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Performance of greengram (*Phaseolus radiatus*) and blackgram (*P. mungo*) genotypes to dates of planting during summer

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Recently high-yielding varieties suitable for spring or summer cultivation have been evolved, requiring their evaluation under different agro-ecological regions. The performance of greengram genotypes varies as per their specific photo-thermal requirement (Faroda *et al.*, 1983; Ali and Meena, 1986; Saini and Jaiswal, 1991). Since information on these aspects is scanty on some released genotypes of greengram and blackgram for north-western plains, an attempt was made to evaluate the performance of genotypes on different dates of planting in summer.

The field experiment was conducted during summers of 1990 and 1991 at Central Potato Research Station, Jalandhar. The experimental soil was sandy loam in texture having pH 7.8. The soil had low available N (176 kg/ha), medium available phosphorus (25.8 kg P_2O_5/ha) and rich available potassium (418 kg K_2O/ha). The field capacity and wilting point of expermental field were 17.5% and 9.45% respectively. Treatments comprised combination of planting dates, viz. 15 March, 25 March, 5 April, and 2 genotypes of each greengram ('SML 32' and 'PDM 11') and blackgram ('Mash 218' and 'PDU 1'). The experiment was laid out in split-plot design keeping planting dates in main plot and genotypes in subplots and replicated 4 times. Sowing was done in rows at 30 cm apart using 30 kg seed rate/ha. A basal dose of 10 kg N/ha and 40 kg P_2O_5/ha through urea and single superphosphate respectively was applied. Sowing was done after a pre-sowing irrigation and first post-sowing irrigation was given at 20 days after sowing. Weather was almost similar in the last week of March during both the years. Thereafter fluctuations in temperature and relative humidity varied more during 1990 than during 1991. Relative humidity was minimum (22–32%) from second week of May to first weak of June during 1991 and from first week of May to last week of May (26–30%) during 1990.

Analysis of pooled data showed that 25 March gave the highest grain yield (14.7 q/ha) (Table 1). Further delay in sowing significantly reduced the yield. In 1990, sowing on 15 March and 5 April reduced the grain yield by 22 and 37% compared with sowing on 25 March. April-sown crop reduced the yield drastically, might be due to rains at the time of maturity. During the second year, first date of sowing, i.e.15 March, was deleted due to heavy rains. However, grain yields among 2 dates of

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Table 1. Yield attributes of greengram and blackgram as affected by dates of sowing and varieties

Treatment	Seeds/ pod (1990)	Seeds/ plant (1991)	Pods/plant			Seed yield (q/ha)		
			1990	1991	Pooled	1990	1991	Pooled
Date of sowing								
15 March	8.3		17			11.9		
25 March	7.5	228	19	33	26	14.5	15.0	14.7
5 April	7.9	176	15	25	20	10.6	14.2	12.4
CD (P = 0.05)	0.48	NS	NS	NS	4.0	2.4	NS	2.23
Variety								
'SML 32'	9.2	262	18	32	25	11.9	12.4	12.1
'PDM 11'	9.3	214	15	24	20	14.5	14.3	14.2
'Mash 218'	6.5	175	19	34	27	11.2	18.9	15.4
'PDU 1'	6.6	155	17	26	21	11.7	12.9	12.7
CD (P = 0.05)	0.71	78.0	NS	NS	NS	3.2	2.9	2.46
Crop								
Greengram	9.3	238	16	28	22	13.2	13.3	13.1
Blackgram	6.6	165	18	30	24	11.5	15.9	14.0
CD (P = 0.05)	0.50	55.0	NS	NS	NS	NS	2.0	NS

sowing were found not significant. On the basis of pooled data, sowing on March recorded higher yield. It might be due to favourable environment at the time of fruiting and maturity. Kaufmann (1972) reported that moderately low air humidity is favourable for seed set, provided soil-moisture supply is adequate. The crop sown on 25 March showed flowering and fruiting during May when relative humidity was minimum during this period during both the years. Thus the results are in agreement with that of Kaufmann (1972). Similar results were reported by Faroda *et al.*(1983). The excessive vegetative growth in the late-sown crop was also found responsible for less fruiting in the April-sown crop compared with March-sown crop. Gaastra (1983) also reported that when soil moisture and light are not limiting factors, high temperature accelerate growth processes. Rawson and Craven (1979) reported that when the mean temperature was 24°C and the day-length was 12–13 hr, all the cultivars flowered; however, some cultivars failed to flower at mean temperature of 33°C. Since the mean temperature varied from 20°C to more than 33°C during the crop-growth period might be responsible for reduction in yield with delayed sowing. Both the genotypes of greengram were statistically at par for of seed yield, seeds/ pod, seeds/plant and pods/plant (Table 1). Blackgram genotype 'Mash 218' recorded significantly higher yield (15.4 q/ha) than the other and the increase was 21%. Interaction between genotypes and dates of planting was found not significant (data not reported). On an average, yield performance of greengram and blackgram were found not significant.

It may be concluded that 'PDM 11' and

'SML 32' of greengram and 'Mash 218' of blackgram may be successfully grown in the fourth week of March in north-western plains of India.

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Effect of *Rhizobium* inoculation and coir dust on growth, nodulation and yield of pigeonpea (*Cajanus cajan*)

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Rangarajan and Prabhakaran (1980) reported biological nitrogen fixation and symbiotic efficiency between pigeonpea [*Cajanus cajan* (L.) Millsp.] and *Rhizobium* strains. Application of certain soil amendments in acid soils increases nodulation of legumes, besides neutralizing the soil acidity (Sakhon *et al.*, 1984). Therefore an experment was conducted during rainy season of 1991, to study the effect of rhizobial inoculation and coir dust in pigeonpea.

A slow-growing, non-acid-producing specific strain, VPR 1 was inoculated using different methods, viz. seed inoculation, slurry inoculation and broth-culture inoculation. The trial was conducted in randomized block design, replicated 4 times. Coir dust @ 5 tonnes/ha was applied at the time of last ploughing. The soil was red-lateritic type, acidic in reaction (pH of