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Influence of potash and sulphur levels on yield, quality and economics of sesamum (*Sesamum indicum* L.)

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SUMMARY

A field experiment was conducted during *Kharif* season of 2008-09 at instructional farm, Junagadh Agricultural University, Junagadh to study the influence of potash and sulphur levels on yield, quality and economics of sesamum. Result of the experiment revealed that an application of potash @ 50 kg ha^{-1} recorded significantly higher seed yield (813 kg ha^{-1}), stover (1165 kg ha^{-1}) yield, oil content (44.89 %), protein content (27.82 %) with the highest net return of Rs. 27937 ha^{-1} and BCR value of 2.58 over control. Similarly sulphur level also recorded significant effect in increasing all these yield and quality parameters. The highest seed yield (804 kg ha^{-1}), stover (1146 kg ha^{-1}) yield, oil content (45.46 %) and protein content (28.04 %) with net return of Rs. 27478 ha^{-1} and BCR value of 2.56 was obtained under the application @ 40 kg ha^{-1} followed by application of sulphur @ 20 kg ha^{-1}.

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Key words : Sesamum, Potash, Sulphur, Oil content, Protein Content, Economics

Sesamum indicum L. (Syn. *Sesamum orientale* L.), which is known variously as sesamum, til, gingelly, simsim, gergelim etc. is one of the most important oilseed crop grown extensively in India. Sesamum is the oldest indigenous oil plant with longest history of its cultivation in India. India is still the world leader. India, China, Burma, Sudan, Pakistan and Mexico are the main sesamum producing countries of the world. In India, sesamum is an important edible oilseed crop, stands next to groundnut. It is mainly grown in Gujarat, Uttar Pradesh, Madhya Pradesh, Karnataka, Orissa, Bihar, Jharkhand, Andhra Pradesh, Kerala and Tamil Nadu.

Fertilizers, even though comparatively a costly input of production are essential for securing higher yields. The prudent use of fertilizers with appropriate method and time of application are the prime importance in securing higher and economic yields. The potassium is one of the major plant nutrients for the growth and development of plants. The major functions are enzymes involved in photosynthesis, metabolism of carbohydrate and protein. The potassium also improves crop quality and yield characteristics by increasing disease resistance in a number of crops. Sulphur as a plant nutrient can play a key role in augmenting the production and productivity of oilseeds in the country as it has a significant influence on quality and development of oil seeds which positively reflect the economics of the Sesamum.

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MATERIALS AND METHODS

A field experiment was conducted during *Kharif* season of 2008 at Instructional Farm, Junagadh Agricultural University, Junagadh to study the influence of potash and sulphur levels on yield, quality and economics of sesamum. The soil of the experiment field was clayey in texture, medium in available nitrogen (266.5 kg ha^{-1}), medium in available phosphorus (38.3 kg ha^{-1}), available sulphur (19.85 kg ha^{-1}) and fairly rich in available potassium (232.4 kg ha^{-1}) with 7.9 pH. Nine treatment combinations comprised of three levels of potash *viz.,* Control (K_0), potash @ 25 kg K_2O ha^{-1} (K_1) and potash @ 50 kg K_2O ha^{-1} (K_2) and three levels of sulphur *i.e.*

Control (S_0), 20 kg S ha^{-1} (S_1) and 40 kg S ha^{-1} (S_2) were tried in factorial randomized block design with four replications. The sesamum variety Gujarat Til-2 was sown on 7 July 2008 keeping 45 cm inter-row spacing and intra-row spacing of 15 cm was maintained by thinning operation. Recommended dose *i.e.* 25:25:00 kg NPK ha^{-1} and other cultural practices were also adopted as per need of crop.

RESULTS AND DISCUSSION

The results obtained from the present investigation have been discussed in detail as under :

Effect on seed and stover yields:

The potash application brought remarkable effect on seed and stover yields of sesamum. Significantly the highest seed (813 kg ha^{-1}) and stover (1165 kg ha^{-1}) yields were recorded with the application of potash @ 50 kg ha^{-1} over control (Table 1). This might be because of favourable effect of potash in improvement of growth and yield attributes. The positive effect of potash on seed and stover yield might be due to its requirement in carbohydrate synthesis, the pronounced role in photosynthesis and cell elongation. The present results are line with those reported by Dasmahapatra *et al.* (1990) and Mandal *et al.* (1990). The results further reported that treatment receiving sulphur @ 40 kg ha^{-1} produced significantly the highest seed (804 kg ha^{-1}) and stover (1146 kg ha^{-1}) yields over control. The bioactivities of sulphur might have played important role in improving yield attributes like capsules per plant, length of capsules and there by seed yield per plant ultimately increase in seed and stover yield. These findings are in line with those of Tiwari *et al.* (2000)., Vaiyapuri *et al.* (2004) and Raja *et al*. (2007).

