

Effect of varieties and sowing dates on disease incidence and productivity of fieldpea (*Pisum sativum*)

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ABSTRACT

A field experiment of fieldpea (*Pisum sativum* L.) was conducted during 1989–90 and 1990–91 at Ambikapur. Early sowing (5 October) with tolerant variety 'Khaperkheda' gave higher grain yield and showed lower disease incidence than 'Rachna' and 'JP 789' under northern hills region of Madhya Pradesh.

One of the possible ways to boost-up the productivity of any crop is to grow the disease-resistant and higher-yielding varieties at suitable time of sowing. In present study, therefore, an attempt was made to find out suitable sowing time and variety of pea for higher production under agro-climatic conditions of northern hills region of Chhattisgarh, Madhya Pradesh.

MATERIALS AND METHODS

A field trial was conducted for 2 years during the winter (*rabi*) season of 1989–90 and 1990–91 at Ambikapur, Madhya Pradesh. The soil of the experimental site was sandy loam having pH 6.5, available N, P and K were 110, 11 and 270 kg/ha respectively. The treatments consisted of 4 sowing dates (5, 25 October, 14 November and 4 December) and 3 varieties ('Khaperkheda', 'Rachna' and 'JP 789'). The experiment was laid out in split-plot design keeping sowing dates in main plots and varieties in sub-plots replicated thrice. The crop was planted in rows 30 cm apart using 80 kg

seed rate/ha. A uniform basal application of 20 kg N, 60 kg P_2O_5 and 30 kg K_2O /ha was done at sowing. Three irrigations at branching, flowering and grain-filling stage were given to crop. The crop sown on 5 October and 25 October harvested 140, 142 and 131, 133 days after sowing; however, 14 November and 4 December-sown crop took 119, 121 and 99, 101 days during 1990 and 1991, respectively. The incidence of both diseases (rust and powdery mildew) was recorded separately at 20 days before harvesting of each treatment using a 0–9 scale (Mayee and Datar, 1986).

RESULTS AND DISCUSSION

Sowing dates

The effect of sowing dates on yield-attributing characters, disease incidence and finally grain yield were significant during both the years (Table 1). The pooled yield obtained in 5 October sowing was 23, 72 and 272% higher than that in 25 October, 14 November and 4 December sowings respectively. The grain yield decreased con-

Table 1. Yield and yield attributes and disease-incidence index in pea as influenced by varieties and sowing dates

Treatment	Pod/ plant		Grains/ pod		Grain yield/ plant (g)		100-grain weight (g)		Disease-incidence index (0-9)					Grain yield (kg/ha)			
	Y ₁	Y ₂	Y ₁	Y ₂	Y ₁	Y ₂	Y ₁	Y ₂	Rust			Powdery mildew		Y ₁	Y ₂	Pooled	
									Y ₁	Y ₂	Mean	Y ₁	Y ₂				Mean
Sowing date																	
5 Oct	12.7	15.9	3.7	3.3	9.31	8.33	20.3	19.5	2.77	3.47	3.12	3.53	4.10	3.82	2,423	2,027	2,225
25 Oct	11.8	14.1	3.2	3.0	7.72	7.42	20.8	19.3	3.43	4.43	3.93	4.23	5.53	4.88	1,893	1,710	1,802
14 Nov	9.7	8.6	2.3	2.5	6.41	4.49	19.4	18.1	4.20	5.07	4.64	5.00	6.33	5.67	1,406	1,179	1,293
4 Dec	8.5	5.0	1.8	1.9	3.73	2.12	17.2	15.9	4.83	5.53	5.18	6.33	7.86	7.10	896	531	614
CD (P = 0.05)	1.9	2.9	0.3	0.2	1.20	0.80	0.9	0.6							235	248	231
Variety																	
'Khaperkheda'	10.7	10.8	2.9	2.7	6.85	5.72	18.9	17.9	3.45	3.06	3.26	4.15	5.18	4.67	1,661	1,417	1,544
'Rachna'	10.6	11.1	2.8	2.6	6.82	5.58	19.6	18.5	3.86	4.68	4.27	4.70	6.03	5.37	1,601	1,358	1,480
'JP 789'	10.6	10.9	2.6	2.6	6.65	5.35	19.7	18.4	4.10	5.33	4.72	5.50	6.68	5.40	1,552	1,298	1,425
CD (P = 0.05)	NS	NS	NS	NS	NS	NS	NS	NS							NS	NS	NS

NS, Non-Significant.

Y₁, 1989-90 Y₂, 1990-91

siderably when sowing was done beyond 14 November. The yield attributes, viz. pods/plant, grain/pod, grain yield/plant and 100-grain weight, were higher when the crop was sown on 5 October which were responsible for significant higher grain yield over delayed sowings. Powdery mildew and rust are being considered as 2 important diseases of pea (Singh, 1971). The data on incidence of rust and powdery-mildew diseases was recorded lower on 5 October than on rest treatments tested in both the years. Mean incidence of 3.12, 3.93, 4.64 and 5.18% of rust and 3.82, 4.88, 5.67 and 7.10% of powdery mildew was respectively recorded when the crop was sown on 5, 25 October, 14 November and 4 December. The lower incidence of the diseases on 5 October-sown crop may be due to non-congenial conditions for the spread of diseases. The present results are in accordance with the findings of Mishra *et al.* (1989).

Variety

All the 3 varieties differed for the inci-

dence of both diseases. The lower incidence of both diseases was noted in 'Khaperkheda' compared with 'Rachna' and 'JP 789'. Mean incidence was recorded in the tune of 3.26, 4.27 and 4.72% of rust and 4.67, 5.37 and 5.40% of powdery mildew in 'Khaperkheda' 'Rachna' and 'JP 789', respectively. The similar observations were reported earlier by Mishra *et al.* (1989). The varieties did not also exhibit significant differences to grain yield and yield attributes. Interaction effect of planting time to varieties was also non-significant.

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