INTERNATIONAL JOURNAL OF FORESTRY AND CROP IMPROVEMENT (June, 2011); 2 (1) : 88-90

RESEARCH ARTICLE

Received : May, 2011; Accepted : June, 2011

Influence of different levels of potash and sulphur on yield attributes and yield of sesamum (*Sesamum indicum* L.) under south Saurashtra region

N.D. BHOSALE, B.M. DABHI, V.P. GAIKWAD AND V.S. BAVISKAR

ABSTRACT

A field experiment was conducted during *kharif* season of 2008 at the Instructional farm, Junagadh Agricultural University, Junagadh to study the Response of sesamum (*Sesamum indicum* L.) to different levels of potash and sulphur under south Saurashtra region. Result of the experiment revealed that an application of potash @ 50 kg ha^{-1} recorded significantly higher yield attributes *i.e.* number of capsules per plant (39.17), length of capsules (2.30 cm) and number of seeds per capsule (57.13) which resulted in significantly highest seed yield (813 kg ha^{-1}) and stover (1165 kg ha^{-1}) yields. Similarly sulphur level also recorded significant effect in increasing all these yield attributes and yield. Sulphur application @ 40 kg ha^{-1} produced significantly higher yield attributes and seed yield (804 kg ha^{-1}) and stover (1146 kg ha^{-1}) yield over other treatments.

KEY WORDS : Sesamum, Potash, Sulphur, Yield attributes and yield

Bhosale, N.D., Dabhi, B.M., Gaikwad, V.P. and Baviskar, V.S. (2011). Influence of different levels of potash and sulphur on yield attributes and yield of sesamum (*Sesamum indicum* L.) under south Saurashtra region, *Internat. J. Forestry & Crop Improv.,* **2** (1) : 88-90.

INTRODUCTION

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 with the maximum production (25.8%) from the largest area (29.3%) and highest export (40%) of sesamum in the world. 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 cultivated in an area of about 17.2 lakh hectares with production of 8.00 lakh tonnes of seeds and productivity of 421 kg ha^{-1}. 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 is also improved 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.

Correspondence to:
N.D. BHOSALE, Department of Agronomy, B.A. College of Agriculture, Anand Agricultural University, ANAND (GUJARAT) INDIA
Email : nileshbhosale007@gmail.com

Authors' affiliations:
B.M. DABHI, Department of Agronomy, College of Agriculture, Junagadh Agricultural University, JUNAGADH (GUJARAT), INDIA

V.P. GAIKWAD AND V.S. BAVISKAR, Department of Agronomy, Anand Agricultural University, ANAND (GUJARAT) INDIA

MATERIALS AND METHODS

A field experiment was conducted during *kharif* season of 2008 at the instructional farm, Junagadh Agricultural University, Junagadh to study the response of sesamum (*Sesamum indicum* L.) to different levels of potash and sulphur under south Saurashtra region. 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 comprising three levels of potash *viz.*, no potash (K_0), 25 kg K_2O ha^{-1} (K_1), 50 kg K_2O ha^{-1} (K_2) and three levels of sulphur

viz., no sulphur (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. Sesamum was fertilized with recommended dose of fertilizer *i.e.* 25: 25: 00 kg NPK ha^{-1} respectively. Out of recommended dose, full dose of Phosphorus and half dose of nitrogen uniformly applied in form of DAP and urea at the time of sowing. Remaining half dose of nitrogen through urea was applied at 30 DAS to crop. However potash and sulphur applied through muriate of potash and gypsum respectively at the time of sowing as per treatment combinations in the experiment. 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 and other cultural practices were also adopted as per need of crop.

