Original Research Article

Effect of Spacing on Yield and Economics of Varieties of Black gram (*Vigna mungo* L.)

ABSTRACT-

A field trial was conducted during Zaid 2021 at Crop Research Farm, Department of Agronomy, SHUATS, Prayagraj (U.P). The soil of experimental plot was flaxen gault in texture, nearly neutral in soil response (pH7.1), low in organic carbon (0.36), available N (171.48 kg/ ha), available P (15.2 kg/ ha) and available K (232.5 kg/ ha). The trial was laid out in Randomized Block Design with nine treatments each replicated thrice on the base of one time trial. The treatments which are T1 25 cm x 20 cm SHEKHAR 2, T2 25 cm x 20 cm PANTU-35, T3 25 cm x 20 cm T9, T4 30 cm x 15 cm SHEKHAR 2, T5 30 cm x 15 cm PANTU-35, T6 30 cm x 15 cm T9, T7 45 cm x 10 cm SHEKHAR 2, T8 45 cm x 10 cm PANTU-35, T9 45 cm x 10 cm T9 used. The results showed that operation of 45 cm x 10 cm SHEKHAR 2 was recorded significantly capsules/ factory (64.64), Seeds/ cover (8.20), Test weight (36.46 g) whereas maximum crop growth rate (4.36 g/ m2/ day) was recorded with treatment 30 cm x 15 cm T9. Still, advanced Seed yield (1062.86 kg/ ha), gross returns (Rs.63771.6/ ha), net return (Rs.39866.95/ ha) and benefit cost rate (1.66) were attained with operation of 30 cm x 15 cm SHEKHAR 2 as compared to other treatments.

Keywords: Spacing, Varieties, yield and Economics.

INTRODUCTION

Beats are imperative protein source for predominately submissive populations of our country. It's eaten in the form of " dal" (wholly or resolve, barked or unhusked) or parched. It's foremost element of both "papad" and " bari" (seasoned ball) making pleasurable curry. A good quantum of lysine is present in the beats. It also restores fertility by fixing atmospheric nitrogen, so as to produce reasonable yields of posterior crops and to meet out the demand of salutary demand regarding proteins, carbohydrates and other nutrient sources. Among colorful beats black gram (Vigna mungoL.) belonging to family Leguminosae is of immense

significance as it contains 55-60 Carbohydrates, 22-25 Protein, 1-1.3 fat and is the richest among the colorful beats in phosphorus being 5-10 times richer than others (Ali etal., 2002). Dried black gram contains about9.7 water,23.4 protein,1.0 fat,57.3 carbohydrate and3.8 fibre along with 154 mg Calcium,9.1 mg Iron,0.37 g riboflavin and0.42 g Thiamine in each gram of black gram (Verma etal., 2011).

India is the largest patron of beats, producing about 25 of the world's product. Because of their vital part in nutritive protection and soil development, beats have been an integral part of sustainable husbandry since ancient times. (Tomar etal., 2011).

Bettered kinds of different palpitation crops hold pledge to increase productivity by 20-25, whereas rearmost technology, which includes bettered kinds and integrated nutrient and pest operation, showed 25-42 advantage over the planter's practices in a large number of frontline demonstrations conducted across the country (Ali and Gupta, 2012).

It's principal demand to maintain optimum factory population by maintaining inter and intra row distance duly. Maximum or minimal factory viscosity may minimize yield of black gram causing physiological change in factory. Hence applicable toxin cure with acceptable factory population may increase crop yield of black gram. Analogous results were noted by (Choudhary etal., 2017).

Factory viscosity can have a major effect on the final yield of utmost of the legumes and the general response of yield to adding population is well proved. To realize the maximum yield eventuality of black gram during summer and stormy season, conservation of optimum space made available to individual factory is of high significance. The distance demand depends upon the growth geste of genotype. So, it's needed to maintain distance for carrying advanced yield (P Veeramani, 2019).