Effect on quality:

It is evident from Table 1 that significantly highest oil content (44.89 %) and protein content (27.82 %) were recorded with the application of potash @ 50 Kg K_2O ha^{-1} over control. The increase in protein content was due to the soil under experiment was medium in available potash and response was restricted to 50 kg K_2O ha^{-1}. These results are in agreement with those reported by Dasmahapatra *et al.* (1990) and protein content. Mandal and Pramanik (1996). Similarly higher oil content was recorded with the application of sulphur @ 40 kg ha^{-1} being at par with sulphur @ 20 kg ha^{-1}. Significantly highest protein content was recorded with the application of sulphur @ 40 kg ha^{-1} over control. Sulphur is important constituent of some amino acid molecules and therefore, resulted in increase in protein content. These results corroborated the findings of Tiwari *et al.* (2000) and Raja *et al.* (2007).

Effect on economics:

The highest net return of Rs. 27937 ha^{-1} with BCR value of 2.58 was obtained with the application of potash @ 50 Kg ha^{-1} followed by application of potash @ 25 Kg ha^{-1} with net return of Rs. 25469 ha^{-1} and BCR value of

Table 1: Influence of potash and sulphur fertilizers on yield, quality and economics of sesamum

Treatments	Seed yield (kg ha^{-1})	Stover yield (kg ha^{-1})	Oil content (%)	Protein content (%)	Economics	
					Net realization (Rs. ha^{-1})	BCR
Potash levels (K)						
K_0 = Control	628	958	40.34	21.91	18133	2.05
K_1 = 25 kg K_20 ha^{-1}	764	1102	43.08	24.58	25469	2.46
K_2 = 50 kg K_20 ha^{-1}	813	1165	44.89	27.82	27937	2.58
S. E. ±	18.12	27.52	0.93	0.69	-	-
C.D. (P=0.05)	52.89	80.32	2.72	2.01	-	-
Sulphur levels (S)						
S_0 = Control	644	973	39.62	22.19	19024	2.10
S_1 = 25 kg S ha^{-1}	756	1105	43.23	24.08	25036	2.44
S_2 = 50 kg S ha^{-1}	804	1146	45.46	28.04	27478	2.56
S. E. ±	18.12	27.52	0.93	0.69	-	-
C.D. (P=0.05)	52.89	80.32	2.72	2.01	-	-
Interaction						
K X S	Sig.	Sig.	NS	NS	-	-
C. V. %	8.54	8.87	7.54	9.63	-	-

2.46. This was due to comparatively more increase in yield was obtained under potash @ 50 Kg ha^{-1} (813 kg ha^{-1}) over potash @ 25 kg ha^{-1} (764 kg ha^{-1}). Results further reported that an appreciable increase in net realization was due to various levels of sulphur. The highest net return of Rs. 27478 ha^{-1} with BCR value of 2.56 was obtained with the application of sulphur @ 40 kg ha^{-1} followed by application of sulphur @ 20 kg ha^{-1} which realized net return of Rs.25036 ha^{-1} and BCR value of 2.44. This was due to comparatively better increase in yield over other treatments.

REFERENCES

Dasmahapatra, A. N., Mondal, S. S., Pradhan B. K. and Pan, P. K. (1990). Response of sesamum to potassium nutrition. *J. Potassium Res.*, **6**(3): 124-128.

Mandal, S. S., Das, S. K., Goswami, S.B. and Pradhan, B.K. (1990). Yield and yield attributes of sesamum as influenced by potassium nutrition and plant density. *Indian Agriculturist,* **34**(2): 99-102.

Mandal, S. S. and Pramanik, C. K. (1996). Integrated fertilizer management with potassium in soybean and sesamum under different cropping systems. *J. Potassium Res.,* **12**(3): 298-304.

Raja, A., Hattab, K.O., Gurusamy, L., Vembu, G. and Suganya, S. (2007). Sulphur application on growth and yield and quality of sesame varieties. *Internat. J. Agric. Res.,* **2**(7): 599-606

Tiwari, R.K., Namdeo, K.N., Jha, Girish and Jha, G. (2000). Effect of nitrogen and sulphur on growth, yield and quality of sesamum (*Sesamum indicum*) varieties. *Res. on Crops.* **1**: (2), 163-167.

Vaiyapuri, V., Amudha, A., Sriramachandrasekharan, M. and Imayavaramban, V. (2004). Effect of sulphur levels and organics on growth and yield of sesamum. *Advances-in-Plant-Sciences,* **17**(2): 681-685.

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