



ISSN Print: 2618-060X
 ISSN Online: 2618-0618
 NAAS Rating (2026): 5.20
 IJRA 2026; 9(10): 423-425
www.agronomyjournals.com
 Received: 27-07-2026
 Accepted: 22-09-2026
 Published: 07-10-2026

Kanchan Sidar

Department of Agronomy,
 Indira Gandhi Krishi
 Vishwavidyalaya, Raipur,
 Chhattisgarh, India

Ambika Tandon

Department of Agronomy,
 College of Agriculture,
 Raipur, Indira Gandhi Krishi
 Vishwavidyalaya,
 Chhattisgarh, India (492012)

Shyamta Suryavanshi

Department of Agronomy,
 Indira Gandhi Krishi
 Vishwavidyalaya, Raipur,
 Chhattisgarh, India

Rohit Kumar

Department of Agronomy,
 Indira Gandhi Krishi
 Vishwavidyalaya, Raipur,
 Chhattisgarh, India

Anjali Kanwar

Department of Agronomy,
 Indira Gandhi Krishi
 Vishwavidyalaya, Raipur,
 Chhattisgarh, India

Corresponding Author:

Kanchan Sidar

Department of Agronomy,
 Indira Gandhi Krishi
 Vishwavidyalaya, Raipur,
 Chhattisgarh, India

Effect of date of sowing on growth, yield and quality of Indian mustard varieties

Kanchan Sidar¹, Ambika Tandon², Shyamta Suryavanshi³, Rohit Kumar⁴, Anjali Kanwar⁵

DOI: <https://www.doi.org/10.33545/2618060X.2026.v9.i10f.6816>

ABSTRACT

A field experiment was conducted during rabi 2025–26 to study the effect of different dates of sowing on growth, yield and quality of Indian mustard under the agro-climatic conditions of Chhattisgarh. The experiment was laid out in a Factorial Randomized Block Design (FRBD) with three replications, comprising four varieties, viz., C.G. Sarson-1, DRMR 150-35, Giriraj and Rukmani, and five dates of sowing, viz., 20, 30 November and 10, 20 and 30 December. The results revealed that DRMR 150-35 recorded the highest plant height (195.70 cm), dry matter accumulation (72.15 g plant⁻¹) and seed yield (15.71 q ha⁻¹), whereas Rukmani recorded the highest oil content (41.50%). Among the dates of sowing, 20 November recorded the highest plant height (166.10 cm), dry matter accumulation (74.10 g plant⁻¹) and seed yield (14.32 q ha⁻¹). Delayed sowing resulted in a progressive reduction in growth and seed yield, with the lowest values recorded under 30 December sowing. The interaction between varieties and dates of sowing was significant for seed yield, while it was non-significant for plant height, dry matter accumulation, harvest index, protein content and oil content. The study indicated that sowing time and varietal selection significantly influenced the growth, productivity and quality parameters of Indian mustard.

Keywords: Indian mustard, Varieties, Sowing dates, Growth, Seed yield, Quality

Introduction

Indian mustard (*Brassica juncea* L.) is an important rabi oilseed crop of India and contributes substantially to the edible oil sector. It is valued for its edible oil and protein-rich meal and is cultivated across diverse agro-climatic conditions. Rapeseed-mustard is one of the major oilseed crops of India and is the second most significant edible oilseed crop after soybean. India is the third-largest producer of rapeseed-mustard globally. During 2024–25, rapeseed-mustard was cultivated on 8.63 million ha, producing 12.61 million tonnes with an average productivity of 1461 kg ha⁻¹ (Kumar *et al.*, 2025) [1].

The growth and productivity of Indian mustard are influenced by environmental and agronomic factors, particularly sowing time. Sowing date determines the temperature conditions experienced by the crop during different growth and reproductive stages and consequently affects plant growth, flowering, yield attributes and seed yield. Dudhade *et al.* (1996) [2] reported significant effects of sowing date on growth, yield attributes and yield of Indian mustard, with delayed sowing adversely affecting seed yield.

Varieties may also differ in their response to different sowing environments. Singh *et al.* (2001) reported significant variation among Indian mustard cultivars for growth, yield attributes and seed yield under different sowing times. Thus, selection of suitable varieties along with an appropriate sowing time is important for obtaining higher productivity.

In Chhattisgarh, mustard is grown during the rabi season, including in rice-based cropping systems. Timely sowing after rice harvest may be affected by field preparation and prevailing environmental conditions. Therefore, evaluation of mustard varieties under different sowing dates is necessary to identify suitable combinations for the agro-climatic conditions of the region. Hence, the present study was undertaken to evaluate the effect of different dates of sowing on growth, yield and quality of Indian mustard varieties under the agro-climatic conditions of Chhattisgarh.

