybean crop during rainy season (*Kharif*) of 2014-15, 2015-16 and 2016-17 at the Instructional farm of the Krishi Vigyan Kendra, KGNMT, Kasturbagram, Indore (M.P.) India. The soil of experimental site was vertisol and uniform in fertility status. It is having almost uniform very light slope in one direction. The experiment was laid out in Randomized Block Design having three treatments *i.e.* FIRBS, BBF and ridge and furrow with seven replications. All these three methods of sowing soybean were fully mechanized and sowing was done by each type separate seed cum ferti seed drill. In case of ridge and furrow method a deep furrow was constructed after each row of planting and in the BBF method of sowing a

deep furrow was given after every five row of after crop. In the case of FIRBS method of soybean a deep furrow was given after every two row of planting of soybean while in this case each two row of soybean was planted on the top of the raised bed. The row to row spacing was given 45 cm in each method.

■ RESULTS AND DISCUSSION

The results obtained from the present investigation as well as relevant discussion have been summarized under following heads :

Growth analysis:

Data presented in Table 1 shows that FIRBS system of land configuration have higher germination (15.71/running meter), plant population (47.73/ sq m) as compared to ridge and furrow and BBF system of land configuration). The data also show that plant height in FIRBS systems (52.38 cm) was significantly higher followed by the R and F (51.33 cm) and BBF system (50.65 cm). The FIRBS system recorded the higher soil

moisture 28.93 per cent as compared to 28.54 and 27.58 R and F and BBF, respectively.

Yield and yield attributes:

Result depicted in the Table 2 shows that FIRBS recorded 1517 kg/ha grain yield which was significantly higher as compared to R and F (1440 kg /ha) and followed by BBF system (1383 kg/ha) of land configuration. While as far as number of pods per plant is concerned FIRB system recorded significantly higher number of pods per plant followed by R and F (40.58) and BBF system (37.49). The seed index of the soybean crop in the FIRBS system was also found higher (12.37 g) as compared to R and F (11.72 g) and BBF (11.40 g) sowing methods. This present findings are in agreement with those of Singh *et al.* (1993).

Economics:

Land configuration treatments had significant effect on economics of soybean as compared to control. A significant increase in the net income under the FIRBS

Table 1: Effect of different land configuration on the growth parameters of soybean crop and soil moisture				
Treatments	Germination count /running meter	Plant population (per sq m)	Plant height (cm)	Soil moisture %
Land configuration				
FIRBS	15.71	47.73	52.38	28.93
R and F	15.33	47.00	51.33	28.54
BBF	15.11	45.13	50.65	27.58
C.D. (P=0.05)	0.59	2.19	0.85	0.42

Table 2 : Effect of different land configuration on yield and yield attributes of soybean crop			
Treatments	No. of pods per plants	Seed index (g)	Yield (kg/ha)
Method of sowing			
FIRBS	47.16	12.37	1517
R and F	40.58	11.72	1440
BBF	37.49	11.40	1383
C.D. (P=0.05)	1.83	NS	64.8

NS=Non-significant

Table 3 : Effect of different land configuration on economics of soybean crop				
Treatments	Cost of cultivation (Rs./ha)	Gross income* (Rs./ha)	Net income (Rs./ha)	B :C ratio
Method of sowing				
FIRBS	23728	48427	24699	2.01
R and F	23246	45987	22741	1.95
BBF	23166	43973	20808	1.86
C.D. (P=0.05)	647.98	518.38	777.57	0.06

*Soybean sale price @ Rs. 30/kg

system (Rs. 24699) as compared to R and F system (Rs. 22741) of sowing and BBF system of sowing (Rs. 20808) was recorded (Table 3). The B:C ratio was also recorded similarly significantly higher in FIRBS system (2.01) followed by R and F (1.95) and BBF systems of land configuration (1.86) (Table 3). Similar work related to the present investigation was carried out by Lomte *et al.* (2006) and Saxena and Chandel (1992).

Conclusion:

Effect of FIRBS sowing method in soybean crop was found better in comparison with ridge and furrow as well as broad bed furrow method. The FIRBS sowing method recorded net return significantly higher over the ridge and furrow and broad bed furrow for soybean crop. The results of experiment indicated that for achieving higher productivity of soybean crop, the soybean crop should be sown in furrow irrigated raised bed system (FIRBS).

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