

EFFECT OF SOWING DATES AND VARIETIES ON GROWTH AND YIELD CONTRIBUTING CHARACTER OF GREEN GRAM(VIGNARADIATA L.)

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Abstract : The sowing date D₁ (25th June) recorded significantly superior in plant height (at harvest), functional leaves, number branches, number of pods plant⁻¹, weight of pod plant⁻¹, grain weight plant⁻¹, number of seed pod⁻¹ and seed index over D₃, D₄ and D₅, in case of grain weight plant⁻¹, number of seed pod⁻¹ and seed index D₂ was at par. The green gram variety V₃(BM-2003-2) was found significantly superior in plant height (at harvest), number of functional leaves plant⁻¹(at harvest), number of branches plant⁻¹(at harvest), number of pods plant⁻¹, weight of pod plant⁻¹, grain weight plant⁻¹, number of seed pod⁻¹ and seed index over V₁(BM-4), V₄ (BPMR-145) and V₅(PKV green gold), but V₂ (BM-2002-1) was at par in plant height and number of branches plant⁻¹.

Keyword: Green gram, sowing dates and varieties

1. INTRODUCTION

Mungbean (*Vignaradiata* L.) is a leguminous pulse crop for in use as a vegetable protein source, animal fodder and green manure. It also play an important role in improving soil fertility through biological nitrogen fixation Asgharmaliket. Al (2006). This is an important short growth duration (60-70 days) grain legumes and high nutritive value. The duration of particular stages of growth is directly related to temperature and the duration for particular species could be predicted using the sum of daily air temperature. The data on the effect of dates of sowing were lacking on the new promising genotypes of mungbean. In addition, there was a dire need to find out genotypes for late sowing according to heat unit requirement.

Among pulses, Green gram is the third most important pulse crop in India. The area under mungbean is 3.38 M ha with an annual 2013-14 production of 1.60 M ton having average productivity of 414 kg ha⁻¹ (Anonymous, 2014). In India, major mungbean producing states are Andhra Pradesh, Orissa, Maharashtra, Madhya Pradesh, Rajasthan, Bihar, Karnataka, Tamilnadu and Uttar Pradesh. In Maharashtra mungbean is growing to the extent of 3.18 lakh ha., with production of 0.89 lakh tones (2014-15) with productivity of 280 kg ha⁻¹. In Marathwada region it is growing to the extent of 1.58 lakh ha with production of 0.30 lakh ton and the productivity is of 210 kg ha⁻¹ (Anonymous, 2014). Mungbean (*Vignaradiate*).

2. MATERIALS AND METHODS

The experiment was conducted at Agronomy farm, and laid out in a split plot design with three replications. The main plot treatments were five sowing dates viz., D₁: 25th June,

D₂: 1st July, D₃: 7th July, D₄: 15th July and D₅: 21st July. The sub plot treatments comprised five varieties viz., V₁: BM-4, V₂: BM-2202-1, V₃: BM 2003-2, BPMR-145 and V₄: PKV green gold. Thus, there were in all 20 treatment combinations. The seed of varieties BM-4, BM-2003-1, BM-2003-2, BPMR-145 and PKV green gold was sown as per the treatments. The seed was dibbled at 30 cm X 10 cm spacing. Before sowing the seed was treated with thirum @ 4 g per kg of seed followed, by Rhizobium and PSB @ 25 g per kg of seed. Nitrogen and phosphorus were applied in the form of urea (46% N) and single Super phosphate (16% P₂O₅) as 25:50:00 kg N:P₂O₅:K₂O per hectore. The whole quantity of fertilizers was applied as a basal dose before sowing. The other usual common packages of practices were followed time to time and periodical growth observations were recorded at an interval of 15 days. Crop was harvested at physiological maturity and data on yield attributes were recorded.

3. EFFECT OF SOWING DATES

3.1 Mean plant height (cm)

The mean plant height of D₁ (25th June) is significantly superior over rest treatments at all growth stages.

3.2 Mean number of functional leaves plant⁻¹

The crop sown on D₁ (25th June) produced significantly higher number of functional leaves plant⁻¹ from 15 DAYS to at harvest over rest of all other sowing dates except 15 DAYS and at harvest it was at par with D₂ (1st July).

Mean number of branches plant⁻¹

The sowing dates D₁(25th June) recorded highest no. of branches plant⁻¹ which was significantly superior over the sowing time D₃, D₄, D₅ but it was found at par with sowing time D₂ (1st July) at all growth stages except 45 DAYS .