Materials and methods

A field experiment was conducted during the rabi season of 2025–26 at the Instructional-cum-Research Farm, IGKV, Raipur, Chhattisgarh, India, to study the effect of date of sowing on growth, yield and quality of Indian mustard varieties. The soil was clayey Vertisol with pH 7.5 and 0.50% organic carbon, containing 220, 16.42 and 312 kg ha⁻¹ available N, P and K, respectively. The experiment was laid out in a Factorial Randomized Block Design (FRBD) with three replications, comprising 20 treatment combinations of four varieties, viz., V₁ (C.G. Sarson-1), V₂ (DRMR 150-35), V₃ (Giriraj) and V₄ (Rukmani), and five sowing dates, viz., D₁ (20 November), D₂ (30 November), D₃ (10 December), D₄ (20 December) and D₅ (30 December 2025). The net plot size was 3.0 × 4.0 m with 30 × 10 cm spacing. A uniform fertilizer dose of

100:80:40 kg ha⁻¹ N:P₂O₅:K₂O was applied, and other recommended agronomic practices were followed uniformly.

Observations on plant height, dry matter accumulation, branches plant⁻¹, crop growth rate (CGR) and relative growth rate (RGR) were recorded at appropriate growth stages. Siliquae plant⁻¹, seeds siliqua⁻¹, seed yield and stover yield were recorded at harvest, while harvest index was calculated. Oil and crude protein contents were determined using standard procedures; crude protein was estimated from total nitrogen by the Kjeldahl method using a conversion factor of 6.25. The data were subjected to analysis of variance (ANOVA) appropriate for FRBD, and treatment means were compared using Critical Difference (CD) at the 5% level of significance following Gomez *et al.* (1984) [3].

Result and Discussion

Plant height

Plant height was significantly influenced by varieties and sowing dates, whereas the variety × sowing date interaction was non-significant. Among the varieties, DRMR 150-35 recorded the maximum plant height (195.70 cm), while Giriraj recorded the minimum (160.80 cm). Among sowing dates, the crop sown on 20 November recorded the highest plant height (166.10 cm), whereas the lowest plant height was recorded with 30 December sowing (101.30 cm). The higher plant height under timely sowing may be attributed to favourable environmental conditions during vegetative growth, which provided a longer period for vegetative development. Delayed sowing exposed the crop to comparatively unfavourable conditions, resulting in restricted plant growth. Similar effects of sowing time on growth of Indian mustard have been reported by Dudhade *et al.* (2001) and Shekhawat *et al.* (2012) [4].

Dry matter accumulation

DRMR 150-35 recorded the highest dry matter accumulation (72.15 g plant⁻¹), while C.G. Sarson-1 recorded the lowest (60.25 g plant⁻¹). Among sowing dates, dry matter accumulation was highest with 20 November sowing (74.10 g plant⁻¹) and lowest with 30 December

sowing (38.30 g plant⁻¹). The variety × date of sowing interaction was non-significant.

Seed yield

Seed yield was significantly affected by varieties, sowing dates and their interaction. DRMR 150-35 recorded the highest seed yield (15.71 q ha⁻¹), whereas C.G. Sarson-1 recorded the lowest (13.32 q ha⁻¹) among varieties. With respect to sowing dates, 20 November sowing produced the highest seed yield (14.32 q ha⁻¹), while the lowest yield was obtained with 30 December sowing (6.71 q ha⁻¹). The superiority of early sowing may be attributed to better crop establishment and favourable temperature and moisture conditions during the reproductive and seed-filling stages. Delayed sowing shortened the crop growth period and may have exposed the reproductive phase to relatively unfavourable temperatures, resulting in reduced seed formation and yield. Similar variation in mustard yield due to sowing date has been reported by Sharma *et al.* (2023) [5].

Harvest index (%)

Harvest index ranged from 27.15% in Rukmani to 27.41% in Giriraj among the varieties, while among sowing dates it ranged from 25.72% under 20 November sowing to 28.76% under 30 December sowing. The effects of variety and date of sowing, as well as their interaction, were non-significant.

Protein content (%)

Protein content ranged from 18.20% in C.G. Sarson-1 to 33.00% in DRMR 150-35 among the varieties. Among sowing dates, protein content ranged from 17.96% under 30 December sowing to 18.72% under 20 November sowing. The effects of variety, date of sowing and their interaction were non-significant.

Oil content (%)

Oil content differed significantly among the varieties. Rukmani recorded the highest oil content (41.50%), followed by Giriraj (40.80%) and DRMR 150-35 (39.80%), whereas C.G. Sarson-1 recorded the lowest (37.48%). The effect of date of sowing and the variety × date of sowing interaction was non-significant for oil content.

