

## International Journal of Agriculture Extension and Social Development

Volume 9; Issue 8; August 2026; Page No. 91-93

Received: 11-05-2026  
Accepted: 15-06-2026

Indexed Journal  
Peer Reviewed Journal

### Effect of sowing time on growth and yield of wheat cultivars (*Triticum aestivum* L.)

Payal Yadav, Hansraj Shivran, Sidra Qidwai and Rahul Kumar Choudhary

Department of Agronomy, School of Agriculture, SGVU, Jaipur, Rajasthan, India

DOI: <https://www.doi.org/10.33545/26180723.2026.v9.i8b.3989>

Corresponding Author: Payal Yadav

#### Abstract

A field experiment was conducted at Agronomy farm, School of Agriculture, Suresh Gyan Vihar University, Jaipur (Rajasthan) during *Rabi*, 2025-26 in loamy sand soil with objective to study the "Effect of Sowing Time on Growth and Yield of Wheat Cultivars (*Triticum aestivum* L.)." A field experiment entitled "Effect of Sowing Time on Growth and Yield of Wheat Cultivars (*Triticum aestivum* L.)" was conducted on loamy sand soil at Research Farm, School of Agriculture, Suresh Gyan Vihar University, Jaipur during *Rabi* 2025-26 seasons. The maximum effective tillers, seed, stover, biological yield, nutrient uptake of wheat were recorded with 10 November over 25 Oct and 10 Dec but remained statistically at par with 25-Nov. The Raj 4037 recorded maximum effective tillers, seed, stover, biological yield, nutrient content and nutrient uptake of wheat over Raj 3765 and Raj 1482 and remained statistically at par with Raj 4079. The maximum gross return (₹169,938/ha) and net return (₹127,558/ha) were recorded under the 10 November sowing, which was significantly superior to 25 October, 25 November and 10 December sowing dates. The maximum gross return (₹167,312/ha) and net return (₹124,932/ha) were recorded with Raj 4037, which remained statistically at par with Raj 4079 and was significantly superior to Raj 3765 and Raj 1482.

**Keywords:** Wheat (*Triticum aestivum* L.), sowing time, wheat cultivars, Raj 4037, growth, yield

#### Introduction

India is self-sufficient in catering to the needs of major food staples like rice and wheat. On an average, wheat contributes to around 35% of total food grain production and 21% of cultivated area in the country (Tripathi *et al.*, 2017). In India, wheat (*Triticum aestivum* L.) is the second most important cereal crop after rice and pre-dominant winter season crop of north-western plains zone. Wheat is grown on 33.60 million hectares (m ha) lands with total production of 120.65 million tons (m t) contributes 34 per cent of the total food grain production in the country with the productivity of 3591 kg ha<sup>-1</sup> (Ministry of Agriculture, GOI 2025-26). Wheat Productivity has to be raised to meet ever increasing food demand in the country. In Rajasthan area under wheat crop is 3.59 m ha with production of 15.05 m t and productivity of 4197 kg ha<sup>-1</sup> (Ministry of Agriculture, GOR, 2025-26). Crop sowing at appropriate time provides favourable conditions for wheat growth and development (Tahir *et al.*, 2019). High yield can be obtained in early sowing due to extended duration at grain filling stage as delayed sowing causes the warmer conditions which reduces the growing season length that lead to decrease in yield (Alam *et al.*, 2022) [12]. Improper selection of varieties also affects crop yield because performance of varieties vary correspondingly with their genetic potential and adaptable environment, so there is scope for increasing yield of wheat with cultivation of climate resilient varieties (Alam *et al.*, 2022) [12].

#### Methods and Materials

The experiment was conducted during *rabi* 2025-26 at Agronomy farm, School of Agriculture, Suresh Gyan Vihar

University, Jaipur. Geographically, the study area is located at 75°48'84" E longitude and 26°82'47" N latitude and this region falls under agro-climatic zone III A (Semi-arid Eastern Plain Zone) of Rajasthan. The treatments in wheat during *rabi* seasons comprising 16 combinations having four sowing time 25<sup>th</sup> Oct, 10<sup>th</sup> Nov, 25<sup>th</sup> Nov and 10<sup>th</sup> Dec and four varieties (Raj- 3765, Raj-4037, Raj-4079 and Raj-1482) treatments was laid out in a factorial randomized block design with three replications. Wheat was sown at 22.5 cm row spacing using seed rate of 100 kg ha<sup>-1</sup>.

