ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 5, Issue, 10, pp.2746-2747, October, 2013

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

YIELD AND QUALITY OF SUMMER SESAME (*Sesamum indicum* L.) AS INFLUENCED BY DIFFERENT LEVELS OF NITROGEN, PHOSPHORUS AND SULPHUR

[1]Sawant V. B., [2]Sonani V. V., *[3]Raskar S. S. and [4]Patil, P. A.

[1]Agriculture Officer, Karnataka
[2]Research Scientist, Pulses Research Station, Anand Agricultural University, Model Farm, Vadodara, Gujarat-390 003
[3]Sr. Agriculture officer, Watershed organization trust, Sangamner, Maharashtra
[4]Agricultural research Officer, Watershed organization trust, Maharashtra

ARTICLE INFO

Article History:
Received 29th July, 2013
Received in revised form
10th August, 2013
Accepted 11th September 2013
Published online 10th October. 2013

Key words:
Sesame, Yield, Quality, Oil content, Sulphur, Nitrogen, Phosphorus.

ABSTRACT

Present study has been undertaken in summer Sesamum 2010 at Pulse Research Station, Anand Agricultural University, Model Farm, Vadodara, Gujarat to find out the effect of different NPK levels on yield and quality. The seed and stalk yields were significantly get influenced by nitrogen and sulphur applications while steady increase has been recorded due to phosphorus levels. Oil content in Sesamum has been observed to be increased with increasing levels of nitrogen and sulphur but there was no any significant effect due to Phosphorus.

INTRODUCTION

The oilseed crops play an important role in agriculture and industrial economy of our country. India occupies a very prominent place in the production of oilseed crops of the world as it produces a large variety of oilseed crops and ranks first in respect of total area and production. Among the six major oilseed crops viz. groundnut, sesamum, castor, rapeseed, mustard and linseed, sesamum stands next to groundnut so far as production of edible oil is concerned. A field experiment was conducted during the summer season of the year 2010 at Pulse Research Station, Anand Agricultural University, Model Farm, Vadodara, Gujarat. Soil of the experimental field was sandy loam with pH 7.5. It was very deep and fairly moisture retentive, low in available nitrogen, zinc and organic carbon and high in available phosphorus and potash. It is mainly grown in the tropics and sub-tropics. Principal sesame growing countries are India, China, Turkey, Burma and Pakistan in Asia; Egypt and Sudan in Africa; Greece in Europe; Venezuela, Argentina and Columbia in South America; Nicaragua and El-Salvador in Central America and Mexico and U.S.A. in North America. In India, it is mainly grown in Uttar Pradesh, Andhra Pradesh, Madhya Pradesh, Rajasthan, Gujarat, Maharashtra, Punjab, Kerala and Tamil Nadu. In Gujarat, it is mostly cultivated in Mehsana, Banaskantha, Sabarkantha, Kheda, Bhavnagar, Surendranagar, Amreli, and Junagadh districts of the state. It is sown throughout the year i.e. during Kharif, Summer and Semi-Rabi as a sole or mixed crop.

Corresponding author: Raskar S. S.
Sr. Agriculture officer, Watershed organization trust, Sangamner, Maharashtra.

MATERIALS AND METHOD

The sesamum variety GT-2 released from Oilseed Research Station, Junagadh Agricultural University, Amreli, for the general cultivation in the entire Gujarat state in 1999. This high yielding variety of sesamum was selected for present study due to very high degree of resistance against disease and pest. Eighteen treatment combinations consisting of three levels of nitrogen (25, 50 and 75 kg ha^{-1}), three levels of phosphorus (12.5, 25 and 37.5 kg ha^{-1}) and two levels of sulphur (0 and 20 kg ha^{-1}) were tested in factorial randomized block design with three replications. In order to record observations on various growth characters viz at different stages, five plants were selected and tagged at random from each net plot. Furrows were opened manually in each plot 2 to 3 cm and at 45 cm row spacing in dry conditions after through preparation of land. The full dose of phosphors and sulphur and half quantity of nitrogen according to treatments were applied at the time of sowing. The remaining half quantity of nitrogen was applied as top dressing after one month of sowing. Eight irrigations were given as when required. The experiment was sown with sesame 'GT-2' on 27th February 2010 and harvested on 24th May 2010.

RESULTS AND DISCUSSION

Effect of nitrogen levels on yield and quality

The seed and stalk yields were also significantly influenced by nitrogen applications (Table 1). Application of 50 and 75 kg N/ha were at par and produced significantly higher seed and stalk yields as compared to 25 kg N/ha. The mean seed yield recorded under application of 50 and 75 kg N/ha were 1316 and 1331 kg/ha which

Table 1. Yield and quality of summer sesame (*Sesamum indicum* L.) as influenced by different levels of nitrogen, phosphorus and sulphur

