



Optimization of sowing time, nitrogen dose and row spacing for canola quality non shattering oilseed rape (*Brassica napus*) for north-west India

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INTRODUCTION

Oilseed rape though resistant to white rust and better adapted to low temperature and frost conditions than Indian mustard (*Brassica juncea*), suffers considerable yield losses at harvest due to pod shattering which is a worldwide problem. As a safeguard, farmers harvest it little early which adversely affects yield and oil quality. Committed efforts directed to germplasm enhancement and subsequent trait selections in India have resulted in identification of non shattering canola quality oilseed rape genotype.

OBJECTIVES

- To find out optimum sowing date, nitrogen dose and row spacing for non shattering canola oilseed rape (*Brassica napus*).

MATERIALS AND METHODS



Location Punjab Agricultural University Ludhiana, India (30°54'N latitude, 75°48'E longitude, 247 metres amsl)

Duration Two years (2015-16 and 2016-17)

Field condition Loamy sand soil (*Typic ustocrepts*), medium in nitrogen available and phosphorus.

Treatments

Main plots Sowing/transplanting dates (4) Three sowing dates (20 October, 5 November, 20 November) and one transplanting date (30 November)

For transplanting, 30 days old seedlings were used.

Sub plots A. Doses of nitrogen (3) 75, 100 and 125 kg/ha
B. row spacing (2) 30 and 45 cm

Nitrogen as per treatments was applied in two equal splits at sowing and about 5 weeks after sowing (after irrigation).

Design of experiment : Split plots **Replications** : 3

RESULTS

- Each fortnightly delay in sowing from 20 October to 20 November significantly reduced the pooled mean plant height, primary branches and siliquae per plant, seed and oil yields. Eventually 20 October sown crop produced (2.843 t/ha) 42.7, 108.3 and 82.8 per cent more pooled mean seed yield and 44.0, 111.9 and 86.8 per cent more oil yield than 5 November, 20 November sown and 30 November transplanted crop, respectively.
- Crop transplanted on 30 November produced significantly higher seed (13.9%) and oil (13.4%) yields than 20 November direct sown crop.
- Application of 100 kg/ha of N resulted in significantly higher seed (7.4%) and oil (7.3%) yields over 75 kg/ha of N (1.844, 0.702 t/ha).
- Row spacing of 30 cm resulted in significantly higher seed (6.7%) and oil (6.9%) yields than 45 cm row spacing.
- Crop sown on 20 October at row spacing of 30 cm with 100 kg/ha of N produced 3.082 t/ha of seed and 1.190 t/ha of oil yield.

Table: Effect of sowing dates, nitrogen and row spacing on growth and yield attributes of non shattering canola oilseed rape (pooled mean of two years)

Treatments	Seed yield (kg/ha)	Oil (%)	Oil yield (kg/ha)	Plant height (cm)	Primary branches per plant	Secondary branches per plant	Total siliquae per plant
Sowing dates							
20 October	2843	38.3	1089	198.6	9.3	5.2	438
5 November	1992	38.0	756	181.9	8.3	5.1	389
20 November	1365	37.7	514	158.3	7.3	6.7	351
30 November (T)	1555	37.5	583	167.8	6.9	6.6	343
CD (p=0.05)	134	0.4	55	6.0	0.4	0.8	42
Doses of nitrogen (kg/ha)							
75	1844	38.0	702	173.8	7.8	5.7	371
100	1981	38.0	753	176.4	8.0	5.9	387
125	1992	37.7	751	179.6	7.9	6.0	383
CD (p=0.05)	79	0.2	30	2.9	NS	NS	NS
Row spacing (cm)							
30	2002	37.9	760	175.5	7.8	5.7	379
45	1875	37.8	711	177.8	8.1	6.1	382
CD (p=0.05)	65	NS	25	NS	0.3	0.4	NS

CONCLUSION

Sowing in mid October at row spacing of 30 cm with 100 kg/ha of N produced highest seed and oil yields.

Non shattering trait in canola oilseed rape offers great promise in reducing losses (improving productivity) enabling mechanical harvesting and area expansion in rapeseed-mustard cultivation regions of India.

Keywords: Canola oilseed rape, sowing date, nitrogen, spacing, seed yield, oil content

