The Pharma Innovation Journal 2022; 11(4): 1287-1289

www.ThePharmaJournal.com

The Pharma Innovation

ISSN (E): 2277- 7695
ISSN (P): 2349-8242
NAAS Rating: 5.23
TPI 2022; 11(4): 1287-1289
© 2022 TPI
www.thepharmajournal.com
Received: 07-01-2022
Accepted: 19-03-2022

Ramavath Praveen Kumar Naik
M.Sc. Scholar, Department of Agronomy, Naini Agricultural institute, SHUATS, Prayagraj Uttar Pradesh, India

Vikram Singh
Associate Professor, Department of Agronomy, Naini Agricultural Institute, SHUATS, Prayagraj, Uttar Pradesh, India

Shruti Grace George
Ph.D. Scholar, Department of Agronomy, SHUATS, Prayagraj, Uttar Pradesh, India

Shrish Kumar Singh
Associate Professor and Head, Department of Agronomy TDPG College, Jaunpur, Uttar Pradesh, India

Corresponding Author:
Ramavath Praveen Kumar Naik
M.Sc. Scholar, Department of Agronomy, Naini Agricultural institute, SHUATS, Prayagraj Uttar Pradesh, India

Effect of sulphur and spacing on growth and yield of blackgram (*Vigna mungo* L.)

Ramavath Praveen Kumar Naik, Vikram Singh, Shruti Grace George and Shrish Kumar Singh

Abstract
A field experiment was conducted during Zaid season (2021) at Crop Research Farm, Department of Agronomy, SHUATS, Prayagraj (U.P.). The soil of experimental plot was sandy loam in texture. The treatment consisted of Sulphur 10 kg/ha + 20 cm x 10 cm, Sulphur 10 kg/ha + 25 cm x 10 cm, Sulphur 10 kg/ha + 30 cm x 10 cm, Sulphur 20 kg/ha + 20 cm x 10 cm, Sulphur 20 kg/ha + 25 cm x 10 cm, Sulphur 20 kg/ha + 30 cm x 10 cm, Sulphur 30 kg/ha + 20 cm x 10 cm, Sulphur 30 kg/ha + 25 cm x 10 cm, Sulphur 30 kg/ha + 30 cm x 10 cm. The experiment was laid out in Randomized Block Design, with 9 treatments replicated thrice. Results that maximum plant height (45.40 cm), numbers of nodules per plant (6.90), plant dry weight (8.20 g/plant), numbers of branches per plant (6.17), number of pods per plant (35.90), number of seeds per pod (7.40), test weight (34.67g), grain yield (0.83 t/ha) and straw yield (1.80 t/ha) was significantly influenced with application of Sulphur 30 kg/ha + 30 cm x 10 cm. Maximum gross returns (INR 60266.66), net returns (INR 34721.26) and B:C ratio (1.35) was recorded with application of Sulphur 30 kg/ha + 30 cm x 10 cm. Therefore, that application of Sulphur 30 kg/ha + 30 cm x 10 cm was more productive and cost effective it can be concluded.

Keywords: Black gram, sulphur, bio, yield attributes, Zaid

Introduction
Pulses are commonly known as food legumes with are secondary to cereals in production and consumption in India. The United Nations, declared 2016 as “International Year of Pulses” (IYP) to heighten public awareness of the nutritional benefits of pulses as part of sustainable food production aimed at food security and nutrition. Pulses are an integrated part to many diets across the globe and they have great potential to improve human health, conserve our soil, protect the environment and contribute to global food security. Blackgram is scientifically known as (*Vigna mungo* L.) and commonly known as Urd in India. It is tropical leguminous plant. Singh *et al*. (2017). Sulphur is being recognized as fourth major essential plant nutrient after N, P and K. Sulphur plays an important role not only in boost up the productivity but also improves the quality of the blackgram. Sulphur plays important role in synthesis of sulphur containing amino acids, i.e., cystine, cysteine and methionine, besides glutathione. Sulphur is also essential for the synthesis of Co-enzyme A, biotin and thiamine or vitamin B1. Sulphur is also a vital part of ferredoxins which participate in oxidoreduction process and has a significant role in nitrate and sulphate reduction. Although not a constituent, sulphur is needed for the synthesis of chlorophyll. Sulphur deficiency had been reported from several states of India and importance of sulphur application for increasing crop yields and quality is being increasingly recognized. Sulphur influences plant growth in two ways, firstly by acting as a nutrient and secondly by improving the favourable soil conditions. Plant density can have a major effect on the final yield of most of the legumes and the general response of yield to increasing population is well documented. To realize the maximum yield potential of blackgram during summer and rainy season, maintenance of optimum space made available to individual plant is of prime importance. Row and plant spacing has to be worked out to get desired spacing. The spacing requirement depends upon the growth behaviour of genotype. So, it is required to maintain spacing for obtaining higher yield. Veeramani, (2019).

