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Effect of delayed sowing dates and genotypes on yield and economics of green gram (*Vigna radiata*)

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Abstract
The sowing dates at D1 i.e. (25th June) was found optimum for achieving higher seed yield as compared to D2 (6st July), D3 (16thJuly) and D4 (20th July) at a spacing 30 cm x 10 cm. The green gram variety BM-2003-2 was found to be highly productive as compared to BM-4, Phule vaibhav and PKVgreen gold. The sowing dates at D1 i.e. (25th June) was found significantly superior in gross return, net returns and B: C ratio over rest of sowing dates. The green gram variety BM-2003-2 was significantly superior in gross return, net returns and B: C ratio over rest of varieties.

Keywords: Green gram, variety and sowing date

Introduction
From ancient time legumes has been important in agriculture, Whyte *et al.* (1953) reported that legumes are being grown as economic crops since the last 6,000 years. Pulses are important not only for their value as human food, but also because of high protein content for livestock. It has been important component of Indian agriculture enabling the land to restore fertility by fixing nitrogen, so as to produce reasonable yields of succeeding crops and to meet out the demand of dietary requirement regarding proteins, carbohydrates and other nutrient sources. India is the largest producer of pulses accounting 22 per cent of the world production, availability of pulses per capita per day in the country is much lesser (30-35 g) than the recommendations of WHO (80 g per capita) and thereby around 80 million children of the country are still protein energy under-nourished. Hence, there is a need for increasing average pulse productivity to fulfill protein requirement. On an average pulses contain 22-24 per cent protein as against 8-10 per cent in cereals. A good amount of lysine is present in the pulses. Pulses vary in maturity periods, hence are useful in different cropping systems.
Mungbean [*Vigna radiata* L.) Wilczek] is an important pulse crop of *kharif* season in India. The crop is highly sensitive to environment. The time of sowing is a non-monetery input which influeaces grain yield extent Singh and Sekhon (2003). Therefore time of sowing show remarkable influence on the growth and productivity of Mungbean in *kharif* due to rainy season Brar *et al.* (1988). The optimum time of sowing ensures the complete harmony between the vegetative and reproductive phases on one hand, and the climatic rhythm on the other and helps in realizing the potential yield Singh and Dhingra (1993). The temperature is the prime weather variable which affects plant life. Heat unit concept is the agronomic application of temperature effect on plant, which has been employed to correlate phenological development in crops and to predict maturity dates Nuttonson (1955), Major *et al.* (1975). Crop phenology is an essential component of the crop-weather models, which can be used to specify the most appropriate rate and time of specific plant growth and development process.

Materials and Methods
The experiment was conducted at Agronomy farm, College of Agriculture, Badnapur and laid out in a split plot design with three replications. The main plot treatments were four sowing dates *viz*., D1: 25th June, D2: 6st July, D3: 16th July and D4: 26th July. The sub plot treatments comprised four varieties *viz*., V1: Phule Vaibhav, V2: BM 4, V3: BM 2003-2 and V4: PKV green gold. Thus, there were in all 16 treatment combinations. The seed of varieties Phule Vaibhav, BM-4, BM-2003-2, 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:P_2O_5:K_2O per hector. 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 and yield were recorded.

Result and Discussion

Effect of sowing dates

Effect on seed yield (kg ha^{-1}).

The mean seed yield (kg ha^{-1}) as influenced by different sowing dates was showed that the date D_1 i.e. (25th June) produced maximum seed yield 1156 (kg ha^{-1}) which was significantly superior over rest of sowing dates followed by D_2 i.e. (6st July) due to the favorable climatic conditions to crop growth. Maih *et al.* (2009) and Sadeghipour (2008) [12] reported that seed yield was reduced by delaying in sowing of crop. The result are confirmed by Aziz *et al.* (2005) and Sharma *et al.* (1989) [15] and Dhanjal *et al.* (2000) [5].

Effect on straw yield (kg ha^{-1}) and biological yield (kg ha^{-1}).

The straw yield (kg ha^{-1}) as influenced by different sowing dates was found to be significant. The sowing date D_4 i.e. (26st July) 952 (kg ha^{-1}) produce recorded lowest straw yield (kg ha^{-1}) than other dates and date D_1 i.e. (25th June) 1723 (kg ha^{1}) recorded significantly higher straw yield rest of the dates followed by D_2 i.e. (6st July). The sowing date D_1 i.e. (25th June) recorded maximum biological yield 2878 (kg ha^{-1}) of green gram which was significantly superior over rest of the sowing dates followed by D_2 i.e. (6st July). Similar trend in seed, straw and biological yield of green gram observed by Taleei *et al.* (1999) [20].

Gross monetary returns (Rs ha^{-1})

The maximum gross monetary returns 53156.83(Rs ha^{-1}) was recorded by date D_1 i.e. (25th June) which was significantly superior over the D_3 i.e. (16th July) and D_4 i.e. (26th July) sowing date and at par with D_2 i.e. (6th July).