MATERIALS AND METHOD

The present examination was carried out during Zaid 2021 at Crop Research Farm, Department of Agronomy, SHUATS, Prayagraj, UP, which is located at25.28 oN latitude,81.54 oE longitude and 98 m altitude above the mean ocean position. The trial laid out in Randomized Block Design which conforming of nine treatments with T1 25 cm x 20 cm SHEKHAR 2, T2 25 cm x 20 cm PANTU-35, T3 25 cm x 20 cm T9, T4 30 cm x 15 cm SHEKHAR 2, T5 30 cm x 15 cm PANTU-35, T6 30 cm x 15 cm T9, T7 45 cm x 10 cm SHEKHAR 2, T8 45 cm x 10 cm PANTU-35, T9 45 cm x 10 cm T9 were replicated thrice.

The experimental point was invariant in geomorphology and flaxen gault in texture, nearly neutral in soil response (pH7.1), low in Organic carbon (0.38), medium available N (225 kg/ ha), advanced available P (19.50 kg/ ha) and medium available K (213.7 kg/ ha). Nutrient sources were Urea, DAP, MOP to fulfill the necessity of Nitrogen, phosphorous and potassium. The operation of diseases was applied as rudimentary at the time of sowing. In the period from germination to crop several factory growth parameters were recorded at frequent intervals along with it after crop several yield parameters were recorded those parameters are growth parameters, factory height, branches per factory, nodes per factory and factory dry weight are recorded. The yield parameters like capsules per factory, seeds per cover, test weight (1000 seeds) and seed yield (kg/ ha) were recorded and statistically anatomized using analysis of friction (ANOVA) as applicable to Randomized Block Design (GomezK.A. and GomezA.A. 1984).

RESULTS

Yield attributes and Yield

Capsules/ Factory

Significantly Maximum Capsules/ factory (64.64) was recorded with the treatment of operation of 45 cm x 10 cm SHEKHAR 2 over all the treatments. Still, the treatments 45 cm

x 10 cm PANTU-35 (64.17) and 45 cm x 10 cm T9 (63.16) which were plant to be statistically at par with 45 cm x 10 cm SHEKHAR 2.

Seeds/ Cover

Significantly loftiest Seeds/ Cover (8.20) was recorded with the with the treatment of operation of 45 cm x 10 cm SHEKHAR 2 over all the treatments. Still, the treatments 45 cm x 10 cm PANTU-35 (8.11) and 45 cm x 10 cm T9 (7.96) which were plant to be statistically at par with 45 cm x 10 cm SHEKHAR 2.

Comment [sl1]: Delete repetition

Test weight (g)

Significantly loftiest Test weight (36.46 g) was recorded with the treatment operation of 45 cm x 10 cm SHEKHAR 2 over all the treatments. Still, the treatments with (36.12 g) in 45 cm x 10 cm PANTU-35 and (35.42 g) in 45 cm x 10 cm T9 which were plant to be statistically at par with 45 cm x 10 cm SHEKHAR 2.

Seed yield (kg/ ha)

Significantly loftiest Seed yield (1062.86 kg/ ha) was recorded with the treatment operation of 30 cm x 15 cm SHEKHAR 2 over all the treatments. Still, the treatments with (1025.61 kg/ ha) in 30 cm x 15 cm PANTU-35 and (997.39 kg/ ha) in 30 cm x 15 cm T9 which were plant to be statistically at par with 30 cm x 15 cm SHEKHAR 2.

Economics

Gross returns (INR/ ha)

Data in Table 2 revealed that Advanced Gross returns have been recorded with the 30 cm x 15 cm SHEKHAR 2 (Rs.63771.6/ ha) over rest of the treatments followed by 30 cm x 15 cm PANTU-35 (Rs.61536.6/ ha) whereas minimal gross return was recorded with 45 cm x 10 cm T9 (Rs.40045.2/ ha).

Net returns (INR/ ha)

Data in Table 2 revealed that Advanced Net returns have been recorded with the treatment 30 cm x 15 cm SHEKHAR 2 (Rs.39866.95/ ha) over rest of the treatments followed by 30 cm x 15 cm PANTU-35 (Rs.37851.95/ ha) whereas minimal Net returns was recorded with 45 cm x 10 cm T9 (Rs.16560.55/ ha).

Benefit Cost rate (B C)

Data in Table 2 revealed that Higher Benefit bring rate have been recorded with the treatment 30 cm x 15 cm SHEKHAR 2 (1.66) over rest of the treatments followed by 30 cm x 15 cm PANTU-35 (1.59) whereas lower Benefit cost rate was recorded with 45 cm x 10 cm T9 (0.70).