Materials and Methods
The experiment was conducted during *Zaid* season of (2021). The experiment was conducted in Randomized Block Design consisting of nine treatment combinations with three replications and was laid out with the different treatments allocated randomly in each replication.

The soil of the experimental field was sandy loam in texture, slightly alkaline reaction (pH 7.1) with low level of organic carbon (0.28%), available N (225 Kg/ha), P (19.50 kg/ha) and higher level of K (92.00 kg/ha). The treatment combinations are Sulphur 10 kg/ha + 20 cm x 10 cm, Sulphur 10 kg/ha + 30 cm x 10 cm, Sulphur 10 kg/ha + 30 cm x 10 cm, Sulphur 20 kg/ha + 20 cm x 10 cm, Sulphur 20 kg/ha + 25 cm x 10 cm, Sulphur 20 kg/ha + 30 cm x 10 cm, Sulphur 30 kg/ha + 20 cm x 10 cm, Sulphur 30 kg/ha + 25 cm x 10 cm, Sulphur 30 kg/ha + 30 cm x 10 cm. The observations were recorded on different growth parameters at harvest *viz*. plant height (cm), number of branches per plant, plant dry weight, Number of pods per plant, number of seeds per pod, test weight, grain yield and stover yield.

Result and Discussion

A. Growth Attributes

At harvest, significantly maximum plant height (45.40 cm) was recorded with application of 30 kg/ha sulphur + 30 x 10 cm. However, treatment with application of 30 Kg/ha sulphur + 25 x 10 cm (42.77 cm), was statistically at par with 30 kg/ha sulphur + 30 x 10 cm compared to other treatments. At harvest observed that significantly maximum number of nodules (6.90) was recorded with application of 30 kg/ha sulphur + 30 x 10 cm. However, treatment with application of 30 Kg/ha sulphur + 25 x 10 cm (6.60) was statistically at par with application of 30 kg/ha sulphur + 30 x 10 cm compared to other treatments. At harvest observed that significantly maximum number of branches (6.17) was recorded with application of 30 kg/ha sulphur + 30 x 10 cm. However, treatment with application of 30 Kg/ha sulphur + 25 x 10 cm (5.44), 30 Kg/ha sulphur + 20 x 10 cm (5.45) and Sulphur 10 kg/ha + 20 cm x 10 cm (5.56) were statistically at par with application of 30 kg/ha sulphur + 30 x 10 cm compared to other treatments. At Harvest recorded that significantly maximum plant dry weight (8.20) was observed with application Sulphur 30 kg/ha + 30 cm x 10 cm. However, treatment with application of Sulphur 30 kg/ha + 20 cm x 10 cm (7.90) was statistically at par with application of Sulphur 30 kg/ha + 30 cm x 10 cm compared to other treatment. E. A. Ali (2011) [1].

B. Yield attributes

Grain yield, recorded maximum with application of Sulphur 30 kg/ha + 30 cm x 10 cm (0.83 t/ha) significantly superior over rest of the treatments. However, treatment with application of Sulphur 30 kg/ha + 25 cm x 10 cm (0.80 t/ha) were statistically at par with application of Sulphur 30 kg/ha + 30 cm x 10 cm compared to other treatments. Stover yield, recorded maximum with application of Sulphur 30 kg/ha + 30 cm x 10 cm (1.82 t/ha) significantly superior over rest of the treatments. However, treatments with application of Sulphur 30 kg/ha + 25 cm x 10 cm (1.75 t/ha) were statistically at par with application of Sulphur 30 kg/ha + 30 cm x 10 cm compared to other treatments. Harvest index, recorded maximum with application of Sulphur 10 kg/ha + 20 cm x 10 cm (36.39%) superior over rest of the treatments and minimum with Sulphur 10 kg/ha + 25 cm x 10 cm (36.26%) and Sulphur 20 kg/ha + 20 cm x 10 cm (35.84%) remaining all other treatments. Shay *et al.* (2015)