Net monetary returns (Rs ha^{-1})

The maximum net monetary return of 23739.33 Rs ha^{-1} was produced by date D_1 i.e. (25th June) which was significantly superior over all rest of sowing dates.

Benefit: cost ratio

The benefit: cost ratio of green gram influenced by sowing dates. The treatments D_1 i.e. (25th June) recorded higher 1.81 benefit: cost ratio compared to other sowing dates D_2, D_3 and D_4.The sowing date D_1 i.e. (25th June) was significantly superior over to other dates but it was at par with D_2 i.e. (6st July).

Effect of variety

Effect on seed yield ha^{-1}.

The green gram variety BM 2003-02 recorded higher seed yield of 1012 kg ha^{-1}. This increase in seed yield of BM 2003-02 might be due to higher production efficiency which was reflected through improvement in different yield contributing characters. Bhise *et al.* (2010) also present study the tested variety has bold seeds, which required optimum sowing date to ensure optimum environmental condition. The higher seed yield was attributed to more number of pods plant^{-1} and number seeds pod^{-1}. Similar result were reported by Samant *et al.* (1999) [13] Kuradikeri and Nadagoudar (1973) [8] from different locations.

Effect on straw yield and biological yield (Kg ha^{-1}).

Green gram genotypes BM 2003-02 produced higher straw yield 1508 (kg ha^{-1}) and biological yield 2521 (kg ha^{-1}).The higher biological yield of BM 2003-02 as compared to BM-4, Phule Vaibhav, and PKV green gold. Such of findings in case of green gram variety were reported by Dixit and Swain (1987) [4].

Gross monetary returns (Rs ha^{-1})

The variety BM 2003-2 (V_3) recorded maximum gross monetary return 46571.17 (Rs ha^{-1}) of green gram which was significantly superior over PKV green gold (V_4), BM-4 (V_2) and Phule Vaibhav (V_1).

Net monetary returns (Rs ha^{-1})

The variety BM 2003-2 (V_3) recorded maximum net monetary returns 15941.17 (Rs ha^{-1}) of green gram which was significantly superior over PKV green gold (V_4), BM-4 (V_2) and Phule Vaibhav (V_1).

Benefit: cost ratio

The data in Table 2 indicated that the benefit: cost ratio of green gram was significantly influenced due to varieties. The variety BM 2003-2 (V3) recorded higher 1.53 benefit: cost ratio compared to rest of varieties.

Table 1: Mean seed yield (kg ha^{-1}) and straw yield (kg ha^{-1}) as influenced by various treatments

Treatments	Seed yield (kg ha^{-1})	Straw yield (kg ha^{-1})	Biological yield (kg ha^{-1})
Sowing dates (D)			
D1: 25th June	1156	1723	40.01
D2: 06st July	1097	1660	39.75
D3: 16th July	769	1169	39.64
D4: 26th July	621	952	39.51
SE ±	37.71	60.50	0.04
CD at 5%	109.92	176.34	0.12
Varieties (V)			
V1: Phule Vaibhav	942	1413	40.00
V2: BM- 4	799	1231	39.26
V3: BM 2003-2	1012	1508	40.13
V4: PKV green gold	888	1353	39.51
SE ±	34.95	21.13	0.08
CD at 5%	102.03	61.60	0.25
Interaction (D x V)			
SE ±	69.91	42.27	0.17
CD at 5%	NS	NS	NS
General Mean	910.67	1376.6	39.73

Table 2: Gross monetary returns (Rs ha^{-1}), net monetary returns (Rs ha^{-1}) and benefit: Cost (B: C) ratio as influenced by different treatments

Treatments	Cost of cultivation	Gross monetary returns (Rs ha^{-1})	Net monetary return (Rs ha^{-1})	B:C ratio
Sowing dates (D)				
D1: 25th June	29414.50	53156.83	23739.33	1.81
D2: 06st July	29917.50	50439.00	20521.50	1.69

D3: 16th July	30917.50	35374.00	4456.50	1.14
SE ±	-	2003.40	2003.40	0.07
CD at 5%	-	6232.94	6232.94	0.23
Varieties (V)				
V1: Phule Vaibhav	30780	43347.33	12567.33	1.42
V2: BM- 4	30630	36773.17	6143.17	1.21
V3: BM 2003-2	30630	46571.17	15941.17	1.53
V4:PKV green gold	30630	40871.00	10241.00	1.35
SE ±	-	622.80	622.80	0.02
CD at 5%	-	1867.25	1867.25	0.06
Interaction (D x V)				
SE ±	-	1250.75	1250.75	0.05
CD at 5%	-	NS	NS	NS
General Mean	-	41890.67	11223.17	1.38

Conclusion

The sowing date D_1 i.e. (25th June) recorded significantly superior in seed yield (1156 kg ha^{-1}), straw yield (1723 kg ha^{1}) biological yield **(**2878 kg ha^{1}) gross monetary returns (53156.83Rs ha^{-1}), net monetary return of (23739.33 Rs ha^{-1}) and benefit: cost ratio (1.18) over rest of sowing dates. The green gram variety BM 2003-02 recorded higher seed yield of (1012 kg ha^{-1}), straw yield (1508kg ha^{-1}), biological yield (2521kg ha-1), gross monetary return (46571.17(Rs ha^{-1}), net monetary returns (15941.17 Rs ha^{-1}) and benefit: cost ratio (1.53).

