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Performance of rainfed Argentine rape (*Brassica napus*) under dates of sowing and row spacing in the mid-hills of north-western Himalayas

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ABSTRACT

A 2-year field experiment conducted during the winter seasons of 1988–89 and 1989–90 indicated that sowing of Argentine rape (*Brassica napus* L.) under rainfed condition in October considerably increased productivity in mid-hills of north–western Himalayas. Sowing in November with daily mean temperature around 13.1°C reduced the yield by 38% compared with the sowing in October with daily mean temperature of 16.1°C. The inter-row spacing from 30 to 45 cm did not affect growth, yield attributes and seed yield.

In mid-hills of north–western Himalayas of India, Argentine rape (*Brassica napus* L.) is a new introduction. Information on the behaviour of this thermo- and photo-sensitive crop under different planting dates is lacking. Hence an investigation was made to study the effect of date of sowing and inter-row spacing on yield of this crop under rainfed, mid-hill condition.

MATERIALS AND METHODS

The experiment was conducted during the winter seasons of 1988–89 and 1989–1991 at Bajaura, Himachal Pradesh. The station is situated at 31°.9'N, 77°E and 1,090 m above mean sea-level. The soil was neutral in

Table 1. Mean monthly meterorological data recorded at Bajaura during 1988–89 and 1989–90

Month	Total rainfall (mm)		Number of rainy days		Temperature (°C)			
	1988–89	1989–90	1988–89	1989–90	1988–89		1989–90	
					Maximum	Minimum	Maximum	Minimum
Sep	241.3	21.0	9	3	29.2	17.1	30.2	16.2
Oct	0.0	7.5	0	3	27.4	8.7	28.1	8.0
Nov	1.1	51.9	1	7	23.0	3.4	21.5	3.5
Dec	153.2	48.2	7	7	16.1	1.8	16.4	2.3
Jan	123.1	28.8	6	3	13.5	0.5	17.5	2.3
Feb	39.8	168.1	8	13	16.1	3.4	14.9	3.5
Mar	121.6	266.5	11	15	19.9	6.5	18.3	5.6
Apr	46.8	52.6	8	7	24.7	8.5	25.0	7.4

Table 2. Growth, yield attributes and yield of rape as influenced by sowing date and row spacing

Treatment	Plant height (cm)		Branches/ plant		Siliquae/ plant		Seeds/ siliqua		1,000-seed weight (g)		Seed yield (q/ha)	
	1988–89	1989–90	1988–89	1989–90	1988–89	1989–90	1988–89	1989–90	1988–89	1989–90	1988–89	1989–90
Dates of sowing												
15–17 Oct	136	144	8.0	7.6	308	243	16.2	17.2	3.28	3.57	15.14	17.60
29–31 Oct	130	130	7.6	7.6	285	232	16.2	17.2	3.10	3.59	13.85	16.28
12–15 Nov	130	126	7.3	6.4	236	197	16.1	17.3	3.09	3.28	12.47	13.35
26–29 Nov	113	125	6.0	5.9	162	143	14.7	16.0	2.98	3.18	10.55	9.01
CD (P = 0.05)	11.2	6.6	1.26	1.17	41.0	24.3	1.32	NS	0.11	NS	1.46	1.73
Row spacing (cm)												
30.0	126	132	7.1	6.7	253	208	15.9	17.4	3.11	3.42	13.18	14.11
37.5	127	131	7.2	7.1	246	204	15.8	16.5	3.12	3.37	13.02	14.11
45.0	128	131	7.4	6.8	245	199	15.7	16.9	3.10	3.41	12.82	13.96
CD (P = 0.05)	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NS, Not significant

reaction (pH 7.1), medium in available N and P, and high in available K. Mean monthly meteorological data of both the years (September to April) are given in Table 1. The rainfall in 2 seasons was 538 and 673 mm.

The experiment was laid out in split-plot design, replicated 3 times. Four dates of sowing (15–17 October, 29–31 October, 12–15 November, and 26–29 November) formed the main-plot treatments and 3 inter-row spacings (30, 37.5 and 45 cm) were accommodated in subplots. The seed of 'Sheetal' rape was sown in furrows made by hand-plough at a depth of 3 cm. Fertilizers (30 kg N, 17.5 kg P and 33 kg K/ha) were mixed with the upper 5 cm-soil layer before sowing. N @ 30 kg/ha was top-dressed at pre-flowering stage.

Growth characters

Final plant height reduced significantly in the late-sown crop as compared to early sowing. During 1989–90, the crop sown on 15–17 October was significantly taller than that on the other sowing dates (Table 2). Plant height did not differ significantly due to different row spacings. Increased plant height in early-sown crop was attributed to early crop emergence, utilizing residual moisture of rainy-season crop. The number of branches/plant also followed trend similar to plant height.

Yield attributes

The yield attributes like number of siliquae/plant, number of seeds/siliqua and 1,000-seed weight were influenced significantly due to seeding dates. In late-seeding dates all these above attributes were significantly adversely affected. Row spacing did not influence these parameters.

Seed yield

The crop sown in October gave higher seed yield than that sown in November (Table 2). This increase in seed yield in October-sown crop was attributed to early emergence and rapid growth due to relatively warmer temperatures. The crop sown in last week of November proved significantly inferior to others.

Inter-row spacing could not influence seed yield. Singh *et al.* (1986) and Gupta and Saini (1988) reported similar observations in *gobhi sarson.*

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