Table 1: Effect of sulphur and spacing on growth attributes of blackgram

Treatments	Plant height (cm) At Harvest	Number of nodules per plant At Harvest	Number of branches per plant At Harvest	Plant dry weight (g/plant) At Harvest
Sulphur 10 kg/ha + 20 cm x 10 cm	37.40	4.90	5.56	6.90
Sulphur 10 kg/ha + 25 cm x 10 cm	39.60	5.00	5.00	7.30
Sulphur 10 kg/ha + 30 cm x 10 cm	41.40	5.40	4.78	7.50
Sulphur 20 kg/ha + 20 cm x 10 cm	41.00	5.30	4.89	7.40
Sulphur 20 kg/ha + 25 cm x 10 cm	41.70	5.80	5.41	7.10
Sulphur 20 kg/ha + 30 cm x 10 cm	42.30	6.00	5.00	7.40
Sulphur 30 kg/ha + 20 cm x 10 cm	41.40	5.60	5.45	7.90
Sulphur 30 kg/ha + 25 cm x 10 cm	42.70	6.60	5.44	7.10
Sulphur 30 kg/ha + 30 cm x 10 cm	45.40	6.90	6.17	8.20
S.Em(±)	0.88	0.13	0.25	0.19
CD (p=0.05)	2.63	0.40	0.74	0.56

Table 2: Effect of sulphur and spacing on yield attributes and yield of blackgram

Treatments	No. of pods per plant	No. of seeds per pod	Test weight (g)	Grain yield (t/ha)	Stover yield (t/ha)	Harvest index (%)
Sulphur 10 kg/ha + 20 cm x 10 cm	27.40	5.00	30.67	0.62	1.08	36.39
Sulphur 10 kg/ha + 25 cm x 10 cm	28.30	5.40	31.33	0.65	1.15	36.26
Sulphur 10 kg/ha + 30 cm x 10 cm	30.60	5.80	32.33	0.69	1.35	33.81
Sulphur 20 kg/ha + 20 cm x 10 cm	30.10	5.60	32.33	0.67	1.19	35.84
Sulphur 20 kg/ha + 25 cm x 10 cm	31.90	6.10	33.00	0.74	1.57	31.89
Sulphur 20 kg/ha + 30 cm x 10 cm	32.90	6.30	33.67	0.77	1.70	30.67
Sulphur 30 kg/ha + 20 cm x 10 cm	30.70	6.00	32.67	0.71	1.45	32.88
Sulphur 30 kg/ha + 25 cm x 10 cm	33.20	6.90	33.00	0.80	1.75	31.34
Sulphur 30 kg/ha + 30 cm x 10 cm	35.90	7.40	34.67	0.83	1.82	31.14
S.Em (±)	1.28	0.26	0.37	0.01	0.04	0.64
CD (5%)	3.84	0.77	1.11	0.03	0.11	1.94

Conclusion

On the basis of one season experimentation application Sulphur 30 kg/ha + 30 cm x 10 cm has performed better in growth and yield parameter and also proven economically viable. The conclusions drawn are based on one season data only which requires further confirmation for recommendation.

Reference

1. Ali EA. Impact of row spacing and nitrogen rates on grain yield and nitrogen use efficiency of pearl millet in Sandy Soil. Journal of Sebha University Pure and Applied Sciences. 2011, 10(1).
2. Chaubey SK, Chaubey S, Dwivedi DP, Singh AK, Singh UP. Production and productivity of lentil (*Lens culinaris* M.) as influenced by various levels of phosphorus and sulphur. Agriways. 2019;7(1):29-32.
3. Cimrin KM, Togay Y, Togay N, Sonmez F. Effect of different Sulphur and pyrite levels on yield, yield components and nutrients uptake of lentil (*Lens culinaris* M.), Indian Journal of Agricultural Sciences. 2008;78(6):543-547.
4. Sahay N, Singh SP, Ali J, Sharma YK. Effect of cobalt and sulphur nutrition on yield, quality and uptake of nutrients in lentil. Legume Research. 2015;38(5):631-634.
5. Sathyamoorthi K, Amanullah MM, Vaiyapuri K, Somasundaram E. Physiological parameters and yield of greengram (*Vigna radiata* L.) as influenced by increased plant density and fertilizer levels. Indian Journal of Crop Sciences. 2008;3:115-122.