Effect of Land Configuration and Sulphur on Growth, Yield and Economics of Groundnut (*Arachis hypogaea*)

ABSTRACT

A field experiment was conducted during *Kharif* 2022 at Crop Research Farm, Department of Agronomy, SHUATS, Prayagraj (U.P) on the topic "Effect of Land Configuration and Sulphur on Growth, Yield and Economics of Groundnut (*Arachis hypogaea*)", to study the response of groundnut under three land configurations such as, flatbed, raised bed and ridges and furrow methods with combination of Sulphur (30,45 and 60 kg/ha). The results revealed that significant and higher plant height (92.18 cm), maximum number of nodules/plant (5.00), higher plant dry weight (35.77 g), maximum number of effective tillers/hill (3.33), spike length (8.00 cm), grains/spike (64.07), test weight (38.02 g), grain yield (5.84 t/ha), straw yield (7.59 t/ha), maximum gross returns (1,50,500.00 INR/ha), net returns (1,02,748.00 INR/ha) and benefit cost ratio (2.15) was recorded in treatment 6 [Raised bed + Sulphur (60kg/ha)].

Keywords: Land Configuration, Sulphur, Growth, Yield, Economics.

INTRODUCTION

Groundnut is one of the most important edible oil seed crop in India. It also called as "King of Vegetable Oil Seeds" and popularly known as Poor Man's Almond. **"**Groundnut is self-Pollinated and allotetraploid legume. Groundnut seed contains 47-53% oil and 26% protein and 11.5% starch, groundnut kernels are good source of all vit-B except B_{12}, vit-E and rich in P, Ca& Mg including micronutrients like Fe and Zn. Groundnut oil is composed of mixed glycerides and unsaturated fatty acids, such as oleic acid (50-65%) and linoleic acid (18-30%). Nearly 81% of kernels are used for oil extraction,12% used for seed purpose, 6% for raw materials and 1% exported in terms of Hand-picked selection. The oil cakes are used to feed live-stock, it consists of N-7.3%, P-1.5%&K-1.3%" **(Dileep *et al.* 2021)**. **"**Groundnut is a tropical crop, grows at altitude of 1065m and latitude between 40^0 N and 40^0 S & annual rainfall with 500-1000 mm is required. Ideal temperature for reproductive stage is 25-30^0C. Groundnut can be grown on all types of soils such as, sandy loam, red soil and heavy black soils, it gives good yield on sandy soils with pH ranges from 5.5-7.0. Groundnut plays important role in improving the soil fertility level through fixation of free atmospheric nitrogen (60-100 kg N/ha) with the help of Rhizobium bacteria" **(Prasad, 2006)**.

"Globally groundnut covers 315 lakh hectares with the production of 536 lakh tonnes and productivity of 1701 kg/ha. China ranks first in groundnut production with 17.57 million tones, followed by India 10.21 million tones, Nigeria 4.45 lakh tones, Sudan 2.83 million tones and United States of America 2.49 million tones. India is major groundnut cultivated country, cultivated in an area with 6.09 lakhs ha. with the production of 10.21 million tonnes and productivity of 1676 kg/ha. Total groundnut cultivated area in Uttar Pradesh was about 0.39 million hectares with the production of 0.74 million tonnes and productivity of 1879 kg/ha" (**GOI, 2021)**.

Nearly 70% of the groundnut area is cultivated as rainfed during *kharif* season (June-July) and late *kharif* (July-August). Due to unpredicted weather changes under rainfed farming, heavy rainfall affects pegging and pod maturation of groundnut crop, which reduces the productivity of crop. To overcome this condition, proper land configuration methods should be adopted as alternate method, which helps in infiltration of excess rain water, minimizing erosion, preventing runoff, facilitates drainage and improves water use efficiency **(Sathiya *et al.* 2020)**. Low yield of groundnut in India specially in Uttar Pradesh during *kharif* season is due to inappropriate practice of required planting methods, inadequate fertilizers use, low seed rate and poor agronomic practices **(Dileep *et al.* 2021)**. Sulphur deficiency in plants have direct impact on yield by delaying maturity, reduce nodulation, increase nitrate content in forage and reduce quality of yield **(Prasad, 2014)**. Sulphur is not mobile in plants as N, P&K and its deficiency in plants generally shows stunted growth and deficiency symptoms at younger leaves **(Rashmi *et al.* 2018)**.

