



Performance of *Brassica juncea* (RGN-73) under changing climatic scenario

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Rapeseed-mustard (*Brassica* spp.) is a major group of oil-seed crops of the world being grown in 53 countries across the six continents with India being the third largest cultivator and producer after Canada and China. It is highly sensitive to temperature and photoperiod, and requires high temperature during early growth stage; and cool weather, clear sky during reproductive phase for better growth and development. About 18-25°C temperature, low humidity, practically no rains, especially at the time of flowering along with cold, frost free days during flowering, seed formation and other developmental stages are desirable atmospheric conditions for the crop. Optimization of date of sowing and planting geometry (Kumari *et al.*, 2012) for Indian mustard cv. RGN-73 is one of the main objectives of the present study.

METHODOLOGY

A field experiment was conducted at the Norman E. Borlaug Crop Research Centre of G.B. Pant University of Agriculture and Technology, Pantnagar to evaluate the performance of *B. juncea* variety RGN-73 under changing climate during *rabi*, 2014-15. The experiment was laid out in split plot design (SPD) taking three dates of sowing i.e. Oct 22, Nov 01 and Nov 11 in main plots and five planting geometries

viz. 30 cm × 10 cm, 30 cm × 20 cm, 30 cm × 30 cm, 45 cm × 15 cm and 45 cm × 30 cm in sub-plots with three replications. Normal crop husbandry practices were followed for the successful raising of crop.

RESULTS

Growth parameters, yield attributes and seed yield were significantly influenced by the sowing date and planting geometries (Table 1). Dry matter accumulation at 120 days after sowing (DAS) was higher in crop sown on October 22 being statistically superior over the other two sowing dates. Among the different planting geometries maximum dry matter was found with 30 cm × 20 cm spacing being statistically on a par with other planting geometries except 45 × 15 and 45 × 30 cm spacing. Crop sown on October, 22 took significantly more time to than the other two sowing dates. Widely spaced plant took more time to mature. Crop sown on October, 22 produced more number of siliquae/plant being significantly superior over November, 01 and 11 sowing. Among the various planting geometries, the wider geometries resulted into more number of siliquae/plant. 45 cm × 30 cm spacing produced the highest number of siliquae which was significantly superior over that of 30 × 10 cm. The highest value of

Table 1. Growth parameters, yield attributes and yields of Indian mustard as influenced by dates of sowing and planting geometry

Treatment	Dry matter 120 DAS (g/plant)	Days taken to mature	Siliquae/ plant	1,000-seed weight (g)	Seed yield (kg/ha)
<i>Date of sowing</i>					
October 22	50.2	140.2	299	3.8	1665
November 01	38.2	138.7	232	3.2	1513
November 11	30.7	136.9	171	2.4	1266
SEm±	2.9	0.3	10	0.1	40
CD (P=0.05)	10.0	1.0	35	0.3	137
<i>Planting geometry</i>					
30 cm × 10 cm	44.1	137.1	182	2.7	1635
30 cm × 20 cm	47.1	137.9	206	2.3	1650
30 cm × 30 cm	45.9	139.2	239	3.3	1611
45 cm × 15 cm	34.7	138.3	230	3.2	1357
45 cm × 30 cm	26.9	140.3	308	3.8	1140
SEm±	2.7	0.5	22	0.14	42
CD (P=0.05)	7.9	1.5	64	0.41	122

Table 2. Interaction effect of sowing dates and planting geometry on seed yield (kg/ha)

Planting geometry (P) / Date of sowing (D)	30 cm × 10 cm	30 cm × 20 cm	30 cm × 30 cm	45 cm × 15 cm	45 cm × 30 cm
October 22	1780	1795	1978	1492	1281
November 01	1569	1732	1599	1484	1180
November 11	1556	1454	1259	1097	961
CD (P=0.05): To compare two P at same D					211
CD (P=0.05): To compare two D at same or different P					233

1000-seed weight (3.8) was recorded in October 22 sown crop being significantly superior over the delayed sowing. The geometry of 45 cm × 30 cm outplayed significantly over rest of the four geometries in case of 1,000 seed weight. The seed yield decreased significantly with delay in sowing date from 22nd of October to the 11th of November, showing the highest yield 1665.3 kg/ha for 22nd October and the lowest yield 1265.8 kg/ha for 11th of November. Among the various planting geometries 30 cm × 20 cm produced the highest seed yield being significantly superior over the two geometries of 45 cm × 15 cm and 45 cm × 30 cm. The interaction between the date of sowing and planting geometry was found to be significant on seed yield (Table 2). Sowing on Oct, 22 showed its supremacy under all the planting geometries over Nov, 01 and

Nov, 11 sowing. However, Nov 01 sowing did not differ significantly under 30 cm × 10 cm, 30 cm × 20 cm, 45 cm × 15 cm and 45 cm × 30 cm planting geometries.

CONCLUSION

From the above study it could be concluded that sowing *B. juncea* variety 'RGN-73' on October 22 with 30 cm × 30 cm planting geometry could be beneficial under the *tarai* conditions of Uttarakhand.

REFERENCES

- Kumari, A., Singh, R.P. and Yeshpal. 2012. Productivity, nutrient uptake and economics of mustard hybrid (*Brassica juncea*) under different planting time and row spacing. *Indian Journal of Agronomy* **57**(1): 61-67.