#### Results and Discussion

##### Effect of date of sowing

The highest number of effective tillers, number of grains per spike and spike length were recorded in the treatment 10-Nov, which was significantly superior to 25-Nov, 25-Oct and 10-Dec. This could be attributed to the favourable environmental conditions and enhanced translocation of photosynthates during the crop's reproductive stage. These findings are in close conformity with (Gurjar *et al.* 2024) [11]. The highest grain, straw and biological yield (4671, 6062 and 10733 kg ha<sup>-1</sup>) was recorded under 10 November sowing, which was significantly superior to 25 October, 25 November and 10 December sowing. Late sowing of wheat led to significantly reduced yields due to adverse growing conditions, including low temperatures and shortened vegetative periods (Gurjar *et al.* 2024 and Rajbanshi *et al.* 2025) [11, 14]. Its might be due to suitable environmental conditions received by crop plants for their growth and yield contributing characters ultimately yield of crop. The maximum gross return (₹169,938/ha) and net return

(₹127,558/ha) were recorded under the 10 November sowing, which was significantly superior to 25 October, 25 November and 10 December sowing dates. Net return increased by 20.88, 8.62 and 5.53 per cent over 10 December, 25 October and 25 November sowing, respectively. This is due to the fact that II fortnight of October sowing resulted in higher grain yield compared to other sowing dates leading to greater returns. Similar results were noted by Yusuf *et al.* 2019) [10]. The maximum B:C ratio (3.01) was recorded under the 10 November sowing, which was significantly superior to 25 October (2.77), 25 November (2.85) and 10 December (2.49) sowing dates. The increase in B:C ratio under 10 November sowing was to the extent of 20.88, 8.66 and 5.61 per cent over 10 December, 25 October and 25 November sowing, respectively Kumar *et al.* (2024) [9]. Patel *et al.* (2025) [7] reported that wheat sown during the optimum period generated significantly higher profitability and B:C ratio than early or late sowing because of better crop performance and higher marketable yield.

### Effect of varieties

Maximum effective tillers per plant, spike length and grains per spike were recorded with Raj 4037 over to Raj-3765 and Raj-1482 and remained statistically at par with Raj 4079. The per centage increased the number of effective tillers per plant with Raj-4037 in tune of 12.57, 9.38 and 4.24 per cent to Raj

1482. Variability among the varieties with respect to the number of tillers might be due to their genetic makeup (Kamboj *et al.* 2022) [3].

The maximum grain, straw and biological yield (4605, 5948 and 10553 kg/ha) was recorded with Raj 4037, which remained statistically at par with Raj 4079. However, Raj 4037 was found significantly superior to Raj 3765 and Raj 1482. Higher productivity of 4037 may be due to better growth performance, higher tillering, superior dry matter accumulation and improved yield attributes. Similar observations were reported by Rabiou *et al.* (2025) [5] and Loyal and Sharma (2026) [6], who found superior grain yield in high-performing wheat varieties.

The maximum gross return (₹167,312/ha) and net return (₹124,932/ha) were recorded with Raj 4037, which remained statistically at par with Raj 4079 and was significantly superior to Raj 3765 and Raj 1482. Net return under Raj 4037 increased by 11.17, 8.64 and 4.91 per cent over Raj 1482, Raj 3765 and Raj 4079, respectively. The maximum B:C ratio (2.95) was recorded with Raj 4037, which remained statistically at par with Raj 4079 (2.81) and was significantly superior to Raj 3765 (2.71) and Raj 1482 (2.65). The improved benefit-cost ratio can be attributed to the increased grain and stover yields achieved through optimal varietal selection, which led to higher gross returns and consequently enhanced profitability. Similar findings were reported by (Dhillon *et al.* 2016 and Khatik *et al.* 2021) [8, 2].

**Table 1:** Effect of sowing time on yield attributes of wheat cultivars

| Treatments     | Yield attributes of wheat   |                   |                  |
|----------------|-----------------------------|-------------------|------------------|
|                | Effective tillers per plant | Spike length (cm) | Grains per spike |
| Date of sowing |                             |                   |                  |
| 25-Oct         | 90.11                       | 6.24              | 33.81            |
| 10-Nov         | 101.19                      | 7.11              | 36.36            |
| 25-Nov         | 94.94                       | 6.81              | 35.28            |
| 10-Dec         | 84.78                       | 6.59              | 34.14            |
| SEm ±          | 1.46                        | 0.16              | 0.65             |
| CD 5%          | 4.21                        | 0.45              | 1.88             |
| Varieties      |                             |                   |                  |
| Raj 3765       | 90.75                       | 6.28              | 34.42            |
| Raj 4037       | 98.00                       | 7.19              | 36.00            |
| Raj 4079       | 95.22                       | 7.00              | 35.22            |
| Raj 1482       | 87.06                       | 6.28              | 33.94            |
| SEm ±          | 1.46                        | 0.16              | 0.65             |
| CD 5%          | 4.21                        | 0.45              | 1.88             |
| CV%            | 5.45                        | 8.11              | 6.46             |

**Table 2:** Effect of sowing time on yield of wheat cultivars

| Treatments     | Yield (kg/ha)       |                     |                          |
|----------------|---------------------|---------------------|--------------------------|
|                | Grain yield (kg/ha) | Straw yield (kg/ha) | Biological yield (kg/ha) |
| Date of sowing |                     |                     |                          |
| 25-Oct         | 4393                | 5701                | 10093                    |
| 10-Nov         | 4671                | 6062                | 10733                    |
| 25-Nov         | 4472                | 5874                | 10346                    |
| 10-Dec         | 4052                | 5321                | 9373                     |
| SEm ±          | 70                  | 81                  | 145                      |
| CD 5%          | 202                 | 234                 | 419                      |
| Varieties      |                     |                     |                          |
| Raj 3765       | 4338                | 5575                | 9913                     |
| Raj 4037       | 4605                | 5948                | 10553                    |
| Raj 4079       | 4436                | 5767                | 10203                    |
| Raj 1482       | 4208                | 5668                | 9876                     |
| SEm ±          | 70                  | 81                  | 145                      |
| CD 5%          | 202                 | 234                 | 419                      |
| CV%            | 5.5                 | 5.9                 | 5.3                      |