Groundnut can be grown under different planting methods like flat bed, broad bed and furrow, ridge and furrow and raised bed are well known. Flatbed sowing is a traditional method of practice, in which seeds are sown with fine tillage and levelling the field. During kharif season rainfed agriculture suffers from hydro physical changes which reduces crop productivity. Under traditional method of sowing excess and prolonged rain causes poor drainage and aeration, resulting in low nutrient availability and reduces microbial activity **(Chowdary *et al.* 2022)**. Raised beds of 15-30cm height are made for planting in raised bed. Cultivation of crops on raised bed reduces soil bulk density, increases hydraulic conductivity and reduces water logging. Raised bed method effectively utilize irrigated water, increases soil water holding capacity and reduces water weed infestation, increases nutrient use efficiency **(Naing *et al.* 2017)**. The loose and well aerated seedbed is very important for groundnut growing, as loose soil surface is useful for penetration of pegs and development of pods **(Kambel *et al.* 2016).**

Ridges and Furrow of 15-20cm height are made with ridges in the field after tillage and seeds are sown on the ridges. This will enhance the root growth, nodule formation, pegging and development of pods as they have good soil aeration and space out to grow **(Sathya *et al.* 2020)**. Sowing on ridges and furrows results in good plant population/m^2 from 8-13% when compared to flatbed method. Ridges and furrows reduce yield loss during excess rainfall, which is properly directed through furrows and increases water use efficiency both under rainfed and irrigated condition. It reduces evaporation losses and also increases nutrient availability, Low pest and disease attack and better aeration within the furrows, and also reduces weed population. However, the conical shape of ridges delay pegs due to the surface of soil **(Chowdary *et al.* 2017)**.

"Sulphur is an essential nutrient for oilseed production and it is the 13th most abundant element in the earth crust with an average concentration of 0.06%. Sulphur is now recognized a fourth major plant nutrient after Nitrogen, Phosphorus and Potassium" **(Nagesh *et al.* 2019)**. "Sulphur is the master nutrient for oil seed production, as each unit of Sulphur fertilizer generates 3-5 units of edible oil. Sulphur helps in the synthesis of cysteine, methionine, chlorophyll, vitamins (B, biotin and thiamine), metabolism of carbohydrates, oil content, protein content and also associated with growth and metabolism, especially by its effect on the proteolytic enzymes. Sulphur is also known to promote nodulation in legumes thereby N fixation and increases the availability of other nutrients" **(Ariraman and Kalaichelvi, 2020)**. More than 41% of Indian soils are deficient in Sulphur. The amount of Sulphur required to produce one ton of seed is about 3-4 kg S, for oil seed crops 12 kg S (ranges 5-20 kg/ha). Oilseed crops from one hectare remove Sulphur nearly 10-25 kg/ha. Most Sulphur is soil applied in a single application, at the time of sowing, in case Sulphur is missed at sowing, it can be top dressed at 20-30 days after sowing in groundnut. With this in mind, the experiment was carried out to determine the influence of land configuration and sulphur on the growth, yield, and economics of groundnut (*Arachis hypogaea*).

MATERIALS AND METHODS

Studying the response of groundnut under three land configurations—flatbed, raised bed, and ridges and furrow methods along with a combination of Sulphur (30, 45, and 60 kg/ha) was the goal of an experiment conducted during Kharif 2022 at the Crop Research Farm, Department of Agronomy, SHUATS, Prayagraj (U.P). The soil of experimental plot was sandy loam in texture, nearly neutral in soil reaction (pH 8.0), low in organic carbon (0.62 %), available N (225 kg/ha), available P (38.2 kg/ha) and available K (240.7 kg/ha). There were 9 treatments, each being replicated thrice and laid out in Randomized Block Design. The treatment combinations are treatment 1 [Flatbed + Sulphur (30 kg/ha)], treatment 2 [Flatbed + Sulphur (45 kg/ha)], treatment 3 [Flatbed + Sulphur (60 kg/ha)], treatment 4 [Raised bed + Sulphur (30 kg/ha)], treatment 5 [Raised bed + Sulphur (45 kg/ha)], treatment 6 [Raised bed + Sulphur (60 kg/ha)], treatment 7 [Ridges and furrow + Sulphur (30 kg/ha)], treatment 8 [Ridges and furrow (45 kg/ha)] and treatment 9 [Ridges and furrow + Sulphur (60 kg/ha)]. "Growth parameters, yield attributes and economics was recorded. The Data recorded on different aspects of crop, such as, growth parameters, yield attributes were subjected to statistically analysis by analysis of variance method" **(Gomez and Gomez, 1976)**.