Table 2. Effect of date of sowing on plant height, dry matter accumulation, seed yield, harvest index protein content and oil content of Indian mustard varieties

Treatment	Plant height	Dry matter accumulation	Seed yield (q ha ⁻¹)	Harvest index (%)	Protein content(%)	Oil content(%)
Varieties						
C.G. Sarson-1	168.50	60.25	13.32	27.36	18.20	37.48
DRMR150-35	195.70	72.15	15.71	27.39	33.00	39.80
Giriraj	160.80	66.30	14.05	27.41	21.00	40.80
Rukmani	162.40	70.20	14.68	27.15	32.00	41.50
SEm(±)	4.14	0.44	0.45	0.61	0.18	0.86
CD(5%)	11.85	1.27	1.30	NS	NS	2.55
Date of sowing						
20 November	166.10	74.10	14.32	25.72	18.72	37.83
30 November	160.50	70.60	13.80	25.75	18.51	37.40
10 December	120.65	56.25	11.20	25.87	18.36	37.20
20 December	111.30	45.85	7.17	26.29	18.18	35.49
30 December	101.30	38.30	6.71	28.76	17.96	34.72
SEm(±)	4.63	0.50	0.51	0.68	0.20	0.72
CD(5%)	13.25	1.42	1.45	NS	NS	NS

Conclusion

The present investigation demonstrated that dates of sowing and varieties influenced the growth, yield and quality of Indian mustard. DRMR 150-35 exhibited superior plant height, dry matter accumula-

tion and seed yield, whereas Rukmani recorded higher oil content. Among the sowing dates, 20 November sowing resulted in better growth and seed yield, while delayed sowing progressively reduced these parameters. The variety × date of sowing interaction was significant for seed yield, indicating differential varietal response to sowing

time. Thus, appropriate sowing time coupled with suitable varietal selection can contribute to improved productivity and quality of Indian mustard under the conditions of the present study.

References

1. Kumar V, Sharma AK, Yogi RK, Singh VV. Rapeseed-Mustard Cultivation in India: National Overview and Regional Insights with Reference to Madhya Pradesh. *Journal of Oilseed Brassica*. 2025;16(2):149-157.
2. Dudhade DD, Gare BN, Khade KK, Rames DG. Effect of sowing date on growth, yield attributes and yield of Indian mustard (*Brassica juncea*). *Indian Journal of Agronomy*. 1996;41(3):413-415.
3. Gomez KA, Gomez AA. *Statistical Procedures for Agricultural Research*. 2nd ed. New York: John Wiley & Sons; 1984.
4. Shekhawat K, Rathore SS, Premi OP, Kandpal BK, Chauhan JS. Advances in agronomic management of Indian mustard (*Brassica juncea* L. Czernj. & Cosson): An overview. *International Journal of Agronomy*. 2012.
5. Sharma, Kumar. Effect of date of sowing on growth, seed yield and economics of Indian mustard varieties under rainfed conditions. *Indian Journal of Agricultural Research*. 2023;57(1):56-59.
6. Akhter L, Singh L, Rasool R, Ramzan S. Effect of dates of sowing and varieties on yield of Brown Sarson (*B. rapa*) under temperate Kashmir. *International Journal of Engineering Science Invention*. 2015;4:65-69.
7. Gunasekera CP, Martin LD, Siddique KHM, Walton GH. Genotype by environment interactions of Indian mustard (*Brassica juncea* L.) and canola (*Brassica napus* L.) in Mediterranean-type environments: II. Oil and protein concentrations in seed. *European Journal of Agronomy*. 2006;25(1):13-21.
8. Gadpayale DP, Katiyar A, Singh L. Quality assessment of meal protein and oil of thirty four promising genotypes of mustard [*Brassica juncea* (L.) Czern. & Coss.]. *Journal of Oilseeds Research*. 2021;38(1):59-62.
9. Samota SK, Sharma R, Paliwal HB. Effect of different sowing dates and varieties on mustard growth and yield in Prayagraj conditions. *International Journal of Environment and Climate Change*. 2022;12(11):2316-2322.
10. Tripathi KBM, Gaur T, Pandey L, Singh A, Tiwari A, Prakash V, Rathore US, Singh RK. Effect of sowing dates on growth and yield of Indian mustard (*Brassica juncea* L.). *International Journal of Current Microbiology and Applied Science*. 2021;10(01):3046-3057.

How to cite this article: Sidar K, Tandon A, Suryavanshi S, Kumar R, Kanwar A. Effect of date of sowing on growth, yield and quality of Indian mustard varieties. *International Journal of Research in Agronomy*. 2026;9(10):423-425. doi: <https://www.doi.org/10.33545/2618060X.2026.v9.i10f.6816>