RESULTS AND DISCUSSION

The results obtained from the present study have been presented under following heads :

Effect of potash:

Data presented in Table 1 revealed that, different levels of potash had significant effect on yield attributes and yield. Significantly higher number of capsules per plant (39.17), length of capsules (2.30 cm) and number of seed per capsule (57.13) was recorded under application of potash @ 50 kg K_2O ha^{-1} but it was at par with application of potash @ 25 kg K_2O ha^{-1}. This trend might be attributed due to the fact that soil under experiment was fairly rich in available potash and response was restricted upto 50 kg K_2O ha^{-1}. The results were accordance with the findings of Majumdar *et al.* (1987) and Dasmahapatra *et al.* (1990) on sesamum. Significantly highest seed (813 kg ha^{-1}) and stover (1165 kg ha^{-1}) yields were recorded with 50 kg K_2O ha^{-1} over control. The improvement in growth characters favorably modified the yield attributes reflected significant and positive correlation with seed and stover yield. Positive effect of potash on seed and stover yields might have been due to its requirement in carbohydrate synthesis, the pronounced role in photosynthesis and cell elongation. Similar results were obtained by Dasmahapatra *et al.* (1990) and Mandal *et al.* (1990).

Effect of sulphur levels:

The data on yield attributes and yield *viz.*, number of capsules per plant, length of capsules, number of seeds per capsule, seed yield and stover yield were significantly influenced by sulphur levels. It is evident from Table 1 revealed that an application of sulphur @ 40 kg ha^{-1} recorded significantly higher number of capsules per plant (38.59), length of capsule (2.27cm) and number of seeds per capsule (56.83) over control while sulphur @ 20 kg ha^{-1} was at par in case of number of capsules per plant, length of capsules, number of seeds per capsule. Similarly treatment receiving sulphur @ 40 kg ha^{-1} produced significantly the highest seed (804 kg ha^{-1}) and stover (1146 kg ha^{-1}) yield over other treatments. Sulphur besides improving vegetative growth, also activate of certain vitamins and co-enzymes. These bio-activities of sulphur

Table 1: Response of potash and sulphur fertilizers on yield attributes and yield of sesamum

Treatments	Number of capsules per plant	Length of capsules (cm)	Number of seeds per capsule	Seed yield (kg ha^{-1})	Stover yield (kg ha^{-1})
Potash levels (K)					
K_0 = Control	34.26	2.08	50.83	628	958
K_1 = 25 kg K_2O ha^{-1}	37.25	2.18	54.74	764	1102
K_2 = 50 kg K_2O ha^{-1}	39.17	2.30	57.13	813	1165
S.E. ±	0.87	0.05	1.24	18.12	27.52
C.D. (P=0.05)	2.54	0.16	3.61	52.89	80.32
Sulphur levels (S)					
S_0 = Control	34.42	2.07	51.39	644	973
S_1 = 20 kg S ha^{-1}	37.67	2.21	54.47	756	1105
S_2 = 40 kg S ha^{-1}	38.59	2.27	56.83	804	1146
S.E. ±	0.87	0.05	1.24	18.12	27.52
C.D. (P=0.05)	2.54	0.16	3.61	52.89	80.32
Interaction					
K x S	Sig.	NS	NS	Sig.	Sig.
C. V. %	8.18	8.57	7.89	8.54	8.87

NS=Non-significant

might have played important role in improving yield attributes like number of capsules per plant, length of capsule and number of seeds per capsule and there by ultimately increase in seed and stover yield. These findings confirmed with the report of Yadav *et al.* (1996), Subrahmaniyan *et al.* (1999), Tiwari *et al.* (2000) Vaiyapuri *et al.* (2004) and Raja *et al.* (2007).

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.

Majumdar, S.K., Barik, K.C., Bera, P.S. and Ghosh, D.C. (1987). Path co-efficient analysis in sesamum (*Sesamum indicum* L.) with varying levels of nitrogen and potassium. *Indian Agriculturist*, **31**(3): 165-169.

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.

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. 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-Sci.*, **17**(2): 681-685.

Yadav,N.P.S., Singh, Vinay., Mehta,V.S. and Singh,V. (1996). Effect of different levels and sources of sulphur on yield, quality and uptake of sulphur by sesamum. *J. Oilseeds Res.*, **13**: (1) : 22-25.

****