RESULT AND DISCUSSION

Growth Parameters of Groundnut

Plant height (cm)

The data revealed that, significant and higher plant height (42.05 cm) was recorded in treatment-6 (Raised bed + Sulphur 60 kg/ha) as compared to rest of the treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 1]. "Significant and higher plant height was with application of Sulphur (60 kg/ha) might be due to rapid cell multiplication and higher chlorophyll content, thereby accelerating photosynthesis rate and eventually more supply of assimilates to plants that in turn increased the growth in terms of greater canopy, height and accumulation of dry matter at successive growth stages". **Yadav *et al.* (2017)**. Further, significant and higher plant height was observed with land configuration of raised bed method, which might be due to more vegetative growth and better root development, root nodulation which directly influenced plant height, resulting in higher plants height. Similar result was also reported by **Patra *et al.* (1996) and Bharade *et al.* (2019)**.

Number of nodules/plant

The data revealed that, significant and maximum number of nodules/plant (49.17) was recorded in treatment-6 (Raised bed + Sulphur 60 kg/ha) as compared to rest of the treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 1]. Significant and maximum number of nodules/plant was with application of Sulphur (60 kg/ha) might be due to higher content of Sulphur in plants, which helps in development of xylem tissues and stimulating photosynthesis, Sulphur containing amino acids, proteins and higher chlorophyll content which results in better root development and promoting nodulation. Similar result was also reported by **Yadav *et al.* (2017)**. Further, significantly maximum number of nodules/plant was observed with land configuration of raised bed method, were 1.08 and 1.2% increased nodules/plant over ridges and furrows and flatbed method, might be due to better root growth, microbial activities, more porosity and moisture in soil, which results in maximum nodules/plant. Similar result was also reported by **Bharade *et al.* (2019)**.

Plant dry weight (g)

The data revealed that, significant and higher plant dry weight (22.03 g) was recorded in treatment-6 (Raised bed + Sulphur 60 kg/ha) as compared to rest of the treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 1]. Significant and higher plant dry weight was with application of Sulphur (60 kg/ha) might be due to growth and development of plants, which obtained by enhanced metabolic activities and photosynthetic rate, resulting in improvement in the accumulation of dry matter at the successive growth stages. Similar result was also reported by **Dileep *et al.* (2021)**.

Crop growth Rate (g/m^2/day)

The data revealed that, significant and higher crop growth rate (15.85 $g/m^2/day$) was recorded in treatment-6 (Raised bed + Sulphur 60 kg/ha) as compared to rest of the treatments. However, the treatment-3 (Flatbed + Sulphur 60 kg/ha) and treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 1]. Significant and higher crop growth rate was with application of Sulphur (60 kg/ha) might be due to improved nutritional environment at the cellular level and higher leaf area index through which may have leads to maximum dry matter accumulation and further increase crop growth rate. Similar findings were also reported by **Sarkar and Banik, (2002) and Dileep *et al.* (2021)**.

Relative growth rate (g/g/day)

The data revealed that, significant and higher relative growth rate (0.082 g/g/day) was recorded with treatment-4 (Raised bed + Sulphur 30 kg/ha) as compared to rest of the treatments. However, the treatment-7 (Ridges and furrows + Sulphur 30 kg/ha) was found to be statistically at par with treatment-4 (Raised bed + Sulphur 30 kg/ha) [Table 1]. Significant and higher relative growth rate was with application of Sulphur (60 kg/ha) might be due to improved photosynthesis rate and nutritional environment at the cellular level, which leads to increase relative growth rate. Similar findings were also reported by **Dileep *et al.* (2021)**.