Yield contributing Characters

Number of pods plant⁻¹

The maximum number of pods plant⁻¹ were observed by the crop sown on D1 i.e. (25th June) was found significantly superior over rest of sowing dates.

Weight of Pods plant⁻¹

The crop sowing on D1 i.e. (25th June) has produced highest pod weight plant⁻¹ and significantly superior over rest of the sowing dates and it was found at par with date D2 i.e. (1st July). The lowest pod weight plant⁻¹ recorded by sowing date D5 i.e. (21st July).

Grain weight plant⁻¹

The date D1 i.e. (25th June) produced maximum grain weight plant⁻¹ which was significantly superior as compared to the other of sowing dates and it was at par with D2 i.e. (1st July).

Number of seeds pod⁻¹

The crop sown on D1 i.e. (25th June) has recorded maximum number of seeds pod⁻¹ and significantly superior over D5 i.e. (21st July) and at par with D2 i.e. (1st July).

Seed index

The crop sown on D1 i.e. (25th June) has recorded maximum seeds index and significantly superior over D5 i.e. (21st July) and at par with D2 i.e. (1st July).

Effect of varieties :

Mean plant height (cm)

The variety BM-2003-2 (V3) was found significantly superior over other varieties in producing taller plant upto harvest. The mean plant height of BM-2003-2 (V3) is significantly superior over variety BPMR-145 (V4) and found at par with the variety BM- 2002-1(V2) except 15 DAS.

Mean number of functional leaves plant⁻¹

Variety BM-2003-2 (V3) was recorded highest maximum number of functional leaves plant⁻¹ and significantly superior over varieties BM-4, BM-2002-1, BPMR-145 and PKV green gold except 15 DAS and 60 DAS (V2) BM-2002-1 was at par with (V3) BM-2003-2.

Mean number of branches plant⁻¹

The variety BM-2003-2(V3) was found significantly superior over varieties BM-4 (V1) and BPMR145(V4) for producing maximum number of leaves plant⁻¹ but at par with BM2002-1(V2).

Yield contributing Characters

Number of pods plant⁻¹

The Higher number of pods plant⁻¹ was produced by variety BM-2003-2 (V3) and it was significantly superior over variety BPMR-145 (V4), BM-4 (V1), BM- 2002-1 (V2).

Weight of Pods plant⁻¹

The variety BM-2003-2 (V3) produced maximum pod weight plant⁻¹ (7.86 g) and found significantly superior as compared to rest of all varieties and at par with BM-2002-1 (V2).

Table 1. Mean plant height (cm), Mean number of functional leaves plant⁻¹ and Mean number of branches plant⁻¹, as influenced by various treatments.

Treatment	Mean plant height (cm) Days after sowing				At harvest	Mean number of functional leaves plant ⁻¹ Days after sowing				At harvest	Mean number of branches plant ⁻¹ Days after sowing				At harvest
	15	30	45	60		15	30	45	60		15	30	45	60	
Sowing dates (D)															
D1 : 25 th June	8.90	24.80	35.52	44.54	44.54	15.12	39.1	57.3	31.4	19.10	4.14	10.88	14.0	15.50	15.50
D2 : 1 st July	8.54	22.56	33.54	40.96	40.96	14.06	34.26	53.66	29.1	17.40	3.74	9.72	12.40	13.96	13.96
D3 : 7 th July	8.22	21.12	32.10	39.94	39.94	13.16	32.00	49.90	25.6	13.98	3.48	8.72	10.52	12.32	12.32
D4 : 15 th July	7.78	20.24	30.86	38.74	38.74	11.36	30.24	46.60	23.2	12.02	3.18	8.00	9.48	11.12	11.12
D5 : 21 st July	7.30	19.40	29.86	36.58	36.58	10.72	26.00	44.06	21.2	10.42	2.90	7.78	8.40	9.68	9.68
SE ±	0.07	0.61	0.53	0.83	0.83	0.42	1.59	0.84	0.35	0.85	1.43	0.39	0.38	0.87	0.87
CD at 5 %	0.20	1.81	1.57	2.44	2.44	1.25	4.68	2.50	1.05	2.51	0.42	1.16	1.13	2.58	2.58
Varieties (V)															
V1 : BM-4	7.66	20.60	30.72	38.46	38.46	12.00	30.60	47.16	24.44	12.64	3.22	8.12	10.04	11.36	11.36
V2 : BM-2002-1	8.14	22.72	34.08	41.32	41.32	14.00	32.92	53.16	27.72	16.22	3.82	9.74	11.38	13.12	13.12
V3: BM-2003-2	9.74	24.16	35.40	43.48	43.48	14.80	36.76	58.24	29.28	18.72	4.04	10.90	13.04	15.50	15.50