**Table 3:** Effect of sowing time on economics of wheat cultivars

| Treatments            | Return (₹/ha) |            |           |
|-----------------------|---------------|------------|-----------|
|                       | Gross return  | Net return | B:C ratio |
| <b>Date of sowing</b> |               |            |           |
| 25-Oct                | 159810        | 117430     | 2.77      |
| 10-Nov                | 169938        | 127558     | 3.01      |
| 25-Nov                | 163255        | 120875     | 2.85      |
| 10-Dec                | 147914        | 105534     | 2.49      |
| SEm ±                 | 2394          | 2394       | 0.06      |
| CD 5%                 | 6913          | 6913       | 0.16      |
| <b>Varieties</b>      |               |            |           |
| Raj 3765              | 157378        | 114998     | 2.71      |
| Raj 4037              | 167312        | 124932     | 2.95      |
| Raj 4079              | 161467        | 119087     | 2.81      |
| Raj 1482              | 154760        | 112380     | 2.65      |
| SEm ±                 | 2394          | 2394       | 0.06      |
| CD 5%                 | 6913          | 6913       | 0.16      |
| CV%                   | 5.2           | 7.1        | 7.0       |

## References

- Government of India. Agricultural Statistics at a Glance 2024-25. New Delhi: Ministry of Agriculture and Farmers Welfare, Government of India; 2024-2025.
- Khatik P, Yadav LR, Gupta AK, Prajapat OP, Verma HP. Performance of bread wheat (*Triticum aestivum*) varieties for productivity, profitability and nutrient uptake under different sowing dates and nitrogen levels. *Indian J Agron*. 2021;66(2):163-169.
- Kamboj E, Singh B, Dhaka AK, Singh K, Kumar S. Growth and yield performance of wheat (*Triticum aestivum* L.) varieties under different sowing times. *Environ Ecol*. 2022;40(1):28-32.
- Government of India. Agricultural Statistics at a Glance 2024-25. New Delhi: Ministry of Agriculture and Farmers Welfare, Government of India; 2024-2025.
- Rabiu RT, Abdulrahman AB, Abdullahi AT, Samaila A, Shittu EA. Productivity of wheat (*Triticum aestivum* L.) varieties as influenced by seed rate and plant population density in the Nigerian Sahel Savanna. 2025.
- Loyal M, Sharma PK. Effect of sowing dates on growth and yield performance of different wheat (*Triticum aestivum* L.) varieties. *Int J Agric Food Sci*. 2026;8(7):165-169.
- Patel HK, Chaudhary M, Yadav S, Meena RS. Effect of sowing time on productivity, nutrient use efficiency and economics of wheat (*Triticum aestivum* L.) under irrigated conditions. *Indian J Agric Sci*. 2025;95(4):487-492.
- Dhillon RS, Bhardwaj KK, Beniwal RS, Bangarwa KS, Kumari S, Godara AS. Performance of wheat as intercrop under different spacings of poplar plantations in semi-arid ecosystem of northern India. *Indian J Ecol*. 2016;43(1):323-327.
- Kumar R, Singh V, Kumar P, Meena RK. Effect of sowing time on productivity, profitability and resource-use efficiency of wheat (*Triticum aestivum* L.). *J Cereal Res*. 2024;16(2):145-152.
- Yusuf M, Kumar S, Dhaka AK, Singh B, Bhuker A. Effect of sowing dates and varieties on yield and quality performance of wheat (*Triticum aestivum* L.). *Agric Sci Dig*. 2019;39(4):306-310.
- Gurjar MK, Singh A, Choudhary V, Sharma D. Effect of date of sowing on growth, yield attributes and productivity of different varieties of wheat (*Triticum aestivum* L.). *Int J Res Agron*. 2024;7(9):810-813.
- Alam MS, Kumar R, Patel JN. Effect of sowing dates and varieties on the nutrient uptake and economics of wheat crop (*Triticum aestivum* L.) under changing climate. *Pharma Innov J*. 2022;11(2):533-538.
- Kantwa CR, Saras PK, Vyas KG, Chaudhari HL, Choudhary RR, Patel SA, *et al*. Effect of wheat varieties and integrated nutrient management practices on nutrient content, uptake and soil nutrient status. *Indian J Agric Res*. 2025;59(2):239-243.
- Rajbanshi D, Sharma R, Bohara B, Chaudhary A, Rasali P, Magar SG. Effect of sowing dates on different wheat varieties at Tikapur, Kailali, Nepal. *Nepal Agric Res J*. 2025;16(1):65-82.