DISCUSSION

Advanced number of capsules/ shops might have been possible due to further vigour and strength attained by the shops as a result of better photosynthetic conditioning with sufficient vacuity of light, and force of nutrients in balanced volume of the shops at growing stages. Jitendrakumar etal. (2015) observed the analogous results. The performance of SHEKHAR 2 variety as regard of capsules/ factory and seeds/ cover was plant to be superior. The probable reason for this may be the inheritable make-up of the variety that has helped in perfecting the photosynthetic exertion due to increased source capacity and effective translocation of photosynthesis to the Gomorrah. The results were in agreement to Siddikee etal. (2018) and Patidar and Singh (2018). Better vacuity of humidity and temperance of soil temperature which led to lesser uptake of nutrients and reduced number of days taken to meet the needed heat units for proper growth and development of shops and eventually the yield attributes. The results were recorded analogous with Anand etal. (2020). The optimum distance 30x15 cm helped plant to admit sufficient quantum of heat, water and nutrients from soil which

increased number of capsules/ shops, seeds/ cover and test weight which directly helped in increase of seed yield in lentil. The results were analogous to Singh etal. (2009). The performance of black gram kinds in respect of seed yield was veritably encouraging and followed a analogous trend that of yield attributes. The variety SHEKHAR 2 recorded advanced seed yield over other kinds might be due to the advanced product effectiveness that has been reflected through enhancement in different yield attributing characters. Analogous findings were reported by Siddikee etal. (2018) and Rathode and Gawande (2014).

CONCLUSION

Comment [sl2]: Short findings. Still can elaborate the results and discussion. Statistical analysis may be carried out.

It is concluded that application of treatment 30 cm x 15 cm + SHEKHAR 2 was recorded significantly higher Seed yield (1062.86 kg/ha), higher gross returns (Rs. 63771.6/ha), net returns (Rs. 39866.95/ha) and benefit cost ratio (1.66) as compared to other treatments. Since, the findings based on the research done in one season.

References

Comment [sl3]: Only 10 references? This is not enough to substantiate the results obtained. Include few more references.

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Table1. Effect of Spacing on Yield attributes and Yield of different varieties of Black gram

	Treatments	Pods/Plant	Seeds/Pod	Test weight (g)	Seed yield (Kg/ha)
1.	25 cm x 20 cm + SHEKHAR 2	59.71	7.43	35.40	950.76
2.	25 cm x 20 cm + PANT U-35	58.43	7.22	34.60	921.66
3.	25 cm x 20 cm + T9	57.66	6.92	34.10	868.32
4.	30 cm x 15 cm + SHEKHAR 2	62.37	7.72	37.20	1062.86
5.	30 cm x 15 cm + PANT U-35	61.86	7.58	36.60	1025.61
6.	30 cm x 15 cm + T9	60.69	7.47	35.80	997.39
7.	45 cm x 10 cm + SHEKHAR 2	64.64	8.20	38.50	811.23
8.	45 cm x 10 cm + PANT U-35	64.17	8.11	38.10	733.15
9.	45 cm x 10 cm + T9	63.16	7.96	37.50	667.42
	F test	**S**	**S**	**S**	**S**
	S. EM (±)	0.51	0.09	0.33	22.11
	CD (P = 0.05)	1.52	0.28	1.00	66.28

Table 2. Effect of Spacing on Economics of different varieties of Black gram

Treatments	Cost of cultivation	Gross returns	Net returns	B:C Ratio
1. 25 cm x 20 cm + SHEKHAR 2	24124.65	57045.6	32920.95	1.36
2. 25 cm x 20 cm + PANT U-35	23884.65	55299.6	31414.95	1.31
3. 25 cm x 20 cm + T9	23884.65	52099.2	28214.55	1.18
4. 30 cm x 15 cm + SHEKHAR 2	23904.65	63771.6	39866.95	1.66
5. 30 cm x 15 cm + PANT U-35	23684.65	61536.6	37851.95	1.59
6. 30 cm x 15 cm + T9	23684.65	59843.4	36158.75	1.52
7. 45 cm x 10 cm + SHEKHAR 2	23684.65	48673.8	24989.15	1.05
8. 45 cm x 10 cm + PANT U-35	23484.65	43989	20504.35	0.87
9. 45 cm x 10 cm + T9	23484.65	40045.2	16560.55	0.70