Yield and yield attributes of Groundnut

Number of pods/plant

The data revealed that, significant and maximum number of pods/plant was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and maximum number of pods/plant yield was with land configuration of raised bed method could be due to loose soil and adequate soil moisture, which help in easy peg penetration and pod development. Similar result was also reported by **Kamble *et al.* (2016)**. Further, significant and maximum number of pods/plant was with application of Sulphur (60 kg/ha) might be due to supply of Sulphur in adequate amount also help in the development of floral and reproductive parts, which results in the maximum development of pods and kernels in plant. Similar result was also reported by **Yadav *et al.* (2017)**.

Number of kernels/pod

The data revealed that, significant and maximum number of kernels/pod was recorded with treatment-3 (Flatbed + Sulphur 60 kg/ha), treatment-6 (Raised bed + Sulphur 60 kg/ha) and treatment-9 (Ridges and furrow + Sulphur 60 kg/ha) was recorded significantly maximum number of kernels/plant (2.00) which was superior over all other treatments. However, the treatment-2 (Flatbed + Sulphur 60 kg/ha), treatment-5 (Raised bed + Sulphur 60 kg/ha) and treatment-8 (Ridges and furrow + Sulphur 60 kg/ha) was found to be statistically at par with treatment-3 (Flatbed + Sulphur 60 kg/ha), treatment-6 (Raised bed + Sulphur 60 kg/ha) and treatment-9 (Ridges and furrow + Sulphur (60 kg/ha) [Table 2]. Significant and maximum number of kernels/pod was with application of Sulphur (60 kg/ha) might be due to synthesis of sulphur containing amino acids, proteins, which leads to stimulating photosynthesis and seed formation and also sulphur plays vital role in energy storage and transformation, carbohydrate metabolism and activation of enzymes, which results in the development of kernels in plants. Similar findings is also reported by **Hinduja *et al.* (2020) and Bhadiyatar *et al.* (2022)**.

Seed Index (g)

The data revealed that, significant and higher seed index (39.81 g) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and higher seed index was with application of Sulphur (60 kg/ha) could be due to sulphur, which is essential for nitrogen fixing nodules in legumes and in formation of chlorophyll, promotes proteins formation, amino acids and seed development. Similar result was also reported by **Aier and Nongmaithem, (2020)**.

Pod yield (t/ha)

The data revealed that, significant and higher pod yield (3.28 t/ha) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and higher pod yield was with land configuration of raised bed method might be due to efficient water management, availability of nutrients to the crop and also loose soil mass with adequate soil moisture which results in easy peg penetration, pod development and thus increasing dry pod yield, Similar result was also reported by **Kamble *et al.* (2016) and Patra *et al.* (1996)**. Further, significant and higher pod yield was with application of Sulphur (60 kg/ha) might be due to maximum availability of Sulphur, which helps in stimulating photosynthesis and seed formation as well as synthesis of Sulphur containing amino acids, proteins, chlorophyll and promoting nodulation may be assigned to increase total biomass production which was finally reflected in increment in pod yiled of groundnut. Similar result was also reported by **Bhadiyatar *et al.* (2022)**.

Seed yield (t/ha)

The data revealed that, significant and higher seed yield (2.24 t/ha) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and higher seed yield was with land configuration of raised bed method might be due to loose soil mass with adequate soil moisture and results in easy peg penetration, pod development and grain formation which increases kernel yield of the crop, Similar result was also reported by **Kamble *et al.* (2016)**. Further, significant and higher kernel yield was with application of Sulphur (60 kg/ha) might be due to overall improvement in growth and development by sulphur fertilization with increased photosynthesis and greater mobilization of photosynthates towards reproductive structures leads to increase in yield of groundnut. Similar result was also reported by **Yadav *et al.* (2018)**.