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References

1. Algan N, Celen AE. Evaluation of mung bean (*Vigna radiate* L.) as green manure in Aegean conditions in terms of soil nutrition under different sowing dates. Afri. J. Agric. Res. 2011; 6:1744-1749.
2. Asghar Malik M, Saleem MF, Ali A, RAF Ishaq. Effect of sowing dates and planting patterns on growth and yield of mungbean. J. Agric. Res. 2006; 44:139-146.
3. Ayub M, Tanveer A, Choudhry MA, Amin MMZ, Murtaza G. Growth and yield response of mungbean (*Vigna radiata* L.) cultivars to varying levels of nitrogen, Pak. J. Biol. Sci. 1999; 2:378-384.
4. Dixit L, Swain. Response of green gram varieties to phosphate fertilization. Indian J. Agron. 1987; 32(3):284-285.
5. Dhanjal R, Prakash O, Ahlawat IPS. Response of spring greengram to dates of sowing. Ann. Agric. Res. 2000; 21:570-571.
6. Fraz RA, Iqbal J, Bakhsh MAAHA. Effect of sowing dates and planting patterns on growth and yield of mung bean (*Vigna radiata* L) cv. M-6. Int. J. Agri. Biol. 2006; 8(3):363-365.
7. Khan A, Malik MA. Determining the biological yield potential of different mungbean cultivars, Bio. J. Sci. 2001; 1:575-76.
8. Kuradikeri CB, BS Nadagoudar. Studies on the performance of green gram (*Phaseolus aureus*) varieties. Mysore J. Agric. Sci. 1973; 7(2):310-312.
9. Malik MA, Saleem MF, Ali A, Rana AF. Effect of sowing dates and planting patterns on growth and yield of mung bean (*Vigna radiata* L.Wilczek). J. Agri. Res, 2006, 44(2).
10. Nag BL, Alimur Rahman, MA Rahman. Growth analysis and yield performance of Black gram varieties. Legume Res. 2000; 23(3):146-150.
11. Patil BL, VS Hegde, PM Saliath. Studies on genetic divergence over stress and non-stress environment in mungbean. Indian J. Gent. Plant Breed. 2003; 63:77-76.
12. Sadeghipour O. Response of mungbean varieties to different sowing dates. Pak. J. Biol. Sci. 2008; 11:2048-50.
13. Samant SC, MH Rashid, P Biswas, Hasan MA. Performance of five cultivars ofmungbean under different dates of sowing. Bangladesh J. Agric. Res. 1999; 24:521–527.
14. Sarkar AR, H Kabir, M Begum, A Salam. Yield and performance of mungbean as affected by planting date, variety and plant density. J. Agron. 2004; 3:18-24.
15. Sharma ML, Bharadwaj GS, Chauhan YS, Sharma SD, Sharma MS. Response of greengram to sowing dates under rainfed conditions. Indian J. Agron. 1989; 34(2):252-254.
16. Singh AK, N Chandra, RC Bharti, SK Dimree. Effect of seed size and seedling depth on Faba bean (Viciafaba L.) productivity. Envi. Ecol. 2010; 28:1722-1727.
17. Singh BG, VUM Rao, CA Sugund, LM Rao. Varietal difference in growth and yield of mungbean (*Vigna radiata* L.) during *summer* and *Kharif* seasons. Indian J. Plant Physiology. 1985; 28(3):207-214.
18. Singh DK, VK Singh. Growth and nitrogen uptake pattern of promising urdbean genotypes under different sowing dates and plant densities during rainy season. Annals of Agril. Research. 2010; 21(3):456-458.
19. Singh RC, Faroda AS. Performance of mungbean varieties under different sowing dates in rainfed condiction. Harayana Agriculture University Journal of Research. 1982; 12:639-643.
20. Taleei AR, Khoda-Bandehand N, Gholamie B. Effects of sowing date on grain yield, yield components and percentage of protein in greengram cultivars. [Persian] Iranian J. Agri. Sci. 1999; 29(4):751-758.
21. Tomar Suresh, Tiwari AS, Tomar AS. Effect of seasons and plant densities on yield and economics of mungbean and urdbean genotyps. Indian J. pulses Res. 1993; 6(2):155-160.
22. Verma CK, Yadav RB, Dhyani BP, Tomar SS. Effect of seed rates and foliar spray of urea on performance of balck gram varieties. Indian Journal of Agricultural sci. 2011; 81(9):881-882.