Treatment	Seed yield (kg/ha)	Stalk yield (kg/ha)	Harvest Index (%)	Oil content in seeds (%)	Nitrogen Uptake (kg/ha)	Phosphorus Uptake (kg/ha)	Sulphur uptake (kg/ha)
Levels of nitrogen, kg/ha (N)							
N_1 : 25	1192	2613	31.60	45.31	44.55	8.30	10.77
N_2 : 50	1316	2843	31.74	47.07	51.08	9.29	12.19
N_3 : 75	1331	2894	31.61	49.93	52.60	9.33	12.61
S Em ±	27.60	79.61	0.65	0.252	1.33	0.19	0.38
CD at 5%	79.23	228.55	NS	0.725	3.81	0.54	1.09
Levels of phosphorus, kg/ha (P)							
P_1 : 12.5	1222	2578	32.32	46.88	47.54	8.44	11.02
P_2 : 25	1322	2869	31.64	47.37	50.84	9.24	12.37
P_3 : 37.5	1296	2902	30.99	48.05	49.85	9.25	12.18
S Em ±	27.60	79.61	0.65	0.252	1.33	0.19	0.38
CD at 5%	79.23	228.55	NS	0.725	NS	0.54	1.09
Levels of sulphur, kg/ha (S)							
S_1 : 0	1226	2683	31.48	47.05	46.82	8.53	11.11
S_2 : 20	1334	2883	31.82	47.81	52.00	9.42	12.61
S Em ±	22.53	65.00	0.53	0.206	1.08	0.15	0.31
CD at 5%	64.69	186.61	NS	0.592	3.11	0.44	0.89
Sig. Interaction	-	-	-	-	-	-	-
CV %	9.15	12.14	8.71	2.26	11.40	8.95	13.61

accounted for 10.4 and 11.6 per cent increase over 25 kg N/ha. The oil content of sesame seeds increased significantly with each increment in nitrogen up to 75 kg N/ha. Application of 75 kg N/ha and 50 kg N/ha were, statistically comparable each other noted significantly higher nitrogen, phosphorus and sulphur uptake by the seeds than application of 25 kg N/ha. The increase in nitrogen, phosphorus and sulphur uptake by seeds was mainly due to seed yield. This result is in conformity with that of Lal *et al*. (1995) and Singh *et al*. (2001).

Effect of phosphorus levels on yield and quality

Increases in phosphorus levels the seed yield and stalk of sesame increased steadily (Table 1). Application of 37.5 kg P_2O_5/ha being at par with 25 kg P_2O_5/ha produced significantly higher seed yield as compared to lower level of 12.5 kg P_2O_5/ha. The mean seed yield recorded under application of 25 and 37.5 kg P_2O_5/ha were 1322 and 1296 kg/ha which accounted for 8.18 and 6.05 per cent increase over 12.5 kg P_2O_5/ha. Increased P levels caused considerable increase in oil content. However, there was no significant difference between two consecutive levels of P. phosphorus failed to exert their significant effect on nitrogen uptake by seed. Application of 25 kg P_2O_5/ha and 37.5 kg P_2O_5/ha being at par with each other noted significantly higher phosphorus and sulphur uptake by the seeds than 12.5 kg P_2O_5/ha. It might be attributed to higher uptake of nutrients *viz.*, N, P and S and higher dry matter accumulation and translocation to reproductive plant parts, more supply of phosphorus during seed development stage of crop which might have helped in synthesis of oil and protein, higher root proliferation of the crop. The results are in conformity with those reported by Patra (2001) as well as Choudhary and Patel (2007).

Effect of sulphur levels on yield and quality

Application of sulphur significantly increased seed and stalk yields as compared to control (Table 1). The per cent increased was to the tune of 8.81 in case of seed and 7.45 in case of stalk yield. Different levels of sulphur with respect to nitrogen, phosphorus and sulphur uptake by seeds were found to be significant.

Application of 20 kg S/ha significantly increased the oil content, nitrogen, phosphorus and sulphur uptake by 1.61, 11.06, 10.43 and 13.50, respectively over control. The increased seed yield was mainly responsible for increased uptake of nitrogen, phosphorus and sulphur by seeds. The results are in close agreement with those of Lal *et al.* (1995), Yadav *et al.* (1996), Choudhari and Patel (2007).

Conclusion

In light of the results obtained from this investigation, it can be concluded that for securing maximum seed yield and quality, it is advisable to apply 50 kg N, 25 kg P_2O_5 and 20 kg S $ha^{-1}$to summer sesame var. GT-2 under middle Gujarat Agro-climatic conditions.

REFERENCES

Choudhari, S. R. and Patel, D. B. (2007). Response of sesamum (*Sesamum indicum* L.) to different levels of phosphorus and sulphur under north Gujarat agroclimatic conditions. *GAU Res. J.*, 32(1-2): 31-33.

Lal, N., Sawargi, S. K., Tripathi, R. S. and Bhambri, M. C. (1995). Effect of nitrogen, potassium and sulphur on seed yield, nutrient uptake, quality and economics of sesame (*Sesamum indicum*). *Indian J. Agron.*, 40(2): 333-335.

Patra, A. K. (2001). Yield and quality of sesamum (*Sesamum indicum*) as influenced by N and P during post rainy season. *Annals of Agric. Res.*, 22(2): 249-252.

Singh, P. K., Prakash, O. and Singh, B. P. (2001). Studies on the effect of N-fertilization and weed control techniques on weed suppression, yield and nutrients uptake in sesame (*Sesamum indicum*). *Indian J. Weed Sci.*, 33(3 & 4): 139-142.

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

****