Haulm yield (t/ha)

The data revealed that, significant and higher haulm yield (4.55 t/ha) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha). Significant and higher seed yield was with land configuration of raised bed method might be due to efficient water management and availability of adequate soil moisture which enhance uptake of nutrients by the crop, which increased plant growth and yield attributes. Similar result was also reported by **Patra *et al.* (1996)** [Table 2]**.** Significant and higher haulm yield was with application of sulphur (60 kg/ha) might be due to applying sulphur promotes overall improvement in crop growth and vigour, as reflected in plant height, dry matter accumulation and number of nodules/plant which marked improvements in haulm yield. Similar result was also reported by **Reddy *et al.* (2022)**.

Harvest index (%)

The data revealed that, significant and higher harvest index (33.10 %) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-3 Flatbed + Sulphur (60 kg/ha), treatment-5 (Raised bed + Sulphur 45 kg/ha) and treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and higher harvest index was with application of sulphur (60 kg/ha) could be due to improved plant growth and yield by sulphur fertilization, which enhance photosynthesis and mobilization of photosynthates towards reproductive and vegetative parts leads to increase in harvest index. Similar findings was also reported by **Yadav *et al.* (2018)**.

Shelling percentage (%)

The data revealed that, significant and higher Shelling percentage (68.20 %) was recorded with treatment-6 (Raised bed + Sulphur 60 kg/ha) which was superior over all other treatments. However, the treatment-9 (Ridges and furrows + Sulphur 60 kg/ha) was found to be statistically at par with treatment-6 (Raised bed + Sulphur 60 kg/ha) [Table 2]. Significant and higher Shelling percentage was with land configuration of raised bed method could be due to soil, water, plant relationship which influenced pod formation and development, thus enabling plants to express their potential to large extent, which reflected in increased in pod yield and there by shelling percentage. Similar findings was also reported by **Kamble *et al.* (2016)**.

Economics

Cost of cultivation (INR/ha)

Cost of cultivation (47,752.00 INR/ha) was found to be highest in treatment-6 (Raised bed + Sulphur 60 kg/ha) and minimum cost of cultivation (43,712.00 INR/ha) was found to be in (treatment-1 Flatbed + Sulphur 30 kg/ha) as compared to other treatments.

Gross return (INR/ha)

Gross returns (1,50,500.00 INR/ha) were found to be highest in treatment-6 (Raised bed + Sulphur 60 kg/ha) and minimum gross returns (1,27,390.00 INR/ha) was found to be in (treatment-1 Flatbed + Sulphur 30 kg/ha) as compared to other treatments.

Net returns (INR/ha)

Net returns (1,02,748.00 INR/ha) were found to be highest in treatment-6 (Raised bed + Sulphur 60 kg/ha) and minimum net returns (83,678.00 INR/ha) was found to be in (treatment-1 Flatbed + Sulphur 30 kg/ha) as compared to other treatments.

Benefit cost ratio (B:C)

Benefit Cost ratio (2.15) was found to be highest in treatment-6 (Raised bed + Sulphur 60 kg/ha) and minimum benefit cost ratio (1.91) was found to be in treatment-1 (Flatbed + Sulphur 30 kg/ha) as compared to other treatments. Higher B:C ratio was recorded with application of sulphur (60 kg/ha) might be due to higher pod and biological yield of groundnut and cheaper cost of sulphur sources, which adds in getting higher farm profitability. Similar findings have also reported by **Yadav *et al.* (2019)**

Table 1 Effect of Different Planting methods and Sulphur on growth attributes of groundnut.