V4: BPMR-145	7.50	19.72	29.76	37.62	37.62	11.14	29.72	43.06	23.32	11.42	2.92	7.68	8.82	9.68	9.68
V5:PKV green gold	7.70	20.92	31.92	39.88	39.88	12.48	31.62	49.92	25.90	13.92	3.44	8.66	11.58	12.92	12.92
SE ±	0.26	0.86	0.89	0.74	0.74	0.74	1.01	1.23	1.04	0.76	0.20	0.68	0.73	0.87	0.87
CD at 5 %	0.78	2.54	2.63	2.18	2.18	2.18	2.99	3.65	3.08	2.26	0.61	2.02	2.17	2.58	2.58
Interaction (D x V)															
SE ±	0.59	1.93	2.00	1.65	1.65	1.65	2.27	2.77	2.34	1.72	0.46	1.53	1.65	1.96	1.96
CD at 5 %	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
General Mean	8.14	21.62	32.37	40.15	40.15	12.88	32.32	50.30	26.13	14.58	3.48	9.02	10.97	12.51	12.51
C. V.	10.36	12.64	8.74	5.83	5.83	18.18	9.95	7.79	12.67	16.69	19.03	14.11	21.29	18.14	19.14

Table 2. Mean number of pods plant⁻¹, weight of pod plant⁻¹, grain weight plant⁻¹, number of seed pod⁻¹ and seed index as influenced by various treatments.

Treatments	No. of pods plant ⁻¹	Wt. of pods plant ⁻¹	Grain weight plant ⁻¹ (g)	No. of seeds pod ⁻¹	Seed index (g)
Sowing dates (D)					
D1 : 25 th June	11.82	8.91	2.85	7.56	4.16
D2 : 1 st July	10.84	7.96	2.53	6.85	3.60
D3 : 7 th July	10.05	6.97	2.20	6.85	3.40
D4 : 15 th July	9.61	5.80	1.82	6.19	3.25
D5 : 21 st July	9.28	4.66	1.44	4.93	2.70
SE ±	0.26	0.39	0.12	0.31	0.20
CD at 5 %	0.79	1.16	0.37	0.91	0.59
Varieties (V)					
V1 : BM-4	9.70	6.31	1.99	5.68	2.96
V2 : BM- 2002-1	10.71	7.38	2.34	7.11	3.95
V3: BM-2003-2	11.61	7.86	2.50	7.57	4.37
V4: BPMR-145	9.25	5.90	1.84	5.17	2.70
V5:PKV green gold	10.33	6.86	2.17	6.84	3.14
SE ±	0.50	0.30	0.09	0.20	0.24
CD at 5 %	1.50	0.91	0.29	0.59	0.72
Interaction (D x V)					
SE ±	1.13	0.69	0.22	0.45	0.54
CD at 5 %	NS	NS	NS	NS	NS
General Mean	10.32	6.86	2.17	6.47	3.42
C. V.	15.60	14.23	14.37	9.91	22.68

Grain weight plant⁻¹

The variety BM-2003-2 (V3) produced maximum grain weight plant⁻¹ was significantly superior over BPMR-145 (V4), BM-4 (V1). but at par with variety BM-2002-1 (V2).

Number of seeds pod⁻¹

The variety BM-2003-2 (V3) has recorded the higher number of seeds pod⁻¹ was significantly superior over rest of varieties but at par with BM-2002-1 (V2).

Seed index

The variety BM-2003-2 (V3) has recorded the higher seed index was significantly superior over rest of varieties but at par with BM-2002-1 (V2).

4. CONCLUSION

On the basis of the field experimentation for a season, it could be concluded that

- Among different sowing dates in green gram, the sowing date D1 i.e. (25th June) was found optimum for achieving higher Mean plant height (cm), Mean number of functional leaves plant⁻¹, Mean number of branches plant⁻¹, Mean number of pods plant⁻¹, weight of pod plant⁻¹, grain weight plant⁻¹, number of seed pod⁻¹ and seed index.
- The green gram variety BM-2003-2 was recorded maximum Mean plant height (cm), Mean number of functional leaves plant⁻¹, Mean number of branches plant⁻¹, Mean number of pods plant⁻¹, weight of pod plant⁻¹, grain weight plant⁻¹, number of seed pod⁻¹ and seed index over BM-4, BM-2002-1, BPMR-145 and PKV green gold.

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