S. No.	Treatment combinations		Growth attributes				
			Plant height (80 DAS)	Number of nodules/plant (60 DAS)	Plant dry weight (80 DAS)	CGR ($g/m^2/day$) (40-60 DAS)	RGR (g/g/day) (20-40 DAS)
1. Flatbed	+	Sulphur (30 kg/ha)	32.98	96.03	17.00	10.72	0.074
2. Flatbed	+	Sulphur (45 kg/ha)	33.45	104.17	18.23	12.18	0.052
3. Flatbed	+	Sulphur (60 kg/ha)	34.31	117.50	20.20	15.40	0.062
4. Raised bed	+	Sulphur (30 kg/ha)	37.16	116.17	17.45	11.57	0.082
5. Raised bed	+	Sulphur (45 kg/ha)	38.71	119.50	19.15	12.55	0.069
6. Raised bed	+	Sulphur (60 kg/ha)	42.05	150.83	22.03	15.85	0.068
7. Ridges and furrow	+	Sulphur (30 kg/ha)	37.02	104.03	18.50	10.69	0.081
8. Ridges and furrow	+	Sulphur (40 kg/ha)	38.50	111.33	19.20	13.12	0.064
9. Ridges and furrow	+	Sulphur (60 kg/ha)	41.33	137.50	21.83	15.57	0.067
	F test		S	S	S	S	S
	S Em (±)		0.15	2.79	0.09	0.22	0.001
	CD (p =0.05)		0.45	8.30	0.27	0.68	0.004

Table 2 Effect of Different Planting methods and Sulphur on yield and yield attributes of groundnut.

S. No.	Treatment combinations	Number of Pods/plant	Number of Kernel/pod	Seed Index(g)	Pod yield (t/ha)	Seed yield (t/ha)	Stover yield (t/ha)	Harvest Index (%)	Shelling (%)
1. Flatbed	+ Sulphur (30 kg/ha)	24.53	1.80	36.75	2.79	1.87	4.09	31.37	67.00
2. Flatbed	+ Sulphur (45 kg/ha)	25.93	1.93	37.77	2.92	1.98	4.21	31.70	67.70
3. Flatbed	+ Sulphur (60 kg/ha)	27.67	2.00	38.75	3.12	2.12	4.40	32.58	67.80
4. Raised bed	+ Sulphur (30 kg/ha)	26.67	1.80	37.12	2.87	1.94	4.17	31.75	67.40
5. Raised bed	+ Sulphur (45 kg/ha)	28.40	1.93	38.06	3.02	2.03	4.30	32.10	67.80
6. Raised bed	+ Sulphur (60 kg/ha)	30.87	2.00	39.81	3.28	2.24	4.55	33.10	68.20
7. Ridges & furrows	+ Sulphur (30 kg/ha)	26.13	1.80	36.94	2.82	1.90	4.11	31.59	67.20
8. Ridges & furrows	+ Sulphur (40 kg/ha)	27.80	1.93	37.90	2.96	2.00	4.25	31.77	67.80
9. Ridges & furrows	+ Sulphur (60 kg/ha)	30.09	2.00	39.40	3.20	2.18	4.45	32.04	68.00
	F test	S	S	S	S	S	S	S	S
	S Em (±)	0.19	0.03	0.17	0.035	0.036	0.02	0.40	0.06
	CD (p=0.05)	0.58	0.11	0.51	0.105	0.107	0.08	1.20	0.20

Table 3 Effect of Different Planting methods and Sulphur on Economics of Groundnut.

S. No.	Treatment combinations			Cost of Cultivation (INR/ha)	Gross returns (INR/ha)	Net Return (INR/ha)	B:C ratio
1.	Flatbed	+	Sulphur (30 kg/ha)	39918.20	113950.00	74031.80	1.85
2.	Flatbed	+	Sulphur (45 kg/ha)	41178.20	120050.00	78871.80	1.91
3.	Flatbed	+	Sulphur (60 kg/ha)	42428.20	128000.00	85571.80	2.01
4.	Raised bed	+	Sulphur (30 kg/ha)	39918.20	117850.00	77931.80	1.95
5.	Raised bed	+	Sulphur (45 kg/ha)	41178.20	124000.00	82821.80	2.01
6.	Raised bed	+	Sulphur (60 kg/ha)	42428.20	134750.00	92321.80	2.17
7.	Ridges and furrow	+	Sulphur (30 kg/ha)	39918.20	115550.00	75631.80	1.89
8.	Ridges and furrow	+	Sulphur (40 kg/ha)	41178.20	121750.00	80571.80	1.95
9.	Ridges and furrow	+	Sulphur (60 kg/ha)	42428.20	131250.00	88821.80	2.09

CONCLUSION

Based on the above findings it is concluded that, raised bed method along with Sulphur (60 kg/ha) was observed higher yield and benefit cost ratio.

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